# Neuroplasticity in post-stroke aphasia: A systematic review and meta-analysis of functional imaging studies of reorganization of language processing

#### Supplementary Tables

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#### Note

Interactive tables with hyperlinks and tooltips can be accessed at: <u>https://langneurosci.org/aphasia-neuroplasticity-review</u>

# Supplementary Table S1. Participants: Cohorts

Study	Language	Inclusion criteria	N	N		Notes
Weiller et al. (1995)	German	Lesion including L pSTG; moderate-to- severe Wernicke's aphasia in the subacute period; now recovered and not aphasic per formal testing; able to perform verb generation task	<u>e</u>	control 6	reus N	6 patients were selected from a database of 600 carefully documented cases
Belin et al. (1996)	French	MCA; persistent severe non-fluent aphasia followed by marked improvement with MIT	<u>7</u>	0	Ν	
Ohyama et al. (1996)	Japanese	Able to repeat single words	<u>16</u>	6	Ν	
Heiss et al. (1997)	German	_	<u>6</u>	6	Ν	
Karbe et al. (1998)	German	MCA; able to repeat single words	<u>12</u>	10	Ν	Only 7 of the 12 patients took part at T2
Cao et al. (1999)	US English	Aphasia with significant recovery over months to years (ADPASS > 70th percentile)	<u>6</u>	37	Ν	2 additional patients excluded: 1 unable to reliably describe performance post-scan; 1 due to head motion
Heiss et al. (1999)	German	AAT repetition $\geq$ 50	23	11	Ν	
Kessler et al. (2000)	German	Mild to moderate aphasia on TT; at least 50 out of 150 on AAT repetition	24	0	Ν	
Rosen et al. (2000)	US English	L IFG, possibly extending to neighboring regions	<u>6</u>	14	Y	1 participant was reported in a previous case study; of the 14 controls, 6 were studied with PET and 8 with fMRI
Blasi et al. (2002)	US English	L IFG, possibly extending to neighboring regions	<u>8</u>	14	Ν	
Leff et al. (2002)	UK English	_	<u>15</u>	8	Ν	
Blank et al. (2003)	UK English	Initial non-fluent aphasia due to anterior perisylvian lesion; subsequently recovered the ability to speak in sentences; patients were divided into those with and without damage to the IFG pars opercularis (POp+: n = 7; POp-: n = 7)	<u>14</u>	12	Ν	8 of 12 controls included in Blank et al. (2002)
Cardebat et al. (2003)	French	No severe aphasia; no leukoaraiosis	<u>8</u>	6	Ν	
Sharp et al. (2004)	UK English	Lesion in vicinity of L STG; no extensive frontal damage; no inferior temporal damage; able to perform tasks	<u>9</u>	18	Ν	
Zahn et al. (2004)	German	Global aphasia in the first three months; some improvement of comprehension within 6-12 months	<u>7</u>	14	Ν	
Crinion & Price (2005)	UK English	-	<u>17</u>	18	Ν	
de Boissezon et al. (2005)	French	Subcortical stroke; no severe aphasia	<u>7</u>	0	Ν	
Connor et al. (2006)	US English	L IFG, possibly extending to neighboring regions	<u>8</u>	14	Y	Re-analysis of data from Blasi et al. (2002)
Crinion et al. (2006)	UK English	-	24	11	Ν	Results of control participants previously reported in Crinion et al. (2003)
Saur et al. (2006)	German	MCA; age < 70 years; able to distinguish forward vs backward speech outside the scanner; no pronounced small vessel disease	<u>14</u>	14	N	4 additional patients excluded: 1 health problems; 1 scanner noise; 2 did not tolerate fMRI; 198 patients with aphasia were screened
Meinzer et al. (2008)	German	-	<u>11</u>	0	Ν	

Raboyeau et al. (2008)	French	Naming deficit; good comprehension	<u>10</u>	20	Ν	
Richter et al. (2008)	German	Main deficits in production rather than comprehension	<u>16</u>	8	Ν	8 additional patients excluded: 5 completed only one of the two sessions; 3 unable to perform the tasks
de Boissezon et al. (2009)	French	Only part of L MCA; able to perform word generation; no severe aphasia	<u>13</u>	0	Y	7 out of 13 patients appear to represent the same data reported in de Boissezon et al. (2005)
Fridriksson et al. (2009)	US English	-	<u>11</u>	10	Ν	
Menke et al. (2009)	German	Moderate to severe anomia	<u>8</u>	9	Ν	
Specht et al. (2009)	German	_	<u>12</u>	12	Ν	15 controls were scanned but 3 were randomly excluded to match group sizes for jICA.
Warren et al. (2009)	UK English	Comprehension deficit per CAT and TROG (1 patient did not meet this criterion); anterolateral superior temporal cortex spared	<u>16</u>	11	Y	8 additional patients excluded: lesions involved L anterolateral superior temporal cortex; reanalysis of subset of dataset from Crinion et al. (2006)
Chau et al. (2010)	Cantonese	_	<u>7</u>	0	Ν	
Fridriksson (2010)	US English	_	<u>19</u>	0	Υ	7 additional patients excluded: 6 for making fewer than 5 correct responses in one or more sessions; 1 for excessive head motion; "several" patients overlapped with those reported by Fridriksson et al. (2009, 2010); demographic data includes excluded patients
Fridriksson et al. (2010)	US English	-	<u>15</u>	9	Ν	
Sharp et al. (2010)	UK English	Lesion in vicinity of L STG; no extensive frontal damage; no inferior temporal damage; able to perform tasks	<u>9</u>	18	Y	Additional analysis of same dataset as Sharp et al. (2004)
Thompson et al. (2010)	US English	Agrammatic	<u>6</u>	12	Ν	
Tyler et al. (2010)	UK English	-	<u>14</u>	10	Ν	2 of the 14 patients were not stroke, but were post resective surgery
van Oers et al. (2010)	Dutch	MCA; mRS < 3; able to perform at least 2 out of the 3 tasks	<u>13</u>	13	Ν	
Papoutsi et al. (2011)	UK English	_	<u>14</u>	15	Y	Reanalysis of same dataset from Tyler et al. (2011); 1 patient had post-surgical haematoma rather than stroke (per Tyler et al., 2011)
Sebastian & Kiran (2011)	US English	-	<u>8</u>	8	Ν	
Szaflarski et al. (2011)	US English	Moderate aphasia, L MCA	<u>8</u>	0	Ν	3 additional patients excluded: 2 metallic artifact; 1 seizure at time of stroke
Tyler et al. (2011)	UK English	_	<u>14</u>	15	Y	Not stated, but it seems like most of the patients also participated in Tyler et al. (2010); 1 patient had post-surgical haematoma rather than stroke
Weiduschat et al. (2011)	German	Age 55-85	<u>10</u>	0	Ν	4 additional patients excluded: 3 malfunction of TMS device or claustrophobia; 1 recovered nearly completely prior to intervention
Allendorfer et al. (2012)	US English	MCA; moderate-severe aphasia; mRS ≤ 3	<u>16</u>	32	Y	"Part of a larger ongoing study", may overlap with other studies from this group
Fridriksson, Hubbard, et al. (2012)	US English	Broca's aphasia	<u>10</u>	20	Ν	3 additional patients excluded: 1 due to a metal implant; 2 for severely non-fluent

						speech; demographic data includes excluded patients
Fridriksson, Richardson, et al. (2012)	US English	_	29	14	Y	1 additional patient excluded: contraindications to MRI; 26 of 30 patients were included in Fridriksson (2010); demographic data includes excluded patient
Marcotte et al. (2012)	Canadian French	Moderate-severe aphasia; anomia	<u>9</u>	0	Ν	
Schofield et al. (2012)	UK English	Comprehension deficit	<u>20</u>	26	Υ	1 additional patient excluded: excessive head motion; patients recruited from database so may have participated in prior studies from this group, but not stated explicitly; demographic data includes excluded patient
Wright et al. (2012)	UK English	_	<u>21</u>	21	Y	Unclear how many, if any, patients were included in previous studies from this group; design is identical to Tyler et al. (2010); 3 of the 21 patients were not stroke, but were post resective surgery
Szaflarski et al. (2013)	US English	_	27	0	Ν	
Thiel et al. (2013)	German	_	24	0	Ν	6 additional patients excluded: 4 did not tolerate MRI or PET scans; 2 TMS device was defective
Abel et al. (2014)	German	Anomia; no severe AoS or dysarthria	<u>14</u>	0	Ν	9 additional patients excluded: 4 for ceiling performance; 5 for technical problems
Benjamin et al. (2014)	US English	"at least minimal evidence of non-fluent output"; lesion including precentral gyrus or underlying white matter	<u>14</u>	0	Ν	
Brownsett et al. (2014)	UK English	No involvement of ACA territory	<u>16</u>	17	Ν	3 additional patients excluded: 2 withdrew after attempting first scan; 1 had severe dysarthria
Mattioli et al. (2014)	Italian	L MCA; comprehension mildly impaired	<u>12</u>	10	Ν	Treated and untreated groups differed in severity at baseline, albeit not significantly
Mohr et al. (2014)	UK English	MCA; mild-moderate non-fluent aphasia; no severe comprehension deficit	<u>6</u>	0	Ν	6 additional patients excluded: 4 for health risks; 2 for technical problems and data loss; patient numbers in tables 1 and 2 appear not to correspond with patient numbers later in the paper
Robson et al. (2014)	UK English	Wernicke's aphasia (impaired spoken single word comprehension, impaired single word repetition, fluent, sentence- like speech with phonological/neologistic errors)	<u>12</u>	12	Ν	
Szaflarski et al. (2014)	US English	_	32	32	Y	Some participants included in Allendorfer et al. (2012); one participant was < 18 years old at time of stroke; there was also a perinatal stroke group, not relevant for this review; 3 participants were excluded but it is not stated whether they were adult or perinatal patients.
van Hees et al. (2014)	Australian English	-	<u>8</u>	14	Ν	
Abel et al. (2015)	German	Anomia; no severe AoS or dysarthria	<u>14</u>	14	Y	9 additional patients excluded: 4 for ceiling performance; 5 for technical problems; same dataset as Abel et al. (2014)
Kiran et al. (2015) Sandberg et al. (2015)	US English US English	Impaired naming —	<u>8</u> 10	8 0	N N	

Geranmayeh et al. (2016)	UK English	No severe receptive aphasia	53	24	Ν	Prior strokes were allowed only if no aphasia resulted
Griffis et al. (2016)	US English	Moderate aphasia, L MCA	8	0	Y	3 additional patients excluded: 2 metallic artifact; 1 seizure at time of stroke; same patients as Szaflarski et al. (2011); different fMRI paradigm acquired in the same sessions
Sims et al. (2016)	US English	Some spared tissue in L IFG	<u>14</u>	8	Y	2 additional patients excluded: 1 had no spared tissue in the L IFG; 1 had a R hemisphere stroke; although not stated, it is apparent that many of the patients were included in Sandberg et al. (2015)
Darkow et al. (2017)	German	L hand motor area spared; mild aphasia	<u>16</u>	16	Ν	
Geranmayeh et al. (2017)	UK English	_	27	0	Y	Patients are a subset of those in Geranmayeh et al. (2016); 24 control participants are described, but no imaging data from the controls are analyzed in this paper
Griffis, Nenert, Allendorfer, & Szaflarski (2017)	US English	_	43	43	Y	Same dataset as Griffis et al. (2017) Hum Brain Mapp
Griffis, Nenert, Allendorfer, Vannest, et al. (2017)	US English	_	43	43	Y	Data were collected as part of "several separate studies"
Harvey et al. (2017)	US English	Mild-moderate non-fluent aphasia; relatively intact comprehension; able to produce meaningful words and phrases	<u>6</u>	0	Ν	
Nardo et al. (2017)	UK English	Anomia; good single word comprehension; relatively spared word and nonword repetition; no AoS; spared or partially spared L IFG	<u>18</u>	0	N	
Nenert et al. (2017)	US English	At least mild aphasia per TT	<u>19</u>	38	Y	Patients are a subset of the 24 participants in Szaflarski et al. (2015), a clinical trial on CIAT
Qiu et al. (2017)	Mandarin	Broca's aphasia	<u>10</u>	10	Ν	
Skipper-Kallal et al. (2017a)	US English	Able to name 20% of pictures correctly in the scanner	32	25	Y	14 additional patients excluded: < 20% accuracy in scanner; 29 of the participants overlap with the other Skipper-Kallal et al. (2017) paper
Skipper-Kallal et al. (2017b)	US English	10% accuracy on scanner task	39	37	Y	10 additional patients excluded: < 10% accuracy in scanner; 29 of the participants overlap with the other Skipper-Kallal et al. (2017) paper
Dietz et al. (2018)	US English	_	<u>12</u>	0	Y	2 additional patients excluded: 1 for illness; 1 for MRI contraindication or personal conflict (inconsistent information provided); same data as Dietz et al. (2016), which is a methodological paper
Hallam et al. (2018)	UK English	Semantic aphasia; left frontal damage (+ other regions, typically)	<u>14</u>	16	Ν	
Nenert et al. (2018)	US English	Aphasia at acute screening (not necessarily at first study time point)	<u>17</u>	85	Ν	1 additional patient excluded: significant signal artifacts; presence and severity of aphasia assessed on hospital admission, not at first study time point, so it is not clear that all participants actually had aphasia at first study time point
Pillay et al. (2018)	US English	Residual phonologic retrieval deficit; intact semantic processing	21	0	N	

Szaflarski et al. (2018)	US English	-	<u>12</u>	0	Ν	1 additional patient excluded: scanned at only 2 out of 3 time points
van de Sandt- Koenderman et al. (2018)	Dutch	Severe non-fluent aphasia (< 50 words/minute); articulation deficits; repetition severely affected; moderate- good auditory comprehension	<u>9</u>	0	Ν	
van Oers et al. (2018)	Dutch	MRS $\leq$ 3; ability to perform tasks	<u>12</u>	8	Ν	
Barbieri et al. (2019)	US English	_	<u>18</u>	23	N	1 additional patient excluded: developed a hematoma between baseline and post- testing; one patient had two strokes within one day, but we would consider that essentially a single stroke
Johnson et al. (2019)	US English	Anomia	30	17	Ν	5 additional patients excluded: 2 withdrew from non-treatment arm; 3 fMRI acquisition errors; 1 did not complete treatment and post-treatment scanning (but of these latter 4, one must have at least completed the non-treatment arm); there were 26 patients in the treated group and 10 in the untreated group, but 6 patients overlapped between the two groups (they joined the treated group after completing the untreated phase)
Kristinsson et al. (2019)	US English	< 80% on PNT; able to name at least 5 out of 40 items during fMRI; WAB-R spontaneous speech ≥ 2; WAB-R auditory comprehension ≥ 2	87	0	Y	65 were previously included in Fridriksson et al. (2018), a tDCS study
Purcell et al. (2019)	US English	Chronic dysgraphia (acquired impairment in spelling)	<u>21</u>	0	Ν	4 additional patients excluded: 3 health reasons; 1 data acquisition error
Sreedharan, Chandran, et al. (2019)	Malayalam	Broca's aphasia or anomic aphasia; comprehension relatively preserved; "motivated for speech therapy"	<u>8</u>	4	Ν	3 additional patients excluded: 2 for claustrophobia; 1 for transportation issues
Hartwigsen et al. (2020)	German	Lesion involving left temporo-parietal cortex and sparing left frontal cortex; relatively well-recovered	<u>12</u>	0	Ν	2 additional patients excluded: 1 lost to follow-up; 1 did not show any sound- related neural activation in auditory cortex after sham cTBS
Stockert et al. (2020)	German	Lesion localized to frontal or temporal cortex	34	17	Υ	50 additional patients excluded: 19 lesions spanned frontal and temporal, or were subcortical, or had persisting large vessel occlusions; 31 not all three timepoints were acquired; 8 patients were included in Saur et al. (2006); there may also be overlap with Saur et al. (2010), a study that did not meet our inclusion criteria; 1630 patients screened for inclusion; frontal patients scanned later than temporal patients at T1 and T2

N aphasia = Number of individuals with aphasia; N control = Number of control participants; Data reuse = Were any of the participants included in any previous studies?; AAT = Aachen Aphasia Test; ACA = anterior cerebral artery; ADPASS = Aphasia Diagnostic Profiles Aphasia Severity Score; AoS = apraxia of speech; CAT = Comprehensive Aphasia Test; CIAT = constraint-induced aphasia therapy; fMRI = functional magnetic resonance imaging; IFG = inferior frontal gyrus; JICA = joint independent components analysis; L = left; MCA = middle cerebral artery; MIT = melodic intonation therapy; mRS = modified Rankin Scale; N = No; PET = positron emission tomography; POp+ = pars opercularis damaged; POp- = pars opercularis spared; pSTG = posterior superior temporal gyrus; R = right; STG = superior temporal gyrus; T1, T2, etc. = first time point, second time point, etc.; TMS = transcranial magnetic stimulation; TROG = Test for Reception of Grammar; TT = Token Test; Y = Yes; Yellow underline = minor limitation; Orange underline = moderate limitation.

## Supplementary Table S2. Participants: Demographic data

Study	Age	Sex	Handedness	Time post onset
Weiller et al. (1995)	N (mean 58 years, range 50-66 years; controls were younger: mean 35 years; range 27-50 years)	Y (6 M/0 F)	Y (6 R/0 L)	Y (range 5-117 months)
Belin et al. (1996)	Y (mean 49.7 years, range 40-58 years)	N	Y (7 R/0 L)	Y (range 15-149 months; including MIT for the most recent 1-108 months)
Ohyama et al. (1996)	Y (mean 56.6 ± 11.8 years, range 38- 75 years)	Y (12 M/4 F)	Y (16 R/0 L)	<u>N*</u> (mean 15.1 ± 16.7 months, range 1.1-50.3 months; a mix of subacute and chronic participants; 8 of each)
Heiss et al. (1997)	Y (range 33-66 years)	Y (4 M/2 F)	Y (6 R/0 L)	Y (T1: ~4 weeks; T2: ~12-18 months)
Karbe et al. (1998)	<u>N</u> (mean 57 years, range 34-78 years; controls not matched for age)	Y (7 M/5 F); stated to be not matched, but difference not significant	Y (12 R/0 L)	Y (T1: mean 24 ± 11 days, ~3-4 weeks; T2: mean 19 ± 2 months, > 1 year)
Cao et al. (1999)	Y (range 20-56 years)	Y (1 M/5 F)	Y (6 R/0 L)	Y (range 5-32 months)
Heiss et al. (1999)	Y (mean 56 ± 12 years, range 31-77 years; assume patient's age of 5.6 years is a typo for 56 years)	Y (15 M/8 F)	Y (23 R/0 L)	Y (T1: ~2 weeks; T2: ~8 weeks)
Kessler et al. (2000)	Y (piracetam group: mean 57.4 ± 13.5 years; placebo group: mean 56.3 ± 10.0 years)	Y (13 M/11 F)	Y (24 R/0 L)	Y (T1: ~2 weeks; T2: ~8 weeks)
Rosen et al. (2000)	<u>N</u> (mean 47 years, range 32-72 years; control participants not age- matched)	Y (3 M/3 F)	Y (6 R/0 L)	Y (range 0.5-7.6 years)
Blasi et al. (2002)	<u>N</u> (mean 48.6 years; patients and controls not closely matched for age, unclear if difference significant)	Y (2 M/6 F)	Y (8 R/0 L)	<u>N</u> (> 6 months; actual TPO not stated)
Leff et al. (2002)	Y (range 43-76 years)	Y (11 M/4 F)	Y (11 R/0 L)	Y (range 5-76 months)
Blank et al. (2003)	Y (POp+: median 50 years, range 36- 72 years; POp-: median 61 years, range 39-70 years)	Y (8 M/6 F)	Y (14 R/0 L)	Y (POp+: median 39 months, range 19-134 months; POp-: median 17 months, range 6-240 months)
Cardebat et al. (2003)	Y (mean 58.4 ± 11.9 years, range 37- 73 years)	Y (7 M/1 F)	Y (8 R/0 L)	<u>N*</u> (T1: 58 ± 35 days, range 11-113 days; T2: 11.7 ± 1.6 months, range 320-460 days; T1 varies considerably from early to late subacute)
Sharp et al. (2004)	Y (median 58 years, range 39-72 years)	Y (8 M/1 F)	Y (9 R/0 L)	Y (mean 45 months, range 14-145 months)
Zahn et al. (2004)	Y (range 29-67 years)	Y (6 M/1 F)	Y (7 R/0 L)	Y (range 6 months-4 years)
Crinion & Price (2005)	Y (mean 62 ± 2.7 SEM years, range 34-75 years)	Y (12 M/5 F)	Y (17 R/0 L)	Y (range 4-125 months; aphasia with temporal damage (n=8) mean 41 months; aphasia without temporal damage (n=9) mean 48 months)
de Boissezon et al. (2005)	Y (mean 52.4 ± 13 years, range 31-69 years)	Y (7 M/0 F)	Y (7 R/0 L)	N <sup>*</sup> (T1: mean 53 ± 35 days, range 11- 108 days; T2: mean 12.2 ± 1.4 months; T1 varies considerably from early to late subacute)
Connor et al. (2006)	<u>N</u> (mean 48.6 years; patients and controls not closely matched for age, unclear if difference significant)	Y (2 M/6 F)	Y (8 R/0 L)	<u>N</u> (> 6 months; actual TPO not stated)
Crinion et al. (2006)	Y (range 32-85 years)	Y (18 M/6 F)	Y (24 R/0 L)	<u>N</u> (mean 32 months, range 2-204 months; combines subacute and chronic patients)
Saur et al. (2006)	Y (mean 51.9 ± 14.2 years, range 16- 68 years)	Y (11 M/3 F)	Y (12 R/1 L)	Y (T1 acute: mean 1.8 days, range 0-4 days; T2 subacute: mean 12.1 days,

				range 3-16 days; T3 chronic: mean 321 days, range 102-513 days)
Meinzer et al. (2008)	Y (median 51.0 years, range 19-66 years)	Y (7 M/4 F)	Y (11 R/0 L)	Y (median 32 months; range 6-480 months)
Raboyeau et al. (2008)	<u>N</u> (mean 53.8 ± 14.7 years; controls were younger)	Y (6 M/4 F)	Y (10 R/0 L)	Y (range 7-102 months)
Richter et al. (2008)	Y (mean 58.3 years; range 42-73 years)	Y (12 M/4 F)	Y (16 R/0 L)	<u>N</u> (> 12 months; actual TPO not stated)
de Boissezon et al. (2009)	Y (range 31.2-74.2 years)	Y (12 M/1 F)	Y (13 R/0 L)	N* (T1: mean 64 ± 32 days; T2: mean 11.8 ± 1.4 months; T1 varies considerably from early to late subacute)
Fridriksson et al. (2009)	Y (mean 58.8 ± 14.7 years, range 33- 78 years)	Y (6 M/5 F)	<u>N</u>	Y (range 10-101 months)
Menke et al. (2009)	Y (range 34-67 years)	Y (5 M/3 F)	Y (8 R/0 L)	Y (range 1.8-6.9 years)
Specht et al. (2009)	<u>N</u> (mean 49 + 14 years, range 30-71 years; controls were younger)	Y (9 M/3 F)	<u>N</u>	<u>N</u> (mean 1.9 ± 1.4 years, range 0.2- 3.7 years; one non-chronic patient is included)
Warren et al. (2009)	<u>N</u> (mean 65.8 ± 2.0 SEM years; controls were younger)	Y (11 M/5 F)	Y (16 R/0 L)	<u>N</u> (mean 28.8 ± 9.2 months SEM; minimum time post onset not reported, but some patients in Crinion et al. (2006) were subacute)
Chau et al. (2010)	Y (mean 63 ± 10 years, range 56-79 years)	Y (5 M/2 F)	Y (7 R/0 L)	Y (mean 17 ± 8 months, range 8-28 months)
Fridriksson (2010)	Y (mean 59.7 ± 12.3 years)	Y (12 M/14 F)	N	Y (> 8 months; actual TPO not stated)
Fridriksson et al. (2010)	Y (mean 61.9 years, range 41-81 years)	<u>N</u> (7 M/8 F); not stated for controls	N	Y (mean 29.7 months, > 6 months)
Sharp et al. (2010)	Y (median 58 years, range 39-72 years)	Y (8 M/1 F)	Y (9 R/0 L)	Y (mean 45 months, range 14-145 months)
Thompson et al. (2010)	Y (mean 54 years, range 38-66 years)	Y (5 M/1 F)	Y (6 R/0 L)	Y (range 6-146 months)
Tyler et al. (2010)	Y (mean 54 years, range 33-76 years)	Y (11 M/3 F)	Y (14 R/0 L)	Y (mean 7 years, range 1.4-37.3 years)
van Oers et al. (2010)	Y (mean 53 ± 14 years, range 29-74 years)	Y (4 M/9 F)	<u>N</u> (13 R/0 L); not stated for controls	Y (range 1.3-4.7 years)
Papoutsi et al. (2011)	Y (mean 56 ± 12 years, range 35-77 years)	Y (11 M/3 F)	Y (14 R/0 L)	Y (mean 8 ± 9 years, range 2-40 years)
Sebastian & Kiran (2011)	Y (range 40-79 years)	<u>N</u> (5 M/3 F); control sex not stated, but reported to be matched	Y (8 R/0 L)	Y (mean 48.3 months, range 30-78 months)
Szaflarski et al. (2011)	Y (mean 54.4 ± 12.7 years)	Y (4 M/4 F)	Y (8 R/0 L)	Y (mean 5.3 ± 3.6 years, > 12 months)
Tyler et al. (2011)	Y (mean 56 years, range 34-77 years)	Y (11 M/3 F)	Y (14 R/0 L)	Y (mean 7 years, > 1.5 years)
Weiduschat et al. (2011)	Y (range 59-83 years)	Y (5 M/5 F)	Y (10 R/0 L)	Y (range 18-97 days; patients at different subacute stages of recovery)
Allendorfer et al. (2012)	Y (mean 54.4 ± 9.5 years, range 38-78 years)	Y (9 M/7 F)	Y (16 R/0 L)	Y (mean 3.7 ± 3.5 years, range 0.5- 11.4 years)
Fridriksson, Hubbard, et al. (2012)	Y (mean 56.9 ± 9.2 years, range 45-75 years)	N (9 M/4 F); control sex not matched	Y (12 R/1 L)	Y (mean 63.8 ± 64.3 months, range 10-261 months)
Fridriksson, Richardson, et al. (2012)	Y (mean 59.2 years, range 33-81 years)	<u>N</u> (14 M/16 F); not stated for controls	<u>N</u>	Y (mean 51.1 months, range 6-350 months)
Marcotte et al. (2012)	Y (mean 62 ± 6.0 years, range 50-67 years)	Y (5 M/4 F)	Y (9 R/0 L)	Y (mean 110.2 ± 92.5 months, range 50-300 months)

			N	
Schofield et al. (2012)	Y (range 35.8-90.3 years)	<u>N</u> (16 M/4 F); control sex not stated	N	Y (mean 3.5 years, range 0.6-8.6 years)
Wright et al. (2012)	Y (mean 57.4 ± 12.5 years)	Y (15 M/6 F)	Y (21 R/0 L)	Y (mean 6.5 ± 7.5 years, > 1.4 years)
Szaflarski et al. (2013)	Y (recovered: mean 50 ± 13 years; non-recovered: mean 51 ± 13 years)	Y (15 M/12 F)	Y (27 R/0 L)	Y (recovered: mean 2.1 ± 2.1 years; non-recovered: mean 4.9 ± 3.1 years)
Thiel et al. (2013)	Y (rTMS group: mean 69.8 ± 8.0 years; sham group: mean 71.2 ± 7.8 years)	N	Y (24 R/0 L)	Y (rTMS group: mean 37.5 ± 18.5 days; sham group: mean 50.6 ± 22.6 days)
Abel et al. (2014)	Y (median 48 years, range 35-74 years)	Y (10 M/4 F)	Y (14 R/0 L)	Y (median 41 months, range 11-72 months)
Benjamin et al. (2014)	Y (intention group: mean 72.1 ± 10.5 years; control group: mean 63.0 ± 9.2 years)	Y (8 M/6 F)	Y (14 R/0 L)	Y (intention group: mean 37.4 ± 33.5 months, range 12-87 months; control group: 38.1 ± 37.4 months, range 10-112 months)
Brownsett et al. (2014)	Y (mean 60 years, range 37-84 years)	Y (11 M/5 F)	Y (16 R/0 L)	Y (mean 4 years, range 6 months-11 years)
Mattioli et al. (2014)	<u>N</u> (range 37-79 years; control ages not reported, though reported to be matched)	<u>N</u> (7 M/5 F); control sex not stated, but reported to be matched	Y (12 R/0 L)	Y (T1: mean 2.2 ± 1.3 days; T2: mean 16.2 ± 1.3 days; T3: mean 190 ± 25.5 days)
Mohr et al. (2014)	Y (range 41-76 years)	Y (5 M/1 F)	Y (6 R/0 L)	Y (range 17-234 months (including excluded patients))
Robson et al. (2014)	Y (mean 70.1 ± 8.7 years, range 59-87 years)	Y (10 M/2 F)	Y (12 R/0 L)	Y (range 7-84 months)
Szaflarski et al. (2014)	Y (mean 51.8 ± 15.1 years)	Y (18 M/14 F)	<u>N</u>	Y (mean 3.2 ± 3.1 years, > 6 months)
van Hees et al. (2014)	Y (mean 56.4 + 9.2 years; range 41-69 years)	Y (3 M/5 F)	Y (8 R/0 L)	Y (mean 52.3 + 49.8 months; range 17-170 months)
Abel et al. (2015)	Y (median 48 years, range 35-74 years)	Y (10 M/4 F)	Y (14 R/0 L)	Y (median 41 months, range 11-72 months)
Kiran et al. (2015)	Y (mean 58 years)	Y (7 M/1 F)	N	Y (range 15-157 months)
Sandberg et al. (2015)	Y (mean 59 years, range 47-75 years)	Y (7 M/3 F)	Y (10 R/0 L)	Y (range 7-134 months)
Geranmayeh et al. (2016)	Y (mean 62 ± 14 years, range 26-83 years)	<u>N</u> (32 M/21 F); controls were mostly female, unlike patients	Y (50 R/3 L)	Y (mean 111 ± 27 days, range 84-200 days)
Griffis et al. (2016)	Y (mean 54.4 ± 12.7 years)	Y (4 M/4 F)	Y (8 R/0 L)	Y (mean 5.3 ± 3.6 years)
Sims et al. (2016)	Y (mean 59.7 years, range 48-75 years)	Y (10 M/4 F)	Y (14 R/0 L)	Y (mean 6 years, range 6 months-13 years)
Darkow et al. (2017)	Y (mean 56.7 ± 10.1 years)	Y (10 M/6 F)	Y (16 R/0 L)	Y (mean 54.3 ± 45.3 months, range 12-169 months)
Geranmayeh et al. (2017)	Y (mean 59.1 ± 10.8 years, range 39- 77 years)	Y (18 M/9 F)	Y (26 R/1 L)	Y (T1: 15 ± 7.6 days (range 5-35 days); T2: 108 ± 26 days (range 87- 200 days))
Griffis, Nenert, Allendorfer, & Szaflarski (2017)	Y (mean 53 ± 15 years, range 23-90 years)	Y (25 M/18 F)	Y (41 R/2 L)	Y (range 1-14 years)
Griffis, Nenert, Allendorfer, Vannest, et al. (2017)	Y (mean 53 ± 15 years, range 23-90 years)	Y (25 M/18 F)	Y (41 R/2 L)	Y (range 1-14 years)
Harvey et al. (2017)	Y (range 47-75 years)	Y (5 M/1 F)	Y (6 R/0 L)	Y (range 6-102 months)
Nardo et al. (2017)	Y (mean 50 ± 12 years, range 21-67 years)	Y (12 M/6 F)	Y (18 R/0 L)	Y (mean 61 ± 58 months, range 5- 264 months)
Nenert et al.	Y (CIAT group: mean 58.0 ± 10.6	Y (11 M/8 F)	<u>N</u> (17 R/0 L); 2	Y (CIAT group: mean 60.2 ± 48.9

(2017)	years; untreated group: mean 50.3 ± 13.3 years)		patients "atypical": unclear whether L or mixed	months; untreated group: mean 41.9 ± 30.0 months; all > 1 year)
Qiu et al. (2017)	Y (mean 55.9 ± 13.4 years, range 40- 70 years)	Y (7 M/3 F)	Y (10 R/0 L)	Y (range 1-3 months)
Skipper-Kallal et al. (2017a)	Y (mean 58.8 ± 8.6 years, range 45.7- 78.2 years)	Y (19 M/12 F); stated to be not matched, but difference not significant	Y (26 R/3 L)	Y (mean 40.9 ± 36.1 months, 4.9- 151.0 months)
Skipper-Kallal et al. (2017b)	Y (mean 59.8 ± 10.0 years)	Y (26 M/13 F)	Y (33 R/4 L); missing for 2 participants	Y (mean 52.9 ± 51.4 months, range 6.3-255.7 months)
Dietz et al. (2018)	Y (AAC group: range 39-63 years; usual care group: range 47-71 years)	Y (5 M/7 F)	Y (11 R/1 L)	Y (AAC group: range 16-170 months; usual care group: range 38-105 months)
Hallam et al. (2018)	Y (mean 61 ± 11 years, range 38-80 years)	Y (5 M/9 F)	N	Y (range 11-264 months)
Nenert et al. (2018)	Y (mean 46 ± 16 years)	Y (9 M/8 F)	<u>N</u> (17 R/O L); all patients stated to be right handed, but "ambidextrous patients" mentioned on p. 364	Y (T1: ~2 weeks; T2: ~6 weeks; T3: ~12 weeks; T4: ~26 weeks; T5: ~52 weeks)
Pillay et al. (2018)	Y (mean 56.4 ± 12.5 years, range 30- 80 years)	Y (11 M/10 F)	Y (21 R/0 L)	Y (mean 1134 ± 1491 days, range 180-6732 days)
Szaflarski et al. (2018)	Y (range 26-66 years)	Y (9 M/3 F)	Y (11 R/1 L)	Y (range 1-12 years)
van de Sandt- Koenderman et al. (2018)	Y (subacute: mean 51.2 years, range 25-61 years; chronic: mean 54.0 years, range 21-66 years)	Y (5 M/4 F)	Y (8 R/0 L)	Y (subacute: range 0.5-3 months; chronic: range 17-40 months)
van Oers et al. (2018)	Y (mean 67.9 ± 11.4 years, range 46- 86 years)	Y (10 M/2 F)	Y (12 R/0 L)	N* (T1: within 2 weeks; T2: ~3 months; T3: ~6 months; T4: ~12 months; specific timing of first time point not stated)
Barbieri et al. (2019)	<u>N</u> (range 22-73 years; controls were younger)	Y (11 M/7 F)	<u>N</u> (15 R/3 L); not stated for controls	Y (range 13-107 months)
Johnson et al. (2019)	Y (treated group: mean 62.8 ± 10.2 years, range 42-80 years; untreated group: mean 59.0 ± 11.8 years, range 39-79 years)	Y (21 M/9 F)	Y (27 R/3 L)	Y (treated group: mean 58.3 ± 51.8 months, range 12-170 months; untreated group: mean 85.2 ± 141.9 months, range 10-467 months)
Kristinsson et al. (2019)	Y (typical BDNF genotype group mean 59.6 $\pm$ 11.2 years, range 29-77 years; atypical BDNF genotype group mean 57.7 $\pm$ 10.9 years, range 30-76 years)	Y (58 M/29 F)	Y (87 R/0 L)	Y (typical BDNF genotype group: mean 44.0 ± 38.7 months; atypical BDNF genotype group: mean 34.5 ± 36.9 months; all participants > 6 months)
Purcell et al. (2019)	Y (range 40-80 years)	Y (13 M/8 F)	Y (16 R/3 L)	Y (range 14-209 months)
Sreedharan, Chandran, et al. (2019)	<u>N</u> (range 18-68 years; controls were younger)	Y (7 M/1 F)	Y (8 R/0 L)	<u>N</u> (6-22 weeks; patients at different subacute stages of recovery)
Hartwigsen et al. (2020)	Y (mean 58.8 years, range 43-72 years)	Y (8 M/4 F)	Y (12 R/0 L)	Y (mean 37.9 ± 34.8 months, range 6- 122 months)
Stockert et al. (2020)	Y (frontal group: mean 52.3 ± 18.9 years, range 15-78 years; temporo- parietal group: mean 54.4 ± 12.7 years, range 31-76 years)	Y (25 M/9 F)	N (31 R/2 L); not stated for controls	Y (frontal group: T1 acute: mean 3.2 $\pm$ 2.0 days, range 1-7 days; T2 subacute: mean 11.9 $\pm$ 2.2 days, range 8-17 days; T3 chronic: mean 272.6 $\pm$ 88.5 days, range 181-435 days; temporo-parietal group: T1 acute: mean 1.6 $\pm$ 0.8 days, range 1-4 days; T2 subacute: mean 10.1 $\pm$ 1.7 days, range 8-13 days; T3 chronic:

mean 262.5 ± 75.0 days, range 184-394 days)

Age = Is age reported for patients and controls, and matched?; Sex = Is sex reported for patients and controls, and matched?; Handedness = Is handedness reported for patients and controls, and matched?; Time post onset = Is time post stroke onset reported and appropriate to the study design?; AAC = Augmentative and Alternative Communication; CIAT = constraint-induced aphasia therapy; F = female; L = left; M = male; MIT = melodic intonation therapy; N = No; POp+ = pars opercularis damaged; POp- = pars opercularis spared; R = right; rTMS = repetitive transcranial magnatic stimulation; SEM = standard error of the mean; T1, T2, etc. = first time point, second time point, etc.; TPO = time post onset; Y = Yes; Yellow underline = minor limitation; Orange underline/\* = moderate limitation.

Study	Aphasia	Language evaluation	Aphasia severity	Aphasia type
Weiller et al. (1995)	Comprehensive battery	AAT	Recovered; not aphasic per formal testing	Recovered, but all had moderate-severe Wernicke's aphasia in the subacute period
Belin et al. (1996)	<u>Severity and</u> <u>type</u>	BDAE	Persistent severe non-fluent aphasia followed by marked improvement with MIT	5 global, 2 Broca's
Ohyama et al. (1996)	Comprehensive battery	WAB	AQ mean 74.3 ± 12.2, range 53.8- 92.4	6 anomic, 4 atypical, 4 mild Broca's, 1 mild Wernicke's, 1 transcortical sensory; alternately: 10 fluent, 6 non- fluent
Heiss et al. (1997)	<u>Severity only</u>	Verbal repetition, confrontation naming, oral and written comprehension, reading abilities, TT, phonemic fluency, clinical impression, family interview	T1: TT range 37-48; T2: TT range 3-39 (1 missing)	T1: 5 global, 1 Wernicke's; T2: not stated
Karbe et al. (1998)	<u>Severity and</u> <u>type</u>	Π	T1: 9 severe; 2 mild; 1 not stated; TT range 3-47 errors; T2: not stated	T1: 8 global, 3 anomic, 1 Wernicke's; T2: not stated
Cao et al. (1999)	<u>Severity and</u> <u>type</u>	ADP	ADPASS percentile range 73-99	3 anomic, 1 conduction, 1 recovered, 1 transcortical sensory
Heiss et al. (1999)	<u>Severity and</u> <u>type</u>	AAT, phonemic fluency	T1: subcortical: TT median 8 errors, range 0-17 errors; frontal: TT median 21 errors, range 4-40 errors; temporal: TT median 39 errors, range 1-47 errors; T2: subcortical: TT median 1 error, range 0-14 errors; frontal: TT median 8 errors, range 0-34; temporal: TT median 34 errors, range 0-44 errors	T1: 6 Wernicke's, 5 Broca's, 5 residual aphasia, 4 anomic, 2 transcortical sensory, 1 conduction; T2: not stated
Kessler et al. (2000)	<u>Severity only</u>	AAT	T1: piracetam group: TT 17.16 $\pm$ 14.31 errors; placebo group: TT 17.91 $\pm$ 15.47 errors; T2: piracetam group: TT 9.66 $\pm$ 12.62 errors; placebo group: TT 12.50 $\pm$ 16.88 errors	Not stated
Rosen et al. (2000)	<u>Severity and</u> <u>type</u>	WAB (except BDAE in 1 patient), reading pseudowords, word stem completion, verb generation, reading single words	AQ range 74-97 (missing in 1 patient)	3 anomic, 1 Broca's, 1 not stated, 1 recovered
Blasi et al. (2002)	Comprehensive battery	WAB or BDAE	AQ range 66.5-89.0 in 6 participants, BDAE aphasia severity of 4 in 1 participant, no formal evaluation in 1 participant	3 anomic, 3 transcortical motor, 1 Broca's, 1 not stated; most were Broca's or global acutely
Leff et al. (2002)	<u>Not at all</u>	PPT (Dutch), British picture vocabulary scale, Action for Dysphasic Adults lexical decision battery, auditory maximal pairs (an offline phoneme discrimination test)	Not stated	Not stated, but all 6 patients with pSTS damage had single word comprehension deficits acutely
Blank et al. (2003)	<u>Type only</u>	CAT, QPA	Not stated	POp+: 4 non-fluent but not agrammatic, 2 agrammatic, 1 recovered; POp-: 4 non-fluent

## Supplementary Table S3. Participants: Characterization of aphasia

				but not agrammatic, 3 recovered
Cardebat et al. (2003)	<u>Not at all</u>	Not stated	Not stated	T1: some prominent symptoms are listed for each patient; T2: not stated
Sharp et al. (2004)	<u>Severity only</u>	Subtests from CAT, subtests from PALPA, Action for dysphasic adults, TROG, PPT	Mild	Not stated
Zahn et al. (2004)	Comprehensive battery	AABT, AAT	TT percentile range 28-63	3 global, 2 Broca's, 2 unclassifiable; all had been global initially
Crinion & Price (2005)	Comprehensive battery	CAT	Not stated	Not stated
de Boissezon et al. (2005)	<u>Type only</u>	Montreal-Toulouse Aphasia Battery	Not stated	T1: 2 Broca's, 2 transcortical sensory, 1 anomic, 1 transcortical motor, 1 Wernicke's; T2: 4 recovered, 1 anomic, 1 transcortical motor; 1 transcortical sensory
Connor et al. (2006)	Comprehensive battery	WAB or BDAE	AQ range 66.5-89.0 in 6 participants, BDAE aphasia severity of 4 in 1 participant, no formal evaluation in 1 participant	3 anomic, 3 transcortical motor, 1 Broca's, 1 not stated; most were Broca's or global acutely
Crinion et al. (2006)	Comprehensive battery	CAT (missing in two participants)	Not stated	Not stated
Saur et al. (2006)	Comprehensive battery	AABT, AAT including TT, analysis of spontaneous speech, CETI, Language Recovery Score (LRS) derived from all these measures plus in-scanner task performance	T1: LRS mean 0.44, range 0.11- 0.81; 1 mild, 1 mild-moderate, 7 moderate, 3 moderate-severe, 2 severe per AAT; T2: LRS mean 0.71, range 0.33-0.92; 2 recovered, 2 recovered-mild, 2 mild, 3 mild-moderate, 3 moderate, 2 severe per AAT; T3: LRS mean 0.91, range 0.66-1.00; 8 recovered, 2 recovered-mild, 3 mild, 1 moderate per AAT	T1: 9 non-fluent, 5 fluent; T2: not stated; T3: 6 recovered, 4 minimal language impairment, 3 anomic, 1 global
Meinzer et al. (2008)	Comprehensive battery	AAT, study-specific picture naming test with 150 items	6 moderate, 4 mild, 1 severe	7 Broca's, 2 Wernicke's, 1 global, 1 unclassified
Raboyeau et al. (2008)	<u>Severity and</u> type	Montreal-Toulouse Aphasia Battery	Mild (but had initially been severe)	4 anomic, 3 conduction, 2 Broca's, 1 AoS
Richter et al. (2008)	Comprehensive battery	AAT, two subtests of ANELT	TT range 5-50	7 anomic, 7 Broca's, 2 global; it was an inclusion criterion that the main deficits were in production
de Boissezon et al. (2009)	Comprehensive battery	Montreal-Toulouse Aphasia Battery	Not stated	T1: 3 transcortical motor, 2 anomic, 2 Broca's, 2 transcortical sensory, 2 Wernicke's, 1 conduction, 1 agrammatic; T2: not stated
Fridriksson et al. (2009)	Comprehensive battery	WAB; BNT	AQ range 31.8-91.5	6 anomic, 4 Broca's, 1 transcortical motor; alternatively: 6 fluent, 5 non- fluent
Menke et al. (2009)	Comprehensive battery	AAT	6 moderate-severe, 2 severe	7 Broca's, 1 global
Specht et al. (2009)	Comprehensive battery	AAT	Not stated	3 global, 3 Wernicke's, 2 amnestic, 2 Broca's, 2 unclassified
Warren et al. (2009)	<u>Not at all</u>	CAT, TROG	Not stated	Not stated

Chau et al. (2010)	Severity only	Cantonese Aphasia Battery (modified WAB)	5 patients had AQ > 75, 2 had AQ < 30	Not stated
Fridriksson (2010)	<u>Severity and</u> type	WAB	AQ mean 60.4 ± 25.6 (including excluded patients)	11 anomic, 10 Broca's, 3 conduction, 1 transcortical motor, 1 Wernicke's (including excluded patients)
Fridriksson et al. (2010)	<u>Severity and</u> type	WAB	AQ mean 77.1, range 47.1-93.7	10 anomic, 3 Broca's, 2 conduction
Sharp et al. (2010)	<u>Severity only</u>	Subtests from CAT, subtests from PALPA, Action for dysphasic adults, TROG, PPT	Mild	Not stated
Thompson et al. (2010)	Comprehensive battery	WAB, NAVS, narrative language sample	AQ range 66.8-85.0	All agrammatic; per WAB scores provided: 3 Broca's, 3 unclassified
Tyler et al. (2010)	<u>Not at all</u>	Sentence-picture matching, lexical decision, phonological similarity, word repetition, sentence repetition, morphological similarity, semantic categorization, sentence acceptability	Not stated	Not stated
van Oers et al. (2010)	Comprehensive battery	AAT, BNT, TT	4 moderate, 4 severe, 3 recovered, 2 mild; all had aphasia initially	5 anomic, 4 Broca's, 3 recovered, 1 Wernicke's
Papoutsi et al. (2011)	<u>Not at all</u>	Sentence-picture matching, grammaticality judgment, lexical decision, phonological discrimination, semantic categorization, sentence repetition, word repetition	Not stated	Not stated
Sebastian & Kiran (2011)	Comprehensive battery	WAB, BNT, portions of PALPA, PPT, CLQT	AQ range 74.0-97.8	6 anomic, 2 recovered
Szaflarski et al. (2011)	Severity and type	BNT; phonemic fluency, semantic fluency, complex ideation from BDAE, PPVT, communicative activities log	Moderate	4 Broca's, 3 anomic, 1 anomic/conduction
Tyler et al. (2011)	<u>Not at all</u>	Sentence-picture matching, grammaticality judgment, lexical decision, phonological discrimination, semantic categorization, sentence repetition, word repetition	Not stated	Not stated
Weiduschat et al. (2011)	<u>Type only</u>	AAT	T1: TT range 0-45 errors; T2: TT range 0-44 errors	T1: 5 Wernicke's, 2 Broca's, 2 global, 1 amnestic fluent; T2: not stated
Allendorfer et al. (2012)	<u>Severity and</u> <u>type</u>	TT, PPVT, BNT, semantic and phonemic fluency, complex ideation subtest of BDAE	Moderate-severe; TT mean 25.5 ± 11.3; unclear how to reconcile moderate-severe severity with mostly anomic aphasia	Mostly anomic with some non- fluent
Fridriksson, Hubbard, et al. (2012)	Comprehensive battery	WAB, BNT, AoS from ABA	AQ mean 48.5 ± 20.6, range 20.9- 73.5	Broca's
Fridriksson, Richardson, et al. (2012)	Severity and <u>type</u>	WAB	AQ mean 57.9 ± 25.8, range 17.2- 95.2	13 Broca's, 10 anomic, 3 conduction, 2 Wernicke's, 1 global, 1 transcortical motor
Marcotte et al. (2012)	Comprehensive battery	Montreal-Toulouse Aphasia Battery, picture naming	Moderate-severe	7 Broca's, 1 Broca's + AoS, 1 Wernicke's + AoS
Schofield et al. (2012)	<u>Severity only</u>	CAT	11 patients (plus one excluded) had moderate comprehension impairments, 9 had severe	Not stated

			comprehension impairments; this distribution was bimodal	
Wright et al. (2012)	<u>Not at all</u>	Sentence-picture matching	Not stated	Not stated
Szaflarski et al. (2013)	<u>Severity only</u>	TT, BNT, semantic fluency, phonemic fluency, PPVT, complex ideation subtest of BDAE	Recovered: TT mean 43 ± 1, ≥ 41; non-recovered: TT mean 23 ± 12, < 41	Not stated
Thiel et al. (2013)	<u>Severity and</u> <u>type</u>	AAT	T1: rTMS group: AAT sum of scores mean 251.5 ± 32.4; sham group: mean 251.1 ± 39.5; T2 not stated	T1: rTMS group: 7 Wernicke's, 3 amnestic, 2 global, 1 Broca's; sham group: 5 Wernicke's, 3 Broca's, 2 global, 1 amnestic; T2: not stated
Abel et al. (2014)	<u>Type only</u>	AAT	Not stated	8 Broca's, 3 Wernicke's, 1 fluent non-classifiable, 1 global, 1 transcortical sensory
Benjamin et al. (2014)	<u>Severity and</u> <u>type</u>	WAB, BNT, PPVT	Intention group: AQ mean 65.5 ± 8.3; control group: AQ mean 71.9 ± 11.9	Intention group: 4 conduction, 2 Broca's, 1 anomic; control group: 4 anomic, 1 Broca's, 1 conduction, 1 transcortical motor
Brownsett et al. (2014)	<u>Not at all</u>	Not stated	Not stated	Not stated, but all had auditory comprehension and repetition deficits, and all could at least attempt to repeat
Mattioli et al. (2014)	Comprehensive battery	ΑΑΤ, ΤΤ	T1: TT range 2-45; T2: TT range 6- 48; T3: TT range 21-48	T1: 8 Broca's, 3 anomic, 1 Wernicke's; T2: not stated
Mohr et al. (2014)	<u>Severity only</u>	BDAE, TT	Mild-moderate; T1: TT range 15- 49 errors (including 2 excluded patients)	Not stated
Robson et al. (2014)	Comprehensive battery	BDAE, PPT, word-to-picture matching test from Cambridge Semantic Battery, single word reading aloud from PALPA	BDAE comprehension range 6-26 (out of 32); BDAE comprehension scores and percentiles do not seem entirely commensurate	All Wernicke's
Szaflarski et al. (2014)	<u>Not at all</u>	Not stated	"complete or almost complete" recovery in a "substantial proportion" of the patients	Not stated
van Hees et al. (2014)	Comprehensive battery	WAB, BNT, PPT, CAT, picture naming from International Picture Naming Project Database	AQ range 57.3-91.6; 5 mild, 2 moderate, 1 mild-moderate	6 anomic, 2 conduction
Abel et al. (2015)	<u>Type only</u>	ΑΑΤ	Not stated	8 Broca's, 3 Wernicke's, 1 fluent non-classifiable, 1 global, 1 transcortical sensory
Kiran et al. (2015)	<u>Severity only</u>	WAB, BNT, PPT, CLQT	AQ range 48.0-97.2	Not stated
Sandberg et al. (2015)	Comprehensive battery	WAB, BNT, subtests from PALPA, PPT, CLQT	AQ range 41.7-99.2	6 anomic, 2 conduction, 1 Broca's, 1 transcortical motor
Geranmayeh et al. (2016)	Comprehensive battery	CAT, QPA	"relatively mild stroke"; 17 patients were so mild that they were not aphasic per the CAT	Not stated
Griffis et al. (2016)	<u>Severity and</u> <u>type</u>	BNT; phonemic fluency, semantic fluency, complex ideation from BDAE, PPVT, communicative activities log	Moderate	4 Broca's, 3 anomic, 1 anomic/conduction
Sims et al. (2016)	<u>Severity and</u> <u>type</u>	WAB, BNT, PPT, CLQT	AQ range 48.0-99.2	4 anomic, 2 Broca's, 2 conduction, 2 transcortical motor, 1 anomic or transcortical motor, 1 Broca's or conduction, 1 "N/A", 1 Wernicke's or conduction
Darkow et al. (2017)	Comprehensive battery	AAT	Mild	Not stated

Geranmayeh et al. (2017)	<u>Not at all</u>	CAT, QPA	Not stated	Not stated
Griffis, Nenert, Allendorfer, & Szaflarski (2017)	Not at all	BNT, semantic fluency, phonemic fluency	Not stated	Not stated
Griffis, Nenert, Allendorfer, Vannest, et al. (2017)	<u>Not at all</u>	BNT, semantic fluency, phonemic fluency	Not stated	Not stated
Harvey et al. (2017)	Comprehensive battery	BDAE, BNT	Mild-moderate	All non-fluent
Nardo et al. (2017)	<u>Not at all</u>	BNT, one CAT subtest, two PALPA subtests	Not stated	Not stated
Nenert et al. (2017)	<u>Severity only</u>	TT, PPVT, BNT, semantic fluency, phonemic fluency, communicative activities log	6 mild (2 control, 4 CIAT); 5 moderate (3 control, 2 CIAT); 8 severe (3 control, 5 CIAT)	Not stated
Qiu et al. (2017)	<u>Severity and</u> type	WAB	Moderate-severe	All Broca's
Skipper-Kallal et al. (2017a)	Comprehensive battery	WAB, PNT	AQ mean 77.7 ± 21.0, range 22.8- 99.2	21 anomic, 7 Broca's, 3 conduction, 1 transcortical sensory
Skipper-Kallal et al. (2017b)	Comprehensive battery		Not stated	23 anomic, 11 Broca's, 3 conduction, 1 transcortical sensory, 1 Wernicke's
Dietz et al. (2018)	<u>Severity and</u> <u>type</u>	WAB, Reading Comprehension Battery for Aphasia	AAC group: AQ range 37.6-82.4; usual care group: AQ range 36.7- 89.2	AAC group: 2 Broca's, 1 anomic, 1 conduction, 1 global, 1 Wernicke's; usual care group: 2 anomic, 2 Broca's, 1 conduction, 1 Wernicke's
Hallam et al. (2018)	Comprehensive battery	Cambridge semantic battery, three additional semantic tasks, connected speech words per minute, repetition from PALPA	Not stated	6 anomic, 2 Broca's, 2 global, 2 transcortical sensory, 1 mixed transcortical, 1 not stated
Nenert et al. (2018)	<u>Not at all</u>	PPVT, BNT, phonemic fluency, semantic fluency, complex ideation subtest of BDAE	Not stated for study timepoints, but on admission, aphasia severity was assessed with the TT: 2 no aphasia per cutoff but clinical impression of aphasia, 5 mild, 6 moderate, 4 severe	Not stated
Pillay et al. (2018)	<u>Not at all</u>	Pseudoword rhyme matching, semantic picture matching (similar to PPT-P), picture naming	Not stated	Not stated
Szaflarski et al. (2018)	Comprehensive battery	WAB, BNT, semantic fluency, phonemic fluency	AQ range 10.4-94.6	8 anomic, 2 Broca's, 1 conduction, 1 global
van de Sandt- Koenderman et al. (2018)	Comprehensive battery	AAT, ANELT	T1: subacute: ASRS median 1, range 0-2; ANELT range 10-29; chronic: ASRS median 1.5, range 1-2; ANELT range 20-29; T2: subacute: ASRS range 1-3; ANELT range 10-43; chronic: ASRS range 1-2; ANELT range 22-31	T1: all severe non-fluent; T2: not stated
van Oers et al. (2018)	Comprehensive battery	AAT, BNT	T1: 8 moderate, 2 severe, 2 not stated; T2: 4 moderate, 3 recovered, 2 not stated, 1 mild, 1 severe	T1: 6 Broca's, 3 anomic, 2 Wernicke's, 1 global; T2: 4 anomic, 3 recovered, 2 Broca's, 1 unclassified, 1 Wernicke's
Barbieri et al. (2019)	Comprehensive battery	WAB, Northwestern Assessment of Verbs and Sentences (NAVS), Northwestern Naming Battery (NNB), analysis of spontaneous speech (Cinderella story) using	AQ range 52.8-91.7	Not stated, except that "language deficits were consistent with nonfluent aphasia and agrammatism"

		Northwestern Narrative Language Analysis (NNLA) protocol		
Johnson et al. (2019)	<u>Severity only</u>	WAB, BNT, PPT	Treated group: AQ mean 60.1 $\pm$ 24.0, range 11.7-95.2; untreated group: AQ mean 65.8 $\pm$ 24.6, range 26.9-91.5	Not stated
Kristinsson et al. (2019)	<u>Severity and</u> <u>type</u>	WAB, PNT, PPT	Typical BDNF genotype group: AQ mean 64.2 ± 20.3; atypical BDNF genotype group: AQ mean 54.3 ± 21.0	Typical BDNF genotype group: 25 Broca's, 12 anomic, 11 conduction, 2 transcortical motor aphasia, 2 Wernicke's, 1 global; atypical BDNF genotype group: 16 Broca's, 6 anomic, 6 conduction, 3 global, 3 Wernicke's
Purcell et al. (2019)	Comprehensive battery	Spelling (PALPA 40 and 54, and other word lists), oral reading (PALPA 35), reading comprehension (PALPA 51), spoken word-picture matching and picture naming tests from Northwestern Naming Battery, PPT-P; note no generic aphasia battery, but fairly complete coverage of language domains	Spelling of untrained items range 51%-94%	4 orthographic working memory deficit, 8 orthographic long-term memory deficit, 9 both types of deficit
Sreedharan, Chandran, et al. (2019)	<u>Severity only</u>	WAB translated into Malayalam	AQ range approximately 50-80	Broca's or anomic
Hartwigsen et al. (2020)	<u>Not at all</u>	AAT	7 mild residual aphasia, 5 recovered	Not stated
Stockert et al. (2020)	<u>Severity only</u>	AAT including TT, comprehension composite (LRScomp) and production composite (LRSprod) were derived	Frontal group: T1 acute: LRScomp mean $0.48 \pm 0.26$ ; T2 subacute: LRScomp mean $0.64 \pm 0.21$ ; T3 chronic: LRScomp mean $0.91 \pm$ 0.07; temporo-parietal group: T1 acute: LRScomp mean $0.63 \pm 0.32$ ; T2 subacute: LRScomp mean $0.79 \pm$ $\pm 0.20$ ; T3 chronic: LRScomp mean $0.91 \pm 0.13$	Not stated

Aphasia [column] = To what extent is the nature of aphasia characterized?; AABT = Aachen Aphasia Bedside Test; AAT = Aachen Aphasia Test; ABA = Apraxia Battery for Adults; ADP = Aphasia Diagnostic Profiles; ADPASS = Aphasia Diagnostic Profiles Aphasia Severity Score; ANELT = Amsterdam-Nijmegen Everyday Language Test; AoS = apraxia of speech; AQ = aphasia quotient; ASRS = Aphasia Severity Rating Scale; BDAE = Boston Diagnostic Aphasia Examination; BNT = Boston Naming Test; CAT = Comprehensive Aphasia Test; CETI = Communicative Effectiveness Index; CIAT = constraintinduced aphasia therapy; CLQT = Cognitive Linguistic Quick Test; LRS = Language Recovery Score; MIT = melodic intonation therapy; NAVS = Northwestern Assessment of Verbs and Sentences; PALPA = Psycholinguistic Assessments of Language Processing in Aphasia; PNT = Philadelphia Naming Test; POp+ = pars opercularis damaged; POp- = pars opercularis spared; PPT = Pyramids and Palm Trees; PPVT = Peabody Picture Vocabulary Test; pSTS = posterior superior temporal sulcus; QPA = Quantitative Production Analysis; rTMS = repetitive transcranial magnetic stimulation; T1, T2, etc. = first time point, second time point, etc.; TROG = Test for Reception of Grammar; TT = Token Test; WAB = Western Aphasia Battery; Yellow underline = minor limitation; Orange underline = moderate limitation.

## Supplementary Table S4. Participants: Characterization of neurological status

Study	First stroke	Stroke type	Lesion	Lesion extent	Lesion location
Weiller et al. (1995)	Yes	lschemic only	Individual lesions	Not stated	Posterior L MCA infarct, lesion to the L posterior STG usually extending to MTG and AG
Belin et al. (1996)	<u>Not stated</u>	Not stated	Individual lesions	Not stated, but note that hypoperfusion greatly exceeded the infarct in all but 1 patient	L MCA; 2 also had ACA
Ohyama et al. (1996)	Yes	Ischemic only	<u>Extent and</u> location	Mean 33.9 ± 26.3 cc, range 8.1- 113.2 cc	L perisylvian
Heiss et al. (1997)	Yes	lschemic only	Individual lesions	Range 27.2-133.2 cc	L MCA; 5 patients had superior temporal damage and 1 had subcortical damage underlying posterior superior temporal cortex
Karbe et al. (1998)	Yes	Ischemic only	<u>Extent and</u> location	Range 2-133 cc	L MCA
Cao et al. (1999)	Yes	Ischemic only	Individual lesions	Extents are reported in three dimensions	4 L MCA, 2 L ICA
Heiss et al. (1999)	Yes	Ischemic only	Extent and location	Range 4.3-154.3 cc (probably; units not stated)	L MCA; 9 subcortical, 7 frontal, 7 temporal
Kessler et al. (2000)	Yes	Ischemic only	Location only	Not stated	10 L frontal, 6 L subcortical, 8 L temporal
Rosen et al. (2000)	Yes	Not stated	Individual lesions	Range 10.7-117.5 cc	L IFG, extending to neighboring areas in most cases
Blasi et al. (2002)	Yes	Ischemic only	Individual lesions	Not stated	L IFG and operculum, extending to adjacent cortex and white matter in several cases
Leff et al. (2002)	Yes	Not stated	Extent and location	Range 0.5-14% of total brain volume	9 L but sparing pSTS, 6 L including pSTS
Blank et al. (2003)	No	Not stated	Individual lesions	Not stated	L frontal, occasionally extending into temporal
Cardebat et al. (2003)	Yes	Mixed etiologies	Individual lesions	Not stated	4 L subcortical, 2 L prerolandic, 2 L postrolandic
Sharp et al. (2004)	Yes	Not stated	Lesion overlay	Not stated	Lesion in vicinity of L STG; no extensive frontal damage; no inferior temporal damage
Zahn et al. (2004)	Yes	Not stated	Lesion overlay	Not stated	L MCA
Crinion & Price (2005)	Yes	Not stated	Lesion overlay	Not stated	L MCA
de Boissezon et al. (2005)	Yes	Mixed etiologies	Individual lesions	Not stated	5 L non-thalamic subcortical, 2 L thalamic
Connor et al. (2006)	Yes	Ischemic only	Individual lesions	Not stated	L IFG and operculum, extending to adjacent cortex and white matter in several cases
Crinion et al. (2006)	Yes	Not stated	Lesion overlay	Not stated	6 L but no temporal damage, 9 L temporal damage excluding anterior temporal cortex, 9 L temporal damage including anterior temporal cortex
Saur et al. (2006)	Yes	lschemic only	Individual lesions	Not stated	L MCA; 4 frontal (2 extending to temporoparietal); 5 temporoparietal (2 extending to subcortical); 4 striatocapsular (2 extending to cortical); 1 frontoparietal
Meinzer et al. (2008)	<u>Not stated</u>	Mixed etiologies	Lesion overlay	Range 31.0-236.0 cc	L

Raboyeau et al. (2008)	Yes	Not stated	Individual lesions	Range 29.9-195.2 cc	L MCA
Richter et al. (2008)	Not stated	Not stated	Individual lesions	Not stated	L
de Boissezon et al. (2009)	Yes	Mixed etiologies	Lesion overlay	Range 0.9-43.4 cc	L MCA (7 subcortical, 6 cortical)
Fridriksson et al. (2009)	Not stated	Not stated	Lesion overlay	Range 3.0-342.2 cc	L MCA
Menke et al. (2009)	Yes	Mixed etiologies	Individual lesions	Not stated	L
Specht et al. (2009)	Not stated	Not stated	Lesion overlay	Not stated	L MCA, with greatest overlap in the posterior STG
Warren et al. (2009)	Yes	lschemic only	Lesion overlay	Patients with positive anterior temporal interconnectivity: mean 93.3 $\pm$ 24.0 cc; patients with negative anterior temporal interconnectivity: mean 96.1 $\pm$ 27.6 cc	L not including anterolateral superior temporal cortex; maximal overlap in posterior superior temporal cortex
Chau et al. (2010)	Yes	Ischemic only	Location only	Not stated	3 L MCA, 2 L frontal, 2 L basal ganglia
Fridriksson (2010)	Yes	Ischemic only	Lesion overlay	Not stated	L MCA
Fridriksson et al. (2010)	Yes	Ischemic only	Lesion overlay	Not stated	L MCA
Sharp et al. (2010)	Yes	Not stated	Lesion overlay	Not stated	Lesion in vicinity of L STG; no extensive frontal damage; no inferior temporal damage
Thompson et al. (2010)	Yes	Not stated	Individual lesions	Not stated	5 L MCA, 1 R MCA with aphasia
Tyler et al. (2010)	Not stated	Mixed etiologies	Lesion overlay	Not stated	L
van Oers et al. (2010)	Yes	Ischemic only	Individual lesions	Range 6.0-167.3 cc	L MCA
Papoutsi et al. (2011)	Not stated	Not stated	Lesion overlay	Not stated	L MCA
Sebastian & Kiran (2011)	Not stated	Mixed etiologies	Individual lesions	Range 23-45 cc	L MCA
Szaflarski et al. (2011)	Not stated	Not stated	Individual lesions	Not stated	L MCA
Tyler et al. (2011)	Not stated	Not stated	Lesion overlay	Not stated	L MCA
Weiduschat et al. (2011)	Yes	Not stated	<u>Extent and</u> location	Range 0.7-88.9 cc	L MCA
Allendorfer et al. (2012)	Not stated	Ischemic only	Individual lesions	Range 2.8-248.9 cc	L MCA
Fridriksson, Hubbard, et al. (2012)	Yes	Not stated	Lesion overlay	Not stated	L MCA
Fridriksson, Richardson, et al. (2012)	Yes	Mixed etiologies	Lesion overlay	Range 7.7-420.5 cc	L MCA
Marcotte et al. (2012)	Yes	Not stated	Lesion overlay	Range 14.6-295.8 cc	L MCA
Schofield et al. (2012)	Yes	Ischemic only	Lesion overlay	Range 24.2-403.6 cc	L MCA
Wright et al. (2012)	Yes	Not stated	Lesion overlay	Not stated	L MCA
Szaflarski et al.	Not stated	Not stated	Lesion	Recovered: median 9.2 cc, range	L MCA

(2013)			overlay	2.2-26.5 cc; non-recovered: median 74 cc, range 5.1-206.0 cc	
Thiel et al. (2013)	Yes	lschemic only	Individual lesions	RTMS group: 233 ± 197 cc; sham group: 244 ± 243 cc; lesion extent in images appears much smaller than the stated volumes	L MCA
Abel et al. (2014)	Yes	Mixed etiologies	Lesion overlay	Not stated	L MCA; 2 also had ACA
Benjamin et al. (2014)	No	Mixed etiologies	Lesion overlay	Not stated	L MCA, extending frontally at least into the precentral gyrus or underlying white matter
Brownsett et al. (2014)	<u>Not stated</u>	Not stated	Lesion overlay	Not stated	L temporal and parietal cortex; 4 extended into the frontal lobe; no lesions involved ACA territory
Mattioli et al. (2014)	Yes	Not stated	Individual lesions	Range 4.4-158.3 cc (possibly; units stated do not seem correct)	L MCA; lesions seem very small in Supplementary Figure 1, but are described as more extensive in Supplementary Table 1
Mohr et al. (2014)	Yes	Mixed etiologies	Lesion overlay	Not stated	L MCA
Robson et al. (2014)	Yes	Mixed etiologies	Lesion overlay	Not stated	L MCA; all involved STG extending into IPL and temporoparietal junction; 8 extending into MTL; 4 extending into inferior frontal
Szaflarski et al. (2014)	Not stated	Not stated	Lesion overlay	60.1 ± 57.5 cc	L MCA
van Hees et al. (2014)	Yes	Not stated	Lesion overlay	Not stated	L hemisphere
Abel et al. (2015)	Yes	Mixed etiologies	Lesion overlay	Not stated	L MCA; 2 also had ACA
Kiran et al. (2015)	Yes	Not stated	Lesion overlay	24.2-431.6 cc	L MCA except for one patient with R MCA and aphasia
Sandberg et al. (2015)	Not stated	Not stated	Lesion overlay	Range 0.3-256.0 cc	L MCA
Geranmayeh et al. (2016)	No	Not stated	Lesion overlay	Mean 25.4 ± 13.5 cc, range 0.3- 168.0 cc	L; modest R involvement in 7 cases
Griffis et al. (2016)	Not stated	Not stated	Individual lesions	Range 1.4-52.5 cc	L MCA
Sims et al. (2016)	Not stated	Not stated	Lesion overlay	Not stated	L MCA
Darkow et al. (2017)	Not stated	Not stated	Lesion overlay	Range 9.7-165.1 cc	L MCA not including hand motor area
Geranmayeh et al. (2017)	No	Not stated	Lesion overlay	Mean 41.4 ± 44.4 cc, range 3.8- 173.9 cc	L; modest R involvement in 3 cases
Griffis, Nenert, Allendorfer, & Szaflarski (2017)	Yes	Not stated	Lesion overlay	Mean 105.2 ± 76.3 cc	L
Griffis, Nenert, Allendorfer, Vannest, et al. (2017)	Yes	Not stated	Individual lesions	Mean 105.2 ± 76.3 cc	L
Harvey et al. (2017)	Yes	Ischemic only	Individual lesions	Range 36.6-252.1 cc	L MCA
Nardo et al. (2017)	Yes	Not stated	Lesion overlay	Not stated	L MCA
Nenert et al. (2017)	Yes	lschemic only	Lesion overlay	Not stated	L MCA
Qiu et al. (2017)	Yes	Mixed etiologies	<u>Not at all</u>	Not stated	L
Skipper-Kallal et	Not stated	Not stated	Lesion	Mean 27.5 ± 22.9 cc	L MCA

(2017)					
al. (2017a)			overlay		
Skipper-Kallal et al. (2017b)	Not stated	Not stated	Lesion overlay	Not stated	L MCA
Dietz et al. (2018)	Yes	lschemic only	Individual lesions	AAC group: range 7849-30570 voxels; usual care group: 1583- 30110 voxels (voxel size not stated)	L MCA
Hallam et al. (2018)	Not stated	Not stated	Lesion overlay	Not stated	L IFG plus other MCA regions; vATL and pMTG spared
Nenert et al. (2018)	No	Ischemic only	Lesion overlay	Not stated	L MCA; mostly posterior per Supplementary Figure 2
Pillay et al. (2018)	Not stated	Ischemic only	Lesion overlay	Mean 73.4 ± 58.6 cc, range 6.7- 227.0 cc	17 L MCA, 2 combined L MCA/ACA, combined 2 L MCA/PCA
Szaflarski et al. (2018)	Yes	Not stated	Individual lesions	Not stated	L MCA
van de Sandt- Koenderman et al. (2018)	<u>Not stated</u>	Not stated	Extent and location	Subacute: range 32.4-141.2 cc (no lesion extent was reported for one subacute participant because there was no tissue loss yet); chronic: range 27.4- 87.9 cc	8 L MCA, 1 L SMA and R insular- temporoparietal
van Oers et al. (2018)	Yes	Ischemic only	Lesion overlay	Range 9-208 cc	L MCA
Barbieri et al. (2019)	Yes	Mixed etiologies	Lesion overlay	Not stated	Mostly L MCA but some lesions include PCA or ACA territory
Johnson et al. (2019)	<u>Not stated</u>	Not stated	Lesion overlay	Treated group: 136.6 ± 81.1 cc, range 11.7-317.1 cc; untreated group: 112.7 ± 94.6 cc, range 1.6-317.1 cc	Mostly MCA with a few extending into PCA
Kristinsson et al. (2019)	No	Mixed etiologies	Lesion overlay	Typical BDNF genotype group: 121.4 ± 73.2 cc; atypical BDNF genotype group: 142.2 ± 88.4 cc	L MCA
Purcell et al. (2019)	Yes	Not stated	Lesion overlay	Range 7.7-215.0 cc	L MCA with L ventral occipitotemporal cortex mostly intact
Sreedharan, Chandran, et al. (2019)	<u>Not stated</u>	Not stated	Individual lesions	Not stated	7 L MCA, 1 bilateral MCA
Hartwigsen et al. (2020)	Yes	Ischemic only	Lesion overlay	Range 11.9-176.3 cc	Left temporo-parietal cortex; maximal overlap in SMG
Stockert et al. (2020)	Yes	lschemic only	Lesion overlay	Frontal group: mean 69.3 ± 34.0 cc, range 12.3-76.6 cc; temporo- parietal group: mean 54.8 ± 41.1 cc, range 6.2-108.5 cc	L MCA, frontal (n = 17) or temporo- parietal (n = 17)

First stroke = First stroke only?; Lesion [column] = To what extent is the lesion distribution characterized?; AAC = Augmentative and Alternative Communication; ACA = anterior cerebral artery; AG = angular gyrus; cc = cubic centimeters; ICA = internal carotid artery; IFG = inferior frontal gyrus; IPL = inferior parietal lobule; L = left; MCA = middle cerebral artery; MTG = middle temporal gyrus; MTL = medial temporal lobe; PCA = posterior cerebral artery; pMTG = posterior middle temporal gyrus; pSTS = posterior superior temporal sulcus; R = right; rTMS = repetitive transcranial magnetic stimulation; SMA = supplementary motor area; STG = superior temporal gyrus; vATL = ventral anterior temporal lobe; Yellow underline = minor limitation; Orange underline = moderate limitation.

## Supplementary Table S5. Imaging: Design

Study	Modality	Study timing	Time points	Intervention
Weiller et al. (1995)	PET (rCBF)	Cross-sectional	_	_
Belin et al. (1996)	PET (rCBF)	Cross-sectional	_	_
Ohyama et al. (1996)	PET (rCBF)	Cross-sectional	_	_
Heiss et al. (1997)	PET (rCMRgl)	Longitudinal— recovery	T1: ~4 weeks; T2: ~12-18 months	Not stated
Karbe et al. (1998)	PET (rCMRgl)	Longitudinal— recovery	T1: mean 24 ± 11 days, ~3-4 weeks; T2: mean 19 ± 2 months, > 1 year	Not stated
Cao et al. (1999)	fMRI	Cross-sectional	—	—
Heiss et al. (1999)	PET (rCBF)	Longitudinal— recovery	T1: ~2 weeks; T2: ~8 weeks	Not stated
Kessler et al. (2000)	PET (rCBF)	Longitudinal— mixed	T1: pre-treatment, ~2 weeks post onset; T2: post-treatment, ~8 weeks post onset	SLT, 1 hour/day, 5 days/week, 6 weeks; 12 patients received piracetam and 12 received placebo; note that the two groups are not directly compared in any imaging or behavioral analyses
Rosen et al. (2000)	PET and fMRI	Cross-sectional	_	-
Blasi et al. (2002)	fMRI	Cross-sectional	_	-
Leff et al. (2002)	PET (rCBF)	Cross-sectional	_	_
Blank et al. (2003)	PET (rCBF)	Cross-sectional	_	_
Cardebat et al. (2003)	PET (rCBF)	Longitudinal— recovery	T1: 58 $\pm$ 35 days, range 11-113 days; T2: 11.7 $\pm$ 1.6 months, range 320-460 days; T1 varies considerably from early to late subacute	Not stated
Sharp et al. (2004)	PET (rCBF)	Cross-sectional	_	_
Zahn et al. (2004)	fMRI	Cross-sectional	_	_
Crinion & Price (2005)	fMRI	Cross-sectional	—	—
de Boissezon et al. (2005)	PET (rCBF)	Longitudinal— recovery	T1: mean 53 $\pm$ 35 days, range 11-108 days; T2: mean 12.2 $\pm$ 1.4 months; T1 varies considerably from early to late subacute	<u>Not stated</u>
Connor et al. (2006)	fMRI	Cross-sectional	—	-
Crinion et al. (2006)	PET (rCBF)	Cross-sectional	—	_
Saur et al. (2006)	fMRI	Longitudinal— recovery	T1 acute: mean 1.8 days, range 0-4 days; T2 subacute: mean 12.1 days, range 3-16 days; T3 chronic: mean 321 days, range 102-513 days	Standard SLT throughout the observation period including at least 3 weeks inpatient
Meinzer et al. (2008)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~2 weeks later	CIAT, 3 hours/day, 5 days/week, 2 weeks
Raboyeau et al. (2008)	PET (rCBF)	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~4 weeks later	Lexical training, 15 minutes/day, 5 days/week, 4 weeks; the control group were trained to relearn foreign words that they had learned in school but since mostly forgotten
Richter et al. (2008)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~2 weeks later	CIAT, 3 hours/day, 10 days
de Boissezon et al. (2009)	PET (rCBF)	Longitudinal— recovery	T1: mean 64 ± 32 days; T2: mean 11.8 ± 1.4 months; T1 varies considerably from early to late subacute	Community SLT; 45 minutes/day, 1-3 days/week
Fridriksson et al. (2009)	fMRI	Cross-sectional	_	_
Menke et al. (2009)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~2 weeks later; T3: 8 months after the end of treatment	Intensive anomia training; 3 hours/day; 2 weeks
Specht et al. (2009)	PET (rCBF)	Cross-sectional	_	_

Warren et al. (2009)	PET (rCBF)	Cross-sectional	-	_
Chau et al. (2010)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~10 weeks later	Acupuncture, 3 sessions/week, 8 weeks
Fridriksson (2010)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment/~4 weeks later; note that there were two separate sessions per time point, as well as another two sessions midway through treatment that are not analyzed in this paper	Anomia treatment using a cueing hierarchy, 3 hours/day, 5 days/week, 2 weeks, with a 1-week gap between the two weeks
Fridriksson et al. (2010)	fMRI	Cross-sectional	_	_
Sharp et al. (2010)	PET (rCBF)	Cross-sectional	_	_
Thompson et al. (2010)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, 9-15 weeks later	Treatment of underlying forms
Tyler et al. (2010)	fMRI	Cross-sectional	-	—
van Oers et al. (2010)	fMRI	Cross-sectional	Behavioral data (TT and a naming measure) were also acquired subacutely (mean 26 ± 18 days, range 5-56 days)	_
Papoutsi et al. (2011)	fMRI	Cross-sectional	-	—
Sebastian & Kiran (2011)	fMRI	Cross-sectional	_	_
Szaflarski et al. (2011)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~2 weeks later	RTMS to residual activation near Broca's area, 5 sessions/week, 2 weeks
Tyler et al. (2011)	fMRI	Cross-sectional	_	-
Weiduschat et al. (2011)	PET (rCBF)	Longitudinal— mixed	T1: pre-treatment/subacute (range 18- 97 days post onset); T2: post-treatment, ~2 weeks later	Individualized SLT, 45 minutes/day, 5 days/week, 2 weeks; 6 patients underwent rTMS to the R IFG pars triangularis; 4 received vertex (sham) rTMS
Allendorfer et al. (2012)	fMRI	Cross-sectional	_	_
Fridriksson, Hubbard, et al. (2012)	fMRI	Cross-sectional	_	-
Fridriksson, Richardson, et al. (2012)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment/~4 weeks later; note that there were two separate sessions per time point, as well as another two sessions midway through treatment that are not analyzed in this paper	Anomia treatment using a cueing hierarchy, 3 hours/day, 5 days/week, 2 weeks, with a 1-week gap between the two weeks
Marcotte et al. (2012)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, 3-6 weeks later (after 80% performance on trained items, or 6 weeks)	Semantic feature analysis, 1 hour/day, 3 days/week, 3-6 weeks
Schofield et al. (2012)	fMRI	Cross-sectional	—	—
Wright et al. (2012)	fMRI	Cross-sectional	—	_
Szaflarski et al. (2013)	fMRI	Cross-sectional	-	-
Thiel et al. (2013)	PET (rCBF)	Longitudinal— mixed	T1: pre-treatment/subacute (rTMS group: mean 37.5 ± 18.5 days post onset; sham group: mean 50.6 ± 22.6 days post onset); T2 post-treatment, ~2.5 weeks later	RTMS group: inhibitory rTMS over the R IFG pars triangularis + SLT for 45 minutes/day, 5 days/week, 2 weeks; control group: sham TMS + SLT
Abel et al. (2014)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~6 weeks later (labeled T2 and T3 in paper)	Lexical therapy, alternating between weeks with phonological and semantic treatment, 4 weeks; 60 out of the 132 items were trained
Benjamin et al. (2014)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment; T3: 3 months after the end of treatment	Word finding therapy for both groups, but the intention group had to produce complex left hand movements, while the control group did not; note that groups were not directly compared in any imaging analyses

Brownsett et al. (2014)	fMRI	Longitudinal— chronic treatment	Patients: T1: acclimatization/chronic (but used in some analyses); T2: pre- treatment/chronic (not stated how long after T1); T3: post-treatment/~4 weeks later; controls: T1: pre-training; T2: post- training/~2 weeks later	Patients: home-based therapy consisting of auditory discrimination and repetition tasks for 3 or 4 weeks between T2 and T3; control: 2 weeks of similar training using noise vocoded speech
Mattioli et al. (2014)	fMRI	Longitudinal— mixed	T1: pre-treatment, mean $2.2 \pm 1.3$ days post onset; T2: post-treatment, mean $16.2 \pm 1.3$ days post onset; T3: mean 190 $\pm 25.5$ days post onset	6 patients were randomized to receive treatment focusing on verbal comprehension and lexical retrieval for 1 hour/day, 5 days/week between T1 and T2; no patient received treatment after T2
Mohr et al. (2014)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~2 weeks later	CIAT, 3-4 hours/day, 5 days/week, 2 weeks
Robson et al. (2014)	fMRI	Cross-sectional	_	_
Szaflarski et al. (2014)	fMRI	Cross-sectional	_	_
van Hees et al. (2014)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, 5-6 weeks later; note that "immediate improvement" was measured at the end of SLT, a week or two prior to T2 scan	SLT with alternating semantic and phonological sessions, 3 days/week, 4 weeks
Abel et al. (2015)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~6 weeks later (labeled T2 and T3 in paper)	Lexical therapy, alternating between weeks with phonological and semantic treatment, 4 weeks; 60 out of the 132 items were trained
Kiran et al. (2015)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~10 weeks later	Semantic feature-based treatment, 10 weeks
Sandberg et al. (2015)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, up to 10 weeks later	Semantic feature-based treatment, 2 hours/day, 2 days/week, up to 10 weeks (depending on when criterion reached)
Geranmayeh et al. (2016)	fMRI	Cross-sectional	-	-
Griffis et al. (2016)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~2 weeks later	RTMS to residual activation near Broca's area, 5 sessions/week, 2 weeks
Sims et al. (2016)	fMRI	Cross-sectional	—	_
Darkow et al. (2017)	fMRI	Longitudinal— chronic treatment	T1/T2: chronic; tDCS and sham sessions in randomized order	_
Geranmayeh et al. (2017)	fMRI	Longitudinal— recovery	T1: 15 ± 7.6 days (range 5-35 days); T2: 108 ± 26 days (range 87-200 days)	Variable modest amounts of SLT (range 0-18 hours) reported in Supplementary Table 1
Griffis, Nenert, Allendorfer, & Szaflarski (2017)	fMRI	Cross-sectional	_	_
Griffis, Nenert, Allendorfer, Vannest, et al. (2017)	fMRI	Cross-sectional	_	_
Harvey et al. (2017)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, 2 months after treatment; T3: 6 months after treatment (the 2- month time point was not included in analysis because there was no significant behavioral effect at that time)	Inhibitory rTMS to R IFG, 10 days
Nardo et al. (2017)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~6 weeks later	Anomia treatment (computer-based practice), 2+ hours/day, 6 weeks
Nenert et al. (2017)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~3 weeks later; T3: 3 months after the end of treatment	CIAT, 4 hours/day, 5 days/week, 2 weeks
Qiu et al. (2017)	fMRI	Cross-sectional	_	_
Skipper-Kallal et al.	fMRI	Cross-sectional	_	_

(2047.)				
(2017a)		Concerning the second		
Skipper-Kallal et al. (2017b)	fMRI	Cross-sectional	_	_
Dietz et al. (2018)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~4 weeks later	AAC group: treatment aimed at teaching participants how to utilize AAC to facilitate discourse; usual care group: traditional SLT, not focused on discourse or AAC specifically
Hallam et al. (2018)	fMRI	Cross-sectional	—	_
Nenert et al. (2018)	fMRI	Longitudinal— recovery	T1: ~2 weeks; T2: ~6 weeks; T3: ~12 weeks; T4: ~26 weeks; T5: ~52 weeks	Not stated
Pillay et al. (2018)	fMRI	Cross-sectional	—	_
Szaflarski et al. (2018)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic (1-2 weeks prior to treatment); T2: post-treatment (within 1 week after end of 2-week treatment); T3: 13-20 weeks after end of treatment	Modified CIAT + intermittent theta burst stimulation to residual left hemispheric language activation, 45 minutes/session, 5 days/week, 2 weeks
van de Sandt- Koenderman et al. (2018)	fMRI	Longitudinal— mixed	T1: pre treatment/subacute or chronic; T2: post-treatment, ~6 weeks later	MIT, 5+ hours/week
van Oers et al. (2018)	fMRI	Longitudinal— recovery	T1: within 2 weeks; T2: ~3 months; T3: ~6 months; T4: ~12 months; specific timing of first time point not stated	Not stated
Barbieri et al. (2019)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~12 weeks later	13 patients were treated and 5 were not; treatment of underlying forms; 90 minutes/session, 2 sessions/week until 80% accuracy met on weekly probe task, then 1 session/week, 12 weeks except for one patient who demonstrated rapid improvement and completed treatment in 6 weeks
Johnson et al. (2019)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, ~12 weeks later	Semantic naming treatment, 2 sessions/week
Kristinsson et al. (2019)	fMRI	Cross-sectional	—	_
Purcell et al. (2019)	fMRI	Longitudinal— chronic treatment	T1: pre-treatment/chronic; T2: post- treatment, 6-24 weeks later	Spelling treatment, 60-80 minutes/day, 2 days/week, range 6-24 weeks
Sreedharan, Chandran, et al. (2019)	fMRI	Longitudinal— mixed	Neurofeedback group: T1: pre- treatment/subacute; T2: 1-5 weeks later; T3: 2-6 weeks after T1; T4: 3-11 weeks after T1; T5: 4-12 weeks after T1; T6: 5-12 weeks after T1; no training group: T1: subacute; T2: 2-12 weeks later; controls: T1: start of study; T2: 1-4 weeks later; T3: 3-5 weeks after T1; T4: 4-8 weeks after T1; T5: 7-37 weeks after T1; T6: 12-43 weeks after T1	4 patients received 4 additional sessions involving neurofeedback training, while 4 patients received treatment as usual
Hartwigsen et al. (2020)	fMRI	Longitudinal— chronic treatment	T1/T2/T3: chronic; sessions consisted of cTBS over left anterior IFG, cTBS over left posterior IFG, or sham; sessions at least 7 days apart in randomized order	CTBS
Stockert et al. (2020)	fMRI	Longitudinal— recovery	T1 acute: 1-7 days; T2 subacute: 8-21 days; T3 chronic: > 6 months	Not stated

Study timing = Is the study cross-sectional or longitudinal?; Time points = If longitudinal, at what time point(s) were imaging data acquired?; Intervention = If longitudinal, was there any intervention between the time points?; AAC = Augmentative and Alternative Communication; CIAT = constraint-induced aphasia therapy; fMRI = functional magnetic resonance imaging; IFG = inferior frontal gyrus; MIT = melodic intonation therapy; PET = positron emission tomography; R = right; rCBF = regional cerebral blood flow; rCMRgI = regional cerebral metabolic rate for glucose; rTMS = repetitive transcranial magnetic stimulation; SLT = speech-language therapy; T1, T2, etc. = first time point, second time point, etc.; tDCS = transcranial direct current stimulation; TT = Token Test; Yellow underline = minor limitation.

## Supplementary Table S6. Imaging: Methodology part 1

Study	Scanner	Timing	Design type	Total images
Weiller et al. (1995)	Y (CTI ECAT 953/15)	Ŷ	PET	6
Belin et al. (1996)	Y (CEA LETI-TTV03)	Υ	PET	4
Ohyama et al. (1996)	Y (Headtome IV tomograph)	Υ	PET	6
Heiss et al. (1997)	Y (Siemens ECAT EXACT HR)	Υ	PET	2
Karbe et al. (1998)	Y (CTI-Siemens ECAT EXACT HR)	<u>N*</u> (activation and control images not acquired on the same day; number of acquisitions not clearly described)	PET	8
Cao et al. (1999)	Y (Magnex Scientific 3 Tesla)	Υ	Block	40
Heiss et al. (1999)	Y (CTI-Siemens ECAT EXACT HR)	Υ	PET	8
Kessler et al. (2000)	Y (CTI-Siemens ECAT EXACT HR)	Υ	PET	8
Rosen et al. (2000)	Y (Siemens 961 EXACT HR; Siemens Vision 1.5 Tesla)	$\underline{N}$ (fMRI timing description is inconsistent)	Mixed	PET: 10; fMRI: 384-768
Blasi et al. (2002)	Y (Siemens Vision 1.5 Tesla)	Υ	Event-related	1024
Leff et al. (2002)	Y (CTI-Siemens ECAT EXACT HR++/966)	Y	PET	16
Blank et al. (2003)	Y (CTI-Siemens ECAT EXACT HR++ (966))	Υ	PET	15 (patients); 12 (controls)
Cardebat et al. (2003)	Y (Siemens ECAT HR+)	Υ	PET	6
Sharp et al. (2004)	Y (Siemens HR++ 966)	Υ	PET	16
Zahn et al. (2004)	Y (Philips ACS NT Gyroscan 1.5 Tesla)	<u>N*</u> (insufficient blocks per experimental condition (3) because blocks were too long (44 s))	Block	198
Crinion & Price (2005)	<u>N</u> (Siemens 1.5 Tesla; model not stated)	$\underline{N}$ (the calculated duration of the stimuli, the calculated duration of the acquisitions, and the stated duration of the acquisitions yield three different numbers)	Block	460
de Boissezon et al. (2005)	Y (CTI-Siemens ECAT EXACT HR+)	Y	PET	6
Connor et al. (2006)	Y (Siemens Vision 1.5 Tesla)	Υ	Event-related	1024
Crinion et al. (2006)	Y (CTI-Siemens ECAT EXACT HR++/966 (16 patients and all controls) or GE Advance (8 patients))	Y	PET	12-16
Saur et al. (2006)	Y (Siemens Trio 3 Tesla)	Υ	Event-related	660
Meinzer et al. (2008)	Y (Philips Intera 1.5 Tesla)	Υ	Block	160
Raboyeau et al. (2008)	Y (Siemens ECAT HR+)	Υ	PET	6
Richter et al. (2008)	Y (Siemens Vision plus 1.5 Tesla)	<u>N</u> (minor discrepancies in description of timing)	Block	134
de Boissezon et al. (2009)	Y (CTI-Siemens ECAT EXACT HR+)	Y	PET	6
Fridriksson et al. (2009)	<u>N</u> (not stated)	N (timing of picture presentation not clearly explained)	Event-related	120
Menke et al. (2009)	Y (Philips Intera 3 Tesla)	$\underline{N}$ (total images acquired not stated)	Event-related	Probably ~360, but not stated
Specht et al. (2009)	Y (CTI-Siemens HR+)	Υ	PET	9
Warren et al. (2009)	Y (CTI-Siemens ECAT EXACT HR++/966 (10 patients and all controls) or GE Advance (6 patients))	Y	PET	12-16
Chau et al. (2010)	<u>N</u> (not stated)	<u>N</u> (inconsistent information regarding timing)	Block	90?
Fridriksson (2010)	Y (Siemens Trio 3 Tesla)	$\underline{N}$ (timing of stimuli within the silent periods	Event-related	120

		is unclear)		
Fridriksson et al. (2010)	Y (Siemens Trio 3 Tesla)	$\underline{N}$ (exact timing of picture presentation not	Event-related	120
111011K35011 et al. (2010)		specified)	Eventrelated	120
Sharp et al. (2010)	Y (Siemens HR++ 966)	Υ	PET	16
Thompson et al. (2010)	Y (Siemens Trio 3 Tesla)	<u>N</u> (total images acquired not stated)	Event-related	Not stated
Tyler et al. (2010)	Y (Siemens Trio 3 Tesla)	<u>N*</u> (there was only one block per condition	Block	69
		per run, so condition could be confounded with low frequency drift; also, the length of the sentences is not stated so it is unclear how well the HRF peak aligns with the sparse acquisitions)		
van Oers et al. (2010)	Y (Philips Achieva 3 Tesla)	Y	Block	3036
Papoutsi et al. (2011)	Y (Siemens Trio 3 Tesla)	<u>N</u> (length of stimuli not described)	Event-related	1059
Sebastian & Kiran (2011)	<u>N</u> (GE 3 Tesla; model not stated)	N* (control events took place in the inter- trial interval between language events, and may have been systematically confounded in timing; the total number of functional images acquired is not stated)	Event-related	Not stated
Szaflarski et al. (2011)	Y (Varian Unity INOVA 4 T)	<u>N</u> (timing not clear, because previous studies cited are not all identical in terms of timing)	Block	Not stated
Tyler et al. (2011)	Y (Siemens Trio 3 Tesla)	<u>N</u> (run length not stated; length of stimuli not described)	Event-related	Not stated but 1059 per Papoutsi et al. (2011)
Weiduschat et al. (2011)	Y (CTI-Siemens ECAT EXACT HR)	Y	PET	8
Allendorfer et al. (2012)	<u>N</u> (Phillips 3 Tesla; model not stated)	Y	Mixed	435
Fridriksson, Hubbard, et al. (2012)	<u>N</u> (Siemens 3 Tesla; model not stated)	<u>N*</u> (it appears that each of the three conditions was presented in a separate run)	Event-related	180?
Fridriksson, Richardson, et al. (2012)	Y (Siemens Trio 3 Tesla)	<u>N</u> (timing of stimuli within the silent periods is unclear)	Event-related	120
Marcotte et al. (2012)	Y (Siemens Trio 3 Tesla)	<u>N</u> (total images acquired not stated)	Event-related	Not stated
Schofield et al. (2012)	Y (Siemens Sonata 1.5 Tesla)	Y	Block	488
Wright et al. (2012)	Y (Siemens Trio 3 Tesla)	N* (there was only one block per condition per run, so condition could be confounded with low frequency drift; also, the length of the sentences is not stated so it is unclear how well the HRF peak aligns with the sparse acquisitions)	Block	69
Szaflarski et al. (2013)	<u>N</u> (Phillips 3 Tesla; model not stated)	Υ	Block	330
Thiel et al. (2013)	Y (CTI-Siemens ECAT EXACT HR)	Y	PET	8
Abel et al. (2014)	Y (Philips Achieva 3 Tesla)	N* (trials too close together (~8 s) and insufficient jitter (1-3 s) for event-related design)	Event-related	560
Benjamin et al. (2014)	Y (Philips Achieva 3 Tesla)	<u>N</u> (total images acquired not stated)	Event-related	Not stated
Brownsett et al. (2014)	Y (Philips Intera 3 Tesla)	N* (timing of sentence presentation not described; sparse event-related design, but ITI of only 8 s and consistent linear order of listening and repetition trials could make it difficult to disentangle hemodynamic responses to listening and repeating trials)	Event-related	168 (patients); 280 (controls)
Mattioli et al. (2014)	Y (Siemens Avanto 1.5 Tesla)	<u>N</u> (timing of stimuli not clearly described)	Event-related	504
Mohr et al. (2014)	Y (Siemens Trio 3 Tesla)	Y	Event-related	76
Robson et al. (2014)	Y (Philips Achieva 3 Tesla)	N* (each condition was acquired in a separate run, which is suboptimal)	Block	417

Szaflarski et al. (2014)	Y (Philips Achieva 3 Tesla, except for 1 patient and 1 control on a Bruker 3 Tesla)	Y	Block	165
van Hees et al. (2014)	Y (Bruker MedSpec 4 Tesla)	Y	Event-related	610
Abel et al. (2015)	Y (Philips Achieva 3 Tesla)	N* (trials too close together (~8 s) and insufficient jitter (1-3 s) for event-related design)	Event-related	560
Kiran et al. (2015)	Y (Philips Achieva 3 Tesla)	<u>N*</u> (picture and scrambled conditions have different durations; ITI 2-4 s seems too short; total images acquired not stated)	Event-related	Not stated
Sandberg et al. (2015)	Y (Philips Achieva 3 Tesla)	<u>N*</u> (total images acquired not stated; ITI of 1-3 s seems short)	Event-related	Not stated
Geranmayeh et al. (2016)	Y (Siemens Trio 3 Tesla)	Y	Event-related	213
Griffis et al. (2016)	Y (Varian Unity INOVA 4 Tesla)	Y	Block	140
Sims et al. (2016)	Y (Philips Achieva 3 Tesla)	<u>N</u> (total images acquired not stated)	Event-related	Not stated
Darkow et al. (2017)	Y (Siemens Trio 3 Tesla)	Y	Event-related	100
Geranmayeh et al. (2017)	Y (Siemens Trio 3 Tesla)	Y	Event-related	213
Griffis, Nenert, Allendorfer, & Szaflarski (2017)	<u>N</u> (Siemens Allegra 3 Tesla or Philips 3 Tesla; model not stated)	Y	Block	165
Griffis, Nenert, Allendorfer, Vannest, et al. (2017)	<u>N</u> (Siemens Allegra 3 Tesla or Philips 3 Tesla; model not stated)	Y	Block	165
Harvey et al. (2017)	Y (Siemens Trio 3 Tesla)	Y	Block	200
Nardo et al. (2017)	Y (Siemens Trio 3 Tesla)	Y	Event-related	696
Nenert et al. (2017)	<u>N</u> (Philips 3 Tesla or Siemens 3 Tesla; models not stated)	Y	Block	600
Qiu et al. (2017)	Y (GE Signa 1.5 Tesla)	<u>N*</u> (only three pictures were named per 30- second block)	Block	186
Skipper-Kallal et al. (2017a)	Y (Siemens Trio 3 Tesla)	<u>N*</u> (total images acquired not stated; separation of adjacent events (covert and overt naming) will be limited because of the small amount of jitter in their timing (only 1500 ms))	Event-related	~450 but not stated
Skipper-Kallal et al. (2017b)	Y (Siemens Trio 3 Tesla)	N* (total images acquired not stated; separation of adjacent events (covert and overt naming) will be limited because of the small amount of jitter in their timing (only 1500 ms))	Event-related	~450 but not stated
Dietz et al. (2018)	Y (Philips Achieva 3 Tesla)	Y	Event-related	135
Hallam et al. (2018)	Y (GE Signa HDx 3 Tesla)	Y	Event-related	348
Nenert et al. (2018)	<u>N</u> (Philips 3 Tesla or Siemens 3 Tesla; models not stated)	Y	Block	600
Pillay et al. (2018)	Y (GE Excite 3 Tesla)	<u>N</u> (precise timing of stimuli not stated; total images acquired not stated)	Event-related	Not stated
Szaflarski et al. (2018)	Y (Siemens Allegra 3 Tesla)	Y	Block	330
van de Sandt- Koenderman et al. (2018)	<u>N</u> (GE 3 Tesla; model not stated)	Y	Block	132
van Oers et al. (2018)	Y (Philips Achieva 3 Tesla)	N* (stimulus presentation was self-paced, but the ITI is not reported, nor are the number of trials presented per condition; it is likely that the language and control blocks contained different numbers of trials)	Block	1656
Barbieri et al. (2019)	Y (Siemens Trio 3 Tesla or Siemens Prisma 3 Tesla)	<u>N*</u> (stimulus timing described does not match stated duration of data acquisition;	Block	~482

		timing of language and control trials not matched)		
Johnson et al. (2019)	Y (Siemens Trio 3 Tesla, except for 2 patients on a Siemens Prisma 3 Tesla)	<u>N*</u> (total images not stated; short ITI and minimal jitter)	Event-related	Not stated
Kristinsson et al. (2019)	Y (Siemens Trio 3 Tesla or Siemens Prisma 3 Tesla)	Y	Event-related	60
Purcell et al. (2019)	<u>N</u> (not stated)	Y	Event-related	1232 (four runs distributed over two days)
Sreedharan, Chandran, et al. (2019)	Y (Siemens Avanto 1.5 Tesla)	<u>N*</u> (picture naming events consistently located between blocks)	Mixed	Probably 964
Hartwigsen et al. (2020)	Y (Siemens Verio 3 Tesla)	<u>N*</u> (stimulus timing not described in detail; stated duration of data acquisition substantially outside possible range of duration of stimuli)	Block	740
Stockert et al. (2020)	Y (Siemens Trio 3 Tesla or Siemens Verio 3 Tesla)	Y	Event-related	660 (20 patients; paradigm 1) or 260 (14 patients; paradigm 2)

Scanner = Is the scanner described?; Timing = Is the timing of stimulus presentation and image acquisition clearly described and appropriate?; Total images = Total images acquired; fMRI = functional magnetic resonance imaging; HRF = hemodynamic response function; ITI = inter-trial interval; N = No; PET = positron emission tomography; Y = Yes; Yellow underline = minor limitation; Orange underline/\* = moderate limitation.

# Supplementary Table S7. Imaging: Methodology part 2

Study	Acquisition	Preprocessing	Model fitting	Registration	Notes
Weiller et al. (1995)	Y (axial; field of view =	Y	Y	Y	
	5.4 cm; perisylvian only)				
Belin et al. (1996)	Y (7 transaxial slices 12 mm apart)	Y	Y	Y	
Ohyama et al. (1996)	<u>N</u> (91 mm field of view; coverage limitations not stated)	Y	Y	<u>N</u> (lesion impact not addressed)	
Heiss et al. (1997)	Y (whole brain)	Υ	Υ	N/A	
Karbe et al. (1998)	Y (whole brain)	Υ	Y	N/A	
Cao et al. (1999)	Y (axial, perisylvian only)	Y	<u>N</u> (first level cross- correlation analysis unclear)	N/A	
Heiss et al. (1999)	Y (whole brain)	Y	Υ	N/A	
Kessler et al. (2000)	Y (whole brain)	Y	Υ	N/A	
Rosen et al. (2000)	Y (whole brain)	Y	Y	Y	1 patient scanned on different PET scanner, and not scanned with fMRI; controls had different fMRI sequence to patients
Blasi et al. (2002)	Y (whole brain)	Y	Y	<u>N</u> (not described)	
Leff et al. (2002)	Y (whole brain)	Y	Υ	Y	
Blank et al. (2003)	Y (whole brain)	Y	Υ	Y	
Cardebat et al. (2003)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact not addressed)	
Sharp et al. (2004)	Y (whole brain)	Y	Y	Y	
Zahn et al. (2004)	Y (whole brain)	Y	Y	N/A	
Crinion & Price (2005)	Y (whole brain)	Y	Y	Y	
de Boissezon et al. (2005)	Y (whole brain)	Y	Υ	<u>N</u> (lesion impact not addressed; minimal due to lesions being small and subcortical)	
Connor et al. (2006)	Y (whole brain)	Y	Y	Y	
Crinion et al. (2006)	Y (whole brain)	Y	Y	Y	Two different scanners used for patients, but not for controls
Saur et al. (2006)	Y (whole brain)	Υ	Υ	Y	
Meinzer et al. (2008)	Y (whole brain)	Y	Υ	Y	
Raboyeau et al. (2008)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact not addressed)	
Richter et al. (2008)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact not addressed)	
de Boissezon et al. (2009)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact not addressed)	
Fridriksson et al. (2009)	Y (whole brain)	Y	Y	Y	Sparse sampling
Menke et al. (2009)	Y (whole brain)	Y	Y	Y	
Specht et al. (2009)	Y (whole brain)	Y	Υ	Y	
Warren et al. (2009)	Y (whole brain)	Y	Y	Y	Two different scanners used for patients, but not for controls
Chau et al. (2010)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact	

				not addressed)	
Fridriksson (2010)	Y (whole brain)	Υ	Υ	Y	Sparse sampling
Fridriksson et al. (2010)	Y (whole brain)	Y	Υ	Υ	Sparse sampling
Sharp et al. (2010)	Y (whole brain)	Y	Υ	Y	
Thompson et al. (2010)	Y (whole brain)	Y	Υ	Y	
Tyler et al. (2010)	Y (whole brain)	Y	Υ	Y	Sparse sampling
van Oers et al. (2010)	Y (whole brain)	Y	Y	Y	Breath holding scan also done to measure hemodynamic responsiveness
Papoutsi et al. (2011)	Y (whole brain)	Y	<u>N</u> (lacks explanation of event durations)	Y	
Sebastian & Kiran (2011)	Y (whole brain)	Υ	<u>N</u> (only correct trials are included but it is not stated how incorrect trials were modeled; in general, it is not stated whether the control events were modeled at all)	Y	
Szaflarski et al. (2011)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact not addressed)	
Tyler et al. (2011)	Y (whole brain)	Υ	<u>N</u> (lacks explanation of event durations)	Y	
Weiduschat et al. (2011)	Y (whole brain)	Υ	Y	Y	
Allendorfer et al. (2012)	Y (whole brain)	Y	<u>N</u> (no description of HRF model, which is important given sparse sampling design)	<u>N</u> (lesion impact not addressed)	Sparse sampling
Fridriksson, Hubbard, et al. (2012)	Y (whole brain)	Υ	<u>N</u> (not described clearly)	Y	Sparse sampling
Fridriksson, Richardson, et al. (2012)	Y (whole brain)	Y	Y	Y	Sparse sampling; 26 patients were also scanned with arterial spin labelling
Marcotte et al. (2012)	Y (whole brain)	Υ	Y	<u>N</u> (lesion impact not addressed)	
Schofield et al. (2012)	Y (mostly whole brain but convexity or cerebellum excluded in some participants)	Y	Y	Y	
Wright et al. (2012)	Y (whole brain)	Y	Υ	Υ	Sparse sampling
Szaflarski et al. (2013)	Y (whole brain)	Υ	Υ	Υ	
Thiel et al. (2013)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact not addressed)	
Abel et al. (2014)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact not addressed)	
Benjamin et al. (2014)	Y (whole brain)	<u>N</u> (not described)	<u>N</u> (not described clearly)	<u>N</u> (lesion impact not addressed)	
Brownsett et al. (2014)	Y (whole brain)	Y	N* (consistent linear order of listening and repetition trials could make it difficult to disentangle hemodynamic responses to listening and repeating trials)	Y	Sparse sampling; different task structure in controls (two repetition trials per listening trial) raises concerns about comparisons between groups
Mattioli et al. (2014)	<u>N</u> (unclear; number of	Y	<u>N</u> (model fitting of	Υ	
			-		

	slices not stated)		noise "bip" not clearly described)		
Mohr et al. (2014)	Y (whole brain)	Υ	Y	<u>N</u> (lesion impact not addressed)	Sparse sampling
Robson et al. (2014)	Y (whole brain)	Y	Y	Y	Spin echo fMRI to minimize ATL dropout
Szaflarski et al. (2014)	Y (whole brain)	Y	Y	Y	
van Hees et al. (2014)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact not addressed)	Slow event-related design; sparse sampling
Abel et al. (2015)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact not addressed)	
Kiran et al. (2015)	Y (whole brain)	Y	Y	Y	Controls were run on two different sets of parameters, neither of which was the same as the patients
Sandberg et al. (2015)	Y (whole brain)	Y	Y	Y	
Geranmayeh et al. (2016)	Y (whole brain)	Υ	Y	Y	Sparse sampling; mini- blocks of 2-4 trials
Griffis et al. (2016)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact not addressed)	
Sims et al. (2016)	Y (whole brain)	Y	Y	Y	No smoothing
Darkow et al. (2017)	Y (whole brain)	Y	Y	Y	Sparse sampling
Geranmayeh et al. (2017)	Y (whole brain)	Y	Y	Y	Sparse sampling; mini- blocks of 2-4 trials
Griffis, Nenert, Allendorfer, & Szaflarski (2017)	Y (whole brain)	Y	Y	Y	
Griffis, Nenert, Allendorfer, Vannest, et al. (2017)	Y (whole brain)	Y	Y	Y	
Harvey et al. (2017)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact not addressed)	
Nardo et al. (2017)	Y (whole brain)	Y	Y	Y	
Nenert et al. (2017)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact not addressed)	
Qiu et al. (2017)	Y (whole brain)	<u>N</u> (not described)	<u>N</u> (no description of model fitting)	<u>N</u> (not described)	
Skipper-Kallal et al. (2017a)	Y (whole brain)	Y	N* (entire phases where picture was displayed modeled as covert and overt naming; difficult to separate phases due to timing)	Y	
Skipper-Kallal et al. (2017b)	Y (whole brain)	Y	N* (not stated but see Skipper-Kallal et al. (2017b))	Y	At each voxel, individuals with lesions to that voxel were excluded from analysis
Dietz et al. (2018)	Y (whole brain)	Y	<u>N</u> (no description of HRF model, which is important given sparse sampling design)	<u>N</u> (lesion impact not addressed)	Additional methodological details in Dietz et al. (2016)
Hallam et al. (2018)	Y (whole brain)	Y	Y	Y	Interleaved silent steady state imaging
Nenert et al. (2018)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact not addressed)	Scanner identity appropriately included as covariate
Pillay et al. (2018)	Y (whole brain)	Υ	Υ	Y	

Szaflarski et al. (2018)	Y (whole brain)	Y	Y	Y	
van de Sandt- Koenderman et al. (2018)	Y (whole brain)	Y	Y	<u>N</u> (lesion impact not addressed)	
van Oers et al. (2018)	Y (whole brain)	Y	γ	Y	Not all participants scanned at each time point; the number scanned at each time point is not stated
Barbieri et al. (2019)	Y (whole brain)	Y	Y	Y	2 runs before treatment and 2 runs after treatment; each pair of runs took place on two separate days (1-7 days apart)
Johnson et al. (2019)	Y (whole brain)	Y	N* (unclear whether there was sufficient resting data to allow the key contrast to be computed)	Y	
Kristinsson et al. (2019)	Y (whole brain)	Υ	Y	Y	Sparse sampling
Purcell et al. (2019)	Y (cerebellum excluded)	Y	N* (not feasible to separate closely spaced instruction, word, and letter/response, especially when responses will be compared to rest)	Y	
Sreedharan, Chandran, et al. (2019)	Y (whole brain)	Y	<u>N*</u> (event timing will make conditions difficult to disentangle)	<u>N</u> (lesion impact not addressed)	
Hartwigsen et al. (2020)	Y (whole brain)	Υ	Y	<u>N</u> (lesion impact not addressed)	
Stockert et al. (2020)	<u>N</u> (whole brain; TE = 96 ms questionable)	Y	Y	Υ	

Acquisition = Are the imaging acquisition parameters, including coverage, adequately described and appropriate?; Preprocessing = Is preprocessing and intrasubject coregistration adequately described and appropriate?; Model fitting = Is first level model fitting adequately described and appropriate?; Registration = Is intersubject normalization adequately described and appropriate?; ATL = anterior temporal lobe; fMRI = functional magnetic resonance imaging; HRF = hemodynamic response function; N = No; N/A = N/A—no intersubject normalization.; PET = positron emission tomography; Y = Yes; Yellow underline = minor limitation; Orange underline/\* = moderate limitation.

# Supplementary Table S8. Conditions

Study	Condition	Response type	Repetitions	All groups could do?	All indivs could do?	Notes
Weiller et al. (1995)	Verb generation	Multiple words (covert)	2	Y	Y	Auditory presentation; pre- scan behavioral data reported
	Pseudoword repetition	Multiple words (covert)	2	Y	Y	
	Rest	None	2	N/A	<u>N/A</u>	
Belin et al. (1996)	Word repetition with MIT-like intonation	Word (overt)	1	Y	<u>U</u>	
	Word repetition	Word (overt)	1	Y	U	
	Listening to words	None	1	N/A	N/A	
	Rest	None	1	N/A	N/A	
Ohyama et al. (1996)	Word repetition	Word (overt)	2	Y	Y	Patients were able to repeat
	Counting	Multiple words (overt)	2	Y	Υ	words well, with phonemic errors on no more than 4 out of 48 words; counting
	Rest	None	2	<u>N/A</u>	<u>N/A</u>	condition not analyzed in this paper
Heiss et al. (1997)	Word repetition	Word (overt)	1	U	U	No information about
	Rest	None	1	<u>N/A</u>	<u>N/A</u>	repetition rate, or whether repetition was overt or covert
Karbe et al. (1998)	Word repetition	Word (overt)	4 (?)	<u>U</u>	<u>U</u>	Inability to repeat single words was an exclusion criterion, but
	Rest	None	4 (?)	<u>N/A</u>	<u>N/A</u>	many patients had severe aphasia so it is unclear how they would have performed
Cao et al. (1999)	Picture naming	Word (covert)	4	Y	Y	
	Viewing nonsense drawings	None	4	N/A	N/A	
Heiss et al. (1999)	Noun repetition	Word (overt)	4	U	U	Inclusion criterion would
	Rest	None	4	<u>N/A</u>	<u>N/A</u>	suggest all patients could do the task, but this is not stated
Kessler et al. (2000)	Word repetition	Word (overt)	4	Y	Y	Inclusion criterion was applied
	Rest	None	4	N/A	<u>N/A</u>	to ensure that the task could be performed
Rosen et al. (2000)	Word stem completion (PET)	Word (overt)	4	Y	Y	Pseudoword reading condition
	Reading pseudowords aloud (PET)	Word (overt)	4	Y	<u>N</u>	not analyzed in this paper
	Rest (PET)	None	2	N/A	N/A	
	Word stem completion (fMRI)	Word (covert)	15-30 (?)	Y	Y	
	Rest (fMRI)	None	15-30 (?)	N/A	N/A	
Blasi et al. (2002)	Word stem completion (novel items)	Word (covert)	196	Y	<u>U</u>	Novel items were presented in runs 1, 6, 7, and 8; repeated
	Word stem completion (repeated items)	Word (covert)	196	Y	<u>U</u>	items were presented in runs 2, 3, 4, and 5; of the four
	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	repeated runs, only run 5 was analyzed.
Leff et al. (2002)	Listening to words at 10 wpm	None	2	N/A	N/A	
	Listening to words at 35 wpm	None	2	N/A	N/A	
	Listening to words at 55 wpm	None	2	N/A	<u>N/A</u>	
	Listening to words at 70 wpm	None	2	N/A	N/A	
	Listening to words at 85 wpm	None	2	N/A	N/A	
	Listening to words at 95 wpm	None	2	N/A	<u>N/A</u>	
	Listening to words at 115 wpm	None	2	<u>N/A</u>	<u>N/A</u>	

	Listening to words at 130 wpm	None	2	<u>N/A</u>	<u>N/A</u>	
Blank et al. (2003)	Propositional speech production	Sentence (overt)	Aphasia: 5; control: 4	Y	Y	Alertness maintained in rest by asking participants to listen to environmental sounds that
	Counting	Multiple words (overt)	Aphasia: 5; control: 4	Y	Y	were presented before and after data acquisition; speech was recorded and rate was
	Rest	None	Aphasia: 5; control: 4	<u>N/A</u>	<u>N/A</u>	measured, also QPA was done of a separate speech sample outside the scanner
Cardebat et al. (2003)	Word generation	Word (overt)	4	Y	<u>U</u>	Participants were asked to generate words that were semantically related to
	Rest	None	2	<u>N/A</u>	<u>N/A</u>	binaurally presented stimuli; 2 runs involved nouns and 2 involved verbs
Sharp et al. (2004)	Semantic decision	Word (overt)	Aphasia: 8; control: 4	Y	Y	Seems the response was a spoken word, but this is not stated explicitly; assuming all
	Syllable count decision	Word (overt)	Aphasia: 8; control: 4	Y	Y	individuals could do the tasks because this was an inclusion criterion and behavioral data
	Semantic decision (noise vocoded) (control only)	Word (overt)	4 (control)	Y	Y	supports
	Syllable count decision (noise vocoded) (control only)	Word (overt)	4 (control)	Y	Y	
Zahn et al. (2004)	Phonetic decision (reversed words vs sounds)	Button press	3	Y	<u>N</u>	
	Lexical decision (words vs reversed words)	Button press	3	Y	Y	
	Semantic decision	Button press	3	Y	N	
	Rest	None	9	N/A	N/A	
Crinion & Price (2005)	Listening to narrative speech	None	32	<u>N/A</u>	<u>N/A</u>	A post-scan surprise recognition test asked whether or not 38 phrases had occurred in any story; patients answered 12-33 of these questions correctly; controls
	Listening to reversed speech	None	8	<u>N/A</u>	<u>N/A</u>	answered 24-37 correctly; also note that all patients performed above chance on CAT auditory sentence comprehension (73%+ accuracy)
de Boissezon et al. (2005)	Word generation	Word (overt)	4	Y	Y	Nouns in two runs, verbs in two runs, combined here
	Rest	None	2	<u>N/A</u>	<u>N/A</u>	because they were combined in analysis
Connor et al. (2006)	Word stem completion (novel items)	Word (covert)	196	Y	U	Novel items were presented in runs 1, 6, 7, and 8; repeated
	Word stem completion (repeated items)	Word (covert)	196	Y	<u>U</u>	items were presented in runs 2, 3, 4, and 5; of the four
	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	repeated runs, only run 5 was analyzed.
Crinion et al. (2006)	Listening to narrative speech	None	6-8	N/A	N/A	
	Listening to reversed speech	None	6-8	N/A	N/A	
Saur et al. (2006)	Listening to sentences and making a plausibility	Button press	92	<u>U</u>	<u>N</u>	In the auditory sentence comprehension condition,

	judgment Listening to reversed speech Rest	Button press None	92 Implicit	Y N/A	<u>U</u> N/A	participants had to press a button to semantically anomalous sentences; in the reversed speech condition, they had to always press the button; the behavioral scores provided are not explained in the paper, but per a personal communication cited by Geranmayeh et al. (2014), 10% of the score reflects discrimination between intelligible and reversed
			baseline			speech, while 90% reflects semantic anomaly judgment; our coding of behavior is based on this limited information
Meinzer et al. (2008)	Picture naming (trained items)	Word (overt)	8	Y	<u>N</u>	One participant was < 10% on trained and untrained items at
	Picture naming (untrained items)	Word (overt)	8	Y	<u>N</u>	T1
	Rest	None	16	N/A	N/A	
Raboyeau et al. (2008)	Picture naming (native language)	Word (overt)	Aphasia: 4; control: 2	Y	<u>U</u>	Picture naming in native language in controls not analyzed in this paper
	Picture naming (relearned foreign language) (controls only)	Word (overt)	2	Y	<u>U</u>	
	Rest	None	2	N/A	N/A	
Richter et al. (2008)	Reading words silently	Word (covert)	4	Y	U	Preliminary data on the tasks
	Word stem completion Rest	Word (covert) None	4 10 (?)	Y <u>N/A</u>	<u>U</u> <u>N/A</u>	suggests that patients would have been able to perform them, and patients were interviewed regarding the tasks after each fMRI session, however the outcomes of these interviews are not reported
de Boissezon et al.	Word generation	Word (overt)	4	Y	Y	
(2009)	Rest	None	2	N/A	<u>N/A</u>	
Fridriksson et al. (2009)	Picture naming Viewing scrambled images	Word (overt) None	80 40	Y N/A	<u>N</u> N/A	
Menke et al. (2009)	Picture naming (trained inages items)	Word (overt)	30	<u>N</u>	NA	Patients could not name trained and untrained items at
	Picture naming (untrained items)	Word (overt)	30	<u>N</u>	<u>N</u>	baseline
	Picture naming (already known items)	Word (overt)	30	Y	<u>U</u>	
	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	
Specht et al. (2009)	Lexical decision (words vs pseudowords)	Button press	3	Y	Y	Behavioral data was lost, but it is clearly stated that all participants could perform all tasks above chance; the tone decision task is not described
	Lexical decision (words vs reversed foreign words)	Button press	3	Y	Y	in sufficient detail, but since it is not used in any contrast of interest, the conditions are

	Tone decision	Button press	3	Y	Y	coded as being clearly described
Warren et al. (2009)	Listening to narrative speech Listening to reversed speech	None None	6-8 6-8	<u>N/A</u> N/A	N/A N/A	
Chau et al. (2010)	Answering questions from Cantonese Aphasia Battery	Button press	3	<u>U</u>	<u>U</u>	<u>Nature of questions not</u> <u>described in detail;</u> responses involved raising left or right
	Visual decision	Button press	3	U	<u>U</u>	finger (not button press per se)
Fridriksson (2010)	Picture naming Viewing abstract pictures	Word (overt) None	80	Y <u>N/A</u>	<u>U</u> <u>N/A</u>	Patients with fewer than 5 correct responses in any session were excluded; there were probably some patients who made 5 or more correct
						responses but less than 10%, but this is not reported
Fridriksson et al.	Picture naming	Word (overt)	80	Y	Y	
(2010)	Viewing abstract pictures	None	40	N/A	N/A	
Sharp et al. (2010)	Semantic decision	Word (overt)	Aphasia: 8; control: 4	Y	Y	Seems the response was a spoken word, but this is not stated explicitly; assuming all
	Syllable count decision	Word (overt)	Aphasia: 8; control: 4	Y	<u>U</u>	individuals could do the semantic task because this was an inclusion criterion and
	Semantic decision (noise vocoded) (control only)	Word (overt)	4 (control)	Y	Y	behavioral data (PPT) supports, but not sure about
	Syllable count decision (noise vocoded) (control only)	Word (overt)	4 (control)	Y	Y	the phonological task
Thompson et al. (2010)	Auditory sentence-picture matching (auditory; object cleft)	Button press	60	N	N	
	Auditory sentence-picture matching (subject cleft)	Button press	60	Y	Y	
	Auditory sentence-picture matching (simple past tense active)	Button press	60	Y	<u>N</u>	
	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	
Tyler et al. (2010)	Listening to normal sentences and detecting a target word	Button press	2	Y	<u>U</u>	Auditory presentation; target detection task with early and late targets; 12-15 trials per
	Listening to grammatical but meaningless sentences and detecting a target word	Button press	2	Y	<u>U</u>	block with single sparse acquisition each, but only one block per run, in fixed order;
	Listening to scrambled sentences and detecting a target word	Button press	2	Y	<u>U</u>	task can apparently be performed by patients with brain damage, but accuracy is
	Listening to "musical rain" and detecting a period of white noise	Button press	2	Y	U	not reported
	Rest	None	2	N/A	<u>N/A</u>	
van Oers et al. (2010)	Written word-picture matching	Button press	6	Y	Y	Patients who could not do tasks were excluded from analyses of those tasks (1 patient from semantic
	Semantic decision	Button press	6	Y	Y	patient from semantic decision; 3 patients from verb generation); wording is
	Verb generation	Word (covert)	8	Y	Y	somewhat unclear regarding exclusion of patients who

	Visual decision Rest	Button press None	12 20	<u>U</u> N/A	<u>U</u> <u>N/A</u>	could not perform verb generation, but we assume they were excluded
Papoutsi et al. (2011)	Listening to unambiguous sentences ("unambiguous")	None	42	<u>N/A</u>	<u>N/A</u>	
	Listening to ambiguous sentences with dominant resolution ("dominant")	None	42	<u>N/A</u>	<u>N/A</u>	
	Listening to ambiguous sentences with subordinate resolution ("subordinate")	None	42	<u>N/A</u>	<u>N/A</u>	
	Listening to filler sentences	None	126	N/A	N/A	
	Listening to "musical rain"	None	42	N/A	N/A	
	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	
Sebastian & Kiran	Picture naming	Word (overt)	60	Y	Y	
(2011)	Viewing scrambled images and saying "pass"	Word (overt)	60	<u>U</u>	<u>U</u>	
	Semantic decision	Button press	48	Y	Y	
	Visual decision	Button press	48	U	U	
Szaflarski et al. (2011)	Semantic decision	Button press	Not stated	<u>U</u>	N	<u>Based on Binder et al. (1997),</u> <u>but details not reported</u> ; group only just above chance,
	Tone decision	Button press	Not stated	<u>U</u>	<u>N</u>	unclear whether significantly better; clearly some individuals were at chance
Tyler et al. (2011)	Listening to unambiguous sentences ("unambiguous")	None	42	<u>N/A</u>	<u>N/A</u>	
	Listening to ambiguous sentences with dominant resolution ("dominant")	None	42	<u>N/A</u>	<u>N/A</u>	
	Listening to ambiguous sentences with subordinate resolution ("subordinate")	None	42	<u>N/A</u>	<u>N/A</u>	
	Listening to filler sentences	None	126	N/A	N/A	
	Listening to "musical rain"	None	42	N/A	N/A	
	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	
Weiduschat et al.	Verb generation	Word (covert)	4	U	U	
(2011)	Rest	None	4	N/A	N/A	
Allendorfer et al. (2012)	Verb generation (overt, event-related)	Multiple words (overt)	15	Y	<u>U</u>	Given the means and standard deviations presented, it is
	Verb generation (covert, event-related)	Multiple words (covert)	15	<u>U</u>	<u>U</u>	likely that some patients could not perform some tasks; post-
	Noun repetition (event- related)	Multiple words (overt)	15	Y	<u>U</u>	scan recognition tests not considered to quantify performance
	Verb generation (covert, block)	Multiple words (covert)	10	<u>U</u>	<u>U</u>	performance
	Finger tapping (block)	Other	10	U	U	
Fridriksson, Hubbard, et al. (2012)	Listening to/watching audiovisual sentences, while producing the same sentences in unison (speech entrainment)	Sentence (overt)	30 (?)	Y	U	<u>Rest condition implied but not</u> described
	Listening to reversed sentences and viewing a mouth speaking, while	Sentence (overt)	30 (?)	Y	<u>U</u>	

	producing unrelated sentences					
	Listening to/watching audiovisual sentences and viewing a mouth	None	30 (?)	<u>N/A</u>	<u>N/A</u>	
	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	
Fridriksson,	Picture naming	Word (overt)	80	Y	U	
Richardson, et al. (2012)	Viewing abstract pictures	None	40	<u>N/A</u>	<u>N/A</u>	
Marcotte et al. (2012)	Picture naming (already known items)	Word (overt)	20	Y	Y	
	Picture naming (trained items)	Word (overt)	20	<u>N</u>	<u>N</u>	
	Picture naming (untrained items)	Word (overt)	40	N	<u>N</u>	
	Viewing scrambled images and saying "baba"	Word (overt)	20	Y	Y	
	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	
Schofield et al. (2012)	Listening to word pairs, speaker gender judgment	Button press	18	Y	U	
	Listening to reversed word pairs, speaker gender judgment	Button press	18	Y	<u>U</u>	
	Rest	None	40 (?)	N/A	N/A	
Wright et al. (2012)	Listening to normal sentences and detecting a target word	Button press	2	Y	Y	Auditory presentation; target detection task with early and late targets; 12-15 trials per
	Listening to grammatical but meaningless sentences and detecting a target word	Button press	2	Y	Y	block with single sparse acquisition each, but only one block of each condition per
	Listening to scrambled sentences and detecting a target word	Button press	2	Y	Y	run, in fixed order
	Listening to "musical rain" and detecting a period of white noise	Button press	2	Y	Y	
	Rest	None	2	N/A	N/A	
Szaflarski et al.	Semantic decision	Button press	10	N	N	
(2013)	Tone decision	Button press	12	N	N	
Thiel et al. (2013)	Verb generation	Word (overt)	4	<u>U</u>	<u>U</u>	
	Rest	None	4	N/A	<u>N/A</u>	
Abel et al. (2014)	Picture naming (semantic trained items)	Word (overt)	30	Y	<u>U</u>	
	Picture naming (phonological trained items)	Word (overt)	30	Y	<u>U</u>	
	Picture naming (untrained items)	Word (overt)	30	Y	<u>U</u>	
	Picture naming (already known items)	Word (overt)	42	Y	<u>U</u>	
	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	
Benjamin et al.	Word generation	Word (overt)	60	<u>U</u>	<u>U</u>	
(2014)	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	
Brownsett et al. (2014)	Listening to sentences	None	Aphasia: not	<u>N/A</u>	<u>N/A</u>	Paradigm was different in patients and controls, and is

			stated; control: 40			not described in sufficient detail for patients; in two patients, only single words
	Repeating sentences (sentence from previous trial)	Sentence (overt)	Aphasia: not stated; control: 40	Y	<u>N</u>	were produced
	Listening to noise vocoded sentences (control only)	None	40 (control)	<u>N/A</u>	<u>N/A</u>	
	Repeating noise vocoded sentences (control only)	Sentence (overt)	80 (control)	Y	<u>U</u>	
	Listening to segmented white noise	None	Aphasia: not stated; control: 40	<u>N/A</u>	<u>N/A</u>	
Mattioli et al. (2014)	Listening to sentences and making a plausibility judgment	Button press	56	Y	U	There is also mention of a noise "bip" that preceded each sentence but details are lacking; half of the sentences
	Listening to reversed speech	None	56	<u>N/A</u>	N/A	were semantically anomalous
Mohr et al. (2014)	Listening to high ambiguity sentences	None	19	<u>N/A</u>	<u>N/A</u>	
	Listening to low ambiguity sentences	None	19	<u>N/A</u>	<u>N/A</u>	
	Listening to signal-correlated noise	None	19	<u>N/A</u>	<u>N/A</u>	
	Rest	None	19	N/A	N/A	
Robson et al. (2014)	Semantic decision (written word)	Button press	16	Y	N	
	Semantic decision (picture)	Button press	16	Y	N	
	Visual decision	Button press	16	Y	<u>N</u>	
	Rest	None	48	N/A	N/A	
Szaflarski et al. (2014)	Verb generation	Multiple words (covert)	5	Y	<u>U</u>	
	Finger tapping	Other	6	Y	Y	
van Hees et al. (2014)	Picture naming (phonological trained items)	Word (overt)	30	Y	N	Some patients named < 10% correct at T1
	Picture naming (semantic trained items)	Word (overt)	30	Y	<u>N</u>	
	Picture naming (known items)	Word (overt)	30	Y	Y	
	Viewing scrambled images	None	30	N/A	N/A	
Abel et al. (2015)	Picture naming Rest	Word (overt) None	132 Implicit baseline	Y <u>N/A</u>	Y <u>N/A</u>	
Kiran et al. (2015)	Picture naming (trained)	Word (overt)	40	U	U	
	Picture naming (untrained)	Word (overt)	40 40	<u>U</u>	<u>U</u>	
	Viewing scrambled images and saying "skip"	Word (overt)	80	<u>U</u>	<u>U</u>	
	Semantic feature decision	Button press	40	U	<u>U</u>	
	Visual decision	Button press	40	U	U	
Sandberg et al. (2015)	Concreteness judgment (abstract words)	Button press	60	Y	<u>N</u>	2 patients below chance on abstract words per
	Concreteness judgment (concrete words)	Button press	60	Y	Y	supplementary table 2
	Letter string judgment Rest	Button press None	60 Implicit	<u>U</u> N/A	<u>U</u> N/A	
			p.icit	<u> </u>		

			baseline			
Coronmoveh et al	Propositional space	Santanca (avart)	60	Y	N	
Geranmayeh et al. (2016)	Propositional speech production	Sentence (overt)			<u>N</u>	
	Counting	Multiple words (overt)	48	Y	U	
	Target decision	Button press	48	Y	U	
	Rest	None	45	N/A	N/A	
Griffis et al. (2016)	Verb generation	Multiple words (covert)	7	Y	Y	
	Finger tapping	Other	7	U	U	
Sims et al. (2016)	Semantic feature decision	Button press	64	Y	U	Number of visual decision
	Visual decision	Button press	Not stated	Y	<u>U</u>	trials not reported
	Semantic relatedness decision	Button press	50	Y	<u>U</u>	
	Pseudoword identity decision	Button press	50	Y	U	
	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	
Darkow et al. (2017)	Picture naming	Word (overt)	80	Y	Y	
	Rest	None	20	N/A	N/A	
Geranmayeh et al. (2017)	Propositional speech production	Sentence (overt)	60	Y	Y	All participants could do the target decision task except for
	Counting	Multiple words (overt)	48	Y	<u>U</u>	one who was at chance
	Target decision	Button press	48	Y	N	
	Rest	None	45	N/A	N/A	
Griffis, Nenert, Allendorfer, &	Semantic decision	Button press	5	<u>N</u>	<u>N</u>	Group performance below chance; several patients at 0
Szaflarski (2017)	Tone decision	Button press	6	<u>U</u>	<u>U</u>	which is difficult to understand in a 2AFC task
Griffis, Nenert, Allendorfer,	Semantic decision	Button press	5	<u>N</u>	<u>N</u>	Group performance below chance; several patients at 0
Vannest, et al. (2017)	Tone decision	Button press	6	<u>U</u>	<u>U</u>	which is difficult to understand in a 2AFC task
Harvey et al. (2017)	Picture naming	Word (overt)	20	Y	Y	Assume all individuals could
	Viewing patterns	None	20	N/A	<u>N/A</u>	do based on inclusion criterion and BNT scores
Nardo et al. (2017)	Picture naming (untrained items, word cue)	Word (overt)	54	Y	U	Spectrally rotated noise vocoded auditory stimulus in
	Picture naming (untrained items, initial phonemes cue)	Word (overt)	54	Y	<u>U</u>	no-cue conditions; one patient had a BNT of 1/60 so it is
	Picture naming (untrained items, final phonemes cue)	Word (overt)	54	Y	<u>U</u>	unclear whether that patient could do the task
	Picture naming (untrained items, no cue)	Word (overt)	54	Y	<u>U</u>	
	Picture naming (trained items, word cue)	Word (overt)	53	Y	<u>U</u>	
	Picture naming (trained items, initial phonemes cue)	Word (overt)	53	Y	<u>U</u>	
	Picture naming (trained items, final phonemes cue)	Word (overt)	53	Y	<u>U</u>	
	Picture naming (trained items, no cue)	Word (overt)	53	Y	<u>U</u>	
	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	
Nenert et al. (2017)	Semantic decision	Button press	10	<u>U</u>	U	Behavioral data are provided
	Tone decision	Button press	10	<u>U</u>	<u>U</u>	for the semantic decision and tone decision tasks, but the

	Verb generation	Multiple words (covert)	10	<u>U</u>	<u>U</u>	denominator is unclear; a post-scan recognition test for		
	Finger tapping	Other	10	<u>U</u>	<u>U</u>	verb generation is reported, but this cannot confirm verb generation performance		
Qiu et al. (2017)	Picture naming Rest	Word (overt) None	9 9	<u>U</u> N/A	<u>U</u> N/A			
Skipper-Kallal et al. (2017a)	Picture naming (silently name)	Word (covert)	32	Y	Y	Covert and overt naming were modeled as two phases of each trial (there was a cue to		
	Picture naming (produce the name)	Word (overt)	32	Y	Y	produce the name after 7500- 9000 ms); 5 participants who were more impaired were given easier pictures to name;		
	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	patients who named less than 20% of items correctly were excluded		
Skipper-Kallal et al. (2017b)	Picture naming (prepare to name)	Word (covert)	32	Y	Y	Covert and overt naming were modeled as two phases of each trial (there was a cue to		
	Picture naming (produce the name)	Word (overt)	32	Y	Y	produce the name after 7500- 9000 ms); 14 participants who were more impaired were given easier pictures to name;		
	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	patients who named less than 10% of items correctly were excluded		
Dietz et al. (2018)	Verb generation (covert)	Multiple words (covert)	15	<u>U</u>	<u>U</u>	Evidence for task performance from Dietz et al. (2016)		
	Verb generation (overt)	Multiple words (overt)	15 Y		<u>U</u>			
	Noun repetition	Multiple words (overt)	15	Y	<u>U</u>			
Hallam et al. (2018)	Listening to high ambiguity sentences	None	24	<u>N/A</u>	<u>N/A</u>	All but one patient had good single word comprehension,		
	Listening to low ambiguity sentences	None	24	<u>N/A</u>	<u>N/A</u>	which was argued to support sentence comprehension		
	Listening to spectrally rotated speech	None	24	<u>N/A</u>	<u>N/A</u>			
	Pressing a button to a visual cue	Button press	9	<u>U</u>	<u>U</u>			
	Rest	None	12	N/A	N/A			
Nenert et al. (2018)	Semantic decision	Button press	5	N	<u>N</u>	Assume semantic decision is		
	Tone decision	Button press	5	Y	U	out of 25, so chance is 12.5		
	Verb generation	Multiple words (covert)	5	U	U	and 95% Cl below chance at T2; post-scan recognition test for verb generation not		
	Finger tapping	Other	5	U	<u>U</u>	considered to quantify task performance		
Pillay et al. (2018)	Reading nouns aloud	Word (overt)	72	Y	N	Some participants had < 10%		
.,,	Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	accuracy, but this is appropriately addressed in the analysis		
Szaflarski et al. (2018)	Semantic decision Tone decision	Button press Button press	5 6	U U	<u>U</u> U			
van de Sandt-	Listening to narrative speech	None	6	N/A	N/A			
Koenderman et al. (2018)	Listening to reversed speech	None	6	N/A	N/A			
van Oers et al. (2018)	Written word-picture matching	Button press	6	<u>U</u>	U			
	Ŭ							

	Semantic decision	Button press	6	U	U	
	Visual decision	Button press	12	U	U	
	Rest	None	12	N/A	N/A	
Barbieri et al. (2019)	Auditory sentence-picture	Button press	32	U	U	Based on the behavioral data
Barbierr et al. (2015)	verification	Button press	52	<u> </u>	<u> </u>	obtained outside the scanner,
	Listening to reversed speech	Button press	8	U	U	it is likely that many patients
	and viewing scrambled	Button press	0	0	0	were at chance on the
	pictures					language task
Johnson et al. (2019)	Picture naming (trained	Word (overt)	36	U	U	The untrained group were not
Jonnoon ee an (2015)	items)			-	-	actually trained on "trained
	Picture naming (untrained	Word (overt)	36	U	U	items"; no accuracy data for
	items, from control category)			-	<u> </u>	untrained group (except for
	Picture naming (untrained	Word (overt)	36	U	U	lack of change between T1 and
	items, from experimental	(		-	-	T2)
	categories)					
	Viewing scrambled images	Word (overt)	36	U	U	
	and saying "skip"			-	-	
	Rest	None	Implicit	N/A	N/A	
			baseline			
Kristinsson et al.	Picture naming	Word (overt)	40	Y	U	
(2019)	Viewing abstract pictures	None	20	N/A	N/A	
Purcell et al. (2019)	Spelling probe (training	Button press	60	Y	U	Condition 3 not used in any
	items)	Baccon press		•	<u> </u>	contrasts
	Spelling probe (known items)	Button press	60	Y	U	
	Case verification	Button press	60	Ŷ	U	
	Rest	None	Implicit	N/A	<u>0</u> <u>N/A</u>	
	Rest	None	baseline			
Sreedharan,	Neurofeedback (try to	Other	24	U	U	Suggested strategies to
Chandran, et al.	activate language areas)			-	-	activate language areas
(2019)	Rest	None	24	N/A	N/A	included "making a speech,
	Picture naming	Other	First and	N	N	having a conversation, reciting
	i letti e hanning	other	last			a poem or any other form of
			timepoints:			language activity performed
			48; other			covertly"; picture naming task
			timepoints:			involved covert word response
			0			and button press; picture naming task not used in any
	Word generation	Multiple words	5	U	U	contrast; word generation task
		(covert)			-	used only to generate ROIs
Hartwigsen et al.	Syllable count decision	Button press	10	Y	Y	Extent of recovery supports
(2020)	Semantic decision	Button press	10	Ŷ	Ŷ	the assertion that all
· ,	Rest	None	20	<u>N/A</u>	<u>N/A</u>	individuals could do the tasks
Stockert et al. (2020)	Listening to normal	None	46			Description implies that
Stockert et al. (2020)	sentences and making a	None	40	<u>U</u>	<u>U</u>	Description implies that paradigm 2 did not include a
	plausibility judgment					semantically anomalous
	(paradigm 1)					condition, but previous papers
	Listening to semantically	Button press	46	U	U	indicate that it did; conditions
	anomalous sentences and	· · · ·		-	-	2, 5, and 6 were not used, and
	making a plausibility					condition 7 was effectively
	judgment (paradigm 1)					contrasted out; reported
	Listening to reversed speech	Button press	Paradigm	Y	U	behavioral data collapses
			1: 92;			across conditions and
			paradigm			paradigms and so does not
			2: 30			establish performance on any specific condition, but the data
	Listening to normal	Button press	15	Y	U	suggest that at least the
	sentences (paradigm 2)					
	. –					conditions where no language-
	Listening to semantically anomalous sentences	Button press	15	Y	U	conditions where no language- related decisions were

(paradigm 2) Listening to pseudoword speech (paradigm 2)	Button press	30	Y	<u>U</u>	required could have been performed by all groups
Rest	None	Implicit baseline	<u>N/A</u>	<u>N/A</u>	

Repetitions = Number of times the condition was repeated per scanning session (PET measurements, blocks, or events); All groups could do? = Were all groups at all time points able to perform the task (if any)?; All indivs could do = Were all individuals at all time points able to perform the task (if any)?; 2AFC = two-alternative forced choice; BNT = Boston Naming Test; CAT = Comprehensive Aphasia Test; fMRI = functional magnetic resonance imaging; MIT = melodic intonation therapy; N = No; N/A = not applicable (no task); PET = positron emission tomography; PPT = Pyramids and Palm Trees; QPA = Quantitative Production Analysis; T1, T2, etc. = first time point, second time point, etc.; U = Unknown; wpm = words per minute; Y = Yes; Yellow underline = minor limitation; Orange underline = moderate limitation.

## Supplementary Table S9. Contrasts

Contrast	Language	Control			Mat	ched	for		Ctrl a	activat	ion	Notes
	condition	condition	Vis	Aud	d Mo	t Cog	g Acc	RT	Rep	Lang	Lat	
Weiller et al. (1995): Contrast 1	Verb generation	Rest	Y	<u>N</u>	Y	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	Y	Y	L posterior temporal, IFG and ventral precentral gyrus, much smaller activations in the R hemisphere
Weiller et al. (1995): Contrast 2	Pseudoword repetition	Rest	Y	<u>N</u>	Y	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>S</u>	<u>S</u>	L posterior temporal only; similar but less extensive activation in the R hemisphere
Belin et al. (1996): Contrast 1	Word repetition with MIT-like intonation	Word repetition	Y	Y	Y	Y	NBD	<u>UNR</u>	N/A	N/A	N/A	
Ohyama et al. (1996): Contrast 1	Word repetition	Rest	Y	N	N	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>S</u>	<u>N</u>	Bilateral auditory and motor activations are prominent, only slightly L-lateralized
Heiss et al. (1997): Contrast 1	Word repetition	Rest	Y	N	N	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>U</u>	N	The only control data is extent of activation and mean signal increase in L and R superior temporal cortex; both of these measures were slightly L- lateralized
Karbe et al. (1998): Contrast 1	Word repetition	Rest	Y	N	N	<u>N</u>	<u>NANC</u>	NANC	<u>S</u>	N	N	ROIs only; negligible evidence of lateralization
Cao et al. (1999): Contrast 1	Picture naming	Viewing nonsense drawings	Y	Y	Y	<u>N</u>	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>U</u>	<u>S</u>	Insufficient data to assess the control activation pattern
Heiss et al. (1999): Contrast 1	Noun repetition	Rest	Y	<u>N</u>	<u>N</u>	<u>N</u>	NANC	NANC	<u>S</u>	<u>S</u>	<u>S</u>	L frontal and bilateral temporal
Kessler et al. (2000): Contrast 1	Word repetition	Rest	Y	N	N	N	<u>NANC</u>	<u>NANC</u>	<u>N</u>	<u>U</u>	<u>U</u>	No control data are reported or cited, however the same task was used in several previous studies by this group
Rosen et al. (2000): Contrast 1	Word stem completion (PET)	Rest (PET)	<u>N</u>	N	<u>N</u>	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>S</u>	Y	L IFG, L ITG, L anterior fusiform
Rosen et al. (2000): Contrast 2	Word stem completion (fMRI)	Rest (fMRI)	<u>N</u>	Y	Y	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>S</u>	Y	L IFG, L intraparietal sulcus
Blasi et al. (2002): Contrast 1	Word stem completion (novel items)	Rest	<u>N</u>	Y	Y	<u>N</u>	<u>NANC</u>	<u>NANC</u>	Y	<u>S</u>	<u>S</u>	Activation of language areas but also other areas; frontal activation is somewhat lateralized
Blasi et al. (2002): Contrast 2	Word stem completion (novel items)	Word stem completion (repeated items)	Y	Y	Y	Y	Y	N	<u>S</u>	<u>U</u>	<u>S</u>	No whole brain analysis of this contrast, but somewhat lateralized in the sense that L but not R frontal areas showed a learning effect
Leff et al. (2002): Contrast 1	Higher word rates	Lower word rates	Υ	N	Υ	Υ	NANB	NANT	<u>S</u>	<u>S</u>	<u>S</u>	Control activation is bilateral in primary auditory cortex and the lateral STG (Fig. 1, labels 1 and 2), but there is a left-lateralized activation in the pSTS (label 3); the scatter plots in Fig. 1 show activity-word rate curves for peak pSTS voxels in individual subjects; slopes were steeper in the left hemisphere (p < 0.05), however,

												the identification of these voxels is not described in sufficient detail (i.e. what was the search region?)
Blank et al. (2003): Contrast 1	Propositional speech production	Rest	Y	N	N	N	<u>NANC</u>	<u>NANC</u>	Y	<u>s</u>	<u>s</u>	Much bilateral activation due to overt speech but pars opercularis and supratemporal plane L- lateralized
Blank et al. (2003): Contrast 2	Propositional speech production	Counting	Y	Y	Y	<u>N</u>	<u>NANC</u>	<u>NANC</u>	Y	<u>S</u>	<u>S</u>	Extrasylvian; somewhat L- lateralized
Cardebat et al. (2003): Contrast 1	Word generation	Rest	Y	<u>N</u>	<u>N</u>	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>S</u>	<u>N</u>	Bilateral fronto-temporal and some other regions per text
Sharp et al. (2004): Contrast 1	Semantic decision	Syllable count decision	Y	Y	Y	Y	N	N	<u>S</u>	<u>S</u>	Y	The control data provided also include the noise vocoded conditions; only ventral temporal activations are shown, which are L-lateralized
Zahn et al. (2004): Contrast 1	Semantic decision	Phonetic decision and lexical decision (conjunction)	Y	Y	Y	Y	<u>AS</u>	<u>UNR</u>	Y	Y	Y	L-lateralized frontal activation, as well as temporal and parietal to a lesser extent; <u>conjunction of</u> <u>baseline conditions not described</u> <u>in sufficient detail</u>
Crinion & Price (2005): Contrast 1	Listening to narrative speech	Listening to reversed speech	Y	Y	Y	Y	<u>NANB</u>	NANT	Y	Y	<u>S</u>	Bilateral (L > R) temporal, L IFG and L dorsal precentral
de Boissezon et al. (2005): Contrast 1	Word generation	Rest	Y	<u>N</u>	<u>N</u>	<u>N</u>	<u>NANC</u>	<u>NANC</u>	<u>N</u>	<u>U</u>	<u>U</u>	
Connor et al. (2006): Contrast 1	Word stem completion (novel items)	Word stem completion (repeated items)	Υ	Υ	Υ	Υ	Y	N	<u>S</u>	U	<u>S</u>	No whole brain analysis of this contrast, but somewhat lateralized in the sense that L but not R frontal areas showed a learning effect; the only contrast analyzed in this paper is the "learning" contrast which corresponds to contrast 2 in Blasi et al. (2002)
Crinion et al. (2006): Contrast 1	Listening to narrative speech	Listening to reversed speech	Y	Y	Y	Y	<u>NANB</u>	NANT	<u>S</u>	Y	<u>S</u>	11 participants; L-lateralized posterior temporal, bilateral anterior temporal, no frontal
Saur et al. (2006): Contrast 1	Listening to sentences and making a plausibility judgment	Listening to reversed speech	Y	Y	N	N	<u>UNR</u>	<u>UNR</u>	Y	Y	Y	L temporal and L > R frontal
Meinzer et al. (2008): Contrast 1	Picture naming (trained items)	Rest	<u>N</u>	<u>N</u>	<u>N</u>	N	<u>NANC</u>	<u>NANC</u>	<u>N</u>	<u>U</u>	<u>U</u>	
Meinzer et al. (2008): Contrast 2	Picture naming (untrained items)	Rest	<u>N</u>	<u>N</u>	N	<u>N</u>	<u>NANC</u>	<u>NANC</u>	<u>N</u>	<u>U</u>	<u>U</u>	
Raboyeau et al. (2008): Contrast 1	Picture naming (native in patients; relearned foreign in controls)	Rest	N	N	N	N		<u>NANC</u>	N	U	U	Presumably only the relearned foreign condition was used in controls (not the native condition), but <u>this is not stated</u> <u>explicitly</u>
Richter et al. (2008): Contrast 1	Reading words silently	Rest	<u>N</u>	Y	Y	<u>N</u>	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>U</u>	<u>U</u>	Appears to be somewhat L- lateralized frontal, but not well visualized
Richter et al.	Word stem	Rest	<u>N</u>	Y	Y	<u>N</u>	NANC	<u>NANC</u>	<u>S</u>	<u>U</u>	<u>N</u>	Bilateral frontal; other regions not

(2008): Contrast 2	completion											well visualized
de Boissezon et al. (2009): Contrast 1	Word generation	Rest	Y	<u>N</u>	<u>N</u>	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>S</u>	<u>N</u>	Control data in Cardebat et al. (2003); bilateral fronto-temporal and some other regions per text
Fridriksson et al. (2009): Contrast 1	Picture naming (correct trials)	Viewing scrambled images	Y	N	N	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>N</u>	<u>S</u>	Control data in Fridriksson et al. (2007); motor activations are prominent; there is some L frontal activation but little temporal activation in either hemisphere
Fridriksson et al. (2009): Contrast 2	Picture naming (phonemic paraphasias)	Picture naming (correct trials)	Y	Y	Y	Y	NBD	<u>UNR</u>	N/A	N/A	N/A	Control data N/A because controls do not typically make errors
Fridriksson et al. (2009): Contrast 3	Picture naming (semantic paraphasias)	Picture naming (correct trials)	Y	Y	Y	Y	NBD	<u>UNR</u>	N/A	N/A	N/A	Control data N/A because controls do not typically make errors
Menke et al. (2009): Contrast 1	Picture naming (trained items)	Rest	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>U</u>	<u>U</u>	Table of coordinates only
Menke et al. (2009): Contrast 2	Picture naming (untrained items)	Rest	N	<u>N</u>	<u>N</u>	<u>N</u>	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>U</u>	<u>U</u>	Table of coordinates only
Specht et al. (2009): Contrast 1	Lexical decision (words vs pseudowords)	Lexical decision (words vs reversed foreign words)	Y	Y	Y	Y	<u>UNR</u>	<u>UNR</u>	Y	<u>S</u>	Y	The contrast activated a ventral part of the L IFG, along with L anterior cingulate and L DLPFC
Warren et al. (2009): Contrast 1	Listening to narrative speech	Listening to reversed speech	Y	Y	Y	Y	<u>NANB</u>	NANT	<u>S</u>	Y	<u>S</u>	11 participants; L-lateralized posterior temporal, bilateral anterior temporal, no frontal
Chau et al. (2010): Contrast 1	Answering questions from Cantonese Aphasia Battery	Visual decision	<u>N</u>	N	Y	N	<u>NANC</u>	<u>NANC</u>	<u>N</u>	<u>U</u>	<u>U</u>	
Fridriksson (2010): Contrast 1	Picture naming (correct trials)	Viewing abstract pictures	Y	N	N	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	N	<u>S</u>	Control data in Fridriksson et al. (2007); motor activations are prominent; there is some L frontal activation but little temporal activation in either hemisphere.
Fridriksson et al. (2010): Contrast 1	Picture naming (correct trials)	Viewing abstract pictures	Y	<u>N</u>	<u>N</u>	<u>N</u>	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>S</u>	<u>S</u>	L-lateralized frontal and temporal activations, but also bilateral visual, motor and auditory
Sharp et al. (2010): Contrast 1	Semantic decision (clear in patients; average of clear and noise vocoded in controls)	Syllable count decision (clear in patients; average of clear and noise vocoded in controls)	Υ	Y	Υ	Y	<u>N</u>	<u>N</u>	<u>S</u>	<u>S</u>	Υ	Not stated exactly what contrast was used in controls
Thompson et al. (2010): Contrast 1	Auditory sentence- picture matching (all three sentence types)	Rest	N	N	N	N	<u>NANC</u>	<u>NANC</u>	N	U	U	
Tyler et al. (2010): Contrast 1	Listening to grammatical but meaningless sentences and	Listening to scrambled sentences and detecting a target word	Y	Υ	Y	Y	<u>UNR</u>	<u>AS</u>	<u>S</u>	Y	N	There are more control participants in another paper (Tyler et al., 2010, Cereb Cortex), but the relevant contrast does not seem to be shown in that paper; the contrast is intended to

	detecting a target word											identify regions involved in syntactic processing, however it seems possible that there are semantic differences between these conditions also
van Oers et al. (2010): Contrast 1	Written word- picture matching	Visual decision	N	Y	Y	N	<u>UNR</u>	<u>UNR</u>	Y	<u>S</u>	<u>S</u>	Not clearly stated that language tasks were contrasted only with arrow decision task and not rest for the first two contrasts, but this can be inferred
van Oers et al. (2010): Contrast 2	Semantic decision	Visual decision	N	Y	Y	N	<u>UNR</u>	<u>UNR</u>	Y	<u>S</u>	<u>S</u>	Not clearly stated that language tasks were contrasted only with arrow decision task and not rest for the first two contrasts, but this can be inferred
van Oers et al. (2010): Contrast 3	Verb generation	Rest	<u>N</u>	Y	Y	<u>N</u>	<u>NANC</u>	NANC	Y	<u>S</u>	<u>S</u>	
Papoutsi et al. (2011): Contrast 1	Listening to ambiguous sentences with subordinate resolution ("subordinate")	Listening to ambiguous sentences with dominant resolution ("dominant")	Y	Y	Y	Y	<u>NANB</u>	NANT	Y	Y	Y	Control data in Tyler et al. (2011); L frontal and temporal
Sebastian & Kiran (2011): Contrast 1	Picture naming (correct trials)	Viewing scrambled images and saying "pass"	Y	Y	Y	N	<u>UNR</u>	<u>UNR</u>	<u>S</u>	<u>S</u>	<u>N</u>	Reporting is selective, but appears mostly bilateral with slight L- lateralization of language areas
Sebastian & Kiran (2011): Contrast 2	Semantic decision (correct trials)	Visual decision	Y	Y	Y	Y	<u>UNR</u>	<u>UNR</u>	<u>S</u>	<u>S</u>	Y	Clearly lateralized frontal activation, but very modest temporal activation
Szaflarski et al. (2011): Contrast 1	Semantic decision	Tone decision	Y	Y	Y	Y	<u>AS</u>	<u>UNR</u>	Y	Y	Y	Control data in Kim et al. (2011) and Szaflarski et al. (2008); L frontal and temporal, plus other semantic regions
Tyler et al. (2011): Contrast 1	Listening to ambiguous sentences (dominant and subordinate)	Listening to unambiguous sentences ("unambiguous")	Y	Y	Y	Y	<u>NANB</u>	NANT	Y	<u>S</u>	Y	L frontal and parietal; R frontal (but L > R); no L temporal
Tyler et al. (2011): Contrast 2	Listening to ambiguous sentences with dominant resolution ("dominant")	Listening to unambiguous sentences ("unambiguous")	Y	Y	Υ	Y	NANB	NANT	Y	<u>S</u>	Y	L frontal and parietal; no L temporal
Tyler et al. (2011): Contrast 3	Listening to ambiguous sentences with subordinate resolution ("subordinate")	Listening to unambiguous sentences ("unambiguous")	Y	Y	Y	Y	<u>NANB</u>	NANT	Y	Y	Y	L frontal, temporal and parietal, R frontal (but L > R)
Tyler et al. (2011): Contrast 4	Listening to ambiguous sentences with subordinate resolution ("subordinate")	Listening to ambiguous sentences with dominant resolution ("dominant")	Y	Y	Y	Y	<u>NANB</u>	NANT	Υ	Y	Y	L frontal and temporal
Weiduschat et al. (2011): Contrast 1	Verb generation	Rest	Y	N	Y	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>U</u>	U	Control data in Herholz et al. (1996); insufficient to fully validate the contrast

Allendorfor et al.       Verb generation (2012): Controls 2       Verb generation (Control and patient class are related)       Verb generation (Control and patient class are control and patient class are control and patient class are control and patient class are related)       Verb generation (Control and patient class are control and													
[212]: Contrast 2       (overl. event-related)       (event-related)       Verb generation       V       N		0		Y	Y	<u>N</u>	<u>N</u>	<u>NANC</u>	<u>NANC</u>	Y	Y	Y	
IQ212): Contrast 3       (overf, event-related)       (over		(overt, event-	-	Y	Y	Y	<u>N</u>	<u>AM</u>	<u>UNR</u>	Y	<u>S</u>	<u>S</u>	temporal and parietal activations, but also extensive midline
Hubbard et al. (2012): Contrast.Weiking audiovision sentences, while producing sentences, in unrelatedKerness and viewing a viewing a unrelatedKerness and viewing a viewing a unrelatedKerness and viewing a viewing a viewing a viewing a unrelatedNNNNNANC NNNUURest condition implied but not explicitly describedFridriksson, Hubbard, et al. (2012): Contrast.Listening baseding, while producing the same sentences in unrelatedRestNNNNNNNUURest condition implied but not explicitly describedFridriksson, Hubbard, et al. (2012): Contrast.RestRestNNNNNNNURest condition implied but not explicitly describedFridriksson, Hubbard, et al. (2012): Contrast.RestRestNN <td></td> <td>(overt, event-</td> <td>(covert, event-</td> <td>Y</td> <td><u>N</u></td> <td><u>N</u></td> <td>Y</td> <td><u>NANC</u></td> <td><u>NANC</u></td> <td>Y</td> <td><u>S</u></td> <td>N/A</td> <td>activations, but also extensive</td>		(overt, event-	(covert, event-	Y	<u>N</u>	<u>N</u>	Y	<u>NANC</u>	<u>NANC</u>	Y	<u>S</u>	N/A	activations, but also extensive
Hubbard, et al. (2012): Contrast 2 audiovisual sentences, while producing the same sentences in unison of speech entrainment)RestNNNNNNNVVNVVNVVNVNNN	Hubbard, et al.	to/watching audiovisual sentences, while producing the same sentences in unison (speech	reversed sentences and viewing a mouth speaking, while producing unrelated	Y	Y	Y	Y	<u>UNR</u>	<u>UNR</u>	<u>S</u>	N	N	combined; this contrast activates bilateral anterior insula and posterior MTG, slightly more
Hubbard, et al. (2012): Contrast 3reversed sentences and wiwing a mouth speaking, while producing unrelatedRestNNNNNANE NNNUExplicitly describedFridriksson, Hubbard, et al. (2012): Contrast 4Listening to/watching asentences and viewing aRestNNNNNNNNVVVRest condition implied but not explicitly describedFridriksson, Hubbard, et al. (2012): Contrast 4Picture naming abstract picturesViewing a abstract picturesYNNNNNNNVVVNVVVNNN </td <td>Hubbard, et al.</td> <td>to/watching audiovisual sentences, while producing the same sentences in unison (speech</td> <td>Rest</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> <td>NANC</td> <td><u>NANC</u></td> <td>N</td> <td><u>U</u></td> <td><u>U</u></td> <td></td>	Hubbard, et al.	to/watching audiovisual sentences, while producing the same sentences in unison (speech	Rest	N	N	N	N	NANC	<u>NANC</u>	N	<u>U</u>	<u>U</u>	
Hubbard, et al. (2012): Contrast 4 audiovisual sentences and viewing a mouthto/watching audiovisual sentences and viewing a abstract picture namingViewing abstract picturesVNNNNANC NANCNNSControl data in Fridriksson et al. (2007); motor activations are prominent; there is some L frontal activation but little temporal activation in either hemisphereMarcotte et al. (2012): Contrast 1Picture naming (T1: known items; T2: trained items; correct trials)Viewing scrambled images and saying "baba"YYYNNYCTUNR NNUUDifferent contrasts at different time points not clearly explainedMarcotte et al. (2012): Contrast 2Picture naming (known items; correct trials)Viewing scrambled images and saying "baba"YYYNYCTUNR NNUUDifferent contrasts at different time points not clearly explainedMarcotte et al. (2012): Contrast 3Picture naming (known items; correct trials)Viewing scrambled images and saying "baba"YYYNYCTUNR NNUUDifferent contrasts at different time points not clearly explainedMarcotte et al. (2012): Contrast 3Picture naming (known items; correct trials)Viewing scrambled 	Hubbard, et al.	reversed sentences and viewing a mouth speaking, while producing unrelated	Rest	N	N	N	N	NANC	<u>NANC</u>	N	<u>U</u>	U	
Richardson, et al. (2012): Contrast 1Bastract picturesBastract picturesImage: Second Se	Hubbard, et al.	to/watching audiovisual sentences and viewing a	Rest	N	N	N	N	NANB	NANT	N	U	U	
(2012): Contrast 1 (2012): Contrast 2: (2012): Contrast 2: (2012): Contrast 2:(T1: known images and saying "baba"scrambled images and saying "baba"scrambled images and saying "baba"scrambled images and saying "baba"scrambled images and saying "baba"scrambled images and saying "baba"YYNYCTUNR VNUUDifferent contrasts at different time points not clearly explainedMarcotte et al. (2012): Contrast 2Picture naming 	Richardson, et al.	Picture naming	abstract	Υ	N	N	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	N	<u>S</u>	(2007); motor activations are prominent; there is some L frontal activation but little temporal activation in either
(2012): Contrast 2(known items, correct trials)scrambled images and saying "baba"time points not clearly explainedMarcotte et al. (2012): Contrast 3Picture naming (trained items, correct trials)ViewingYYYNYCTUNRNUUDifferent contrasts at different time points not clearly explained		(T1: known items; T2: trained items;	scrambled images and	Y	Y	Y	<u>N</u>	YCT	<u>UNR</u>	N	U	<u>U</u>	
(2012): Contrast 3 (trained items, scrambled time points not clearly explained correct trials) images and		(known items,	scrambled images and	Y	Y	Y	N	YCT	<u>UNR</u>	N	U	U	
		(trained items,	scrambled images and	Y	Y	Y	N	YCT	<u>UNR</u>	N	U	U	

Schofield et al. (2012): Contrast 1	Listening to word pairs or reversed word pairs, speaker gender judgment	Rest	N	N	N	N	<u>NANC</u>	<u>NANC</u>	Y	N	N	Control data in Leff et al. (2008); auditory contrast, not intended to be language contrast
Schofield et al. (2012): Contrast 2	Listening to word pairs, speaker gender judgment	Listening to reversed word pairs, speaker gender judgment	Y	Y	Y	Y	<u>UNR</u>	<u>UNR</u>	Y	<u>S</u>	Y	Control data in Leff et al. (2008); L-lateralized activation of posterior STS
Wright et al. (2012): Contrast 1	Listening to normal sentences and detecting a target word	Rest	<u>N</u>	<u>N</u>	N	N	<u>NANC</u>	<u>NANC</u>	Y	<u>N</u>	N	Bilateral superior temporal, sensorimotor and visual
Wright et al. (2012): Contrast 2	Listening to grammatical but meaningless sentences and detecting a target word	Rest	N	N	N	N	<u>NANC</u>	<u>NANC</u>	N	U	U	
Szaflarski et al. (2013): Contrast 1	Semantic decision	Tone decision	Y	Y	Y	Y	<u>AM</u>	<u>UNR</u>	Y	Y	Y	Control data in Kim et al. (2011) and Szaflarski et al. (2008); L frontal and temporal, plus other semantic regions
Thiel et al. (2013): Contrast 1	Verb generation	Rest	Y	<u>N</u>	N	<u>N</u>	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>U</u>	U	Cites Weiduschat et al. (2011) which in turn cites Herholz et al. (1996) which provides some minimal control data
Abel et al. (2014): Contrast 1	Picture naming (all conditions)	Rest	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>NANC</u>	<u>NANC</u>	<u>N</u>	<u>U</u>	<u>U</u>	But see control data reported in a subsequent paper (Abel et al., 2015)
Abel et al. (2014): Contrast 2	Picture naming (trained items)	Picture naming (untrained items)	Y	Y	Y	Y	<u>N</u>	<u>UNR</u>	<u>N</u>	<u>U</u>	<u>U</u>	
Abel et al. (2014): Contrast 3	Picture naming (semantic trained items)	Picture naming (phonological trained items)	Y	Y	Y	Y	Y	<u>UNR</u>	<u>N</u>	<u>U</u>	<u>U</u>	
Benjamin et al. (2014): Contrast 1	Word generation	Rest	N	N	N	N	<u>NANC</u>	<u>NANC</u>	<u>N</u>	<u>U</u>	U	Contrast not described explicitly but there is only one possible contrast
Brownsett et al. (2014): Contrast 1	Listening to sentences	Listening to segmented white noise	Y	Y	Y	Y	<u>NANB</u>	NANT	<u>N</u>	<u>U</u>	<u>U</u>	
Brownsett et al. (2014): Contrast 2	Listening to sentences (patients) or listening to noise vocoded sentences (controls)	Listening to segmented white noise	Υ	Υ	Y	Υ	<u>NANB</u>	NANT	N	U	U	
Mattioli et al. (2014): Contrast 1	Listening to sentences and making a plausibility judgment	Listening to reversed speech	Y	Υ	N	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>S</u>	Y	10 participants; quite lateralized activity centered on the anterior Sylvian fissure; it is mentioned that "noise" was also included on the negative side of the contrast; it is unclear if this refers to the

												noise "bip", which would be inappropriate
Mohr et al. (2014): Contrast 1	Listening to sentences (high and low ambiguity)	Listening to signal- correlated noise	Y	Y	Y	Y	<u>NANB</u>	NANT	N	<u>U</u>	<u>U</u>	Some control data in Rodd et al. (2005), but half of the participants were performing a probe judgment task, unlike in the present study
Mohr et al. (2014): Contrast 2	Listening to high ambiguity sentences	Listening to low ambiguity sentences	Y	Y	Y	Y	<u>NANB</u>	NANT	N	<u>U</u>	<u>U</u>	Some control data in Rodd et al. (2005), but half of the participants were performing a probe judgment task, unlike in the present study
Robson et al. (2014): Contrast 1	Semantic decision (written word and picture)	Visual decision and rest	N	Υ	N	N	NANC	NANC	<u>S</u>	<u>S</u>	N	Control data are provided in Table 6 for contrasts of written word semantic decision vs dual baseline, and picture semantic decision vs dual baseline, but not for the main effect of semantic decision; these data suggest that the contrast activates ventral temporal regions bilaterally; two contrasts are described: (1) written word judgment versus a dual baseline of visual judgment and rest; (2) picture judgment versus a dual baseline of visual judgment and rest; these two primary contrasts are reported in patients and controls separately, but no between-group contrasts are reported, so these contrasts are excluded from our review; rather, the between-groups analyses in the paper take the form of ANOVAs; the main effect of group in these ANOVAs collapses across the two described contrasts, therefore we have coded the contrast as the average of the two described contrasts; the exact nature of the computation of dual baseline contrasts is not described
Szaflarski et al. (2014): Contrast 1	Verb generation	Finger tapping	Y	Y	<u>N</u>	N	<u>NANC</u>	<u>NANC</u>	Y	Y	<u>S</u>	Control data in Szaflarski et al. (2008); frontal activation L- lateralized, temporal less so
van Hees et al. (2014): Contrast 1	Picture naming (phonological trained items, correct trials)	Viewing scrambled images	Y	Ν	N	N	NANC	NANC	<u>S</u>	U	U	Control data are described for naming untrained items; the data are reported only briefly in the text; it is notable that no speech motor, visual, or auditory activations are reported, as might be expected in a picture naming task; correct and incorrect trials were apparently modeled separately, but this is not clearly stated, nor are the criteria for deciding whether trials were correct; it is generally not clear which contrasts exactly were run
van Hees et al.	Picture naming	Viewing	Υ	N	N	N	NANC	NANC	<u>S</u>	<u>U</u>	<u>U</u>	Control data are described for

(2014): Contrast 2	(semantic trained items, correct trials)	scrambled images										naming untrained items; the data are reported only briefly in the text; it is notable that no speech motor, visual, or auditory activations are reported, as might be expected in a picture naming task; correct and incorrect trials were apparently modeled separately, but this is not clearly stated, nor are the criteria for deciding whether trials were correct; it is generally not clear which contrasts exactly were run
Abel et al. (2015): Contrast 1	Picture naming	Rest	N	N	N	N	<u>NANC</u>	<u>NANC</u>	Y	<u>N</u>	<u>N</u>	Bilateral somato-motor, auditory and to a lesser extent higher level visual regions; finite impulse analysis only
Kiran et al. (2015): Contrast 1	Picture naming (trained)	Viewing scrambled images and saying "skip"	Y	Y	Y	N	<u>UNR</u>	<u>UNR</u>	<u>S</u>	N	<u>S</u>	Overlap of individual participant activation maps; somewhat lateralized frontal and temporal, but also bilateral occipito- temporal
Kiran et al. (2015): Contrast 2	Semantic feature decision	Visual decision	Y	Y	Y	N	<u>UNR</u>	<u>UNR</u>	<u>S</u>	N	<u>S</u>	Overlap of individual participant activation maps; somewhat lateralized frontal and temporal, but also bilateral occipito- temporal; this contrast inferred but not described
Sandberg et al. (2015): Contrast 1	Concreteness judgment (abstract words, correct trials)	Rest	N	Y	N	N	<u>NANC</u>	NANC	N	U	U	The concreteness judgment task was compared to the letter string judgment task to define ROIs for connectivity analysis, but the group analysis meeting criteria for this review <u>appears to be</u> <u>based only on comparisons</u> <u>between time points on the</u> <u>concreteness judgment</u> <u>conditions</u>
Sandberg et al. (2015): Contrast 2	Concreteness judgment (concrete words, correct trials)	Rest	N	Y	N	N	NANC	NANC	N	U	U	The concreteness judgment task was compared to the letter string judgment task to define ROIs for connectivity analysis, but the group analysis meeting criteria for this review <u>appears to be</u> <u>based only on comparisons</u> <u>between time points on the</u> <u>concreteness judgment</u> <u>conditions</u>
Geranmayeh et al. (2016): Contrast 1	Propositional speech production	Rest	N	N	N	N	<u>NANC</u>	NANC	<u>S</u>	<u>S</u>	N	Control data for univariate analysis in Geranmayeh et al. (2014), but note that the present paper does not describe a univariate analysis; control activations reflect speech rather than language
Geranmayeh et al. (2016): Contrast 2	Propositional speech production	Counting	N	Y	Y	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	Υ	Υ	Control data for univariate analysis in Geranmayeh et al. (2014), but note that the present paper does not describe a univariate analysis; control

												activations are L frontal, L pSTS, L SMA, L > R occipito-temporal
Geranmayeh et al. (2016): Contrast 3	Propositional speech production	Target decision	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>NANC</u>	<u>NANC</u>	<u>N</u>	<u>U</u>	<u>U</u>	
Griffis et al. (2016): Contrast 1	Verb generation	Finger tapping	Y	Y	<u>N</u>	<u>N</u>	<u>NANC</u>	<u>NANC</u>	Y	Y	<u>S</u>	Control data in Szaflarski et al. (2008); frontal activation L- lateralized, temporal less so
Sims et al. (2016): Contrast 1	Semantic feature decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls)	Visual decision or pseudoword identity decision	Y	Υ	Υ	Υ	N	<u>UNR</u>	N	<u>U</u>	U	8 patients and 4 controls performed one paradigm, while 6 patients and 4 controls performed another; the data were combined based on the assumption that similar processes were implicated by the two contrasts
Darkow et al. (2017): Contrast 1	Picture naming	Rest	<u>N</u>	<u>N</u>	<u>N</u>	N	<u>NANC</u>	<u>NANC</u>	<u>N</u>	<u>U</u>	<u>U</u>	
Geranmayeh et al. (2017): Contrast 1	Propositional speech production	Rest	N	N	N	N	NANC	NANC	Υ	N	N	Control data in Geranmayeh et al. (2014); speech not language; relevant activations are bilateral; not entirely clear that the whole brain analysis is indeed propositional speech production vs rest; a contrast of target decision vs mean of propositional speech and counting is also used to define the preSMA/dACC ROI
Griffis, Nenert, Allendorfer, & Szaflarski (2017): Contrast 1	Semantic decision	Tone decision	Y	Y	Y	Y	<u>UNR</u>	<u>UNR</u>	Y	Y	Y	Temporal activation is mid MTG and AG rather than pSTS
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): Contrast 1	Semantic decision	Tone decision	Y	Y	Y	Y	<u>UNR</u>	<u>UNR</u>	Y	Y	Y	Temporal activation is mid MTG and AG rather than pSTS
Harvey et al. (2017): Contrast 1	Picture naming	Viewing patterns	Y	<u>N</u>	N	N	NANC	NANC	<u>N</u>	<u>U</u>	<u>U</u>	
Nardo et al. (2017): Contrast 1	Picture naming (all conditions, correct trials)	Rest	N	<u>N</u>	<u>N</u>	<u>N</u>	<u>NANC</u>	<u>NANC</u>	<u>N</u>	<u>U</u>	<u>U</u>	<u>It is difficult to determine exactly</u> what contrasts were employed
Nardo et al. (2017): Contrast 2	Picture naming (untrained items, no cue, correct trials)	Picture naming (trained items, no cue, correct trials)	Y	Y	Y	Y	YCT	N	<u>N</u>	<u>U</u>	U	It is difficult to determine exactly what contrasts were employed
Nenert et al. (2017): Contrast 1	Semantic decision	Tone decision	Y	Y	Y	Y	AM	<u>UNR</u>	Y	Y	Y	Lateralized frontal, temporal, and parietal
Nenert et al. (2017): Contrast 2	Verb generation	Finger tapping	Y	Y	N	N	<u>NANC</u>	<u>NANC</u>	Y	Y	<u>S</u>	Control data in Szaflarski et al. (2008); frontal activation L- lateralized, temporal less so
Qiu et al. (2017): Contrast 1	Picture naming	Rest	N	<u>N</u>	N	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>N</u>	<u>S</u>	Somewhat L-lateralized frontal and anterior temporal language activations, but the majority of activation is in unexpected regions
Skipper-Kallal et al. (2017a): Contrast 1	Picture naming (silently name, correct trials)	Rest	N	Y	Y	N	<u>NANC</u>	<u>NANC</u>	Y	<u>N</u>	<u>N</u>	Bilateral frontal and occipito- temporal, but not posterior temporal
Skipper-Kallal et	Picture naming	Rest	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	NANC	<u>NANC</u>	Y	<u>N</u>	<u>N</u>	Bilateral frontal and occipito-

al. (2017a): Contrast 2	(produce the name, correct trials)											temporal, but not posterior temporal; speech motor activation not readily apparent
Skipper-Kallal et al. (2017a): Contrast 3	Picture naming (both phases, correct trials)	Picture naming (both phases, incorrect trials)	Y	U	U	Y	NBD	<u>UNR</u>	N/A	N/A	N/A	Control data N/A because controls do not typically make errors; it is unclear whether there were no-response trials and whether they were modeled as incorrect
Skipper-Kallal et al. (2017b): Contrast 1	Picture naming (prepare to name, correct trials)	Rest	<u>N</u>	Y	Y	<u>N</u>	<u>NANC</u>	<u>NANC</u>	Y	<u>N</u>	<u>N</u>	Bilateral frontal and occipito- temporal, but not posterior temporal
Skipper-Kallal et al. (2017b): Contrast 2	Picture naming (produce the name, correct trials)	Rest	N	<u>N</u>	<u>N</u>	<u>N</u>	<u>NANC</u>	<u>NANC</u>	Y	<u>N</u>	<u>N</u>	Bilateral frontal and occipito- temporal, but not posterior temporal; speech motor activation not readily apparent
Dietz et al. (2018): Contrast 1	Verb generation (overt)	Noun repetition	Y	Y	Y	N	<u>UNR</u>	<u>UNR</u>	Y	<u>S</u>	<u>S</u>	Control data in Allendorfer et al. (2012); somewhat L-lateralized frontal, temporal and parietal activations, but also extensive midline activation
Hallam et al. (2018): Contrast 1	Listening to high or low ambiguity sentences	Listening to spectrally rotated speech	Y	Y	Y	Y	<u>NANB</u>	NANT	<u>S</u>	<u>U</u>	<u>U</u>	Hard to evaluate contrast because a "semantic mask" is used but is not described in detail
Hallam et al. (2018): Contrast 2	Listening to high ambiguity sentences	Listening to low ambiguity sentences	Y	Y	Y	Y	<u>NANB</u>	NANT	<u>N</u>	<u>U</u>	<u>U</u>	
Nenert et al. (2018): Contrast 1	Semantic decision	Tone decision	Y	Y	Y	Y	<u>AM</u>	<u>UNR</u>	Y	Y	Y	L lateral and medial frontal and AG, strongly lateralized
Nenert et al. (2018): Contrast 2	Verb generation	Finger tapping	Y	Y	<u>N</u>	N	NANC	<u>NANC</u>	Y	Y	Y	L lateral and medial frontal and mid temporal, strongly lateralized
Pillay et al. (2018): Contrast 1	Reading nouns aloud (correct trials)	Reading nouns aloud (incorrect trials)	Y	Y	Y	Y	NBD	Y	N/A	N/A	N/A	Control data N/A because controls do not typically make errors
Szaflarski et al. (2018): Contrast 1	Semantic decision	Tone decision	Y	Y	Y	Y	<u>UNR</u>	<u>UNR</u>	Y	Y	Y	L frontal and temporal, plus other semantic regions
van de Sandt- Koenderman et al. (2018): Contrast 1	Listening to narrative speech	Listening to reversed speech	Y	Y	Y	Y	<u>NANB</u>	NANT	N	<u>U</u>	<u>U</u>	
van Oers et al. (2018): Contrast 1	Written word- picture matching	Visual decision	<u>N</u>	Y	Y	<u>N</u>	<u>UNR</u>	<u>UNR</u>	<u>S</u>	<u>N</u>	<u>S</u>	Primarily bilateral visual activations; frontal activation is L- lateralized
van Oers et al. (2018): Contrast 2	Semantic decision	Visual decision	<u>N</u>	Y	Y	N	<u>UNR</u>	<u>UNR</u>	<u>S</u>	<u>S</u>	Y	L frontal, L posterior ITG, L superior parietal
Barbieri et al. (2019): Contrast 1	Auditory sentence- picture verification	Listening to reversed speech and viewing scrambled pictures	Υ	Υ	Υ	N	<u>UNR</u>	<u>UNR</u>	Y	<u>S</u>	<u>S</u>	L-lateralized inferior frontal and posterior temporal, but also bilateral posterior inferior temporal and lateral occipital activations; <u>contrast described as</u> <u>"passive &gt; control" but seems to</u> <u>involve active and passive</u> <u>sentences</u>
Johnson et al. (2019): Contrast 1	Picture naming (trained items)	Rest	N	<u>N</u>	<u>N</u>	<u>N</u>		<u>NANC</u>	<u>S</u>	<u>N</u>	<u>N</u>	Most ROIs deactivated in controls
Kristinsson et al. (2019): Contrast 1	Picture naming	Viewing abstract pictures	Y	<u>N</u>	<u>N</u>	<u>N</u>	<u>NANC</u>	<u>NANC</u>	<u>N</u>	<u>U</u>	<u>U</u>	

Purcell et al. (2019): Contrast 1	Spelling probe (training items)	Rest	N	N	N	N	<u>NANC</u>	<u>NANC</u>	N	U	U	Task comes from Rapp and Lipka (2011), who report lateralized activations for the contrast of spelling probes to case verification, but do not report results relative to fixation baseline
Purcell et al. (2019): Contrast 2	Spelling probe (known items)	Rest	N	N	N	N	<u>NANC</u>	<u>NANC</u>	N	U	U	Task comes from Rapp and Lipka (2011), who report lateralized activations for the contrast of spelling probes to case verification, but do not report results relative to fixation baseline
Sreedharan, Chandran, et al. (2019): Contrast 1	Neurofeedback (try to activate language areas)	Rest	N	Y	Y	N	<u>NANC</u>	<u>NANC</u>	<u>S</u>	<u>U</u>	N	Task activated L IFG and L STG in controls (Fig. 8c), but no data on other regions, and language activations were not lateralized (Fig. 9d)
Hartwigsen et al. (2020): Contrast 1	Syllable count decision	Rest	Y	<u>N</u>	<u>N</u>	<u>N</u>	<u>NANC</u>	<u>NANC</u>	Y	Y	<u>S</u>	Control data in Hartwigsen et al. (2017); L-lateralized IFG but bilateral SMG
Hartwigsen et al. (2020): Contrast 2	Semantic decision	Rest	Y	<u>N</u>	<u>N</u>	<u>N</u>	<u>NANC</u>	<u>NANC</u>	Y	Y	Y	Control data in Hartwigsen et al. (2017); L-lateralized IFG and AG most prominent
Stockert et al. (2020): Contrast 1	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2)	Listening to reversed speech	Y	Y	N	N	UNR	NANC	<u>S</u>	Y	Y	Not stated which of the two paradigms controls were run on, but clearly L-lateralized frontal and temporal activation; bilateral MD network activation also noted; 20 patients performed paradigm 1 and 14 patients performed paradigm 2; data were combined despite some differences; <u>unclear</u> whether all reversed speech was included, or only reversed speech derived from plausible sentences

Vis = Are the language and control conditions matched for visual demands?; Aud = Are the language and control conditions matched for auditory demands?; Mot = Are the language and control conditions matched for cognitive demands?; Acc = Is accuracy matched between the language and control tasks for all groups at all time points?; RT = Is reaction time matched between the language and control tasks for all groups at all time points?; Lar = Is reaction time matched between the language and control tasks for all groups at all time points?; Lar = Is reaction time matched between the language and control tasks for all groups at all time points?; Rep = Are control data reported in the paper, or in a previous publication that is cited?; Lang = Does the contrast selectively activate plausible relevant language regions in neurologically normal individuals?; Lat = Are activations lateralized in neurologically normal individuals?; AG = angular gyrus; AM = Appear mismatched; ANOVA = analysis of variance; AS = Appear similar; C = Accuracy or RT is covariate; DLPFC = dorsolateral prefrontal cortex; fMRI = functional magnetic resonance imaging; IFG = inferior frontal gyrus; ITG = inferior temporal gyrus; L = left; MIT = melodic intonation therapy; MTG = middle temporal gyrus; N = No; N/A = not applicable; NAM = No, but attempt made; NANB = Not applicable, no behavioral measure; NANC = Not applicable, tasks not comparable.; NANT = Not applicable, no timeable task; NBD = No, by design; PET = positron emission tomography; pSTS = posterior superior temporal sulcus; R = right; ROI = region of interest; S = Somewhat; SMA = supplementary motor area; STG = superior temporal gyrus; STS = superior temporal sulcus; T1, T2, etc. = first time point, second time point, etc.; U = Unknown; UNR = Unknown, not reported; UNT = Unknown, no test; Y = Yes; YCT = Yes, correct trials only; Yellow underline = minor limitation; Orange underline = moderate limitation; Red underline = major limitation.

## Supplementary Table S10. All analyses

Analysis	First level contrast	Second level contrast	Match Acc	ed for RT	Stats	Notes	Findings
Weiller et al. (1995): Vox 1	Verb generation vs rest	CAC Aphasia vs control	<u>AM</u>	<u>UNR</u>	Vox NDC	Behavioral data notes: in practice trials, patients produced 1.5 words on average per prompt, not all of which were verbs, while controls 2.3 words on average per prompt, almost all of which were verbs; search volume: perisylvian; software: SPM; qualitative comparison on p. 729 (the word "significant" is used)	↑ R IFG ↑ R posterior STG/STS/MTG ↓ L posterior STG/STS/MTG notes: based more on Figure 2 than the text
Weiller et al. (1995): Vox 2	Pseudoword repetition vs rest	CAC Aphasia vs control	<u>AS</u>	UNR	Vox <u>NDC</u>	Behavioral data notes: all participants are reported to have had no difficulties in performing the repetition task; search volume: perisylvian; software: SPM; qualitative comparison on p. 729 (the word "significant" is used)	<ul> <li>↑ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R IFG</li> <li>↑ R posterior</li> <li>STG/STS/MTG</li> <li>↓ L posterior</li> <li>STG/STS/MTG</li> <li>notes: based more</li> <li>on Figure 2 than</li> <li>the text</li> </ul>
Belin et al. (1996): ROI 1	Word repetition with MIT-like intonation vs word repetition	CB Aphasia	NBD	UNR	ROI Anat <u>NC</u>	Behavioral data notes: more words were correctly repeated with MIT (16.3 $\pm$ 8) than without (12.4 $\pm$ 8; p < 0.03); number of ROIs: 18; ROIs: (1) L Broca's area; (2) L prefrontal; (3) L sensorimotor mouth; (4) L parietal; (5) L Wernicke's area; (6) L Heschl's gyrus; (7) L anterior STG; (8) L MTG; (9) L temporal pole; (10-18) homotopic counterparts; how ROIs defined: individual anatomical images; activation quantified as mean rCBF, not including any intersection of the infarct with the ROI; three left hemisphere ROIs were excluded (3, 6, 9) because they were completely infarcted in 4 or more patients	↑ L IFG ↑ L dorsolateral prefrontal cortex ↓ R posterior STG
Ohyama et al. (1996): ROI 1	Word repetition vs rest	CAC Aphasia vs control	UNR	UNR	ROI Func <u>NC</u>	Behavioral data notes: some of the patients made a few errors, so as a group they may have been less accurate than controls; number of ROIs: 7; ROIs: (1) L posterior inferior frontal; (2) R posterior inferior frontal; (3) L posterior superior temporal; (4) R posterior superior temporal; (5) L rolandic; (6) R rolandic; (7) SMA; how ROIs defined: spheres around control peaks; the rCBF increase in R PIF was also significant at p < 0.005 for nonfluent patients with Fisher's protected least-significant difference	↑ R IFG ↑ R posterior STG/STS/MTG
Ohyama et al. (1996): ROI 2	Word repetition vs rest	CAA Aphasia fluent (n = 10) vs non-fluent (n = 6)	<u>UNR</u>	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 7; ROIs: (1) L posterior inferior frontal; (2) R posterior inferior frontal; (3) L posterior superior temporal; (4) R posterior superior temporal; (5) L	↓ R IFG

						rolandic; (6) R rolandic; (7) SMA; how ROIs defined: spheres around control peaks	
Ohyama et al. (1996): ROI 3	Word repetition vs rest	CC Aphasia Covariate: spontaneous speech (WAB)	<u>UNR</u>	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 7; ROIs: (1) L posterior inferior frontal; (2) R posterior inferior frontal; (3) L posterior superior temporal; (4) R posterior superior temporal; (5) L rolandic; (6) R rolandic; (7) SMA; how ROIs defined: spheres around control peaks; no correction for multiple comparisons across WAB subscores	↑ L IFG
Ohyama et al. (1996): ROI 4	Word repetition vs rest	CC Aphasia Covariate: comprehension (WAB)	<u>UNR</u>	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 7; ROIs: (1) L posterior inferior frontal; (2) R posterior inferior frontal; (3) L posterior superior temporal; (4) R posterior superior temporal; (5) L rolandic; (6) R rolandic; (7) SMA; how ROIs defined: spheres around control peaks; this non-significant finding is implied but not stated explicitly	None
Ohyama et al. (1996): ROI 5	Word repetition vs rest	CC Aphasia Covariate: repetition (WAB)	<u>UNR</u>	UNR	ROI Func <u>NC</u>	Number of ROIs: 7; ROIs: (1) L posterior inferior frontal; (2) R posterior inferior frontal; (3) L posterior superior temporal; (4) R posterior superior temporal; (5) L rolandic; (6) R rolandic; (7) SMA; how ROIs defined: spheres around control peaks; this non-significant finding is implied but not stated explicitly	None
Ohyama et al. (1996): ROI 6	Word repetition vs rest	CC Aphasia Covariate: naming (WAB)	<u>UNR</u>	UNR	ROI Func <u>NC</u>	Number of ROIs: 7; ROIs: (1) L posterior inferior frontal; (2) R posterior inferior frontal; (3) L posterior superior temporal; (4) R posterior superior temporal; (5) L rolandic; (6) R rolandic; (7) SMA; how ROIs defined: spheres around control peaks; this non-significant finding is implied but not stated explicitly	None
Heiss et al. (1997): Vox 1	Word repetition vs rest	LAA (Aphasia with good recovery (n = 3) T2 vs T1) vs (aphasia with poor recovery (n = 3) T2 vs T1) Somewhat valid (TT not optimal measure of overall language function)	UNR	UNR	Vox NDC	Search volume: whole brain; software: not stated; qualitative generalization across individuals on pp. 214-6	↑ L posterior STG/STS/MTG ↓ R posterior STG/STS/MTG notes: the consistent aspects of the findings were that there was an emergence of L posterior temporal activation in patients with better recovery, and R posterior temporal activation in patients with worse recovery
Heiss et al. (1997): ROI 1	Word repetition vs rest	LAA (Aphasia with good recovery (n = 3) T2 vs	<u>UNR</u>	<u>UNR</u>	ROI Anat <u>NDC</u>	Number of ROIs: 2; ROIs: (1) L superior temporal cortex; (2) R superior temporal cortex; how ROIs defined:	↑ L posterior STG/STS/MTG ↑ L Heschl's gyrus

		T1) vs (aphasia with poor recovery (n = 3) T2 vs T1) <u>Somewhat valid</u> (TT not optimal measure of overall language function)				individual anatomical images; activation quantified in terms of extent exceeding 10% signal change, and mean % increase over the activation; qualitative generalization across individuals on pp. 214, 216	
Karbe et al. (1998): ROI 1	Word repetition vs rest	CAC Aphasia T1 vs control	<u>UNR</u>	<u>UNR</u>	ROI Anat <u>NDC</u>	Number of ROIs: 8; ROIs: (1) L IFG; (2) L STG/HG; (3) L SMA; (4) L ventral precentral; (5-8) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 219, but only the L SMA comparison is explicitly quantified	↑ L SMA/medial prefrontal ↑ R SMA/medial prefrontal ↓ L posterior STG ↓ L Heschl's gyrus
Karbe et al. (1998): ROI 2	Word repetition vs rest	CC Aphasia (subset who returned for follow- up) T1 (n = 7) Covariate: TT T1 <u>Somewhat valid</u> (TT not optimal measure of overall language function)	<u>UNR</u>	<u>UNR</u>	ROI Anat <u>NC</u>	Number of ROIs: 8; ROIs: (1) L IFG; (2) L STG/HG; (3) L SMA; (4) L ventral precentral; (5-8) homotopic counterparts; how ROIs defined: individual anatomical images	None
Karbe et al. (1998): ROI 3	Word repetition vs rest	CC Aphasia (subset who returned for follow- up) T2 (n = 7) Covariate: TT T2 <u>Somewhat valid</u> (TT not optimal measure of overall language function)	UNR	UNR	ROI Anat <u>NC</u>	Number of ROIs: 8; ROIs: (1) L IFG; (2) L STG/HG; (3) L SMA; (4) L ventral precentral; (5-8) homotopic counterparts; how ROIs defined: individual anatomical images	↓ L SMA/medial prefrontal ↓ R ventral precentral/inferior frontal junction ↓ R SMA/medial prefrontal ↓ R posterior STG ↓ R Heschl's gyrus notes: more activation in patients with more severe aphasia per TT
Karbe et al. (1998): ROI 4	Word repetition vs rest	LC Aphasia (subset who returned for follow- up) (n = 7) T2 vs T1 Covariate: subsequent outcome (T2) TT Not valid (the logic behind correlating activation changes and language outcome is unclear; TT not optimal measure of overall language function)	UNR	UNR	ROI Anat One	Number of ROIs: 1; ROI: L STG/HG; how ROI defined: individual anatomical images	↑ L posterior STG ↑ L Heschl's gyrus notes: increase in activation for repetition was correlated with better aphasia outcome per TT
Karbe et al. (1998): ROI 5	Word repetition vs rest	CC Aphasia (subset who returned for follow- up) T2 (n = 7) Covariate: previous $\Delta$ (T2 vs T1) activation in L STG/HG Not valid (logically problematic because	<u>UNR</u>	UNR	ROI Anat <u>NC</u>	Number of ROIs: 4; ROIs: (1) R IFG; (2) R STG/HG; (3) R SMA; (4) R ventral precentral; how ROIs defined: individual anatomical images	<ul> <li>↓ R IFG</li> <li>↓ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↓ R SMA/medial</li> <li>prefrontal</li> <li>↓ R posterior STG</li> <li>↓ R Heschl's gyrus</li> <li>notes: patients</li> </ul>

	patients with less severe initial aphasia would also be expected to show little L temporal increase, but would not be expected to show R temporal recruitment)					with more increase in L STG/HG activation showed less activation of R hemisphere regions at T2
Cao et al. Picture naming (1999): viewing nonsens ROI 1 drawings		<u>UNR</u>	<u>UNR</u>	ROI Mix <u>NC</u>	Number of ROIs: 6; ROIs: (1) L IFG and MFG; (2) L pSTG, AG and SMG; (3) R IFG and MFG; (4) R pSTG, AG and SMG; (5) frontal LI; (6) temporal LI; how ROIs defined: (1-4) individual anatomical images; activation quantified in terms of extent	<ul> <li>↑ R IFG</li> <li>↑ R dorsolateral</li> <li>prefrontal cortex</li> <li>↑ R supramarginal</li> <li>gyrus</li> <li>↑ R angular gyrus</li> <li>↑ R posterior STG</li> <li>↓ LI (frontal)</li> <li>↓ LI (temporal)</li> </ul>
Cao et al.Picture naming(1999):viewing nonsenseROI 2drawings		<u>UNR</u>	<u>UNR</u>	ROI Mix <u>NC</u>	Number of ROIs: 6; ROIs: (1) L IFG and MFG; (2) L pSTG, AG and SMG; (3) R IFG and MFG; (4) R pSTG, AG and SMG; (5) frontal LI; (6) temporal LI; how ROIs defined: (1-4) individual anatomical images; activation quantified in terms of extent	↑ LI (frontal)
Heiss et al. Noun repetition (1999): rest ROI 1	vs LA Aphasia with subcortical damage (n = 9) T2 vs T1	<u>UNR</u>	UNR	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 434	↑ L mid temporal ↑ R Heschl's gyrus ↓ R IFG pars opercularis
Heiss et al. Noun repetition (1999): rest ROI 2	vs LA Aphasia with frontal damage (n = 7) T2 vs T1	UNR	UNR	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 434	↑ L posterior STG ↑ L mid temporal ↑ R Heschl's gyrus ↓ R IFG pars opercularis
Heiss et al. Noun repetition (1999): rest ROI 3	vs LA Aphasia with temporal damage (n = 7) T2 vs T1	UNR	UNR	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 434	<ul> <li>↑ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R mid temporal</li> <li>↓ R SMA/medial</li> <li>prefrontal</li> </ul>
Heiss et al. Noun repetition (1999): rest	vs CAA	UNR	UNR	ROI	Number of ROIs: 14; ROIs: (1) L IFG	↑ L IFG pars

		(n = 7) vs with subcortical damage T1 (n = 9)				gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 434	prefrontal ↓ L posterior STG ↓ R IFG pars opercularis ↓ R posterior STG ↓ R mid temporal
Heiss et al. (1999): ROI 5	Noun repetition vs rest	CAA Aphasia with temporal damage T1 (n = 7) vs with frontal damage T1 (n = 7)	UNR	UNR	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 434	<ul> <li>↑ L IFG pars</li> <li>opercularis</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↓ R IFG pars</li> <li>opercularis</li> <li>↓ R posterior STG</li> <li>↓ R mid temporal</li> </ul>
Heiss et al. (1999): ROI 6	Noun repetition vs rest	CAA Aphasia with temporal damage T2 (n = 7) vs with subcortical damage T2 (n = 9)	UNR	UNR	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 434	<ul> <li>↑ L IFG pars</li> <li>opercularis</li> <li>↑ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↓ L posterior STG</li> <li>↓ L mid temporal</li> <li>↓ R posterior STG</li> <li>↓ R Heschl's gyrus</li> </ul>
Heiss et al. (1999): ROI 7	Noun repetition vs rest	CAA Aphasia with temporal damage T2 (n = 7) vs with frontal damage T2 (n = 7)	UNR	UNR	ROI Anat NDC	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 434	<ul> <li>↑ L IFG pars</li> <li>opercularis</li> <li>↑ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↓ L posterior STG</li> <li>↓ L mid temporal</li> <li>↓ R posterior STG</li> <li>↓ R Heschl's gyrus</li> </ul>
Heiss et al. (1999): ROI 8	Noun repetition vs rest	CAC Aphasia with subcortical damage T1 (n = 9) vs control	UNR	UNR	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 434	<ul> <li>↑ R IFG pars</li> <li>opercularis</li> <li>↓ L IFG</li> <li>↓ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↓ L Heschl's gyrus</li> <li>↓ L mid temporal</li> <li>↓ R Heschl's gyrus</li> </ul>
Heiss et al. (1999): ROI 9	Noun repetition vs rest	CAC Aphasia with frontal damage T1 (n = 7) vs control	<u>UNR</u>	<u>UNR</u>	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L	↑ R IFG pars opercularis ↓ L IFG pars opercularis

						temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 434	↓ L ventral precentral/inferior frontal junction ↓ L posterior STG/STS/MTG ↓ L Heschl's gyrus ↓ L mid temporal ↓ R Heschl's gyrus
Heiss et al. (1999): ROI 10	Noun repetition vs rest	CAC Aphasia with temporal damage T1 (n = 7) vs control	UNR	UNR	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 434; L IFG pars opercularis noted as different in text despite being significant in both groups	<ul> <li>↑ L IFG pars</li> <li>opercularis</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↓ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↓ L posterior STG</li> <li>↓ L Heschl's gyrus</li> <li>↓ L mid temporal</li> <li>↓ R posterior STG</li> <li>↓ R Heschl's gyrus</li> <li>↓ R mid temporal</li> </ul>
Heiss et al. (1999): ROI 11	Noun repetition vs rest	CAC Aphasia with subcortical damage T2 (n = 9) vs control	UNR	UNR	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 434	↓ L IFG pars opercularis ↓ L ventral precentral/inferior frontal junction ↓ L Heschl's gyrus
Heiss et al. (1999): ROI 12	Noun repetition vs rest	CAC Aphasia with frontal damage T2 (n = 7) vs control	UNR	UNR	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 434	↓ L IFG pars opercularis ↓ L ventral precentral/inferior frontal junction ↓ L Heschl's gyrus
Heiss et al. (1999): ROI 13	Noun repetition vs rest	CAC Aphasia with temporal damage T2 (n = 7) vs control	UNR	UNR	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 434	<ul> <li>↑ L IFG pars</li> <li>opercularis</li> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↓ L posterior STG</li> <li>↓ L Heschl's gyrus</li> <li>↓ L mid temporal</li> <li>↓ R posterior STG</li> <li>↓ R Heschl's gyrus</li> </ul>
Heiss et al. (1999): ROI 14	Noun repetition vs rest	LA Aphasia with subcortical or frontal damage and good recovery (n = 11) T2 vs T1	<u>UNR</u>	<u>UNR</u>	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L	↑ L SMA/medial prefrontal ↑ L Heschl's gyrus ↑ R ventral precentral/inferior frontal junction

						posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on pp. 434-5	↑ R SMA/medial prefrontal ↑ R Heschl's gyrus ↓ R IFG pars opercularis
Heiss et al. (1999): ROI 15	Noun repetition vs rest	LA Aphasia with subcortical or frontal damage and poor recovery (n = 5) T2 vs T1	<u>UNR</u>	UNR	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on pp. 434-5	<ul> <li>↑ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R Heschl's gyrus</li> <li>↓ R IFG pars</li> <li>opercularis</li> </ul>
Heiss et al. (1999): ROI 16	Noun repetition vs rest	CAA Aphasia with subcortical and frontal damage and good recovery T1 (n = 11) vs with subcortical and frontal damage and poor recovery T1 (n = 5)	UNR	UNR	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 435	↑ L posterior STG ↑ L mid temporal
Heiss et al. (1999): ROI 17	Noun repetition vs rest	CAA Aphasia with subcortical and frontal damage and good recovery T2 (n = 11) vs with subcortical and frontal damage and poor recovery T2 (n = 5)	UNR	UNR	ROI Anat <u>NDC</u>	Number of ROIs: 14; ROIs: (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images; qualitative comparison on p. 435	<ul> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ L posterior STG</li> <li>↑ L Heschl's gyrus</li> <li>↑ L mid temporal</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↓ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> </ul>
Kessler et al. (2000): ROI 1	Word repetition vs rest	LA Aphasia treated with pirecetam (n = 12) T2 vs T1	<u>UNR</u>	<u>UNR</u>	ROI Anat <u>NC</u>	Number of ROIs: 14; ROIs: (1) L BA 44; (2) L BA 45; (3) L ventral PrCG; (4) L HG; (5) L BA 41 and 42; (6) L BA 22; (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images	↑ L IFG pars triangularis ↑ L posterior STG ↑ L Heschl's gyrus
Kessler et al. (2000): ROI 2	Word repetition vs rest	LA Aphasia treated with placebo (n = 12) T2 vs T1	<u>UNR</u>	<u>UNR</u>	ROI Anat <u>NC</u>	Number of ROIs: 14; ROIs: (1) L BA 44; (2) L BA 45; (3) L ventral PrCG; (4) L HG; (5) L BA 41 and 42; (6) L BA 22; (7) L SMA; (8-14) homotopic counterparts; how ROIs defined: individual anatomical images	↑ L ventral precentral/inferior frontal junction
Rosen et al. (2000): Vox 1	Word stem completion (PET) vs rest (PET)	CAC Aphasia vs control	N	Y	Vox <u>U</u>	Search volume: whole brain; software: not stated; correction for multiple comparisons unclear; there may be circularity in only correcting for the number of regions that seemed to show differences	↑ L SMA/medial prefrontal ↑ R IFG ↑ R Heschl's gyrus ↓ L IFG
Rosen et al. (2000): Vox 2	Word stem completion (fMRI) vs rest (fMRI)	CAC Aphasia (n = 5) vs control	<u>UNR</u>	<u>UNR</u>	Vox <u>NDC</u>	Search volume: whole brain; software: not stated; qualitative comparison on p. 1888	↑ R IFG ↓ L IFG

Rosen et al. (2000): ROI 1	Word stem completion (fMRI) vs rest (fMRI)	CAC Aphasia (n = 5) vs control	<u>UNR</u>	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 2; ROIs: (1) R IFG; (2) SMA; how ROIs defined: <u>not stated but</u> <u>seem to be functional; possibly</u> <u>circular because not clear how ROIs</u> <u>defined</u>	↑ R IFG
Blasi et al. (2002): Vox 1	Word stem completion (novel items) vs rest	CAC Aphasia vs control	N	N	Vox U	Behavioral data notes: covert task but overt data acquired separately; patients less accurate and slower than controls; search volume: whole brain; software: not stated; voxelwise p: ~.001 ( $z > 3$ ); cluster extent cutoff: 45 voxels (size not stated); Monte Carlo analysis not described in detail; rather than fitting a HRF, the authors looked at the shape of the signal in the 8 volumes following each stimulus	<ul> <li>↑ R IFG pars</li> <li>opercularis</li> <li>↑ R IFG pars</li> <li>triangularis</li> <li>↑ R insula</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R dorsal</li> <li>precentral</li> <li>↓ L IFG pars</li> <li>opercularis</li> <li>↓ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>notes: labels</li> <li>based on</li> <li>coordinates</li> <li>reported</li> </ul>
Blasi et al. (2002): ROI 1	Word stem completion (novel items) vs word stem completion (repeated items)	CAC Aphasia vs control	Y	Y	ROI Func <u>NC</u>	Behavioral data notes: covert task but overt data acquired separately; no interaction of group by practice for accuracy or RT; number of ROIs: 14; ROIs: (1) L dorsal IFG; (2) L ventral IFG; (3) R MFG; (4) L anterior fusiform; (5) R anterior fusiform; (6) R posterior fusiform; (7) R lateral occipital; (8) R lateral cerebellum; (9) L SMA; (10) R dorsal IFG; (11) R posterior fusiform; (12) R lateral occipital; (13) R lingual; (14) L MTG; how ROIs defined: regions that were active for the main effect of word stem completion (irrespective of practice) in either group and modulated by practice in that group; circular because ROIs defined in one group or the other; the L ROIs showed repetition suppression in controls but not in patients, and this difference is interpreted by the authors, but not supported statistically.	<ul> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> <li>↓ L IFG</li> <li>↓ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↓ L posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> <li>notes: labels</li> <li>based on</li> <li>coordinates</li> <li>reported</li> </ul>
Leff et al. (2002): Vox 1	Higher word rates vs lower word rates	CAC Aphasia with pSTS damage (n = 6) vs control	NANB	NANT	Vox <u>NDC</u>	Search volume: whole brain; software: SPM99; qualitative comparison on p. 555; a FWE-corrected SPM is reported of the relationship in the 6 patients with L pSTS damage (Fig. 2), however it is masked in a way that is not explained (see figure caption), and there is no direct comparison between patients with L pSTS damage and controls	↑ R posterior STS
Leff et al. (2002): Vox 2	Higher word rates vs lower word rates	CAA Aphasia with pSTS (n = 6) damage vs without pSTS damage (n = 9)	NANB	NANT	Vox NDC	Search volume: whole brain; software: SPM99; qualitative comparison on p. 555; a FWE-corrected SPM is reported of the relationship in the 6 patients with L pSTS damage (Fig. 2), however it is masked in a way that is not	↑ R posterior STS

Explained (see figure caption), and patients with LSPTS tarnage and patients with LSPTS from each search region in not stated; the controls and patients with LSPTS from each search region in not stated; the controls with PSPTS the DSTS from each search region in not stated; the controls with PSPTS the DSTS from each search region in not stated; the controls with PSPTS the DSTS from each subjects with PSPTS from each								
[2002]: ROI 1vs lower word ratesAphasia wth pSTS domage (n = 0)'s control (n = 8)'sFunc Rol defined: the paek voxel for the subjects individual analysis, but the subject							there is no direct comparison between patients with L pSTS damage and	
[2002]: R012vs lower word ratesAphasia with pSTS damage (n = 0) vs aphasia without pSTS damage (n = 9)Func solutionR01 defined: the patistic word rates not sarch region is not stated; the controls and patients without pSTS damage were combined, however it is stated in the caption to Figure 2 that the patients with patients without pSTS damage were combined, however it is stated in the caption to Figure 2 that the patients with pSTS damage were combined, however it is stated in the caption to Figure 2 that the patients with pSTS damage were combined, however it is stated in the caption to Figure 2 that the patients with pSTS damage were combined, but offine speech sample differed; search volume: voxels spared in all patients; software: SPMS9; voxelwise p: FWE p < .05 with SVC in R pars opercularis1 R IFG pars opercularis onter: no voxels such and the patient without pSTS damage (n = 7) vs controlN NANT Vox SVCBehavioral data notes: word rates not sy control1 R IFG pars opercularis opercularis opercularis opercularis opercularisBlank et al. (2003): Vox 2Propositional speech production vs restCAC 	(2002):	vs lower word	Aphasia with pSTS damage (n = 6) vs	NANB	NANT	Func	ROI defined: the peak voxel for the contrast in the R pSTS from each subject's individual analysis, but <u>the</u> <u>search region is not stated</u> ; the controls and patients without pSTS damage were combined, however it is stated in the caption to Figure 2 that the patients with pSTS damage were	↑ R posterior STS
(2003): Vox 1speech production vs restAphasia with IFG POp damage (n = 7) vs controlSVCreported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R pars opercularisopercularis ontes: no voxels survived FWE correction without SVCBlank et al. (2003): Vox 2Propositional speech production vs restCAC Aphasia with IFG POp damage (n = 7) vs controlNNANT VoxBehavioral data notes: word rates not reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R 	(2002):	vs lower word	Aphasia with pSTS damage (n = 6) vs aphasia without pSTS	NANB	NANT	Func	ROI defined: the peak voxel for the contrast in the R pSTS from each subject's individual analysis, but <u>the</u> <u>search region is not stated</u> ; the controls and patients without pSTS damage were combined, however it is stated in the caption to Figure 2 that the patients with pSTS damage were	↑ R posterior STS
(2003): Vox 2speech production vs restAphasia without IFG POp damage (n = 7) vs controlSVC vsreported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R pars opercularisopercularisBlank et al. (2003): Vox 3Propositional speech production vs restCAA Aphasia with IFG POp damage (n = 7) vs without IFG POp damage (n = 7)NANT vsVox Behavioral data notes: word rates not reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R pars opercularisNone notes: patients with L IFG POp damage (n = 7) 	(2003):	speech production	Aphasia with IFG POp damage (n = 7) vs	<u>N</u>	NANT		reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R	opercularis notes: no voxels survived FWE correction without
(2003): Vox 3speech production vs restAphasia with IFG POp damage (n = 7) vs without IFG POp damage (n = 7)SVC without IFG POp damage (n = 7)reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R pars opercularisnotes: patients with L IFG POp damage showed numerically more signal in the R IFG POpBlank et al. (2003): Vox 4Propositional speech production vs countingCAC Aphasia with IFG POp 	(2003):	speech production	Aphasia without IFG POp damage (n = 7) vs	<u>N</u>	NANT		reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R	
(2003): Vox 4speech production vs countingAphasia with IFG POp damage (n = 7) vs controlSVCreported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R pars opercularisBlank et al. (2003): Vox 5Propositional speech production vs countingCAC 	(2003):	speech production	Aphasia with IFG POp damage (n = 7) vs without IFG POp	N	NANT		reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R	notes: patients with L IFG POp damage showed numerically more signal in the R IFG
(2003): Vox 5speech production vs countingAphasia without IFG POp damage (n = 7) vs controlSVC serverreported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R pars opercularisBlank et al. (2003): Vox 6Propositional speech production vs countingCAA Aphasia with IFG POp damage (n = 7) vs without IFG POp damage (n = 7)NANT vs vs vs eventionVox server server voxelwise p: FWE p < .05 with SVC in R	(2003):	speech production	Aphasia with IFG POp damage (n = 7) vs	N	NANT		reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R	None
(2003):speech productionAphasia with IFG POpSVCreported, but offline speech sampleVox 6vs countingdamage (n = 7) vsdiffered; search volume: voxels sparedwithout IFG POpin all patients; software: SPM99;damage (n = 7)voxelwise p: FWE p < .05 with SVC in R	(2003):	speech production	Aphasia without IFG POp damage (n = 7) vs	N	NANT		reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R	None
	(2003):	speech production	Aphasia with IFG POp damage (n = 7) vs without IFG POp	<u>N</u>	NANT		reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R	None

Blank et al. (2003): ROI 1	Propositional speech production vs rest	CC Aphasia with IFG POp damage (n = 7) Covariate: speech rate during scan	<u>UNR</u>	NANT	ROI Func One	Number of ROIs: 1; ROI: R IFG pars opercularis; how ROI defined: defined by flipping L IFG pars opercularis activation in controls	None
Blank et al. (2003): ROI 2	Propositional speech production vs rest	CC Aphasia without IFG POp damage (n = 7) Covariate: speech rate during scan	<u>UNR</u>	NANT	ROI Func One	Number of ROIs: 1; ROI: R IFG pars opercularis; how ROI defined: defined by flipping L IFG pars opercularis activation in controls	None
Blank et al. (2003): ROI 3	Propositional speech production vs rest	CC Aphasia with IFG POp damage (n = 7) Covariate: four different QPA measures	<u>UNR</u>	NANT	ROI Func One	Number of ROIs: 1; ROI: R IFG pars opercularis; how ROI defined: defined by flipping L IFG pars opercularis activation in controls	None
Cardebat et al. (2003): Vox 1	Word generation vs rest	LA Aphasia T2 vs T1	Ν	UNR	Vox <u>CA</u>	Search volume: whole brain; software: SPM99; voxelwise p: .05; cluster extent cutoff: 50 voxels (size not stated); nature of inclusive masks unclear	<ul> <li>↑ L dorsolateral prefrontal cortex</li> <li>↑ L SMA/medial prefrontal</li> <li>↑ L somato-motor</li> <li>↑ L posterior</li> <li>↑ STG/STS/MTG</li> <li>↑ L cerebellum</li> <li>↑ R IFG pars</li> <li>↑ R dorsolateral prefrontal cortex</li> <li>↑ R SMA/medial prefrontal</li> <li>↑ R somato-motor</li> <li>↑ R posterior</li> <li>↑ STG/STS/MTG</li> <li>↑ R cerebellum</li> <li>notes: based on</li> <li>Figure 2</li> </ul>
Cardebat et al. (2003): Vox 2	Word generation vs rest	LC Aphasia T2 vs T1 Covariate: ∆ word generation accuracy	С	UNR	Vox <u>CA</u>	Search volume: whole brain; software: SPM99; voxelwise p: .001; cluster extent cutoff: 100 voxels (size not stated); <u>nature of inclusive masks</u> <u>unclear</u>	↑ L posterior STG/STS/MTG ↑ R posterior STG/STS/MTG ↑ R cerebellum ↓ L occipital ↓ L hippocampus/MTL ↓ R dorsolateral prefrontal cortex ↓ R occipital
Sharp et al. (2004): Vox 1	Semantic decision vs syllable count decision	CAC Aphasia vs control (clear speech)	<u>AM</u>	Y	Vox <u>SVC</u>	Behavioral data notes: interaction of group by task not reported for accuracy; search volume: whole brain; software: SPM99; voxelwise p: FWE p < .05 with SVC in fusiform gyri, temporal poles, L IFG, L orbitofrontal and L SFG	↓ L posterior inferior temporal gyrus/fusiform gyrus
Sharp et al. (2004): Vox 2	Semantic decision vs syllable count decision	CC Aphasia Covariate: semantic decision accuracy	С	<u>UNR</u>	Vox <u>SVC</u>	Search volume: whole brain; software: SPM99; voxelwise p: FWE p < .05 with SVC in fusiform gyri, temporal poles, L IFG, L orbitofrontal and L SFG; <u>fixed</u> <u>effects</u> ; <u>this analysis is not clearly</u> <u>described</u>	↑ R posterior inferior temporal gyrus/fusiform gyrus notes: patients who were more accurate had more activity in R

							anterior fusiform gyrus
Sharp et al. (2004): ROI 1	Semantic decision vs syllable count decision	CAC Aphasia vs control (clear speech)	<u>AM</u>	Y	ROI Anat One	Behavioral data notes: interaction of group by task not reported for accuracy; number of ROIs: 1; ROI: L fusiform gyrus; how ROI defined: probabilistic brain atlas	↓ L posterior inferior temporal gyrus/fusiform gyrus
Sharp et al. (2004): ROI 2	Semantic decision vs syllable count decision	CAC Aphasia vs control (noise vocoded)	NAM	Y	ROI Anat One	Behavioral data notes: patients were more accurate on semantic decisions than syllable decisions, whereas controls were less accurate on noise vocoded semantic decisions than clear syllable decisions (which were the baseline for this analysis); number of ROIs: 1; ROI: L fusiform gyrus; how ROI defined: probabilistic brain atlas	None notes: this analysis suggests that the difference between groups in the L fusiform gyrus disappears when the controls perform a semantic task that is similarly challenging
Zahn et al. (2004): ROI 1	Semantic decision vs phonetic decision and lexical decision (conjunction)	CAC Aphasia vs control	<u>UNT</u>	UNR	ROI LI One	Behavioral data notes: relative performance on language and control tasks unclear; number of ROIs: 1; ROI: language network LI; <u>conjunction</u> <u>analyses not clearly described</u> ; in two patients, a different conjunction was used (lexical decision vs phonetic decision & semantic decision vs phonetic decision)	None notes: LI > 0 in 12 out of 14 controls and 5 out of 7 patients; no significant difference
Crinion & Price (2005): Vox 1	Listening to narrative speech vs listening to reversed speech	CAC Aphasia without temporal lobe damage (n = 9) vs control	<u>NANB</u>	NANT		Search volume: whole brain; software: SPM2; voxelwise p: FWE p < .05; cluster extent cutoff: 5 voxels (size not stated)	↓ L dorsal precentral ↓ R somato-motor
Crinion & Price (2005): Vox 2	Listening to narrative speech vs listening to reversed speech	CAC Aphasia with temporal lobe damage (n = 8) vs control	<u>NANB</u>	NANT		Search volume: whole brain; software: SPM2; voxelwise p: FWE p < .05; cluster extent cutoff: 5 voxels (size not stated)	↓ L posterior STS ↓ L mid temporal
Crinion & Price (2005): Vox 3	Listening to narrative speech vs listening to reversed speech	CAA Aphasia with temporal lobe damage (n = 8) vs without temporal lobe damage (n = 9)	<u>NANB</u>	NANT		Search volume: whole brain; software: SPM2; voxelwise p: FWE p < .05; cluster extent cutoff: 5 voxels (size not stated)	↓ L posterior STG/STS/MTG ↓ L mid temporal
Crinion & Price (2005): Vox 4	Listening to narrative speech vs listening to reversed speech	CC Aphasia without temporal lobe damage (n = 9) Covariate: sentence comprehension (CAT)	NANB	NANT		Search volume: whole brain; software: SPM2; voxelwise p: FWE p < .05; cluster extent cutoff: 5 voxels (size not stated); conjunction with main effect of story comprehension (details hard to follow); this was a multiple regression also involving patients with temporal lobe damage	↑ L posterior STS ↑ R mid temporal notes: patients with better sentence comprehension had more activation in the L posterior STS and R mid STS
Crinion & Price (2005): Vox 5	Listening to narrative speech vs listening to reversed speech	CC Aphasia with temporal lobe damage (n = 8) Covariate: sentence comprehension (CAT)	<u>NANB</u>	NANT		Search volume: whole brain; software: SPM2; voxelwise p: FWE p < .05; cluster extent cutoff: 5 voxels (size not stated); conjunction with main effect of story comprehension (details hard to follow); this was a multiple	↑ R mid temporal notes: patients with better sentence comprehension had more

						regression also involving patients	activation in the R
						without temporal lobe damage	mid STS
Crinion & Price (2005): Cplx 1	Listening to narrative speech vs listening to reversed speech	CAA Aphasia with temporal damage (n = 8) vs without temporal damage (n = 9)	NANB	NANT	Cplx	Correlations were computed between activity in each voxel, and the sentence comprehension measure from the CAT, and were compared between the two aphasia groups, in regions with a main effect of story comprehension. <u>The voxelwise</u> <u>threshold was p &lt; .001, uncorrected</u> for multiple comparisons.	Other: Activity in the L posterior STS was positively correlated with sentence comprehension in patients without temporal lobe damage, but not in patients with temporal lobe damage
Crinion & Price (2005): Cplx 2	Listening to narrative speech vs listening to reversed speech	CAC Aphasia without temporal damage (n = 9) vs control	<u>NANB</u>	NANT	Cplx	Correlations were computed between activity in each voxel, and post-scan story recall, and were compared between patients without temporal damage and controls, in regions with a main effect of story comprehension. The threshold was p < 0.05 corrected, plus a minimum cluster size of 5 voxels.	None
Crinion & Price (2005): Cplx 3	Listening to narrative speech vs listening to reversed speech	CAC Aphasia with temporal damage (n = 8) vs control	<u>NANB</u>	NANT	Cplx	Correlations were computed between activity in each voxel, and post-scan story recall, and were compared between patients with temporal damage and controls, in regions with a main effect of story comprehension. The threshold was p < 0.05 corrected, plus a minimum cluster size of 5 voxels.	None
Crinion & Price (2005): Cplx 4	Listening to narrative speech vs listening to reversed speech	CAA Aphasia with temporal damage (n = 8) vs without temporal damage (n = 9)	<u>NANB</u>	NANT	Cplx	Correlations were computed between activity in each voxel, and post-scan story recall, and were compared between the two aphasia groups, in regions with a main effect of story comprehension. The threshold was p < 0.05 corrected, plus a minimum cluster size of 5 voxels.	None
de Boissezon et al. (2005): Vox 1	Word generation vs rest	CC Aphasia T1 Covariate: time post onset	Y	UNR	Vox <u>CA</u>	Behavioral data notes: no significant correlation between time post onset and accuracy; search volume: whole brain; software: SPM2; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	<ul> <li>↑ L orbitofrontal</li> <li>↑ L anterior</li> <li>temporal</li> <li>↑ L occipital</li> <li>↑ L anterior</li> <li>cingulate</li> <li>↑ L cerebellum</li> <li>↑ R anterior</li> <li>temporal</li> <li>↑ R occipital</li> <li>notes: more</li> <li>activity with longer</li> <li>time post onset;</li> <li>based on</li> <li>coordinates in</li> <li>Table 3a</li> </ul>
de Boissezon et al.	Word generation vs rest	CC Aphasia T1 Covariate: word	С	<u>UNR</u>	Vox <u>CA</u>	Search volume: whole brain; software: SPM2; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	↑ L IFG pars triangularis ↑ L dorsolateral prefrontal cortex

(2005): Vox 2		generation accuracy T1					<ul> <li>↑ L precuneus</li> <li>↑ L Heschl's gyrus</li> <li>↑ L anterior</li> <li>temporal</li> <li>↑ R insula</li> <li>↑ R posterior STG</li> <li>notes: based on</li> <li>coordinates in</li> <li>Table 3b</li> </ul>
de Boissezon et al. (2005): Vox 3	Word generation vs rest	LA Aphasia T2 vs T1	N	<u>UNR</u>	Vox <u>CA</u>	Search volume: whole brain; software: SPM2; voxelwise p: .001; cluster extent cutoff: 100 voxels (size not stated); description of masking unclear, but seems to be inclusively masked with T1, which seems inappropriate	<ul> <li>↑ L insula</li> <li>↑ L posterior STG</li> <li>↑ R orbitofrontal</li> <li>↑ R posterior STG</li> <li>↑ R cerebellum</li> <li>notes: based on</li> <li>coordinates in</li> <li>Table 2</li> </ul>
de Boissezon et al. (2005): Vox 4	Word generation vs rest	LC Aphasia T2 vs T1 Covariate: ∆ word generation accuracy	С	<u>UNR</u>	Vox <u>CA</u>	Search volume: whole brain; software: SPM2; voxelwise p: .01; cluster extent cutoff: 20 voxels (size not stated)	<ul> <li>↑ L mid temporal</li> <li>↑ R anterior</li> <li>temporal</li> <li>↑ R cerebellum</li> <li>notes: based on</li> <li>coordinates in</li> <li>Table 3c</li> </ul>
Connor et al. (2006): Vox 1	Word stem completion (novel items) vs word stem completion (repeated items)	CAC Aphasia vs control	Y	Υ	Vox NDC	Behavioral data notes: covert task but overt data acquired separately; no interaction of group by practice for accuracy or RT; search volume: cerebellum; software: not stated; qualitative comparison on p. 174; Monte Carlo-based thresholding not described; rather than fitting a HRF, the authors looked at the shape of the signal in the 8 volumes following each stimulus	↑ L cerebellum ↓ R cerebellum
Connor et al. (2006): ROI 1	Word stem completion (novel items) vs word stem completion (repeated items)	CAC Aphasia vs control	Y	Υ	ROI Func One	Behavioral data notes: covert task but overt data acquired separately; no interaction of group by practice for accuracy or RT; number of ROIs: 1; ROI: L cerebellum; how ROI defined: L cerebellar region with a learning effect in the patients; circular because ROIs defined in one group; rather than fitting a HRF, the authors looked at the shape of the signal in the 8 volumes following each stimulus	↑ L cerebellum
Crinion et al. (2006): Vox 1	Listening to narrative speech vs listening to reversed speech	CAC Aphasia vs control	<u>NANB</u>	NANT	Vox VFWE	Search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05	None
Crinion et al. (2006): Vox 2	Listening to narrative speech vs listening to reversed speech	CAC Aphasia without temporal lobe damage (n = 6) vs control	<u>NANB</u>	NANT		Search volume: voxels spared in all included patients; software: SPM99; voxelwise p: FWE p < .05	None
Crinion et al. (2006): Vox 3	Listening to narrative speech vs listening to reversed speech	CAC Aphasia with temporal lobe damage (n = 18) vs control	<u>NANB</u>	NANT		Search volume: voxels spared in all included patients; software: SPM99; voxelwise p: FWE p < .05	None
Crinion et	Listening to	сс	NANB	NANT	ROI	Number of ROIs: 1; ROI: L ATL; how	↑ L anterior

Image: Section of the section of th							
al. (2006): ROI 2narrative speech vs listening to reversed speechAphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13) Covariate: time post onsetFunc OneROI defined: activation in the control group; two other ROIs are described in the methods, but never used in any analysesJ L anterior temporal data and 1 outlier) or posterior temporal data and 1 outlier) or posterior temporal damage sparing anterior temporal damage sparing anterior temporal data and 1 outlier) or posterior temporal damage sparing anterior temporal damage excluding anterior temporal cortex (n = 9) vs with no temporal lobe damage (excluding 1 with missing behavioral data and 1 outlier) (n = 4)NANE Func Func OneNumber of ROIs: 1; ROI: L ATL; how ROI defined: activation in the control group; two other ROIs are described in the methods, but never used in any analysesJ L anterior temporal notes: patients with posterior temporal damage (excluding 1 with missing behavioral data and 1 outlier) (n = 4)NANE ROIROI Func Func OneNumber of ROIs: 1; ROI: L ATL; how ROI defined: activation in the control group; two other ROIs are described in the methods, but never used in any analysesJ L anterior temporal data and 1 outlier) (n e control group; directual tecescues ROI defined in one group; two other ROIs areJ L anterior		vs listening to	temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13) Covariate: auditory sentence			group; same result obtained with or without excluding one outlier; two other ROIs are described in the methods, but never used in any	notes: more activity in patients with better auditory sentence
al. (2006): ROI 3narrative speech vs listening to reversed speechAphasia with temporal damage excluding anterior temporal cortex (n = 9) vs with no temporal lobe damage (excluding 1 with missing behavioral data and 1 outlier) (n = 4)Func OneROI defined: activation in the control group; two other ROIs are described in the methods, but never used in any analysestemporal notes: patients with posterior temporal damage (excluding 1 with missing behavioral data and 1 outlier) (n = 4)Func NANBROI defined: activation in the control group; two other ROIs are described in analysestemporal notes: patients with posterior temporal damage (carcluding 1 with missing behavioral data and 1 outlier) (n = 4)Func NANBNANT ROI Func OneROI defined: activation in the control group; circular because ROI defined in one group; two other ROIs aretemporal notes: 1 arge difference 2.7 ±	al. (2006):	narrative speech vs listening to	Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13) Covariate: time post	<u>NANB</u> NAN	Func	ROI defined: activation in the control group; two other ROIs are described in the methods, but never used in any	None
al. (2006):narrative speechAphasia withFuncROI defined: activation in the controltemporalROI 4vs listening totemporal damageOnegroup; circular because ROI defined in one group; two other ROIs arenotes: large	al. (2006):	narrative speech vs listening to	Aphasia with temporal damage excluding anterior temporal cortex (n = 9) vs with no temporal lobe damage (excluding 1 with missing behavioral data and 1 outlier) (n	<u>NANB</u> NAN	Func	ROI defined: activation in the control group; two other ROIs are described in the methods, but never used in any	temporal notes: patients with posterior temporal damage had less signal
makes finding	al. (2006):	narrative speech vs listening to	Aphasia with temporal damage excluding anterior temporal cortex (n =	NANB NAN	Func	ROI defined: activation in the control group; <u>circular because ROI defined in</u> <u>one group</u> ; two other ROIs are described in the methods, but never	temporal notes: large difference 2.7 ± 0.8 (patients) vs 6.3 ± 1.4 (controls) makes finding suggestive even in light of the
Crinion etListening toCCNANBNANTROINumber of ROIs: 1; ROI: L ATL; howNoneal. (2006):narrative speechAphasia with noFuncROI defined: activation in the controlnotes: r = 0.39; pROI 5vs listening totemporal damageOnegroup; two other ROIs are described in0.1; seems to be	al. (2006):	narrative speech vs listening to	Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13) Covariate: auditory single word	NANB NAN	Func	ROI defined: activation in the control group; two other ROIs are described in the methods, but never used in any	None notes: r = 0.39; p > 0.1; seems to be a clear trend so lack of significance may reflect only
Saur et al.       Listening to       LA       AM       UNR       Vox       Behavioral data notes: accuracy       ↑ L insula         (2006):       sentences and       Aphasia T2 vs T1       NC       combines language and control conditions; search volume: whole       ↑ R IFG pars         Vox 1       making a plausibility       ↑ R insula       ↑ R insula	(2006):	sentences and making a	LA	<u>AM UNR</u>		combines language and control	↑ R IFG pars orbitalis

	judgment vs listening to reversed speech					brain; software: SPM2; voxelwise p: .001; cluster extent cutoff: none	↑ R SMA/medial prefrontal notes: R IFG/insula activation noted to survive FWE correction at p < .05
Saur et al. (2006): Vox 2	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LA Aphasia T3 vs T2	<u>AM</u>	<u>UNR</u>	Vox <u>NC</u>	Behavioral data notes: accuracy combines language and control conditions; search volume: whole brain; software: SPM2; voxelwise p: .005; cluster extent cutoff: none; threshold was lowered to reveal the R frontal change in activation	↓ R IFG pars orbitalis ↓ R occipital
Saur et al. (2006): Vox 3	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LA Aphasia T3 vs T1	<u>AM</u>	<u>UNR</u>	Vox <u>NC</u>	Behavioral data notes: accuracy combines language and control conditions; search volume: whole brain; software: SPM2; voxelwise p: .001; cluster extent cutoff: none	<ul> <li>↑ L IFG pars</li> <li>orbitalis</li> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ L posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> <li>↑ R IFG pars</li> <li>orbitalis</li> <li>↑ R insula</li> </ul>
Saur et al. (2006): Vox 4	Listening to sentences and making a plausibility judgment vs listening to reversed speech	CAC Aphasia T1 vs control	<u>AM</u>	UNR	Vox <u>NC</u>	Behavioral data notes: accuracy combines language and control conditions; search volume: whole brain; software: SPM2; voxelwise p: .001; cluster extent cutoff: none	<ul> <li>↓ L IFG pars</li> <li>triangularis</li> <li>↓ L IFG pars</li> <li>orbitalis</li> <li>↓ L insula</li> <li>↓ L posterior MTG</li> <li>↓ L posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> <li>↓ R IFG pars</li> <li>orbitalis</li> <li>↓ R insula</li> <li>notes: L STG in</li> <li>table is actually</li> <li>MTG based on</li> <li>coordinates</li> </ul>
Saur et al. (2006): Vox 5	Listening to sentences and making a plausibility judgment vs listening to reversed speech	CAC Aphasia T2 vs control	<u>AM</u>	<u>UNR</u>	Vox <u>NC</u>	Behavioral data notes: accuracy combines language and control conditions; search volume: whole brain; software: SPM2; voxelwise p: .005; cluster extent cutoff: none; threshold was lowered to reveal L IFG	↑ L IFG pars orbitalis ↑ L insula ↑ L SMA/medial prefrontal ↑ R IFG
Saur et al. (2006): Vox 6	Listening to sentences and making a plausibility judgment vs listening to reversed speech	CAC Aphasia T3 vs control	<u>AS</u>	<u>UNR</u>	Vox <u>NC</u>	Behavioral data notes: accuracy combines language and control conditions; search volume: whole brain; software: SPM2; voxelwise p: .001; cluster extent cutoff: none	None
Saur et al. (2006): Vox 7	Listening to sentences and making a plausibility judgment vs	CC Aphasia T1 Covariate: language recovery score T1	<u>AM</u>	<u>UNR</u>	Vox <u>NC</u>	Behavioral data notes: accuracy combines language and control conditions; search volume: whole brain; software: SPM2; voxelwise p: .001; cluster extent cutoff: none	↑ L IFG ↑ L SMA/medial prefrontal ↑ R IFG pars triangularis

	listening to reversed speech						
Saur et al. (2006): Vox 8	Listening to sentences and making a plausibility judgment vs listening to reversed speech	CC Aphasia T2 Covariate: language recovery score T2	<u>UNT</u>	<u>UNR</u>	Vox <u>NC</u>	Behavioral data notes: accuracy combines language and control conditions; search volume: whole brain; software: SPM2; voxelwise p: .001; cluster extent cutoff: none	None
Saur et al. (2006): Vox 9	Listening to sentences and making a plausibility judgment vs listening to reversed speech	CC Aphasia T3 Covariate: language recovery score T3	<u>UNT</u>	<u>UNR</u>	Vox <u>NC</u>	Behavioral data notes: accuracy combines language and control conditions; search volume: whole brain; software: SPM2; voxelwise p: .001; cluster extent cutoff: none	None
Saur et al. (2006): Vox 10	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LC Aphasia T2 vs T1 Covariate: % change in language recovery score	<u>UNT</u>	<u>UNR</u>	Vox <u>NC</u>	Behavioral data notes: accuracy combines language and control conditions; search volume: whole brain; software: SPM2; voxelwise p: .001; cluster extent cutoff: none	↑ L SMA/medial prefrontal ↑ R insula ↑ R SMA/medial prefrontal
Saur et al. (2006): Vox 11	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LC Aphasia T3 vs T2 Covariate: % change in language recovery score	<u>UNT</u>	<u>UNR</u>	Vox <u>NC</u>	Behavioral data notes: accuracy combines language and control conditions; search volume: whole brain; software: SPM2; voxelwise p: .001; cluster extent cutoff: none	None
Saur et al. (2006): Vox 12	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LC Aphasia T3 vs T1 Covariate: % change in language recovery score	<u>UNT</u>	<u>UNR</u>	Vox <u>NC</u>	Behavioral data notes: accuracy combines language and control conditions; search volume: whole brain; software: SPM2; voxelwise p: .001; cluster extent cutoff: none	None
Saur et al. (2006): ROI 1	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LA Aphasia T2 vs T1	<u>AM</u>	UNR	ROI Func FWE	Behavioral data notes: accuracy combines language and control conditions; number of ROIs: 6; ROIs: (1) L IFG pars orbitalis; (2) L IFG pars triangularis; (3) L MTG; (4) R insula; (5) R IFG pars triangularis; (6) R SMA; how ROIs defined: peak voxels of overall activation map based on all three time points in patients	↑ R insula ↑ R SMA/medial prefrontal notes: some other ROIs also significant prior to correction for multiple comparisons; n.b. performance confound
Saur et al. (2006): ROI 2	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LA Aphasia T3 vs T2	<u>AM</u>	<u>UNR</u>	ROI Func FWE	Behavioral data notes: accuracy combines language and control conditions; number of ROIs: 6; ROIs: (1) L IFG pars orbitalis; (2) L IFG pars triangularis; (3) L MTG; (4) R insula; (5) R IFG pars triangularis; (6) R SMA; how ROIs defined: peak voxels of overall activation map based on all three time points in patients	None notes: some other ROIs also significant prior to correction for multiple comparisons; n.b. performance confound
Saur et al. (2006): ROI 3	Listening to sentences and making a plausibility	LA Aphasia T3 vs T1	<u>AM</u>	<u>UNR</u>	ROI Func FWE	Behavioral data notes: accuracy combines language and control conditions; number of ROIs: 6; ROIs: (1) L IFG pars orbitalis; (2) L IFG pars	↑ L posterior MTG notes: some other ROIs also significant prior to

Judgment vs reversed speech         Creating to reversed speech         Creating to reversed speech         Creating to speech plausibility         CAC         Am         USB reversed         INTG (4) Rinslate (8) RE (5, RMA how plausibility         Comparisons n.b. comparisons n.b. ports in platents         Comparisons n.b. reversed         Comparisons n.b. ports in platents         Comparisons n.b. ports in pla								
[2006]: RO14 plausibility pla		listening to					R IFG pars triangularis; (6) R SMA; how ROIs defined: peak voxels of overall activation map based on all three time	multiple comparisons; n.b. performance
[2006]: ROI 5 making a plausibility judgment vs listening to reversed speechAphasia T2 vs control scaleFunc v vcombines language and control conditions; number of ROIs: 6 ROIs: (1) LIFG pars orbitalis(2) LIFG pars reversed speechNoneSaur et al. 	(2006):	sentences and making a plausibility judgment vs listening to		<u>AM</u>	<u>UNR</u>	Func	combines language and control conditions; number of ROIs: 6; ROIs: (1) L IFG pars orbitalis; (2) L IFG pars triangularis; (3) L MTG; (4) R insula; (5) R IFG pars triangularis; (6) R SMA; how ROIs defined: peak voxels of overall activation map based on all three time points in patients; <u>circular because</u>	↓ R IFG pars triangularis notes: R IFG difference described in text
(2006): making a plausibility judgment vs listening to reversed speechAphasia T3 vs controlFunc vscombines language and control conditions; number of ROIs: 6, ROIs: (1) L IFG pars ortiang(12). LMTG; (4) R insula; (5) R IFG pars triangularis; (3) LMTG; (4) R	(2006):	sentences and making a plausibility judgment vs listening to		<u>AM</u>	UNR	Func	combines language and control conditions; number of ROIs: 6; ROIs: (1) L IFG pars orbitalis; (2) L IFG pars triangularis; (3) L MTG; (4) R insula; (5) R IFG pars triangularis; (6) R SMA; how ROIs defined: peak voxels of overall activation map based on all three time points in patients; <u>circular because</u>	None
al. (2008): (trained items) vs ROI 1 rest Covariate: A picture naming (trained items) rest Covariate: A picture naming (trained items) Source (trained items) increased from NC S1.7 ± 24.8 to 78.8 ± 22.1, which was statistically significant (p < 0.0001); number of ROIs: 4; ROIs (1) perliesional area of slow wave activity determined with MEG; (2) right hemisphere homotopic to lesion; (3) right hemisphere and it is not clear how this was handled; how ROIs defined: the dependent measure was the number of voxels in each ROI exceeding certain thresholds that differed across subjects depending on their strength of activation; it appears that increases and decreases may have been summed, though the description is hard to follow; 2 of the 11 patients were classified as outliers and excluded from analyses, however no plots are provided to justify their status as outliers	(2006):	sentences and making a plausibility judgment vs listening to		<u>AS</u>	<u>UNR</u>	Func	combines language and control conditions; number of ROIs: 6; ROIs: (1) L IFG pars orbitalis; (2) L IFG pars triangularis; (3) L MTG; (4) R insula; (5) R IFG pars triangularis; (6) R SMA; how ROIs defined: peak voxels of overall activation map based on all three time points in patients; <u>circular because</u>	None
	al. (2008):	(trained items) vs	Aphasia T2 vs T1 Covariate: Δ picture naming (trained	С	UNR	Oth	Behavioral data notes: picture naming score (trained items) increased from $51.7 \pm 24.8$ to $78.8 \pm 22.1$ , which was statistically significant (p < 0.0001); number of ROIs: 4; ROIs: (1) perilesional area of slow wave activity determined with MEG; (2) right hemisphere homotopic to lesion; (3) right hemisphere homotopic to slow wave area; (4) remainder of left hemisphere; for one patient, maximal slow wave activity was in the right hemisphere and it is not clear how this was handled; how ROIs defined: the dependent measure was the number of voxels in each ROI exceeding certain thresholds that differed across subjects depending on their strength of activation; it appears that increases and decreases may have been summed, though the description is hard to follow; 2 of the 11 patients were classified as outliers and excluded from analyses, however no plots are provided to justify their	improved picture naming of trained items was correlated with increased signal in 3 of the 4 ROIs, the exception being the right hemisphere ROI homotopic to the slow wave area; after removing the two outliers, only the correlation in the left hemisphere area of slow wave activity remained
	Meinzer et	Picture naming	LC	С	UNR	ROI		Other:

al. (2008): ROI 2	(untrained items) vs rest	Aphasia T2 vs T1 Covariate: Δ picture naming (untrained items)			Oth <u>NC</u>	score (untrained items) increased from 54.0 ± 24.3 to 70.5 ± 26.7, which was statistically significant (p= 0.002); number of ROIs: 4; ROIs: (1) perilesional area of slow wave activity determined with MEG; (2) right hemisphere homotopic to lesion; (3) right hemisphere homotopic to slow wave area; (4) remainder of left hemisphere; for one patient, maximal slow wave activity was in the right hemisphere and it is not clear how this was handled; how ROIs defined: the dependent measure was the number of voxels in each ROI exceeding certain thresholds that differed across subjects depending on their strength of activation; it appears that increases and decreases may. have been summed, though the description is hard to follow; 2 of the 11 patients were classified as outliers and excluded from analyses, however no plots are provided to justify their status as outliers	improved picture naming of untrained items was correlated with increased signal in all 4 ROIs; after removing the two outliers, none of the correlations remained significant
Raboyeau et al. (2008): Vox 1	Picture naming (native in patients; relearned foreign in controls) vs rest	LAC (Aphasia T2 vs T1) vs (control T2 vs T1)	NAM	UNR	Vox <u>CA</u>	Behavioral data notes: relearned foreign language was an attempt to equate to recovery in patients; still, patients improved less than controls, as shown by a significant interaction of group by time (p < .0001); search volume: whole brain; software: SPM2; voxelwise p: .01; cluster extent cutoff: 30 voxels (size not stated); nature of control contrast not clear; negative tail of contrast was masked to exclude lesioned areas, but the mask may have been more extensive than that	↑ L orbitofrontal
Raboyeau et al. (2008): Vox 2	Picture naming (native in patients; relearned foreign in controls) vs rest	LC Aphasia T2 vs T1 Covariate: ∆ picture naming accuracy	С	UNR	Vox <u>CA</u>	Search volume: whole brain; software: SPM2; voxelwise p: .01; cluster extent cutoff: 30 voxels (size not stated); nature of control contrast not clear	<ul> <li>↑ R insula</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↑ R orbitofrontal</li> <li>↑ R anterior</li> <li>cingulate</li> <li>↓ L intraparietal</li> <li>sulcus</li> <li>↓ L precuneus</li> <li>↓ L posterior</li> <li>cingulate</li> <li>↓ R dorsal</li> <li>↓ R precuneus</li> <li>↓ R precuneus</li> </ul>
Richter et al. (2008): Vox 1	Reading words silently vs rest	CAC Aphasia T1 vs control	<u>UNR</u>	<u>UNR</u>	Vox <u>M**</u>	Search volume: R hemisphere; software: BrainVoyager QX 1.7; voxelwise p: R IFG/R insula ROI: .005; elsewhere: .001; cluster extent cutoff: R IFG/R insula ROI: 0.108 cc; elsewhere: none	↑ R IFG ↑ R insula
Richter et al. (2008): Vox 2	Word stem completion vs rest	CAC Aphasia T1 vs control	<u>UNR</u>	<u>UNR</u>	Vox <u>M**</u>	Search volume: R hemisphere; software: BrainVoyager QX 1.7; voxelwise p: R IFG/R insula ROI: .005; elsewhere: .001; cluster extent cutoff:	↑ R dorsal precentral

						R IFG/R insula ROI: 0.108 cc; elsewhere: none	
Richter et al. (2008): Vox 3	Reading words silently vs rest	CC Aphasia T1 Covariate: subsequent Δ (T2 vs T1) overall language measure (composite measure of AAT spontaneous speech, token test, ANELT auditory comprehensibility, ANELT semantic comprehensibility) Somewhat valid (T1 behavioral measure should be included in model)	UNR	UNR	Vox <u>NC</u>	Search volume: R hemisphere; software: BrainVoyager QX 1.7; voxelwise p: .05; cluster extent cutoff: none; nature of thresholding not entirely clear, so coded according to best guess	↑ R IFG ↑ R insula ↑ R ventral precentral/inferior frontal junction ↑ R posterior MTG notes: increased activity correlated with more behavioral improvement
Richter et al. (2008): Vox 4	Word stem completion vs rest	CC Aphasia T1 Covariate: subsequent Δ (T2 vs T1) overall language measure (composite measure of AAT spontaneous speech, token test, ANELT auditory comprehensibility, ANELT semantic comprehensibility) Somewhat valid (T1 behavioral measure should be included in model)	UNR	UNR	Vox <u>NC</u>	Search volume: R hemisphere; software: BrainVoyager QX 1.7; voxelwise p: .05; cluster extent cutoff: none; nature of thresholding not <u>entirely clear</u> , so coded according to best guess	↑ R IFG ↑ R insula notes: increased activity correlated with more behavioral improvement
Richter et al. (2008): Vox 5	Reading words silently vs rest	LA Aphasia T2 vs T1	<u>UNR</u>	<u>UNR</u>	Vox <u>M**</u>	Search volume: R hemisphere; software: BrainVoyager QX 1.7; voxelwise p: R IFG/R insula ROI: .005; elsewhere: .001; cluster extent cutoff: R IFG/R insula ROI: 0.108 cc; elsewhere: none	None
Richter et al. (2008): Vox 6	Word stem completion vs rest	LA Aphasia T2 vs T1	<u>UNR</u>	<u>UNR</u>	Vox <u>M**</u>	Search volume: R hemisphere; software: BrainVoyager QX 1.7; voxelwise p: R IFG/R insula ROI: .005; elsewhere: .001; cluster extent cutoff: R IFG/R insula ROI: 0.108 cc; elsewhere: none	None
Richter et al. (2008): ROI 1	Reading words silently vs rest	CC Aphasia T1 Covariate: subsequent Δ (T2 vs T1) overall language measure (composite measure of AAT spontaneous speech, token test, ANELT auditory comprehensibility, ANELT semantic comprehensibility) Somewhat valid (T1	UNR	UNR	ROI Func One	Number of ROIs: 1; ROI: L IFG/insula or L perilesional; how ROI defined: peak activations in individual patients in L IFG/insula or L perilesional regions (somewhat unclear)	None

	behavioral measure should be included in model)					
Richter et Word st al. (2008): complet ROI 2	em CC ion vs rest Aphasia T1 Covariate: subsequent ∆ (T2 vs T1) overall language measure (composite measure of AAT spontaneous speech, token test, ANELT auditory comprehensibility, ANELT semantic comprehensibility) <u>Somewhat valid</u> (T1 behavioral measure should be included in model)	UNR	UNR	ROI Func One	Number of ROIs: 1; ROI: L IFG/insula or L perilesional; how ROI defined: peak activations in individual patients in L IFG/insula or L perilesional regions (somewhat unclear)	None
Richter et Reading al. (2008): silently ROI 3		UNR	UNR	ROI Func <u>NC</u>	Number of ROIs: 4; ROIs: (1) R IFG/insula; (2) R precentral; (3) R MTG; (4) L IFG/insula or L perilesional; how ROIs defined: regions where T1 activation was correlated with subsequent improvement, along with the previously defined left hemisphere ROI; circular because functional ROIs based on related contrast on same data	↓ R posterior MTG notes: decreased activity over time correlated with more behavioral improvement
Richter et Word st al. (2008): complet ROI 4	em LC ion vs rest Aphasia T2 vs T1 Covariate: Δ overall language measure (composite measure of AAT spontaneous speech, token test, ANELT auditory comprehensibility, ANELT semantic comprehensibility)	<u>UNR</u>	UNR	ROI Func <u>NC</u>	Number of ROIs: 3; ROIs: (1, 2) two clusters within R IFG/insula ROI; (3) L IFG/insula or L perilesional; how ROIs defined: regions where T1 activation was correlated with subsequent improvement, along with the previously defined left hemisphere ROI; circular because functional ROIs based on related contrast on same data	↓ R IFG ↓ R insula notes: decreased activity over time correlated with more behavioral improvement
de Word ge Boissezon vs rest et al. (2009): Vox 1	neration LA Aphasia with "good recovery" (n = 6) T2 vs T1 <u>Somewhat valid</u> (the "good recovery" group showed more improvement than the "poor recovery" group in terms of accuracy on the task, but the distinction was not borne out in behavioral data more generally)	Υ	UNR	Vox <u>CA</u>	Behavioral data notes: p = 0.07; search volume: whole brain; software: SPM2; voxelwise p: .001; cluster extent cutoff: 100 voxels (size not stated); <u>contrast may not have included</u> <u>resting condition; inappropriate</u> <u>masking</u>	<ul> <li>↑ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ L posterior</li> <li>STG/STS/MTG</li> <li>↑ R dorsolateral</li> <li>prefrontal cortex</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↑ R angular gyrus</li> <li>↑ R thalamus</li> <li>↑ R basal ganglia</li> <li>↓ L cerebellum</li> <li>notes: based on</li> <li>coordinates in</li> <li>Table 5</li> </ul>
de Word ge	neration LA	Y	UNR	Vox	Search volume: whole brain; software:	↑ L ventral

Boissezon et al. (2009): Vox 2	vs rest	Aphasia with "poor recovery" (n = 7) T2 vs T1 <u>Somewhat valid</u> (the "poor recovery" group showed less improvement than the "good recovery" group in terms of accuracy on the task, but the distinction was not borne out in behavioral data more generally)			<u>CA</u>	SPM2; voxelwise p: .001; cluster extent cutoff: 100 voxels (size not stated); <u>contrast may not have included</u> <u>resting condition; inappropriate</u> <u>masking</u>	precentral/inferior frontal junction ↑ R somato-motor ↑ R cerebellum ↓ R basal ganglia
de Boissezon et al. (2009): Vox 3	Word generation vs rest	CC Aphasia Covariate: word generation accuracy	C	UNR	Vox <u>CA</u>	Search volume: whole brain; software: SPM2; voxelwise p: .01; cluster extent cutoff: 100 voxels (size not stated); each patient's two sessions may be entered into the model without accounting for the dependence between them	<ul> <li>↑ L supramarginal gyrus</li> <li>↑ L occipital</li> <li>↑ L anterior</li> <li>cingulate</li> <li>↑ R insula</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↑ R posterior STG</li> <li>↑ R anterior</li> <li>temporal</li> <li>↑ R occipital</li> <li>↓ L cerebellum</li> </ul>
Fridriksson et al. (2009): Vox 1	Picture naming (correct trials) vs viewing scrambled images	CAC Aphasia vs control	YCT	<u>UNR</u>	Vox <u>C-</u>	Search volume: voxels spared in all patients; software: FSL (FEAT 5.4); voxelwise p: ~.01 (z > 2.3); cluster extent cutoff: based on GRFT	None
Fridriksson et al. (2009): Vox 2	Picture naming (phonemic paraphasias) vs picture naming (correct trials)	CB Aphasia	NBD	<u>UNR</u>	Vox <u>C</u> -	Search volume: voxels spared in all patients; software: FSL (FEAT 5.4); voxelwise p: ~.01 (z > 2.3); cluster extent cutoff: based on GRFT	↑ L superior parietal ↑ L posterior inferior temporal gyrus/fusiform gyrus ↑ L occipital
Fridriksson et al. (2009): Vox 3	Picture naming (semantic paraphasias) vs picture naming (correct trials)	CB Aphasia	NBD	<u>UNR</u>	Vox <u>C-</u>	Search volume: voxels spared in all patients; software: FSL (FEAT 5.4); voxelwise p: ~.01 (z > 2.3); cluster extent cutoff: based on GRFT	↑ R posterior inferior temporal gyrus/fusiform gyrus ↑ R occipital
Fridriksson et al. (2009): ROI 1	Picture naming (correct trials) vs viewing scrambled images	CC Aphasia Covariate: picture naming accuracy	YCT	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 5; ROIs: (1) R IFG/insula; (2) R motor/premotor; (3) R SMA; (4) R inferior parietal; (5) R superior temporal; how ROIs defined: regions activated for picture naming vs viewing scrambled images in aphasia	↑ R IFG ↑ R insula notes: R IFG showed more activation in patients who produced more correct responses
Menke et al. (2009): Vox 1	Picture naming (trained items) vs rest	LC Aphasia T2 vs T1 Covariate: subsequent outcome (T2) picture naming of trained items outside the scanner <u>Not valid</u> (the logic behind correlating activation changes	<u>UNT</u>	<u>UNR</u>	Vox <u>M**</u>	Search volume: whole brain; software: SPM2; voxelwise p: .05, but at least one voxel in the cluster had to be p < .001; cluster extent cutoff: 0.270 cc; there was an exclusive mask based on activation changes for untrained pictures, but <u>it is unclear what the</u> <u>behavioral covariate was for the mask</u> <u>generation, nor were the regions in</u> <u>the mask reported</u>	<ul> <li>↑ L occipital</li> <li>↑ L</li> <li>hippocampus/MTL</li> <li>↑ R precuneus</li> <li>↑ R occipital</li> <li>↑ R posterior</li> <li>cingulate</li> <li>↑ R</li> <li>hippocampus/MTL</li> </ul>

		and language outcome is unclear)					
Menke et al. (2009): Vox 2	Picture naming (untrained items) vs rest	LC Aphasia T3 vs T1 Covariate: subsequent outcome (T3) picture naming of trained items outside the scanner <u>Not valid</u> (the logic behind correlating activation changes and language outcome is unclear)	<u>UNT</u>	UNR	Vox <u>M**</u>	Search volume: whole brain; software: SPM2; voxelwise p: .05, but at least one voxel in the cluster had to be p < .001; cluster extent cutoff: 0.270 cc; there was an exclusive mask based on activation changes for untrained pictures, but <u>it is unclear what the</u> behavioral covariate was for the mask generation, nor were the regions in the mask reported	<ul> <li>↑ R posterior</li> <li>STG/STS/MTG</li> <li>↓ L SMA/medial</li> <li>prefrontal</li> <li>↓ R inferior</li> <li>parietal lobule</li> <li>↓ R posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> <li>↓ R basal ganglia</li> </ul>
Specht et al. (2009): Vox 1	Lexical decision (words vs pseudowords) vs lexical decision (words vs reversed foreign words)	CAC Aphasia vs control	UNR	UNR	Vox <u>CA</u>	Search volume: whole brain; software: SPM5; voxelwise p: .001; cluster extent cutoff: 0.64 cc	↑ R posterior STG ↑ R Heschl's gyrus notes: activation is 1105 voxels (> 8 cc) so quite convincing, but when the contrast was examined in the patient group, this region was not activated.
Specht et al. (2009): Cplx 1	Lexical decision (words vs pseudowords) vs lexical decision (words vs reversed foreign words)	CAC Aphasia vs control	UNR	UNR	Cplx	Joint ICA was performed on structural and functional contrast images using FIT 1.1b. Only 1 of the 8 components differed between groups in its loadings and was interpretable. The structural part of this component related to the patients' lesions. The functional part was <u>thresholded at</u> <u>voxelwise p &lt; .001 (CDT), arbitrary</u> minimum cluster extent = 0.64 cc.	Other: The component that differed between groups showed more activation for patients than controls in the L anterior temporal lobe, L cerebellum, R posterior STG, R anterior temporal lobe, R posterior inferior temporal gyrus/fusiform gyrus, R cerebellum, and R brainstem, and less activation in patients than controls in the L IFG, L anterior temporal lobe, L occipital lobe, L anterior cingulate, L cerebellum, L thalamus, and R IFG.
Warren et al. (2009): ROI 1	Listening to narrative speech vs listening to reversed speech	CAC Aphasia vs control	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these	None notes: L IFG pars triangularis almost reached significance (p = .053) for more activation in patients

						(5-6); <u>somewhat circular because ROIs</u> were defined only in regions where <u>controls showed significant</u> <u>connectivity (even though ROIs were</u> <u>anatomical)</u>	
Warren et al. (2009): ROI 2	Listening to narrative speech vs listening to reversed speech	CC Aphasia Covariate: auditory sentence comprehension	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)	↑ L anterior temporal
Warren et al. (2009): ROI 3	Listening to narrative speech vs listening to reversed speech	CC Aphasia Covariate: written sentence comprehension	<u>NANB</u>	NANT	ROI Anat <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)	None
Warren et al. (2009): ROI 4	Listening to narrative speech vs listening to reversed speech	CC Aphasia Covariate: auditory single word comprehension	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)	None notes: L anterior temporal p = .08
Warren et al. (2009): ROI 5	Listening to narrative speech vs listening to reversed speech	CC Aphasia Covariate: auditory syntactic comprehension	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)	None notes: L anterior temporal p = .09
Warren et al. (2009): ROI 6	Listening to narrative speech vs listening to reversed speech	CC Aphasia Covariate: connectivity between L and R ATL	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 2; ROIs: (1) L anterior superior temporal cortex; (2) R anterior superior temporal cortex; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)	None
Warren et al. (2009): ROI 7	Listening to narrative speech vs listening to reversed speech	CC Aphasia Covariate: time post onset	NANB	NANT	ROI Anat One	Number of ROIs: 1; ROI: L anterior superior temporal cortex; how ROI defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)	None
Warren et	Listening to	СС	<u>NANB</u>	NANT	ROI	Number of ROIs: 1; ROI: L anterior	None

al. (2009): ROI 8	narrative speech vs listening to reversed speech	Aphasia Covariate: lesion volume			Anat One	superior temporal cortex; how ROI defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)	
Warren et al. (2009): ROI 9	Listening to narrative speech vs listening to reversed speech	CAC Aphasia with positive anterior temporal interconnectivity (n = 8) vs control	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6); somewhat circular because ROIs were defined only in regions where controls showed significant connectivity (even though ROIs were anatomical); excluded 3 patients with L IFG damage	↑ L IFG pars triangularis
Warren et al. (2009): ROI 10	Listening to narrative speech vs listening to reversed speech	CAC Aphasia with negative anterior temporal interconnectivity (n = 8) vs control	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6); somewhat circular because ROIs were defined only in regions where controls showed significant connectivity (even though ROIs were anatomical); excluded 1 patient with L IFG damage	None
Warren et al. (2009): ROI 11	Listening to narrative speech vs listening to reversed speech	CAA Aphasia with positive anterior temporal interconnectivity (n = 8) vs with negative anterior temporal interconnectivity (n = 8)	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6); excluded 4 patients with L IFG damage	↑ L IFG pars triangularis
Warren et al. (2009): Cplx 1	Listening to narrative speech vs listening to reversed speech	CC Aphasia Covariate: lesion status of each voxel	<u>NANB</u>	NANT	Cplx	VLSM with <u>FDR correction</u> was used to identify any regions in which damage was predictive of L anterior temporal activation.	None
Chau et al. (2010): Vox 1	Answering questions from Cantonese Aphasia Battery vs visual decision	LC Aphasia T2 vs T1 Covariate: Δ WAB AQ <u>Somewhat valid</u> (no treatment effect)	UNR	<u>UNR</u>	Vox U	Search volume: whole brain; software: SPM2; stated to be corrected p < 0.05, but the nature of correction is not described; it is not entirely clear whether the functional measure was the difference between T1 and T2 (we assume it is); it is also not clear whether or not 2 patients with low AQ were excluded (we assume not)	↑ L posterior MTG notes: finding based on table; additional small activations are shown in figure but not table
Fridriksson	Picture naming	LC	YCT	<u>UNR</u>	Vox	Search volume: whole brain; software:	↑ L dorsolateral

picturesnaming accuracyprecentral/inferior frontal junction 1 L supramarginal gyrus 1 L intraparietal sulcus 1 L superior parietal 1 L precuneus notes: activated regions were on the borders on the lesion distribution in the 19 included patientsFridriksson et al. (2010):Picture naming (correct trials) vs viewing abstractCC Aphasia CC Covariate: pictureYCT VN VN VN Ce Ce Couster extent cutoff: based on GRFT1 L IG pars orbitalis
et al.(correct trials) vsAphasiaC-FSL 4.1; voxelwise p: ~.02 (z > 2);orbitalis(2010):viewing abstractCovariate: picturecluster extent cutoff: based on GRFT↑ L occipital
Vox 1       pictures       naming accuracy       ↑ L anterior         cingulate       notes: greater         activation was       associated with         better picture       naming; L IFG pars         orbitalis activation       classified as         middle frontal       gyrus in the paper,         but coordinates       suggest otherwise
FridrikssonPicture naming (correct trials) vsCACYCTUNRVoxSearch volume: whole brain; software:Noneet al.(correct trials) vsAphasia vs controlC-FSL 4.1; voxelwise p: ~.02 (z > 2);Image: cluster extent cutoff: based on GRFT(2010):viewing abstractimage: cluster extent cutoff: based on GRFTVox 2image: cluster extent cutoff: based on GRFT
Fridriksson et al. (2010):Picture naming (correct trials) vs viewing abstractCCYCTUNR VICTROI FuncNumber of ROIs: 1; ROI: a single ROI comprising 3 regions where activation in patients was correlated with picture naming accuracy: the L IFG pars orbitalis, occipital lobe, and anterior cingulate; how ROI defined: based on SPM analysis 1; the purpose of this analysis was to determine whether patients with better naming showed less activation than cingulate in the patients with better naming, or not activated in the patients with worse naming, relative to the control meanOther: patients with better naming activation than controls.
Fridriksson et al. (2010): picturesPicture naming (correct trials) vs viewing abstract Cplx 1CC Aphasia Covariate: lesion status of each voxelYCT VLUNR VLSM was used to identify any regions in which damage was predictive of activation in the regions identified in SPM analysis 1, considered as a single ROI. There was no correction for multiple comparisons, and the analysis is appropriately presented as exploratory.Other: Only in the L IFG pars opercularis was damage predictive of reduced activation in the potentially compensatory network.
Sharp et al.Semantic decisionCACNAMASROIBehavioral data notes: accuracy andOther:(2010):(clear in patients; average of clearAphasia vs controlOthRT were not significantly different for the semantic task; statistics are not reported for the syllable counting task,Other:

	in controls) vs syllable count decision (clear in patients; average of clear and noise vocoded in controls)					but the data provided suggest that accuracy was probably not matched, while RT probably was; number of ROIs: 12; ROIs: functional connectivity between pairs of spared nodes of the L hemisphere semantic network and R hemisphere homotopic regions: (1) L SFG-L AG; (2) L SFG-L IFG; (3) L SFG-L IT; (4) L AG-L IFG; (5) L AG-L IT; (6) L IFG-L IT; (7-12) homotopic counterparts; how ROIs defined: partial correlations between nodes	between L SFG and L AG than controls while performing the semantic task; this was not the case for the syllable counting task, however connectivity during performance of the two tasks was not compared directly
Thompson et al. (2010): ROI 1	Auditory sentence- picture matching (all three sentence types) vs rest	LA Aphasia T2 vs T1	AS	<u>AS</u>	ROI Anat <u>NC</u>	Number of ROIs: 18; ROIs: (1) L BA 7; (2) L BA 9; (3) L BA 13; (4) L BA 21; (5) L BA 22; (6) L BA 39; (7) L BA 40; (8) L BA 44; (9) L BA 45; (10-18) homotopic counterparts; how ROIs defined: WFU pickatlas; proportion of patients who showed increases and decreases in (parts of) each ROI in individual fixed effects SPM analyses	<ul> <li>↑ L angular gyrus</li> <li>↑ L superior</li> <li>parietal</li> <li>↑ L mid temporal</li> <li>↑ R supramarginal</li> <li>gyrus</li> <li>↑ R superior</li> <li>parietal</li> <li>↓ L insula</li> <li>↓ L posterior STG</li> <li>notes: these are</li> <li>the regions</li> <li>involved in what</li> <li>the authors</li> <li>interpret as a</li> <li>"general shift"</li> </ul>
Tyler et al. (2010): Vox 1	Listening to grammatical but meaningless sentences and detecting a target word vs listening to scrambled sentences and detecting a target word	CAC Aphasia vs control	UNR	<u>AS</u>	Vox NDC	Behavioral data notes: the two groups showed similar differences between RTs in the two conditions of the contrast; search volume: whole brain; software: SPM5; qualitative comparison on pp. 3402-3; each group is presented at voxelwise p < .005 (CDT), cluster-corrected p < .05 with GRFT	<ul> <li>↑ R IFG pars</li> <li>triangularis</li> <li>↑ R IFG pars</li> <li>orbitalis</li> <li>↓ L posterior MTG</li> <li>notes: several</li> <li>other potential</li> <li>differences are</li> <li>apparent in the</li> <li>figure, but only the</li> <li>differences</li> <li>tabulated are</li> <li>interpreted in the</li> <li>text</li> </ul>
Tyler et al. (2010): ROI 1	Listening to grammatical but meaningless sentences and detecting a target word vs listening to scrambled sentences and detecting a target word	CC Aphasia Covariate: RT difference between early and late targets on grammatical but meaningless sentences (a measure of syntactic processing)	UNR	UNR	ROI Func One	Behavioral data notes: analyses focuses on RT differences between early and late targets, not on mean RT per se; number of ROIs: 1; ROI: L IFG pars triangularis and orbitalis; how ROI defined: activated for the same contrast	↑ L IFG pars triangularis ↑ L IFG pars orbitalis notes: L IFG showed more activation in patients that had a larger target position effect (indicative of
							better syntactic processing)

	detecting a target word vs listening to scrambled sentences and detecting a target word	early and late targets on normal sentences					
Tyler et al. (2010): ROI 3	Listening to grammatical but meaningless sentences and detecting a target word vs listening to scrambled sentences and detecting a target word	CC Aphasia Covariate: RT difference between early and late targets on scrambled sentences	UNR	UNR	ROI Func One	Number of ROIs: 1; ROI: L IFG pars triangularis and orbitalis; how ROI defined: activated for the same contrast	None
Tyler et al. (2010): ROI 4	Listening to grammatical but meaningless sentences and detecting a target word vs listening to scrambled sentences and detecting a target word	CC Aphasia Covariate: damage to L IFG, estimated from T1 signal	UNR	<u>UNR</u>	ROI Func One	Number of ROIs: 1; ROI: R IFG pars triangularis and orbitalis; how ROI defined: activated for the same contrast	None notes: no correlation (p = .57)
Tyler et al. (2010): ROI 5	Listening to grammatical but meaningless sentences and detecting a target word vs listening to scrambled sentences and detecting a target word	CC Aphasia Covariate: syntactic processing (presumably the target position effect, though this is not stated)	UNR	<u>UNR</u>	ROI Func One	Number of ROIs: 1; ROI: R IFG pars triangularis and orbitalis; how ROI defined: activated for the same contrast	None notes: no correlation (p = .41)
Tyler et al. (2010): Cplx 1	Listening to grammatical but meaningless sentences and detecting a target word vs listening to scrambled sentences and detecting a target word	CC Aphasia Covariate: lesion status of each voxel	UNR	<u>UNR</u>	Cplx	VBM was used to identify any regions where damage was predictive of activation in the L IFG pars triangularis and orbitalis. Tissue integrity was quantified in terms of T1 signal. <u>Clusterwise correction was used,</u> which is not appropriate for VBM.	Other: Only in the L IFG itself was damage predictive of reduced activation in the L IFG.
van Oers et al. (2010): ROI 1	Written word- picture matching vs visual decision	CAC Aphasia vs control	UNR	<u>UNR</u>	ROI Mix <u>NC</u>	Behavioral data notes: accuracy not reported for control condition; number of ROIs: 7; ROIs: (1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal L1; (6) temporal L1; (7) whole network L1; how ROIs defined: WFU pickatlas	↓ L IFG ↓ LI (language network) ↓ LI (frontal)
van Oers et al. (2010): ROI 2	Semantic decision vs visual decision	CAC Aphasia vs control	<u>UNR</u>	<u>UNR</u>	ROI Mix <u>NC</u>	Behavioral data notes: accuracy not reported for control condition; number of ROIs: 7; ROIs: (1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG);	↓ L IFG ↓ Ll (language network) ↓ Ll (frontal)

(3) Rameteric Inguage region (IFG) (2) posterior Inguag								
al. (2010):       rest.       Aphasia vs control       Mix       Ianguage region (FG); (2) Posterior in pauge region (FG); (2) Posterior in Pau							R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs	
al. (2010): RO14picture matching covariate: picture- word matching accuracyMine covariate: picture- word matching 	al. (2010):	U		UNR	<u>UNR</u>	Mix	language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs defined: WFU pickatlas	↓ LI (language network)
al (2010): ROI 5vs visual decision Covariate: semantic decision accuracyMix wslanguage region (IFG): (2) L posterior language region (IFG): (4) R posterior language region (IFG): (4) R posterior language region (IFG): (2) L posterior lut; (6) temporal LL; (7) whole network L; how ROIs defined: WFU pickatasNonevan Oers et al. (2010): ROI 6Written word- picture matching vs visual decisionCC Aphasia Covariate: overall language region (IFG): (2) L posterior posterior language region (IFG): (2) L posterior (3) R anterior language region (IFG): (4) R posterior language region (IFG): (4) R posterior language region (IFG): (4) 	al. (2010):	picture matching	Aphasia Covariate: picture- word matching	С	<u>UNR</u>	Mix	language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs	None
al. (2010): ROI 6picture matching vs visual decisionAphasia Covariate: overall language measureMix wixlanguage region (IFG); (2) L posterior language region (IFG); (4) R posterior language region (IFG); (4) R posterior language region (IFG); (4) R posterior language region (IFG); (2) L posterior (3) R anterior language region (IFG); (2) L posterior (1) whole network Lt; how ROIs defined: WFU pickatlas† LI (language network)van Oers et al. (2010): al. (2010): al. (2010): ROI 7Semantic decision vs visual decisionCC Aphasia Covariate: overall language measureUNR 	al. (2010):		Aphasia Covariate: semantic	С	<u>UNR</u>	Mix	language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs	None
al. (2010): ROI 7vs visual decision ROI 7Aphasia Covariate: overall language measureMix Covariate: overall language measureIanguage region (IFG); (2) L posterior language region (IFG); (4) R posterior language region (IFG); (2) L posterior 	al. (2010):	picture matching	Aphasia Covariate: overall	<u>UNR</u>	<u>UNR</u>	Mix	language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs	None
al. (2010): ROI 8restAphasiaMixlanguage region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, SMG, STG, MTG); (3) R anterior language region (AG, SMG, STG, MTG); (3) R anterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs defined: WFU pickatlasvan Oers et al. (2010): van Oers et al. (2010):Written word- picture matching vs visual decisionCC AphasiaUNR CC VOR CCNumber of ROIs: 2; ROIs: (1) R anterior 	al. (2010):		Aphasia Covariate: overall	<u>UNR</u>	UNR	Mix	language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs defined: WFU pickatlas; not clear if it	
al. (2010): ROI 9picture matching vs visual decisionAphasiaAnat Covariate: lesion volumelanguage region (IFG); (2) R posterior language region (AG, SMG, STG, MTG); how ROIs defined: WFU pickatlasvan Oers et al. (2010):Semantic decision vs visual decisionCC AphasiaUNR MRUNR AnatROI Anat language region (IFG); (2) R posteriorvan Oers et al. (2010):Semantic decision vs visual decisionCC AphasiaUNR MRNumber of ROIs: 2; ROIs: (1) R anterior language region (IFG); (2) R posterior	al. (2010):		Aphasia Covariate: overall	UNR	<u>UNR</u>	Mix	language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs	None
al. (2010): vs visual decision Aphasia Anat language region (IFG); (2) R posterior	al. (2010):	picture matching	Aphasia Covariate: lesion volume	<u>UNR</u>	<u>UNR</u>	Anat	language region (IFG); (2) R posterior language region (AG, SMG, STG, MTG); how ROIs defined: WFU pickatlas	None
	al. (2010):			<u>UNR</u>	<u>UNR</u>	Anat		None

		Covariate: lesion volume				language region (AG, SMG, STG, MTG); how ROIs defined: WFU pickatlas	
van Oers et al. (2010): ROI 11	Verb generation vs rest	CC Aphasia Covariate: lesion volume	<u>UNR</u>	<u>UNR</u>	ROI Anat <u>NC</u>	Number of ROIs: 2; ROIs: (1) R anterior language region (IFG); (2) R posterior language region (AG, SMG, STG, MTG); how ROIs defined: WFU pickatlas	None
van Oers et al. (2010): ROI 12	Written word- picture matching vs visual decision	CC Aphasia Covariate: damage to L hemisphere language regions	<u>UNR</u>	<u>UNR</u>	ROI Anat <u>NC</u>	Number of ROIs: 2; ROIs: (1) R anterior language region (IFG); (2) R posterior language region (AG, SMG, STG, MTG); how ROIs defined: WFU pickatlas	None
van Oers et al. (2010): ROI 13	Semantic decision vs visual decision	CC Aphasia Covariate: damage to L hemisphere language regions	<u>UNR</u>	<u>UNR</u>	ROI Anat <u>NC</u>	Number of ROIs: 2; ROIs: (1) R anterior language region (IFG); (2) R posterior language region (AG, SMG, STG, MTG); how ROIs defined: WFU pickatlas	None
van Oers et al. (2010): ROI 14	Verb generation vs rest	CC Aphasia Covariate: damage to L hemisphere language regions	<u>UNR</u>	<u>UNR</u>	ROI Anat <u>NC</u>	Number of ROIs: 2; ROIs: (1) R anterior language region (IFG); (2) R posterior language region (AG, SMG, STG, MTG); how ROIs defined: WFU pickatlas	None
van Oers et al. (2010): ROI 15	Written word- picture matching vs visual decision	CC Aphasia Covariate: previous (current vs subacute) Δ naming <u>Not valid</u> (current activation will reflect not just prior recovery, but also current language function)	UNR	UNR	ROI Anat <u>NC</u>	Number of ROIs: 7; ROIs: (1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs defined: WFU pickatlas	None
van Oers et al. (2010): ROI 16	Semantic decision vs visual decision	CC Aphasia Covariate: previous (current vs subacute) Δ naming <u>Not valid</u> (current activation will reflect not just prior recovery, but also current language function)	UNR	UNR	ROI Anat <u>NC</u>	Number of ROIs: 7; ROIs: (1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs defined: WFU pickatlas	↑ L IFG
van Oers et al. (2010): ROI 17	Verb generation vs rest	CC Aphasia Covariate: previous (current vs subacute) Δ naming Not valid (current activation will reflect not just prior recovery, but also current language function)	UNR	<u>UNR</u>	ROI Anat <u>NC</u>	Number of ROIs: 7; ROIs: (1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs defined: WFU pickatlas	↑ L IFG
van Oers et al. (2010): ROI 18	Written word- picture matching vs visual decision	CC Aphasia Covariate: previous (current vs subacute) Δ TT <u>Not valid</u> (current activation will reflect	<u>UNR</u>	<u>UNR</u>	ROI Anat <u>NC</u>	Number of ROIs: 7; ROIs: (1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal	None

		not just prior recovery, but also current language function; TT not optimal measure of overall language function)				Ll; (7) whole network Ll; how ROIs defined: WFU pickatlas	
van Oers et al. (2010): ROI 19	Semantic decision vs visual decision	CC Aphasia Covariate: previous (current vs subacute) Δ TT Not valid (current activation will reflect not just prior recovery, but also current language function; TT not optimal measure of overall language function)	UNR	UNR	ROI Anat <u>NC</u>	Number of ROIs: 7; ROIs: (1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal Ll; (6) temporal Ll; (7) whole network Ll; how ROIs defined: WFU pickatlas	↑ L IFG ↑ R IFG
van Oers et al. (2010): ROI 20	Verb generation vs rest	CC Aphasia Covariate: previous (current vs subacute) Δ TT <u>Not valid</u> (current activation will reflect not just prior recovery, but also current language function; TT not optimal measure of overall language function)	UNR	UNR	ROI Anat <u>NC</u>	Number of ROIs: 7; ROIs: (1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs defined: WFU pickatlas	↑ L IFG ↑ R IFG
Papoutsi et al. (2011): Vox 1	Listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to ambiguous sentences with dominant resolution ("dominant")	CC Aphasia Covariate: difference in percent of unacceptable judgments between subordinate and dominant sentences (dominance effect)	NANB	NANT	Vox <u>C-</u>	Search volume: whole brain; software: SPM8; voxelwise p: .01; cluster extent cutoff: based on GRFT	↑ L insula ↑ L posterior STG/STS/MTG ↑ L mid temporal
Papoutsi et al. (2011): Cplx 1	Listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to ambiguous sentences with dominant resolution ("dominant")	CC Aphasia Covariate: modulation of L IFG connectivity by dominance effect	NANB	NANT	Cplx	A PPI analysis was carried out with the L IFG as the seed region. Correlations were computed between voxelwise modulation of connectivity with this region, and a behavioral measure of syntactic processing, which was the dominance effect: the difference in percent of unacceptable judgments between subordinate and dominant sentences. The resultant SPM was thresholded at voxelwise $p < .01$ (CDT), then corrected for multiple corrections based on cluster extent and GRFT using SPM8.	Other: patients with better syntactic performance had more connectivity from the L IFG seed region to L pMTG and adjacent areas (including the insula); pMTG also significant at voxelwise p < .001 in Figure 2B, corrected for

							multiple comparisons with GRFT
Papoutsi et al. (2011): Cplx 2	Listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to ambiguous sentences with dominant resolution ("dominant")	CC Aphasia Covariate: modulation of L pMTG connectivity by dominance effect	<u>NANB</u>	NANT	Cplx	A similar PPI analysis was carried out with the L pMTG as the seed region. <u>Thresholding was the same as in the</u> <u>previous analysis.</u>	None
Sebastian & Kiran (2011): ROI 1	Picture naming (correct trials) vs viewing scrambled images and saying "pass"	CC Aphasia Covariate: lesion volume	YCT	<u>UNR</u>	ROI Mix <u>NC</u>	Number of ROIs: 4; ROIs: (1) L IFG (oper/tri); (2) L posterior perisylvian (pSTG, pMTG, AG, SMG); (3) R IFG (oper/tri); (4) R posterior perisylvian (pSTG, pMTG, AG, SMG); (5) language network LI; how ROIs defined: Harvard-Oxford atlas	<ul> <li>↑ R supramarginal gyrus</li> <li>↑ R angular gyrus</li> <li>↑ R posterior</li> <li>STG/STS/MTG</li> <li>↓ LI (language network)</li> <li>notes: larger</li> <li>lesions were</li> <li>associated with</li> <li>more R posterior</li> <li>perisylvian</li> <li>activation</li> </ul>
Sebastian & Kiran (2011): ROI 2	Semantic decision (correct trials) vs visual decision	CC Aphasia Covariate: lesion volume	ҮСТ	<u>UNR</u>	ROI Mix <u>NC</u>	Number of ROIs: 4; ROIs: (1) L IFG (oper/tri); (2) L posterior perisylvian (pSTG, pMTG, AG, SMG); (3) R IFG (oper/tri); (4) R posterior perisylvian (pSTG, pMTG, AG, SMG); (5) language network LI; how ROIs defined: Harvard–Oxford atlas	None
Szaflarski et al. (2011): Vox 1	Semantic decision vs tone decision	LA Aphasia T2 vs T1 <u>Somewhat valid</u> (patients improved only on semantic fluency)	Υ	UNR	Vox <u>NC</u>	Behavioral data notes: language and control tasks both matched; search volume: whole brain; software: in- house; voxelwise p: .05; cluster extent cutoff: none; the figure shows a cutoff of $z > 10$ , which would not correspond to $p < .05$ ; increases and decreases in Figure 3 do not accord with the data from T1 and T2 in Figure 2, raising concerns about the implementation of the analyses; there is no explicit description of the second level analysis	<ul> <li>↑ L IFG</li> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ L orbitofrontal</li> <li>↑ L inferior parietal</li> <li>lobule</li> <li>↑ L supramarginal</li> <li>gyrus</li> <li>↑ L angular gyrus</li> <li>↑ L precuneus</li> <li>↑ L occipital</li> <li>↑ L basal ganglia</li> <li>↑ L</li> <li>hippocampus/MTL</li> <li>↑ R dorsal</li> <li>precentral</li> <li>↑ R precuneus</li> <li>↑ R basal ganglia</li> <li>↑ R</li> <li>hippocampus/MTL</li> <li>↓ R basal ganglia</li> <li>↑ R</li> <li>hippocampus/MTL</li> <li>↓ R insula</li> <li>↓ R supramarginal</li> <li>gyrus</li> <li>↓ R posterior STG</li> </ul>

							notes: based on a combination of coordinates in Table 2, and Figure 3
Szaflarski et al. (2011): ROI 1	Semantic decision vs tone decision	LA Aphasia T2 vs T1 <u>Somewhat valid</u> (patients improved only on semantic fluency)	Y	UNR	ROI Func <u>NC</u>	Behavioral data notes: language and control tasks both matched; number of ROIs: 3; ROIs: (1) frontal LI; (2) temporal LI; (3) language network LI; T1 LI (temporal) is reported to be negative, which does not accord with the voxelwise analysis in Figure 2; increases and decreases in Figure 3 do not accord with the data from T1 and T2 in Figure 2, raising concerns about the implementation of the analyses	↑ LI (language network) ↑ LI (frontal) ↑ LI (temporal)
Tyler et al. (2011): Vox 1	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")	CAC Aphasia vs control	<u>NANB</u>	NANT	Vox NDC	Search volume: plausible fronto- temporo-parietal language regions; software: SPM5; qualitative comparison on p. 423	↓ L IFG
Tyler et al. (2011): Vox 2	Listening to ambiguous sentences with dominant resolution ("dominant") vs listening to unambiguous sentences ("unambiguous")	CAC Aphasia vs control	<u>NANB</u>	NANT	Vox NDC	Search volume: plausible fronto- temporo-parietal language regions; software: SPM5; qualitative comparison on p. 423	↓ L IFG
Tyler et al. (2011): Vox 3	Listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to unambiguous sentences ("unambiguous")	CAC Aphasia vs control	<u>NANB</u>	NANT	Vox NDC	Search volume: plausible fronto- temporo-parietal language regions; software: SPM5; qualitative comparison on p. 423	↓ L IFG notes: lack of patient activation in pMTG implied in text, but this activation looks fairly similar in patients and controls (c.f. Figure 3C vs 2C)
Tyler et al. (2011): Vox 4	Listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to ambiguous sentences with dominant resolution ("dominant")	CAC Aphasia vs control	NANB	NANT	Vox NDC	Search volume: plausible fronto- temporo-parietal language regions; software: SPM5; qualitative comparison on p. 423	↓ L IFG ↓ L posterior MTG
Tyler et al. (2011): Vox 5	Listening to ambiguous sentences (dominant and	CC Aphasia Covariate: performance on	<u>NANB</u>	NANT	Vox <u>C-</u>	Search volume: plausible fronto- temporo-parietal language regions; software: SPM5; voxelwise p: .01; cluster extent cutoff: based on GRFT	↑ L IFG pars triangularis ↑ L IFG pars orbitalis

	subordinate) vs listening to unambiguous sentences ("unambiguous")	acceptability judgment task (difference in percent of unacceptable judgments between ambiguous and unambiguous sentences)					↑ R insula ↑ R mid temporal notes: also L pMTG but this did not reach significance
Tyler et al. (2011): Vox 6	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")	CC Aphasia Covariate: performance on sentence-picture matching task	NANB	NANT	Vox <u>CA</u>	Search volume: plausible fronto- temporo-parietal language regions; software: SPM5; voxelwise p: .01; cluster extent cutoff: 30 (units not stated)	↑ L IFG pars orbitalis ↑ L posterior MTG ↑ R insula ↑ R posterior STG ↑ R mid temporal
Tyler et al. (2011): Vox 7	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")	CC Aphasia Covariate: performance on word monitoring task	<u>NANB</u>	NANT	Vox <u>CA</u>	Search volume: plausible fronto- temporo-parietal language regions; software: SPM5; voxelwise p: .05; cluster extent cutoff: 10 (units not stated)	↑ L IFG pars orbitalis ↑ L posterior MTG ↑ R insula ↑ R mid temporal
Tyler et al. (2011): Vox 8	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")	CC Aphasia Covariate: difference in percent of unacceptable judgments between subordinate and dominant sentences (dominance effect)	NANB	NANT	Vox <u>C-</u>	Search volume: plausible fronto- temporo-parietal language regions; software: SPM5; voxelwise p: .01; cluster extent cutoff: based on GRFT	None
Tyler et al. (2011): ROI 1	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")	CC Aphasia Covariate: performance on acceptability judgment task (difference in percent of unacceptable judgments between ambiguous and unambiguous sentences)	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 3; ROIs: (1) IFG pars opercularis; (2) IFG pars triangularis; (3) IFG pars orbitalis; how ROIs defined: AAL	↑ L IFG pars triangularis ↑ L IFG pars orbitalis
Tyler et al. (2011): ROI 2	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")	CC Aphasia Covariate: difference in percentage of unacceptable judgments between subordinate and dominant sentences (dominance effect)	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 3; ROIs: (1) IFG pars opercularis; (2) IFG pars triangularis; (3) IFG pars orbitalis; how ROIs defined: AAL	None
Weiduschat et al. (2011): ROI 1	Verb generation vs rest	LA Aphasia T2 vs T1 (regardless of rTMS)	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 3; ROIs: (1) IFG LI; (2) superior temporal LI; (3) SMA LI	None
Weiduschat	Verb generation vs	LA	<u>UNR</u>	<u>UNR</u>	ROI	Number of ROIs: 3; ROIs: (1) IFG LI; (2)	None

et al. (2011): ROI 2	rest	Aphasia treated with rTMS (n = 6) T2 vs T1			LI <u>NC</u>	superior temporal Ll; (3) SMA Ll	
Weiduschat et al. (2011): ROI 3	Verb generation vs rest	LAA (Aphasia with R IFG rTMS (n = 6) T2 vs T1) vs (with sham rTMS (n = 4) T2 vs T1)	UNR	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 3; ROIs: (1) IFG LI; (2) superior temporal LI; (3) SMA LI	↑ LI (frontal) notes: IFG LI was stable in the stimulation group, but shifted to the R in the sham group, yielding a significant difference between groups
Weiduschat et al. (2011): ROI 4	Verb generation vs rest	LC Aphasia T2 vs T1 (regardless of rTMS) Covariate: ∆ AAT total score	<u>UNR</u>	<u>UNR</u>	ROI LI One	Number of ROIs: 1; ROI: IFG LI	None
Allendorfer et al. (2012): ROI 1	Verb generation (covert, block) vs finger tapping (block)	CAC Aphasia vs control	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 2; ROIs: (1) frontal LI; (2) temporal LI	↓ LI (temporal)
Allendorfer et al. (2012): ROI 2	Verb generation (overt, event- related) vs noun repetition (event- related)	CAC Aphasia vs control	N	<u>UNR</u>	ROI LI <u>NC</u>	Behavioral data notes: patients less accurate and produced less responses on both conditions, but the difference between groups was greater for verb generation; number of ROIs: 2; ROIs: (1) frontal LI; (2) temporal LI	↓ LI (frontal)
Allendorfer et al. (2012): ROI 3	Verb generation (overt, event- related) vs verb generation (covert, event-related)	CAC Aphasia vs control	<u>N</u>	<u>UNR</u>	ROI LI <u>NC</u>	Behavioral data notes: overt performance differed, so covert performance probably did too; number of ROIs: 2; ROIs: (1) frontal LI; (2) temporal LI	None notes: lack of lateralization in controls makes this analysis difficult to interpret
Allendorfer et al. (2012): ROI 4	Verb generation (overt, event- related) vs noun repetition (event- related)	CC Aphasia Covariate: overt verb generation accuracy	С	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 3; ROIs: (1) L MTG; (2) L SFG/CG; (3) left MFG; how ROIs defined: regions activated by the contrast of overt verb generation vs noun repetition in patients	↑ L dorsolateral prefrontal cortex ↑ L SMA/medial prefrontal
Allendorfer et al. (2012): ROI 5	Verb generation (overt, event- related) vs verb generation (covert, event-related)	CC Aphasia Covariate: overt verb generation accuracy	С	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 2; ROIs: (1) R insula/IFG; (2) R STG; how ROIs defined: prominent R hemisphere activations for the contrast of overt and covert verb generation in patients	None
Fridriksson, Hubbard, et al. (2012): Vox 1	Listening to/watching audiovisual sentences, while producing the same sentences in unison (speech entrainment) vs listening to reversed sentences and viewing a mouth speaking, while producing unrelated sentences	CAC Aphasia T1 vs control	UNR	NANT	Vox U	Search volume: whole brain; software: FSL (FEAT 5.98); thresholding not stated	↑ L angular gyrus ↓ L anterior temporal notes: based on coordinates in Table 2

Fridriksson, Hubbard, et al. (2012): Vox 2	Listening to/watching audiovisual sentences, while producing the same sentences in unison (speech entrainment) vs rest	LA Aphasia T2 vs T1	UNR	NANT	Vox U	Search volume: whole brain; software: FSL (FEAT 5.98); thresholding not stated	<ul> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ L anterior</li> <li>cingulate</li> <li>↑ R precuneus</li> <li>↑ R occipital</li> <li>↑ R</li> <li>hippocampus/MTL</li> <li>↓ L supramarginal</li> <li>gyrus</li> <li>notes: some labels</li> <li>changed based on</li> <li>coordinates</li> </ul>
Fridriksson, Hubbard, et al. (2012): Vox 3	Listening to reversed sentences and viewing a mouth speaking, while producing unrelated sentences vs rest	LA Aphasia T2 vs T1	<u>UNR</u>	NANT	Vox <u>U</u>	Search volume: whole brain; software: FSL (FEAT 5.98); thresholding not stated	None
Fridriksson, Hubbard, et al. (2012): Vox 4	Listening to/watching audiovisual sentences and viewing a mouth vs rest	LA Aphasia T2 vs T1	<u>NANB</u>	NANT	Vox <u>U</u>	Search volume: whole brain; software: FSL (FEAT 5.98); thresholding not stated	None
Fridriksson, Hubbard, et al. (2012): ROI 1	Listening to/watching audiovisual sentences, while producing the same sentences in unison (speech entrainment) vs listening to reversed sentences and viewing a mouth speaking, while producing unrelated sentences	CAC Aphasia T1 vs control	UNR	NANT	ROI Func <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior insula/IFG pars orbitalis; (2) R anterior insula/IFG pars orbitalis; (3) Broca's area; (4) L MTG; (5) L BA 37; (6) R BA 37; how ROIs defined: regions activated in both groups considered together; there were no interactions of group by condition; two regions showed main effects of group but this is not pertinent to the contrast	None
Fridriksson, Richardson, et al. (2012): ROI 1	Picture naming vs viewing abstract pictures	LC Aphasia T2 vs T1 Covariate: Δ picture naming accuracy	С	<u>UNR</u>	ROI Oth NC	Number of ROIs: 3; ROIs: (1) perilesional L hemisphere language regions; (2) perilesional L hemisphere non-language regions; (3) undamaged non-perilesional L hemisphere language regions; how ROIs defined: based on individual lesions and control activation for picture naming	Other: change in perilesional non- language regions positively correlated with improvement in accuracy
Fridriksson, Richardson, et al. (2012): ROI 2	Picture naming vs viewing abstract pictures	LC Aphasia T2 vs T1 Covariate: Δ (decrease in) semantic errors	<u>UNR</u>	UNR	ROI Oth <u>NC</u>	Number of ROIs: 3; ROIs: (1) perilesional L hemisphere language regions; (2) perilesional L hemisphere non-language regions; (3) undamaged non-perilesional L hemisphere language regions; how ROIs defined: based on individual lesions and control activation for picture naming	Other: change in undamaged non- perilesional language regions negatively correlated with decrease in semantic errors
Fridriksson,	Picture naming vs	LC	<u>UNR</u>	<u>UNR</u>	ROI	Number of ROIs: 3; ROIs: (1)	Other:

Richardson, et al. (2012): ROI 3	viewing abstract pictures	Aphasia T2 vs T1 Covariate: Δ (decrease in) phonological paraphasias			Oth <u>NC</u>	perilesional L hemisphere language regions; (2) perilesional L hemisphere non-language regions; (3) undamaged non-perilesional L hemisphere language regions; how ROIs defined: based on individual lesions and control activation for picture naming	change in perilesional language regions, and change in undamaged non- perilesional language regions, negatively correlated with decrease in phonological paraphasias
Fridriksson, Richardson, et al. (2012): ROI 4	Picture naming vs viewing abstract pictures	CC Aphasia T1 Covariate: subsequent Δ (T2 vs T1) picture naming accuracy <u>Somewhat valid</u> (T1 behavioral measure should be included in model)	UNR	UNR	ROI Oth <u>NC</u>	Number of ROIs: 3; ROIs: (1) perilesional L hemisphere language regions; (2) perilesional L hemisphere non-language regions; (3) undamaged non-perilesional L hemisphere language regions; how ROIs defined: based on individual lesions and control activation for picture naming	None
Fridriksson, Richardson, et al. (2012): ROI 5	Picture naming vs viewing abstract pictures	CC Aphasia T1 Covariate: subsequent Δ (T2 vs T1, decrease in) semantic errors <u>Somewhat valid</u> (T1 behavioral measure should be included in model)	UNR	UNR	ROI Oth <u>NC</u>	Number of ROIs: 3; ROIs: (1) perilesional L hemisphere language regions; (2) perilesional L hemisphere non-language regions; (3) undamaged non-perilesional L hemisphere language regions; how ROIs defined: based on individual lesions and control activation for picture naming	Other: change in perilesional language regions correlated with decrease in phonological paraphasias
Fridriksson, Richardson, et al. (2012): ROI 6	Picture naming vs viewing abstract pictures	CC Aphasia T1 Covariate: subsequent Δ (T2 vs T1, decrease in) phonological paraphasias Somewhat valid (T1 behavioral measure should be included in model)	UNR	UNR	ROI Oth <u>NC</u>	Number of ROIs: 3; ROIs: (1) perilesional L hemisphere language regions; (2) perilesional L hemisphere non-language regions; (3) undamaged non-perilesional L hemisphere language regions; how ROIs defined: based on individual lesions and control activation for picture naming	None
Marcotte et al. (2012): Vox 1	Picture naming (T1: known items; T2: trained items; correct trials) vs viewing scrambled images and saying "baba"	LA Aphasia T2 vs T1	YCT	UNR	Vox <u>NDC</u>	Search volume: whole brain; software: SPM5; qualitative comparison on p. 1780; <u>different contrasts at different</u> <u>time points not clearly explained</u>	<ul> <li>↑ L supramarginal gyrus</li> <li>↓ L dorsal</li> <li>precentral</li> <li>↓ L posterior MTG</li> <li>notes: labels</li> <li>based on figures</li> <li>rather than text</li> </ul>
Marcotte et al. (2012): Vox 2	Picture naming (known items, correct trials) vs viewing scrambled images and saying "baba"	CC Aphasia T1 Covariate: subsequent Δ (T2 vs T1) naming of trained items <u>Somewhat valid</u> (T1 behavioral measure should be included in model)	YCT	<u>UNR</u>	Vox <u>CA</u>	Search volume: whole brain; software: SPM5; voxelwise p: .005; cluster extent cutoff: 10 voxels (size not stated); different contrasts at different time points not clearly explained	<ul> <li>↑ L dorsolateral prefrontal cortex</li> <li>↑ L SMA/medial prefrontal</li> <li>↑ L somato-motor</li> <li>↑ L anterior cingulate</li> <li>↑ R dorsolateral prefrontal cortex</li> <li>↑ R somato-motor</li> <li>↑ R thalamus</li> </ul>

							notes: labels based on figures and text
Marcotte et al. (2012): Vox 3	Picture naming (trained items, correct trials) vs viewing scrambled images and saying "baba"	CC Aphasia T2 Covariate: previous ∆ (T2 vs T1) naming of trained items <u>Not valid</u> (T2 activation not an appropriate measure of treatment-induced recovery because it reflects T2 performance)	YCT	UNR	Vox <u>CA</u>	Search volume: whole brain; software: SPM5; voxelwise p: .005; cluster extent cutoff: 10 voxels (size not stated); different contrasts at different time points not clearly explained	↑ L somato-motor notes: label based on figure
Schofield et al. (2012): Vox 1	Listening to word pairs or reversed word pairs, speaker gender judgment vs rest	CAC Moderate aphasia (n = 11) vs control	<u>UNR</u>	<u>UNR</u>	Vox <u>NC</u>	Search volume: whole brain; software: SPM8; voxelwise p: .001; cluster extent cutoff: none	↓ L Heschl's gyrus notes: structurally, HG was not significantly damaged in this group
Schofield et al. (2012): Vox 2	Listening to word pairs or reversed word pairs, speaker gender judgment vs rest	CAC Severe aphasia (n = 9) vs control	<u>UNR</u>	UNR	Vox <u>M**</u>	Search volume: whole brain; software: SPM8; voxelwise p: MGB: SVC; elsewhere: .001; cluster extent cutoff: none	↓ L posterior STG ↓ L Heschl's gyrus ↓ L thalamus notes: specifically: PT, HG and MGB; structurally, the PT and HG were significantly damaged, but not the MGB
Schofield et al. (2012): Vox 3	Listening to word pairs or reversed word pairs, speaker gender judgment vs rest	CAA Severe (n = 9) vs moderate (n = 11) aphasia	<u>UNR</u>	<u>UNR</u>	Vox <u>NC</u>	Search volume: whole brain; software: SPM8; voxelwise p: .001; cluster extent cutoff: none	↓ L posterior STG notes: specifically, PT; structurally, severe patients had more damage in HG and PT
Wright et al. (2012): Vox 1	Listening to normal sentences and detecting a target word vs rest	CAC Aphasia vs control	Y	UNR	Vox <u>NC</u>	Search volume: whole brain; software: SPM5; voxelwise p: .01	↓ L posterior STG/STS/MTG ↓ L Heschl's gyrus ↓ L mid temporal notes: at a more stringent threshold of p < .001, with correction for multiple comparisons based on GRFT and cluster extent, only L HG showed reduced activity in patients
Wright et al. (2012): Cplx 1	Listening to normal sentences and detecting a target word vs rest	CC Aphasia Covariate: see statistical details	UNR	<u>UNR</u>	Cplx	Joint ICA was performed on structural and functional contrast images for each of the two contrasts using FIT 2.0b. Seven components were derived, of which 2 were further investigated since their loadings correlated with relevant behavioral measures. Functional components were	Other: Contrast 1 loaded primarily on the R STG for component 1 (the "semantics component") and on the L ITG for

							thresholded at p < .001, cluster- corrected for multiple comparisons,	component 2 (the "syntax
							minimum cluster extent = 1.27 cc. Component 1 was considered a "semantics component" because it correlated with the semantic behavioral measure and not with either of the two syntactic measures. This component did not have any anatomical aspect to it. Component 2 was considered a "syntax component" because it correlated with both syntactic behavioral measures and not with the semantic measure. This conceptualization seems somewhat speculative, given that WPE NP and WPE AP are rather indirect measures of syntactic and semantic processing. Component 2 involved damage to left frontal and insular cortex, and underlying dorsal white matter.	component").
	ight et (2012): x 2	Listening to grammatical but meaningless sentences and detecting a target word vs rest	CC Aphasia Covariate: see statistical details	UNR	UNR	Cplx	Joint ICA was performed on structural and functional contrast images for each of the two contrasts using FIT 2.0b. Seven components were derived, of which 2 were further investigated since their loadings correlated with relevant behavioral measures. Functional components were thresholded at p < .001, cluster- corrected for multiple comparisons, minimum cluster extent = 1.27 cc. Component 1 was considered a "semantics component" because it correlated with the semantic behavioral measure and not with either of the two syntactic measures. This component did not have any anatomical aspect to it. Component 2 was considered a "syntax component" because it correlated with both syntactic behavioral measures and not with the semantic measures and not with the semantic measures. This conceptualization seems somewhat speculative, given that WPE NP and WPE AP are rather indirect measures of syntactic and semantic processing. Component 2 involved damage to left frontal and insular cortex, and underlying dorsal white matter.	Other: Contrast 2 loaded primarily on the R posterior STG for component 1 (the "semantics component") and on the L posterior STG and L IFG for component 2 (the "syntax component").
et a	13):	Semantic decision vs tone decision	CAA Aphasia not recovered (n = 18) vs recovered (n = 9)	<u>AM</u>	UNR	Vox <u>CCS</u>	Behavioral data notes: interaction of group by condition not reported; non- recovered patients were significantly less accurate only on the semantic decision condition, but they actually showed a smaller difference between conditions than the recovered patients; search volume: whole brain; software: AFNI; voxelwise p: .05; cluster extent cutoff: 4.16 cc; <u>cluster- defining threshold (CDT) p &lt; 0.05 too</u> lenient	<ul> <li>↑ L dorsolateral</li> <li>prefrontal cortex</li> <li>↑ L superior</li> <li>parietal</li> <li>↑ L cerebellum</li> <li>↑ R cerebellum</li> <li>↓ R posterior STG</li> </ul>

Szaflarski et al. (2013): ROI 1	Semantic decision vs tone decision	CC Aphasia (recovered and non-recovered) Covariate: BNT	<u>UNR</u>	<u>UNR</u>	ROI Func FWE	Number of ROIs: 4; ROIs: (1) bilateral cerebellum; (2) R pSTG; (3) L superior parietal lobule; (4) L superior frontal gyrus; how ROIs defined: regions that were differentially recruited between recovered and non-recovered patients; average t scores from individual SPMs; <u>circular because</u> <u>defined based on recovered status</u>	↑ L dorsolateral prefrontal cortex
Szaflarski et al. (2013): ROI 2	Semantic decision vs tone decision	CC Aphasia (recovered and non-recovered) Covariate: semantic fluency	UNR	UNR	ROI Func FWE	Number of ROIs: 4; ROIs: (1) bilateral cerebellum; (2) R pSTG; (3) L superior parietal lobule; (4) L superior frontal gyrus; how ROIs defined: regions that were differentially recruited between recovered and non-recovered patients; average t scores from individual SPMs; <u>circular because</u> <u>defined based on recovered status</u>	↑ L dorsolateral prefrontal cortex
Szaflarski et al. (2013): ROI 3	Semantic decision vs tone decision	CC Aphasia (recovered and non-recovered) Covariate: single word comprehension (PPVT)	UNR	UNR	ROI Func FWE	Number of ROIs: 4; ROIs: (1) bilateral cerebellum; (2) R pSTG; (3) L superior parietal lobule; (4) L superior frontal gyrus; how ROIs defined: regions that were differentially recruited between recovered and non-recovered patients; average t scores from individual SPMs; <u>circular because</u> <u>defined based on recovered status</u>	↑ L dorsolateral prefrontal cortex
Szaflarski et al. (2013): ROI 4	Semantic decision vs tone decision	CC Aphasia (recovered and non-recovered) Covariate: BDAE complex ideation subtest	UNR	UNR	ROI Func FWE	Number of ROIs: 4; ROIs: (1) bilateral cerebellum; (2) R pSTG; (3) L superior parietal lobule; (4) L superior frontal gyrus; how ROIs defined: regions that were differentially recruited between recovered and non-recovered patients; average t scores from individual SPMs; <u>circular because</u> <u>defined based on recovered status</u>	↑ L dorsolateral prefrontal cortex
Szaflarski et al. (2013): ROI 5	Semantic decision vs tone decision	CC Aphasia (recovered and non-recovered) Covariate: phonemic fluency	<u>UNR</u>	<u>UNR</u>	ROI Func FWE	Number of ROIs: 4; ROIs: (1) bilateral cerebellum; (2) R pSTG; (3) L superior parietal lobule; (4) L superior frontal gyrus; how ROIs defined: regions that were differentially recruited between recovered and non-recovered patients; average t scores from individual SPMs; <u>circular because</u> <u>defined based on recovered status</u>	↓ R posterior STG
Szaflarski et al. (2013): ROI 6	Semantic decision vs tone decision	CC Aphasia (recovered and non-recovered) Covariate: semantic decision accuracy	С	<u>UNR</u>	ROI Func FWE	Number of ROIs: 4; ROIs: (1) bilateral cerebellum; (2) R pSTG; (3) L superior parietal lobule; (4) L superior frontal gyrus; how ROIs defined: regions that were differentially recruited between recovered and non-recovered patients; average t scores from individual SPMs; <u>circular because</u> <u>defined based on recovered status</u>	None
Thiel et al. (2013): Vox 1	Verb generation vs rest	LAA (Aphasia with rTMS (n = 13) T2 vs T1) vs (aphasia with sham (n = 11) T2 vs T1)	<u>UNR</u>	UNR	Vox <u>NDC</u>	Search volume: whole brain; software: SPM8; qualitative comparison on p. 2244	↑ L IFG ↑ L posterior STG/STS/MTG ↓ R IFG ↓ R posterior STG/STS/MTG notes:

							approximate interpretation of qualitative patterns shown in Figure 3; T1 R lateralization surprising relative to other findings from this group
Thiel et al. (2013): ROI 1	Verb generation vs rest	LAA (Aphasia with rTMS (n = 13) T2 vs T1) vs (aphasia with sham (n = 11) T2 vs T1)	<u>UNR</u>	<u>UNR</u>	ROI LI One	Number of ROIs: 1; ROI: language network LI; <u>actual LIs are not reported,</u> <u>only change in LI</u>	↑ LI (language network) notes: T1 R lateralization surprising relative to other findings from this group
Thiel et al. (2013): ROI 2	Verb generation vs rest	LC Aphasia T2 vs T1 Covariate: Δ AAT total score	UNR	UNR	ROI LI One	Number of ROIs: 1; ROI: language network LI; model did not include treatment group (rTMS vs sham)	<ul> <li>↑ LI (language network)</li> <li>notes: patients</li> <li>who improved</li> <li>more showed a</li> <li>greater leftward</li> <li>shift of activation;</li> <li>T1 R lateralization</li> <li>surprising relative</li> <li>to other findings</li> <li>from this group</li> </ul>
Abel et al. (2014): Vox 1	Picture naming (all conditions) vs rest	CC Aphasia T1 Covariate: subsequent ∆ (T2 vs T1) picture naming Somewhat valid (T1 behavioral measure should be included in model)	С	<u>UNR</u>	Vox <u>CCTB</u>	Search volume: whole brain; software: SPM8; voxelwise p: .01; cluster extent cutoff: 11 voxels (size not stated)	↑ L IFG pars opercularis ↓ R basal ganglia
Abel et al. (2014): Vox 2	Picture naming (all conditions) vs rest	LC Aphasia T2 vs T1 Covariate: ∆ picture naming accuracy	С	<u>UNR</u>	Vox <u>CCTB</u>	Search volume: whole brain; software: SPM8; voxelwise p: .01; cluster extent cutoff: 11 voxels (size not stated)	<ul> <li>↑ L somato-motor</li> <li>↑ L inferior parietal</li> <li>lobule</li> <li>↑ L supramarginal</li> <li>gyrus</li> <li>↑ L posterior STS</li> <li>↑ L posterior MTG</li> <li>↑ L occipital</li> </ul>
Abel et al. (2014): Vox 3	Picture naming (trained items) vs picture naming (untrained items)	LA Aphasia T2 vs T1	N	UNR	Vox <u>CCTB</u>	Behavioral data notes: trained items improved more than untrained items; search volume: whole brain; software: SPM8; voxelwise p: .01; cluster extent cutoff: 11 voxels (size not stated)	<ul> <li>↑ L precuneus</li> <li>↑ L posterior STG</li> <li>↑ L Heschl's gyrus</li> <li>↑ L mid temporal</li> <li>↑ L posterior</li> <li>cingulate</li> <li>↑ L thalamus</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R somato-motor</li> <li>↑ R Heschl's gyrus</li> <li>↑ R posterior</li> <li>cingulate</li> <li>↑ R thalamus</li> <li>↑ R basal ganglia</li> </ul>
Abel et al.	Picture naming	LA	Y	<u>UNR</u>	Vox	Behavioral data notes: no differential	↑ R superior

(2014): Vox 4	(semantic trained items) vs picture naming (phonological trained items)	Aphasia T2 vs T1			CCTB	effects for semantic vs phonological trained items; search volume: whole brain; software: SPM8; voxelwise p: .01; cluster extent cutoff: 11 voxels (size not stated)	parietal ↓ L dorsolateral prefrontal cortex ↓ L somato-motor ↓ L occipital ↓ L anterior cingulate ↓ L posterior cingulate ↓ R precuneus ↓ R occipital ↓ R anterior cingulate ↓ R posterior cingulate ↓ R posterior cingulate ↓ R hippocampus/MTL
Abel et al. (2014): Vox 5	Picture naming (all conditions) vs rest	CAA Aphasia with semantic impairment T1 (n = 8) vs with phonological impairment T1 (n = 6)	<u>UNR</u>	<u>UNR</u>	Vox <u>CCTB</u>	Search volume: whole brain; software: SPM8; voxelwise p: .01; cluster extent cutoff: 11 voxels (size not stated)	↑ R IFG pars triangularis ↑ R dorsolateral prefrontal cortex
Abel et al. (2014): Vox 6	Picture naming (all conditions) vs rest	LAA (Aphasia with semantic impairment (n = 8) T2 vs T1) vs (aphasia with phonological impairment (n = 6) T2 vs T1)	N	<u>UNR</u>	Vox <u>CCTB</u>	Behavioral data notes: phonological patients showed more improvement on trained items; search volume: whole brain; software: SPM8; voxelwise p: .01; cluster extent cutoff: 11 voxels (size not stated)	<ul> <li>↑ L somato-motor</li> <li>↑ L Heschl's gyrus</li> <li>↑ L anterior</li> <li>temporal</li> <li>↑ L occipital</li> <li>↑ L thalamus</li> <li>↑ L basal ganglia</li> <li>↑ R somato-motor</li> <li>↓ L IFG pars</li> <li>opercularis</li> </ul>
Abel et al. (2014): Vox 7	Picture naming (all conditions) vs rest	LA Aphasia with semantic impairment (n = 8) T2 vs T1	N	<u>UNR</u>	Vox <u>CCTB</u>	Search volume: whole brain; software: SPM8; voxelwise p: .01; cluster extent cutoff: 11 voxels (size not stated)	↑ L basal ganglia
Abel et al. (2014): Vox 8	Picture naming (all conditions) vs rest	LA Aphasia with phonological impairment (n = 6) T2 vs T1	N	<u>UNR</u>	Vox <u>CCTB</u>	Search volume: whole brain; software: SPM8; voxelwise p: .01; cluster extent cutoff: 11 voxels (size not stated)	None
Benjamin et al. (2014): ROI 1	Word generation vs rest	LA Aphasia with intention treatment (n = 7) T2 vs T1	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 3; ROIs: (1) lateral frontal Ll; (2) medial frontal Ll; (3) posterior perisylvian Ll	↓ LI (frontal) notes: laterality shift for lateral frontal LI, not medial frontal LI
Benjamin et al. (2014): ROI 2	Word generation vs rest	LA Aphasia with intention treatment (n = 6) T3 vs T1	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 3; ROIs: (1) lateral frontal Ll; (2) medial frontal Ll; (3) posterior perisylvian Ll	↓ LI (frontal) notes: laterality shift for both lateral and medial frontal LIs
Benjamin et al. (2014): ROI 3	Word generation vs rest	LA Aphasia with control treatment (n = 7) T2 vs T1	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 3; ROIs: (1) lateral frontal Ll; (2) medial frontal Ll; (3) posterior perisylvian Ll	None
Benjamin et al. (2014): ROI 4	Word generation vs rest	LA Aphasia with control treatment (n = 7) T3 vs T1	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 3; ROIs: (1) lateral frontal Ll; (2) medial frontal Ll; (3) posterior perisylvian Ll	None
Benjamin	Word generation	LC	UNR	UNR	ROI	Number of ROIs: 3; ROIs: (1) lateral	↓ LI (temporal)

et al. (2014): ROI 5	vs rest	Aphasia with intention treatment (n = 7) T2 vs T1 Covariate: Δ category- member generation probe performance			LI <u>NC</u>	frontal Ll; (2) medial frontal Ll; (3) posterior perisylvian Ll	
Benjamin et al. (2014): ROI 6	Word generation vs rest	LC Aphasia with control treatment (n = 7) T2 vs T1 Covariate: $\Delta$ category- member generation probe performance	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 3; ROIs: (1) lateral frontal LI; (2) medial frontal LI; (3) posterior perisylvian Ll	None
Benjamin et al. (2014): ROI 7	Word generation vs rest	LC Aphasia with intention treatment (n = 7) T2 vs T1 Covariate: Δ picture naming probe performance	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 3; ROIs: (1) lateral frontal LI; (2) medial frontal LI; (3) posterior perisylvian Ll	None
Benjamin et al. (2014): ROI 8	Word generation vs rest	LC Aphasia with control treatment (n = 7) T2 vs T1 Covariate: Δ picture naming probe performance	<u>UNR</u>	<u>UNR</u>	ROI LI NC	Number of ROIs: 3; ROIs: (1) lateral frontal LI; (2) medial frontal LI; (3) posterior perisylvian LI	None
Brownsett et al. (2014): Vox 1	Listening to sentences vs listening to segmented white noise	CAC Aphasia (T2 and T3) vs control (T1 and T2)	N	NANT	Vox <u>C-</u>	Behavioral data notes: significant difference in accuracy of subsequent repetition; search volume: whole brain; software: FSL (FEAT 5.98); voxelwise p: ~.01 (z > 2.3); cluster extent cutoff: based on GRFT	<ul> <li>L insula</li> <li>L anterior</li> <li>cingulate</li> <li>R insula</li> <li>R anterior</li> <li>cingulate</li> <li>L SMA/medial</li> <li>prefrontal</li> <li>L precuneus</li> <li>L posterior</li> <li>cingulate</li> <li>R SMA/medial</li> <li>prefrontal</li> <li>R precuneus</li> <li>R posterior</li> <li>cingulate</li> <li>R posterior</li> <li>cingulate</li> <li>a prefrontal</li> <li>refrontal</li> <li>refrontal</li> <li>refrontal</li> <li>refrontal</li> <li>refrontal</li> <li>a precuneus</li> <li>a precuneus</li> <li>refrontal</li> <l< td=""></l<></ul>
Brownsett et al. (2014): Vox 2	Listening to sentences (patients) or listening to noise vocoded sentences (controls) vs	CAC Aphasia (T2 and T3) vs control (T1 and T2)	Y	NANT	Vox <u>C-</u>	Behavioral data notes: no significant difference in accuracy of subsequent repetition; search volume: whole brain; software: FSL (FEAT 5.98); voxelwise p: ~.01 ( $z > 2.3$ ); cluster extent cutoff: based on GRFT	None

	listening to segmented white noise						
Brownsett et al. (2014): ROI 1	Listening to sentences vs listening to segmented white noise	CC Aphasia mean of T1, T2, T3 Covariate: picture description score (CAT), mean of T1, T2, T3	UNR	NANT	ROI Func One	Behavioral data notes: referring to accuracy of subsequent repetition; correlation with picture description is not reported; number of ROIs: 1; ROI: dorsal anterior cingulate cortex/midline superior frontal gyrus; how ROI defined: contrast of listening to vocoded speech and listening to normal speech in controls; same result obtained with age and lesion volume included in the model	<ul> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ L anterior</li> <li>cingulate</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↑ R anterior</li> <li>cingulate</li> <li>notes: increased</li> <li>activation of</li> <li>dACC/SFG was</li> <li>correlated with</li> <li>higher scores on</li> <li>picture description</li> </ul>
Mattioli et al. (2014): Vox 1	Listening to sentences and making a plausibility judgment vs listening to reversed speech	CAA Aphasia treated T2 (n = 6) vs untreated T2 (n = 6) <u>Somewhat valid</u> (groups were different but not due to treatment)	Y	UNR	Vox <u>CA</u>	Search volume: whole brain; software: BrainVoyager QX 1.9; voxelwise p: .001; cluster extent cutoff: 0.16 cc; methods report cluster extent threshold (we assume this was done), but <u>figure caption states uncorrected</u>	<ul> <li>↑ L IFG pars</li> <li>opercularis</li> <li>↑ L IFG pars</li> <li>triangularis</li> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ L angular gyrus</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R supramarginal</li> <li>gyrus</li> <li>notes: based on</li> <li>coordinates in</li> <li>Table 2</li> </ul>
Mattioli et al. (2014): Vox 2	Listening to sentences and making a plausibility judgment vs listening to reversed speech	CAA Aphasia treated T3 (n = 6) vs untreated T3 (n = 6) <u>Somewhat valid</u> (groups were different but not due to treatment)	Y	UNR	Vox <u>CA</u>	Search volume: whole brain; software: BrainVoyager QX 1.9; voxelwise p: .001; cluster extent cutoff: 0.16 cc; methods report cluster extent threshold (we assume this was done), but <u>figure caption states uncorrected</u>	<ul> <li>↑ L IFG pars</li> <li>triangularis</li> <li>↑ L insula</li> <li>↑ L supramarginal</li> <li>gyrus</li> <li>notes: based on</li> <li>coordinates in</li> <li>Table 2; also</li> <li>increases in R IFG</li> <li>and R</li> <li>supramarginal</li> <li>gyrus but only</li> <li>uncorrected</li> </ul>
Mattioli et al. (2014): Vox 3	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LAA (Aphasia treated (n = 6) T2 vs T1) vs (untreated (n = 6) T2 vs T1) <u>Somewhat valid</u> (no treatment effect)	Y	UNR	Vox <u>NDC</u>	Search volume: whole brain; software: BrainVoyager QX 1.9; qualitative comparison on p. 548	<ul> <li>↑ L IFG</li> <li>↑ R posterior STG</li> <li>↓ L inferior parietal lobule</li> <li>↓ R IFG</li> <li>notes: treated</li> <li>patients showed</li> <li>increases in L IFG</li> <li>and R STG, while</li> <li>untreated patients</li> <li>showed increases</li> <li>in L IPL and R IFG</li> </ul>
Mattioli et al. (2014): Vox 4	Listening to sentences and making a plausibility judgment vs	LAA (Aphasia treated (n = 6) T3 vs T2) vs (untreated (n = 6) T3 vs T2)	Y	<u>UNR</u>	Vox <u>NDC</u>	Search volume: whole brain; software: BrainVoyager QX 1.9; qualitative comparison on p. 548	None notes: the two groups were reported to have comparable

	listening to reversed speech	<u>Somewhat valid</u> (no treatment effect)					increases in L hemisphere language areas
Mattioli et al. (2014): Vox 5	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LA Aphasia treated (n = 6) T2 vs T1	Y	<u>UNR</u>	Vox <u>NC</u>	Search volume: whole brain; software: BrainVoyager QX 1.9; voxelwise p: .005; cluster extent cutoff: none	↑ L IFG pars opercularis ↑ R posterior STG
Mattioli et al. (2014): Vox 6	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LA Aphasia untreated (n = 6) T2 vs T1	Y	<u>UNR</u>	Vox <u>NC</u>	Search volume: whole brain; software: BrainVoyager QX 1.9; voxelwise p: .005; cluster extent cutoff: none	↑ L inferior parietal lobule ↑ R insula
Mattioli et al. (2014): Vox 7	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LA Aphasia treated (n = 6) T3 vs T2	Y	<u>UNR</u>	Vox <u>NC</u>	Search volume: whole brain; software: BrainVoyager QX 1.9; voxelwise p: .005; cluster extent cutoff: none	↑ L IFG ↑ L insula ↑ L inferior parietal lobule ↑ L anterior temporal ↑ R insula
Mattioli et al. (2014): Vox 8	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LA Aphasia untreated (n = 6) T3 vs T2	Y	UNR	Vox <u>NC</u>	Search volume: whole brain; software: BrainVoyager QX 1.9; voxelwise p: .005; cluster extent cutoff: none	<ul> <li>↑ L IFG pars</li> <li>opercularis</li> <li>↑ L IFG pars</li> <li>triangularis</li> <li>↑ L IFG pars</li> <li>orbitalis</li> <li>↑ L angular gyrus</li> <li>↑ L superior</li> <li>parietal</li> <li>↑ L posterior</li> <li>STG/STS/MTG</li> <li>↑ R IFG pars</li> <li>opercularis</li> <li>↑ R angular gyrus</li> </ul>
Mattioli et al. (2014): ROI 1	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LAA (Aphasia treated (n = 6) T1 $\neq$ T2 $\neq$ T3) vs (untreated (n = 6) T1 $\neq$ T2 $\neq$ T3) Somewhat valid (no treatment effect)	Y	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 4; ROIs: (1) L IFG; (2) R IFG; (3) L STG; (4) R STG; how ROIs defined: based on functional data from patients and controls, but details not stated; <u>a different set of ROIs are</u> mentioned in the results so it is not really clear which set were actually <u>used</u>	↑ L IFG notes: interaction of time by treatment: treated group showed greater L IFG activity at T2
Mattioli et al. (2014): ROI 2	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LC Aphasia treated (n = 6) T2 vs T1 Covariate: Δ written language (AAT)	Υ	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 4; ROIs: (1) L IFG; (2) R IFG; (3) L STG; (4) R STG; how ROIs defined: based on functional data from patients and controls, but details not stated; a different set of ROIs are mentioned in the results so it is not really clear which set were actually used	None
Mattioli et al. (2014): ROI 3	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LC Aphasia treated (n = 6) T2 vs T1 Covariate: Δ naming (AAT)	Y	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 4; ROIs: (1) L IFG; (2) R IFG; (3) L STG; (4) R STG; how ROIs defined: based on functional data from patients and controls, but details not stated; <u>a different set of ROIs are</u> mentioned in the results so it is not	↑ L IFG

						<u>really clear which set were actually</u> <u>used</u>	
Mattioli et al. (2014): ROI 4	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LC Aphasia untreated (n = 6) T2 vs T1 Covariate: Δ written language (AAT)	Y	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 4; ROIs: (1) L IFG; (2) R IFG; (3) L STG; (4) R STG; how ROIs defined: based on functional data from patients and controls, but details not stated; <u>a different set of ROIs are</u> <u>mentioned in the results so it is not</u> <u>really clear which set were actually</u> <u>used</u>	None
Mattioli et al. (2014): ROI 5	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LC Aphasia untreated (n = 6) T2 vs T1 Covariate: ∆ naming (AAT)	Y	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 4; ROIs: (1) L IFG; (2) R IFG; (3) L STG; (4) R STG; how ROIs defined: based on functional data from patients and controls, but details not stated; <u>a different set of ROIs are</u> mentioned in the results so it is not really clear which set were actually <u>used</u>	↑ R IFG
Mohr et al. (2014): Vox 1	Listening to sentences (high and low ambiguity) vs listening to signal-correlated noise	LA Aphasia T2 vs T1	<u>NANB</u>	NANT	Vox <u>NDC</u>	Search volume: whole brain; software: SPM8; qualitative generalization across individuals on pp. 8-9	None
Mohr et al. (2014): ROI 1	Listening to high ambiguity sentences vs listening to low ambiguity sentences	LA Aphasia T2 vs T1	NANB	NANT	ROI Func <u>NC</u>	Number of ROIs: 4; ROIs: (1) L IFG; (2) R IFG; (3) L ITG; (4) R ITG; the temporal ROIs are described as STG but they seem to be in the ITG; how ROIs defined: defined based on control data from Rodd et al. (2005) but <u>the</u> coordinates do not match so it is not clear exactly how they were defined; ANOVA of timepoint by hemisphere by site, with a significant interaction of timepoint by hemisphere	↑ R IFG ↑ R posterior inferior temporal gyrus/fusiform gyrus notes: all signal changes were negative (i.e. less activation for ambiguous sentences), making interpretation challenging
Robson et al. (2014): Vox 1	Semantic decision (written word and picture) vs visual decision and rest	CAC Aphasia vs control	Ν	Ν	Vox <u>CA</u>	Behavioral data notes: patients also less accurate on control condition, but control condition includes rest so coded based on language condition only; search volume: whole brain; software: SPM8; voxelwise p: .005; cluster extent cutoff: 4 voxels (size not stated); <u>dual baseline computation not explained</u>	<ul> <li>↑ L IFG pars orbitalis</li> <li>↑ L mid temporal</li> <li>↑ L anterior temporal</li> <li>↑ L cerebellum</li> <li>↑ L</li> <li>↑ hippocampus/MTL</li> <li>↑ R mid temporal</li> <li>↑ R anterior temporal</li> <li>↑ R posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> <li>↑ R cerebellum</li> <li>↑ R</li> <li>hippocampus/MTL</li> <li>↓ R posterior</li> <li>cingulate</li> </ul>
Robson et al. (2014): ROI 1	Semantic decision (written word and	CAC Aphasia vs control	N	N	ROI Func <u>NC</u>	Behavioral data notes: patients also less accurate on control condition, but control condition includes rest so	↑ L anterior temporal ↑ L posterior

picture vs vsual decision and restwith the second second naguage condition grue second second naguage condition pole (3) natrier 375 (2) Liter poly grue second second second naguage condition grue second second second naguage condition grue second second second naguage condition grue second second second second naguage condition grue second second second second second second naguage condition grue second second second second second second second naguage condition grue second sec								
et al. (2014): Vox 1finger tapping (2014): Vox 1Aphasia vs controlNDE vsCC vsCC vsNDE vsCC vsIs build vsIs bu							only; number of ROIs: 10; ROIs: (1) L anterior fusiform gyrus; (2) L temporal pole; (3) L anterior STS; (4) L IFG; (5) L ventral occipito-temporal; (6-10) homotopic counterparts; how ROIs defined: spheres around functional peaks from literature; <u>dual baseline</u>	gyrus/fusiform gyrus ↑ R posterior inferior temporal gyrus/fusiform
et al. (2014): (R011)finger tapping (R011)Aphasia vs controlLl N(2) temporal L1; (3) language network L1 (f (ronta)) notes: temporal L1 (al. 2014): van Hees et al. (2014): vox 1finger tapping (R1) phonological trained items, correct trials) vs source and temporal trained (generalite rested) timagesQC C C VCTVCT VCTUNR VCS Search volume: whole brain; software: cutoff: 0.999 ccnetwork) notes: temporal L1 (Generalite rested) turined items, somewhat valid (T1 behavioral measure should be included in 	et al. (2014):			<u>UNR</u>	<u>UNR</u>		CCHIPS; qualitative comparison on pp. 5-6 (page numbers refer to PMC	lobule ↓ L superior parietal ↓ L posterior STG/STS/MTG ↓ L occipital
al. (2014): Vox 1 Vox 1(phonological trained items, correct trials) vs viewing scrambled imagesAphasia T1 Covariate: T1) picture naming (phonological treated items) Somewhat valid (T1 behavioral measure should be included in model)CCS viewing scrambled (phonological treated items)AFNI; voxelwise p: .005; cluster extent cutoff: 0.999 ccImagesvan Hees et al. (2014): Vox 2Picture naming (semantic trained 	et al. (2014):	-		<u>UNR</u>	<u>UNR</u>	LI	(2) temporal LI; (3) language network	network) ↓ LI (frontal) notes: temporal LI was also marginally significantly
al. (2014): Vox 2 trials) vs viewing scrambled imagesAphasia T1 Covariate: subsequent A (T2 vs subsequent A (T2 vs 	al. (2014):	(phonological trained items, correct trials) vs viewing scrambled	Aphasia T1 Covariate: subsequent Δ (T2 vs T1) picture naming (phonological treated items) <u>Somewhat valid</u> (T1 behavioral measure should be included in	YCT	UNR		AFNI; voxelwise p: .005; cluster extent	None
al. (2014): Vox 3(phonological trained items, correct trials) vs viewing scrambled imagesAphasia T2 Covariate: previous Δ (T2 vs T1) picture naming (phonological treated items) Not valid (T2 activation not an appropriate measure of treatment-induced recovery because it reflects T2 performance)CCS CCS AFNI; voxelwise p: .005; cluster extent cutoff: 0.999 ccgyrus ↑ R precuneusVox 3(T2 vs T1) picture naming (phonological treated items) Not valid (T2 activation not an appropriate measure of treatment-induced recovery because it reflects T2 performance)CCS AFNI; voxelwise p: .005; cluster extent cutoff: 0.999 cc↑ R precuneus	al. (2014):	(semantic trained items, correct trials) vs viewing	Aphasia T1 Covariate: subsequent Δ (T2 vs T1) picture naming (semantic treated items) <u>Somewhat valid</u> (T1 behavioral measure should be included in	YCT	UNR		AFNI; voxelwise p: .005; cluster extent	↑ L basal ganglia
	al. (2014):	(phonological trained items, correct trials) vs viewing scrambled	Aphasia T2 Covariate: previous Δ (T2 vs T1) picture naming (phonological treated items) <u>Not valid</u> (T2 activation not an appropriate measure of treatment-induced recovery because it reflects T2	YCT	UNR		AFNI; voxelwise p: .005; cluster extent	gyrus
	van Hees et	Picture naming		YCT	UNR	Vox	Search volume: whole brain; software:	None

al. (2014): Vox 4	(semantic trained items, correct trials) vs viewing scrambled images	Aphasia T2 Covariate: previous ∆ (T2 vs T1) picture naming (semantic treated items) <u>Not valid</u> (T2 activation not an appropriate measure of treatment-induced recovery because it reflects T2 performance)			<u>CCS</u>	AFNI; voxelwise p: .005; cluster extent cutoff: 0.999 cc	
van Hees et al. (2014): Vox 5	Picture naming (phonological trained items, correct trials) vs viewing scrambled images	CC Aphasia T1 Covariate: subsequent outcome (T2) picture naming Not valid (not appropriate to correlate T1 imaging with T2 behavior without T1 behavior in model)	YCT	UNR	Vox CCS	Search volume: whole brain; software: AFNI; voxelwise p: .005; cluster extent cutoff: 0.999 cc	None
van Hees et al. (2014): Vox 6	Picture naming (semantic trained items, correct trials) vs viewing scrambled images	CC Aphasia T1 Covariate: subsequent outcome (T2) picture naming <u>Not valid</u> (not appropriate to correlate T1 imaging with T2 behavior without T1 behavior in model)	YCT	UNR	Vox CCS	Search volume: whole brain; software: AFNI; voxelwise p: .005; cluster extent cutoff: 0.999 cc	None
van Hees et al. (2014): Vox 7	Picture naming (phonological trained items, correct trials) vs viewing scrambled images	CC Aphasia T2 Covariate: picture naming T2	YCT	<u>UNR</u>	Vox <u>CCS</u>	Search volume: whole brain; software: AFNI; voxelwise p: .005; cluster extent cutoff: 0.999 cc	None
van Hees et al. (2014): Vox 8	Picture naming (semantic trained items, correct trials) vs viewing scrambled images	CC Aphasia T2 Covariate: picture naming T2	ҮСТ	<u>UNR</u>	Vox <u>CCS</u>	Search volume: whole brain; software: AFNI; voxelwise p: .005; cluster extent cutoff: 0.999 cc	None
Abel et al. (2015): Vox 1	Picture naming vs rest	LA Aphasia T2 vs T1	N	N	Vox CCTB	Behavioral data notes: RT shorter at T2; search volume: whole brain; software: SPM8; voxelwise p: .01; cluster extent cutoff: 11 voxels (size not stated)	<ul> <li>↓ L IFG pars</li> <li>triangularis</li> <li>↓ L dorsolateral</li> <li>prefrontal cortex</li> <li>↓ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↓ L dorsal</li> <li>precentral</li> <li>↓ L SMA/medial</li> <li>prefrontal</li> <li>↓ L somato-motor</li> <li>↓ L inferior parietal</li> <li>lobule</li> <li>↓ L precuneus</li> <li>↓ L posterior</li> <li>cingulate</li> </ul>

							↓ L cerebellum ↓ R SMA/medial prefrontal ↓ R somato-motor ↓ R precuneus ↓ R posterior STS ↓ R posterior MTG ↓ R posterior cingulate ↓ R cerebellum ↓ R thalamus ↓ R hippocampus/MTL
Abel et al. (2015): Vox 2	Picture naming vs rest	CAC Aphasia T1 vs control T1	<u>AM</u>	N	Vox <u>CCTB</u>	Behavioral data notes: controls responded more quickly; search volume: whole brain; software: SPM8; voxelwise p: .01; cluster extent cutoff: 11 voxels (size not stated)	<ul> <li>↑ R precuneus</li> <li>↓ L somato-motor</li> <li>↓ L Heschl's gyrus</li> <li>↓ L anterior</li> <li>cingulate</li> <li>↓ L posterior</li> <li>cingulate</li> <li>↓ L thalamus</li> <li>↓ L basal ganglia</li> <li>↓ R insula</li> <li>↓ R somato-motor</li> <li>↓ R mid temporal</li> </ul>
Abel et al. (2015): Vox 3	Picture naming vs rest	LAC (Aphasia T2 vs T1) vs (control T2 vs T1)	<u>AM</u>	UNR	Vox <u>CCTB</u>	Behavioral data notes: RT not reported for controls; search volume: whole brain; software: SPM8; voxelwise p: .01; cluster extent cutoff: 11 voxels (size not stated)	<ul> <li>↓ L precuneus</li> <li>↓ L anterior</li> <li>cingulate</li> <li>↓ L posterior</li> <li>cingulate</li> <li>↓ L basal ganglia</li> <li>↓ R precuneus</li> <li>↓ R posterior STS</li> <li>↓ R posterior</li> <li>cingulate</li> <li>↓ R thalamus</li> <li>↓ R</li> <li>hippocampus/MTL</li> </ul>
Abel et al. (2015): Vox 4	Picture naming vs rest	CAC Aphasia T1 vs control T1	<u>AM</u>	UNR	Vox <u>NDC</u>	Behavioral data notes: RT not reported for controls; search volume: whole brain; software: SPM8; qualitative comparison between activation in the first 5 TRs after each stimulus on p. 1101	None notes: the time course of response is stated to be similar in patients and controls, however the response in patients appears like it could be a couple of seconds slower
Abel et al. (2015): Cplx 1	Picture naming vs rest	CAC Aphasia vs control	N	<u>UNR</u>	Cplx	Behavioral data notes: RT not reported for controls; Joint ICA was performed on structural and functional contrast images using FIT 1.2c. Three of the 7 components differed between groups in their loadings. Components were thresholded at $z > 3.09$ , not corrected for multiple comparisons.	Other: Three structural- functional components are described in Figure 5 and Table 4. Functional activations are generally small and do not obviously relate to

							language processing. It is mentioned in the supplementary results that "the lesion maps may dominate estimation of the mixing parameter" (p. 10).
Kiran et al. (2015): Vox 1	Picture naming (trained) vs viewing scrambled images and saying "skip"	LA Aphasia T2 vs T1	UNR	UNR	Vox NDC	Search volume: whole brain; software: SPM8; analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients	<ul> <li>L IFG</li> <li>L dorsolateral prefrontal cortex</li> <li>L ventral precentral/inferior frontal junction</li> <li>L dorsal precentral</li> <li>L SMA/medial prefrontal</li> <li>L supramarginal gyrus</li> <li>L angular gyrus</li> <li>L angular gyrus</li> <li>L posterior MTG</li> <li>R IFG</li> <li>R dorsolateral prefrontal cortex</li> <li>R SMA/medial prefrontal</li> <li>R supramarginal gyrus</li> <li>R posterior STG</li> <li>R posterior MTG</li> <li>R posterior inferior temporal gyrus/fusiform gyrus</li> <li>notes: regions are approximate since only broad regions are described in Table 6</li> </ul>
Kiran et al. (2015): Vox 2	Semantic feature decision vs visual decision	LA Aphasia T2 vs T1	UNR	UNR	Vox NDC	Search volume: whole brain; software: SPM8; analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients	<ul> <li>↑ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ L dorsal</li> <li>precentral</li> <li>↑ L posterior MTG</li> <li>↑ R IFG</li> <li>↑ R dorsolateral</li> <li>prefrontal cortex</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↑ R angular gyrus</li> <li>↑ R posterior STG</li> <li>↑ R posterior MTG</li> <li>notes: regions are</li> <li>approximate since</li> <li>only broad regions</li> <li>are described in</li> <li>Table 7</li> </ul>
Sandberg	Concreteness	LA	Y	Y	Vox	Search volume: whole brain; software:	↑ L IFG pars

et al. (2015): Vox 1	judgment (abstract words, correct trials) vs rest	Aphasia with response to treatment (n = 9) T2 vs T1			<u>NC</u>	SPM8; voxelwise p: .001; cluster extent cutoff: none; <u>images show peaks</u> <u>instead of activations</u>	opercularis ↑ L dorsolateral prefrontal cortex ↑ L SMA/medial prefrontal ↑ L inferior parietal lobule ↑ L supramarginal gyrus ↑ L angular gyrus ↑ L angular gyrus ↑ L posterior inferior temporal gyrus/fusiform gyrus ↑ L posterior cingulate ↑ L basal ganglia ↑ R orbitofrontal ↑ R supramarginal gyrus ↑ R angular gyrus ↑ R angular gyrus ↑ R angular gyrus ↑ R anterior temporal ↑ R occipital
Sandberg et al. (2015): Vox 2	Concreteness judgment (concrete words, correct trials) vs rest	LA Aphasia with generalization of treatment effects to concrete words (n = 7) T2 vs T1	Y	Y	Vox <u>NC</u>	Search volume: whole brain; software: SPM8; voxelwise p: .001; cluster extent cutoff: none; <u>images show peaks</u> <u>instead of activations</u>	<ul> <li>↑ L insula</li> <li>↑ L inferior parietal</li> <li>lobule</li> <li>↑ L supramarginal</li> <li>gyrus</li> <li>↑ L precuneus</li> <li>↑ L occipital</li> <li>↑ R dorsolateral</li> <li>prefrontal cortex</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R posterior STG</li> <li>↑ R posterior</li> <li>cingulate</li> </ul>
Geranmayeh et al. (2016): ROI 1	Propositional speech production vs rest	CAC Aphasia vs control	N	<u>UNR</u>	ROI Func <u>NC</u>	Behavioral data notes: difference in AICW/trial; number of ROIs: 4; ROIs: (1) L fronto-temporo-parietal network; (2) R fronto-temporo-parietal network; (3) cingulo-opercular network; (4) default mode network; how ROIs defined: identified using ICA in controls; <u>circular because ROIs defined in one</u> <u>group</u>	↑ L insula ↑ L anterior cingulate ↑ R insula ↑ R anterior cingulate
Geranmayeh et al. (2016): ROI 2	Propositional speech production vs counting	CAC Aphasia vs control	N	UNR	ROI Func <u>NC</u>	Behavioral data notes: difference in AICW/trial; number of ROIs: 4; ROIs: (1) L fronto-temporo-parietal network; (2) R fronto-temporo-parietal network; (3) cingulo-opercular network; (4) default mode network; how ROIs defined: identified using ICA in controls; circular because ROIs defined in one group	<ul> <li>↑ L insula</li> <li>↑ L anterior</li> <li>cingulate</li> <li>↑ R insula</li> <li>↑ R anterior</li> <li>cingulate</li> <li>↓ L IFG</li> <li>↓ L inferior parietal</li> <li>lobule</li> <li>↓ L posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> </ul>

Geranmayeh et al. (2016): ROI 3	Propositional speech production vs target decision	CAC Aphasia vs control	N	<u>UNR</u>	ROI Func <u>NC</u>	Behavioral data notes: difference in AICW/trial; number of ROIs: 4; ROIs: (1) L fronto-temporo-parietal network; (2) R fronto-temporo-parietal network; (3) cingulo-opercular network; (4) default mode network; how ROIs defined: identified using ICA in controls; circular because ROIs defined in one group	None
Geranmayeh et al. (2016): Cplx 1	Propositional speech production vs rest	CAC Aphasia vs control	Ν	UNR	Cplx	Behavioral data notes: difference in AICW/trial; Activity was compared between pairs of ICA-derived networks. However, <u>circularity was</u> <u>introduced because the networks</u> <u>were defined based on the control</u> <u>group</u> .	Other: Patients showed greater differential activation than controls between (1) L fronto- temporo-parietal network and the DMN; (2) R fronto- temporo-parietal network and the DMN; (3) cingulo- opercular network and the DMN.
Geranmayeh et al. (2016): Cplx 2	Propositional speech production vs rest	CC Aphasia Covariate: appropriate information-carrying words	С	UNR	Cplx	Multiple regression was used to determine whether differential activation between networks was predictive of the behavioral measure: appropriate information-carrying words. There is no issue of circularity with this analysis since it involved only individuals with aphasia.	Other: Differential activation between L fronto-temporo- parietal network and the DMN was positively correlated with AICW. Differential activation between R fronto-temporo- parietal network and the DMN was negatively correlated with AICW.
Geranmayeh et al. (2016): Cplx 3	Propositional speech production vs rest	CAC Aphasia vs control	Ν	UNR	Cplx	Behavioral data notes: difference in AICW/trial; PPI analyses were used to investigate how the speech condition modulated functional connectivity between (1) L fronto-temporo-parietal network and the DMN; (2) R fronto- temporo-parietal network and the DMN. However, <u>circularity was</u> <u>introduced because the networks</u> were defined based on the control <u>group</u> .	Other: In controls, the L FTP network reduced connectivity with the DMN during speech, while the R FTP network increased connectivity with the DMN during speech. Both of these interactions were significantly decreased in patients. This was also true for contrasts 2 and 3.
Griffis et al. (2016): Vox 1	Verb generation vs finger tapping	LA Aphasia T2 vs T1 <u>Somewhat valid</u> (patients improved	<u>UNR</u>	<u>UNR</u>	Vox <u>NC</u>	Search volume: whole brain; software: SPM12; voxelwise p: .001; cluster extent cutoff: none	<ul> <li>↑ L IFG pars</li> <li>opercularis</li> <li>↑ R cerebellum</li> <li>↑ R thalamus</li> <li>↓ R anterior</li> </ul>

		only on semantic fluency)					temporal ↓ R cerebellum notes: based on description in text; it is noted that no regions survived FDR correction
Griffis et al. (2016): ROI 1	Verb generation vs finger tapping	LA Aphasia T2 vs T1 <u>Somewhat valid</u> (patients improved only on semantic fluency)	<u>UNR</u>	<u>UNR</u>	ROI Mix <u>FDR</u>	Number of ROIs: 3; ROIs: (1) L IFG; (2) R IFG; (3) frontal LI; how ROIs defined: first principal component of 8 mm spheres defined based on previously reported control peaks; lesion volume included in model	↑ L IFG ↓ R IFG ↑ LI (frontal)
Griffis et al. (2016): ROI 2	Verb generation vs finger tapping	LC Aphasia T2 vs T1 Covariate: Δ semantic fluency <u>Somewhat valid</u> (patients improved only on semantic fluency)	<u>UNR</u>	<u>UNR</u>	ROI Mix FDR	Number of ROIs: 3; ROIs: (1) L IFG; (2) R IFG; (3) frontal LI; how ROIs defined: first principal component of 8 mm spheres defined based on previously reported control peaks; lesion volume included in model	↓ R IFG notes: decreased R IFG activation was correlated with improved semantic fluency
Griffis et al. (2016): Cplx 1	Verb generation vs finger tapping	LA Aphasia T2 vs T1 <u>Somewhat valid</u> (patients improved only on semantic fluency)	UNR	UNR	Cplx	PPI analyses were used to investigate change over time in modulation by verb generation of functional connectivity between L IFG and R IFG.	Other: There was a significant decrease in modulation by verb generation of functional connectivity between L IFG and R IFG (p = 0.03). Prior to TMS, connectivity increased during verb generation compared to finger tapping, while after TMS, connectivity decreased during verb generation compared to finger tapping.
Griffis et al. (2016): Cplx 2	Verb generation vs finger tapping	LC Aphasia T2 vs T1 Covariate: $\Delta$ semantic fluency in association with modulation of interhemispheric IFG connectivity by verb generation <u>Somewhat valid</u> (patients improved only on semantic fluency)	UNR	UNR	Cplx	PPI analyses were used to investigate whether change over time in modulation by verb generation of functional connectivity between L IFG and R IFG was associated with changes in semantic fluency scores, which are limited as a measure of language improvement.	None
Griffis et al. (2016): Cplx 3	Verb generation vs finger tapping	LA Aphasia T2 vs T1 <u>Somewhat valid</u> (patients improved only on semantic fluency)	<u>UNR</u>	<u>UNR</u>	Cplx	PPI analyses were used to investigate change over time in modulation by verb generation of functional connectivity between R IFG and all other brain regions. <u>Voxelwise p &lt;</u> .001, not corrected for multiple comparisons.	Other: Reduced connectivity was observed in the L IFG pars opercularis, L anterior temporal

Sime et al. (2016): Rel 1 entered exists decision (6 patients, 4 controls) or sumatic entered exists decision (7 patients, 4 controls) or sumatic entered exists decision (7 patients, 4 controls) or sumatic entered exists decision (7 patients, 4 controls) or sumatic entered exists decision of patients, 4 controls or sumatic entered exists decision of patients, 4 controls or sumatic entered exists decision of patients, 4 controls or sumatic entered exists decision or patients, 4 controls or sumatic entered exists decision or patients decision or patients, 4 controls or sumatic entered								
[2016]: ROI1 ROI1 ROI1 ROI1decision (6 expanders, 4 controls) or semantic feature decision accuracyAnat controls, 1, LFG pars triangularis opercularis (3) LFG pars triangularis (3) LFG pars triangularis (3) LFG pars triangularis (3) LFG pars triangularis (4) LFG; (5) LMFG; (6) LMFG; (7) L AGSMG; (8) LFG pars triangularis triangularis triangularis (4) LFG; (5) LMFG; (6) LMFG; (7) L AGSMG; (8) LFG pars triangularis triangularisSims et al. (2016): semantic relatedness decision (7 patients, 4 controls) vs visual decision (8 patients, 4 controls) vs visual decision (7 patients, 4 controls) vs visual decision (8 patients, 4 controls) vs visual decision (8 patients, 4 controls) vs visual decision (8 patients, 4 controls) vs visual decision (8 patients, 4 controls) vs visual decision or pseudoword identity decisionCC C Aphasia Covariate: WAB AQUNR VNR N								lobe, L basal ganglia, R SMA and pre-SMA, R somato-motor cortex, R posterior MTG, and R cerebellum. It is noted that no regions survived
(2016): RO12 RO12 RO12 Semantic effecture (2016): addition (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision (6 patients, 4 controls) vs visual decision (6 patients, 4 controls) vs visual decision (7 patients, 4 controls) vs visual decision (7 patients, 4 	(2016):	decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or pseudoword	Aphasia Covariate: semantic feature decision	С	<u>UNR</u>	Anat	pars orbitalis; (2) L IFG pars opercularis; (3) L IFG pars triangularis; (4) L SFG; (5) L MFG; (6) L MTG; (7) L AG/SMG; (8) L ACC; (9-16) homotopic	opercularis ↑ L IFG pars
(2016): ROI 3 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision respendivorusAphasiaAnat NC vspars orbitalis; (2) L IFG pars opercularis; (3) L IFG pars triangularis; (4) L SFG; (5) L MTG; (7) L AGS/MG; (8) L ACC; (9-16) homotopic counterparts; how ROIs defined: AALSims et al. (2016): ROI 4Semantic feature decision (8 patients, 4 controls) vs visual decision or pseudowordCC AphasiaUNR VMR VMR VMR VMR VMR VMR VMR VMR NCNumber of ROIs: 16; ROIs: (1) L IFG pars orbitalis; (2) L IFG pars opercularis; (3) L IFG pars triangularis; (4) L SFG; (5) L MTG; (7) L AGS/MG; (8) L ACC; (9-16) homotopic counterparts; how ROIs defined: AALNoneSims et al. (2016): matrix relatedness decision (6 matrix; 4 controls) or semantic relatedness decision (8 	(2016):	decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or pseudoword	Aphasia	UNR	<u>UNR</u>	Anat	pars orbitalis; (2) L IFG pars opercularis; (3) L IFG pars triangularis; (4) L SFG; (5) L MFG; (6) L MTG; (7) L AG/SMG; (8) L ACC; (9-16) homotopic	None
<ul> <li>(2016): decision (6 Aphasia</li> <li>ROI 4 patients, 4 Covariate: PPT</li> <li>controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or pseudoword identity decision</li> <li>Sims et al. (2016):</li> <li>Semantic feature decision (6 CC Aphasia</li> <li>C CC Aphasia</li> <lic aphasia<="" cc="" li=""> <li>C CC Aphasia&lt;</li></lic></ul>	(2016):	Semantic feature decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or pseudoword	Aphasia	UNR	<u>UNR</u>	Anat	pars orbitalis; (2) L IFG pars opercularis; (3) L IFG pars triangularis; (4) L SFG; (5) L MFG; (6) L MTG; (7) L AG/SMG; (8) L ACC; (9-16) homotopic	None
Sims et al.Semantic featureCCYUNRROIBehavioral data notes: no correlation↑ R supramarginal(2016):decision (6AphasiaAnatbetween lesion volume and accuracy, gyrusgyrus	(2016):	Semantic feature decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or pseudoword	Aphasia	<u>UNR</u>	<u>UNR</u>	Anat	pars orbitalis; (2) L IFG pars opercularis; (3) L IFG pars triangularis; (4) L SFG; (5) L MFG; (6) L MTG; (7) L AG/SMG; (8) L ACC; (9-16) homotopic	None
	(2016):	Semantic feature decision (6		Y	<u>UNR</u>	Anat	between lesion volume and accuracy,	gyrus

Darkow et al. (2017): ROI 1	Picture naming vs rest	repeated measures <u>Somewhat valid</u> (no behavioral difference) CAC Aphasia after sham stimulation (n = 16) vs control	AS	<u>UNR</u>	ROI Func <u>NC</u>	Behavioral data notes: patients named > 90% correctly in all sessions; control RT not reported; number of ROIs: 3; ROIs: (1) bilateral anterior cingulate;	↑ L insula ↑ L anterior cingulate
Darkow et al. (2017): Vox 1	Picture naming vs rest	CAA Aphasia after tDCS (n = 16) vs aphasia after sham stimulation (n = 16); same patients, order counterbalanced,	Υ	Υ	Vox C+	Search volume: whole brain; software: SPM8; voxelwise p: .001; cluster extent cutoff: based on GRFT; repeated measures	↓ L insula ↓ L anterior cingulate ↓ R occipital ↓ R anterior cingulate
Sims et al. (2016): Cplx 2	Semantic feature decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or pseudoword identity decision	CAC Aphasia vs control	UNR	UNR	Cplx	Correlations were computed between functional activation in 16 regions, and <u>qualitatively compared</u> between patients and controls (p. 123). <u>There</u> <u>was no correction for multiple</u> <u>comparisons.</u>	Other: In controls, all regions were generally correlated with one another. This was largely true in patients too, with the exception of the R IFG pars orbitalis, which was negatively correlated with the L IFG.
Sims et al. (2016): Cplx 1	pseudoword identity decision Semantic feature decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or pseudoword identity decision	CC Aphasia Covariate: lesion status of 8 ROIs	UNR	UNR	Cplx	Multivariate mixed-effects linear regression analyses were used to identify relationships between structural damage to 8 regions, and functional activation in 16 regions. Results were corrected for multiple comparisons based on FDR. <u>This</u> <u>analysis was not described in</u> <u>sufficient detail.</u>	Other: Sparing of the L ACC and L SFG was associated with more functional activation in many regions, however this is difficult to interpret since these regions were largely or completely spared in many patients. Damage to the L IFG pars orbitalis, L MTG and L AG/SMG was associated with activation of the L ACC, L SFG (and other regions) potentially indicative of compensatory processing.
	controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or	Covariate: lesion volume				accuracy was also tested; number of ROIs: 8; ROIs: as above but only in the R hemisphere; how ROIs defined: AAL	↑ R posterior MTG notes: MTG included anterior too; SMG/AG was single ROI

C2: Linzulz (3) Ringuial grupt, how RDS is defined: regions that were less active in patients with DCS vis sharing: cardue Decause RDS defined in one resource active in patients with DCS vis sharing in the CDS (CONTERCE) in all sessions control solutions in the CDS in all COUTE in the CDS in all COUTE in all sessions control solutions in the CDS in all COUTE in the CDS in all control in all sessions control in all sessions control in all sessions control in the CDS vis sharing vis								
al. (2017):       rest       Aphasia after IDCS (n       Image: Second Construction and Second Construction Construt							ROIs defined: regions that were less active in patients with tDCS vs sham; circular because ROIs defined in one	
al. (2017): Cplx 1restAphasia after tDCS (n =16) is ame patients, order is ame patient, order repeated measures 	al. (2017):		Aphasia after tDCS (n	<u>AS</u>	<u>UNR</u>	Func	<ul> <li>&gt; 90% correctly in all sessions; control RT not reported; number of ROIs: 3; ROIs: (1) bilateral anterior cingulate;</li> <li>(2) L insula; (3) R lingual gyrus; how ROIs defined: regions that were less active in patients with tDCS vs sham; circular because ROIs defined in one</li> </ul>	None
al. (2017): Cplx 2rest FAphasia after sham stimulation (n = 16) vs controlAphasia after sham stimulation (n = 16) vs controlFrelevant components: language, motor and visual. Thresholding of the functional maps is not described, but they appear to reflect coherent components were component is left-lateralized, unlike the model-based picture naming contrast.Mean activity of these components were and controls. 	al. (2017):		Aphasia after tDCS (n = 16) vs aphasia after sham stimulation (n = 16); same patients, order counterbalanced, repeated measures <u>Somewhat valid</u> (no	Υ	Y	Cplx	ICA was used to derive three task- relevant components: language, motor and visual. <u>Thresholding of the</u> <u>functional maps is not described</u> , but they appear to reflect coherent components of a picture naming network. These components were compared between stimulation conditions in terms of mean activity and power in three frequency bins. It should be noted that the language component is left-lateralized, unlike the model-based picture naming	Activity in the language component was greater in the tDCS condition. In the frequency domain, the tDCS condition showed reduced power in the highest frequency bin, and increased power in the lowest frequency
al. (2017):restAphasia after tDCS (n = 16) vs controlrelevant components: language, motor and visual. Thresholding of the functional maps is not described, but they appear to reflect coherent components of a picture naming network. These components were compared between stimulation conditions in terms of mean activity and power in three frequency bins. It should be noted that the language component is left-lateralized, unlike the model-based picture naming contrast.Geranmayeh et al.Propositional speech production (2017):CC vs restAM Phasia mean of T1, T2 Covariate:Vox CA 	al. (2017):		Aphasia after sham stimulation (n = 16) vs	UNR	UNR	Cplx	relevant components: language, motor and visual. <u>Thresholding of the</u> <u>functional maps is not described</u> , but they appear to reflect coherent components of a picture naming network. These components were compared between stimulation conditions in terms of mean activity and power in three frequency bins. It should be noted that the language component is left-lateralized, unlike the model-based picture naming	Other: Mean activity of these components did not differ between patients and controls. However, patients showed increased power in the middle frequency bin of the visual
et al.speech productionAphasia mean of T1,CAcorrelated with change in AICW, butprefrontal(2017):vs restT2not stated whether T2 AICW↑ L anteriorVox 1Covariate:correlated with change in AICW;cingulate	al. (2017):		Aphasia after tDCS (n	UNR	UNR	Cplx	relevant components: language, motor and visual. <u>Thresholding of the</u> <u>functional maps is not described</u> , but they appear to reflect coherent components of a picture naming network. These components were compared between stimulation conditions in terms of mean activity and power in three frequency bins. It should be noted that the language component is left-lateralized, unlike the model-based picture naming	None
	et al. (2017):	speech production	Aphasia mean of T1, T2 Covariate:	<u>AM</u>	<u>UNR</u>		correlated with change in AICW, but not stated whether T2 AICW correlated with change in AICW;	prefrontal ↑ L anterior cingulate

		T1) number of appropriate information-carrying words <u>Somewhat valid</u> (potentially confounded by T1 and T2 language function; language function at T1 was predictive of change in language function)				patients; software: FSL; voxelwise p: .05; cluster extent cutoff: 1.6 cc	prefrontal ↑ R somato-motor ↑ R posterior STS ↑ R anterior cingulate notes: findings based on figures and coordinates; the pre-SMA/dACC peak noted to survive FWE correction at p < .001
Geranmayeh et al. (2017): ROI 1	Propositional speech production vs rest	LA Aphasia T2 vs T1	<u>N</u>	<u>UNR</u>	ROI Func One	Behavioral data notes: number of AICW increased; number of ROIs: 1; ROI: L pre-SMA; how ROI defined: peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia; no main effect of session in session by language recovery ANOVA	None
Geranmayeh et al. (2017): ROI 2	Propositional speech production vs rest	LC Aphasia T2 vs T1 Covariate: Δ number of appropriate information-carrying words	<u>UNR</u>	<u>UNR</u>	ROI Func One	Number of ROIs: 1; ROI: L pre-SMA; how ROI defined: peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia; no interaction of session by language recovery in ANOVA	None
Geranmayeh et al. (2017): ROI 3	Propositional speech production vs rest	CC Aphasia mean of T1, T2 Covariate: simultaneous Δ (T2 vs T1) number of appropriate information-carrying words <u>Somewhat valid</u> (potentially confounded by T1 and T2 language function; language function at T1 was predictive of change in language function)	<u>AM</u>	UNR	ROI Func One	Behavioral data notes: T1 AlCW correlated with change in AlCW, but not stated whether T2 AlCW correlated with change in AlCW; number of ROIs: 1; ROI: L pre-SMA; how ROI defined: peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia	↑ L SMA/medial prefrontal notes: patients with more pre- SMA activity improved more
Geranmayeh et al. (2017): ROI 4	Propositional speech production vs rest	CC Aphasia mean of T1, T2 Covariate: simultaneous $\Delta$ (T2 vs T1) number of appropriate information-carrying words <u>Somewhat valid</u> (potentially confounded by T1 and T2 language function; language function at T1 was predictive of change in language function)	AM	UNR	ROI Func One	Behavioral data notes: T1 AICW correlated with change in AICW, but not stated whether T2 AICW correlated with change in AICW; number of ROIs: 1; ROI: L pre-SMA; how ROI defined: peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia; lesion size covariate	↑ L SMA/medial prefrontal notes: patients with more pre- SMA activity improved more

Geranmayeh et al. (2017): S. vir estCC ophasia mean dTI, T2 Covariate simulaneous AT2 vs T1) number of appropriate information-carrying wordsAM vir estUN vir estBehavioral data notes: T1 AICW not stated whith here IN AICW, but not stated whith here IN AICW ounds of appropriate information-carrying wordsT1 LSMA/medial mean et T1, vir estGeranmayeh et al. (2017): NoPropositional speech production vir estCC caraine speech production (2017): No vir estAM vir								
Geranmayeh (2017): RO16       Propositional speech production vs rest       CC Aphasia nof T1, 2 Covariate: subsequent outcome (T2 number of appropriate (T2 number of appropriate of the information-carrying words       AM       UNR VS       RO1 Event Subsequent notices covariate: subsequent outcome appropriate (T2 number of appropriate rorelated with change in ACW) number of ROIS: 1; RO1: LPS: Subsequent notices propositional speech and counting in people with aphasia; lesion size, T1 performance, and age covariates       1, LSM/medial preformal         Geranmayeh et al. (2017):       Propositional speech production speech production covariate)       CC Aphasia T1 Covariate: subsequent 2(T2 vs T1) number of appropriate information-carrying words       N       UNR Enc. Covariate: subsequent 2(T2 vs T1) number of appropriate information-carrying words       ROI Enc. Covariate: subsequent 2(T2 vs T1) number of appropriate information-carrying words       N       UNR Enc. Covariate: Somewhat wall covariate)       ROI Enc. Covariate: Somewhat wall covariate)       ROI Enc. Covariate: subsequent 2(T2 vs T1) number of appropriate information-carrying words       N       UNR Enc. Covariate: speech and counting in propositional speec	et al. (2017):	speech production	Aphasia mean of T1, T2 Covariate: simultaneous Δ (T2 vs T1) number of appropriate information-carrying	<u>AM</u>	<u>UNR</u>	Func	correlated with change in AICW, but not stated whether T2 AICW correlated with change in AICW; number of ROIs: 1; ROI: L pre-SMA; how ROI defined: peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia; lesion size, T1	prefrontal notes: patients with more pre- SMA activity
et al. (2017): ROI 7speech production vs restAphasia T1 Covariate: subsequent A (T2 vs T1) number of appropriate information-carrying wordsFunc Correlated with change in AICW; number of ROIs: 1; ROI: L pre-SMA; how ROI defined: peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasiaprefrontalGeranmayeh et al. (2017): ROI 8Propositional speech production tanguage function; language function; l	et al. (2017):	speech production	Aphasia mean of T1, T2 Covariate: subsequent outcome (T2) number of appropriate information-carrying words <u>Not valid</u> (mathematically equivalent to the previous analysis, because of the inclusion of T1 performance as a	<u>AM</u>	UNR	Func	correlated with change in AICW, but not stated whether T2 AICW correlated with change in AICW; number of ROIs: 1; ROI: L pre-SMA; how ROI defined: peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia; lesion size, T1	
et al. (2017): ROI 8speech production vs restAphasia T2 Covariate: previous Δ (T2 vs T1) number of appropriate information-carrying wordsFunc Correlated with change in AICW, but not stated whether T2 AICW correlated with change in AICW; number of ROIs: 1; ROI: L pre-SMA; how ROI defined: peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia activation changes and language outcome is unclear)Func Correlated with change in AICW; number of ROIs: 1; ROI: L pre-SMA; how ROI defined: peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia activation changes and language outcome is unclear)Func CUNR ROI Number of ROIs: 3; ROIs: (1) L AG and bilateral midline components of the canonical semantic network, along with reduced activity in R frontal, temporal and parietal regions; (2) prefrontal† L IFG t dorsolateral prefrontalGriffis, ROI 1Semantic decision vs tone decision (2017): ROI 1CUNR PWEROI PWENumber of ROIs: 3; ROIs: (1) L AG and bilateral midline components of the canonical semantic network, along with reduced activity in R frontal, temporal and parietal regions; (2) bilateral IFG pars orbitalis; (3) L IFG† L SMA/medial temporal and parietal regions; (2) prefrontal	et al. (2017):	speech production	Aphasia T1 Covariate: subsequent $\Delta$ (T2 vs T1) number of appropriate information-carrying words <u>Somewhat valid</u> (potentially confounded by T1 language function; language function at T1 was predictive of change in language	N	UNR	Func	correlated with change in AICW; number of ROIs: 1; ROI: L pre-SMA; how ROI defined: peak voxel of the contrast of target decision vs mean of propositional speech and counting in	
Nenert,vs tone decisionAphasiaOthbilateral midline components of the↑ L dorsolateralAllendorfer,Covariate: semanticFWEcanonical semantic network, alongprefrontal cortex& Szaflarskidecision accuracywith reduced activity in R frontal, temporal and parietal regions; (2)↑ L SMA/medialROI 1fsemanticbilateral IFG pars orbitalis; (3) L IFG↑ L angular gyrus	et al. (2017):	speech production	Aphasia T2 Covariate: previous ∆ (T2 vs T1) number of appropriate information-carrying words <u>Not valid</u> (the logic behind correlating activation changes and language	<u>AM</u>	<u>UNR</u>	Func	correlated with change in AICW, but not stated whether T2 AICW correlated with change in AICW; number of ROIs: 1; ROI: L pre-SMA; how ROI defined: peak voxel of the contrast of target decision vs mean of propositional speech and counting in	
	Nenert, Allendorfer, & Szaflarski (2017):		CC Aphasia Covariate: semantic	С	UNR	Oth	bilateral midline components of the canonical semantic network, along with reduced activity in R frontal, temporal and parietal regions; (2) bilateral IFG pars orbitalis; (3) L IFG	<sup>↑</sup> L dorsolateral prefrontal cortex ↑ L SMA/medial prefrontal ↑ L angular gyrus

						regions; how ROIs defined: ROIs are mixing coefficients of functional networks arising from mCCA + jICA that were differently represented in the patient and control groups	<ul> <li>L posterior</li> <li>cingulate</li> <li>R IFG pars</li> <li>orbitalis</li> <li>R SMA/medial</li> <li>prefrontal</li> <li>R precuneus</li> <li>R posterior</li> <li>cingulate</li> <li>L insula</li> <li>R IFG pars</li> <li>opercularis</li> <li>R IFG pars</li> <li>triangularis</li> <li>R insula</li> <li>R dorsal</li> <li>precentral</li> <li>R supramarginal</li> <li>gyrus</li> <li>R mid temporal</li> <li>notes: all 3</li> <li>networks were</li> <li>significantly</li> <li>correlated;</li> <li>analysis of</li> <li>networks so</li> <li>involvement of</li> <li>each individual</li> <li>region cannot be</li> <li>assured</li> </ul>
Griffis, Nenert, Allendorfer, & Szaflarski (2017): ROI 2	Semantic decision vs tone decision	CC Aphasia Covariate: average of semantic and phonemic fluency	UNR	UNR	ROI Oth FWE	Number of ROIs: 3; ROIs: (1) L AG and bilateral midline components of the canonical semantic network, along with reduced activity in R frontal, temporal and parietal regions; (2) bilateral IFG pars orbitalis; (3) L IFG and DLPFC along with bilateral midline regions; how ROIs defined: ROIs are mixing coefficients of functional networks arising from mCCA + jICA that were differently represented in the patient and control groups	<ul> <li>L IFG</li> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L posterior cingulate</li> <li>R SMA/medial prefrontal</li> <li>R precuneus</li> <li>R posterior cingulate</li> <li>L insula</li> <li>R IFG pars opercularis</li> <li>R IFG pars triangularis</li> <li>R insula</li> <li>R dorsal precentral</li> <li>R supramarginal gyrus</li> <li>R mid temporal notes: networks 1 and 3 were significantly correlated; analysis of</li> </ul>

							networks so involvement of each individual region cannot be assured
Griffis, Nenert, Allendorfer, & Szaflarski (2017): ROI 3	Semantic decision vs tone decision	CC Aphasia Covariate: BNT	UNR	UNR	ROI Oth FWE	Number of ROIs: 3; ROIs: (1) L AG and bilateral midline components of the canonical semantic network, along with reduced activity in R frontal, temporal and parietal regions; (2) bilateral IFG pars orbitalis; (3) L IFG and DLPFC along with bilateral midline regions; how ROIs defined: ROIs are mixing coefficients of functional networks arising from mCCA + jICA that were differently represented in the patient and control groups	<ul> <li>↑ L IFG</li> <li>↑ L dorsolateral prefrontal cortex</li> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ L angular gyrus</li> <li>↑ L precuneus</li> <li>↑ L posterior</li> <li>cingulate</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↑ R precuneus</li> <li>↑ R posterior</li> <li>cingulate</li> <li>↓ R IFG pars</li> <li>opercularis</li> <li>↓ R IFG pars</li> <li>triangularis</li> <li>↓ R insula</li> <li>↓ R dorsal</li> <li>precentral</li> <li>↓ R supramarginal</li> <li>gyrus</li> <li>↓ R mid temporal</li> <li>notes: networks 1</li> <li>and 3 were</li> <li>significantly</li> <li>correlated;</li> <li>analysis of</li> <li>networks so</li> <li>involvement of</li> <li>each individual</li> <li>region cannot be</li> <li>assured</li> </ul>
Griffis, Nenert, Allendorfer, & Szaflarski (2017): Cplx 1	Semantic decision vs tone decision	CAC Aphasia vs control	Ν	UNR	Cplx	Behavioral data notes: semantic decision accuracy not matched, but tone decision accuracy not reported; Multimodal canonical correlation analysis (mCCA) and joint ICA were used to identify 3 joint ICs (structural/functional) that were differently represented in the patient and control groups. Although there was no correction for multiple comparisons when the functional maps were thresholded, the maps for the three networks each appeared to relate to coherent parts of the semantic network.	Other: The first joint IC comprised preservation of tissue in L posterior temporo-parietal region, activity in the L AG and bilateral midline components of the canonical semantic network, and reduced activity in R frontal, temporal and parietal regions. The second joint IC comprised preservation of

							tissue in the the L basal ganglia/insula region, and activity predominantly in the IFG pars orbitalis bilaterally. The third joint IC comprised preservation of the L IFG and activity in the L IFG and DLPFC along with bilateral midline regions. The first joint IC was considered to provide more robust evidence for structure- function relationships than the other two, because it was the only one where individual structural and functional mixing coefficients remained correlated even when lesion volume was included as a covariate.
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): Vox 1	Semantic decision vs tone decision	CC Aphasia Covariate: semantic decision accuracy	C	UNR	Vox <u>CCTB</u>	Search volume: whole brain; software: SPM12/in-house; voxelwise p: .01; cluster extent cutoff: 126 voxels (size not stated); lesion volume covariate	<ul> <li>L dorsolateral prefrontal cortex</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L mid temporal</li> <li>L anterior temporal</li> <li>L posterior cingulate</li> <li>L cerebellum</li> <li>L brainstem</li> <li>L</li> <li>K lFG pars orbitalis</li> <li>R angular gyrus</li> <li>R precuneus</li> <li>R anterior temporal</li> <li>R occipital</li> <li>R brainstem</li> <li>R brainstem</li> <li>R hippocampus/MTL</li> <li>L brainstem</li> <li>R anterior temporal</li> <li>R occipital</li> <li>R brainstem</li> <li>R hippocampus/MTL</li> <li>L somato-motor notes: based on figure and table; larger activations</li> </ul>

							are compelling; smaller activations are not due to lenient correction approach
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): Vox 2	Semantic decision vs tone decision	CC Aphasia Covariate: average of semantic and phonemic fluency	UNR	UNR	Vox CCTB	Search volume: whole brain; software: SPM12/in-house; voxelwise p: .01; cluster extent cutoff: 126 voxels (size not stated); lesion volume covariate	<ul> <li>↑ L IFG</li> <li>↑ L dorsolateral prefrontal cortex</li> <li>↑ L SMA/medial prefrontal</li> <li>↑ L angular gyrus</li> <li>↑ L precuneus</li> <li>↑ L posterior STS</li> <li>↑ L mid temporal</li> <li>↑ L posterior cingulate</li> <li>↑ L brainstem</li> <li>↑ L</li> <li>↑ L brainstem</li> <li>↑ L</li> <li>↑ R SMA/medial prefrontal</li> <li>↑ R precuneus</li> <li>↑ R posterior cingulate</li> <li>↑ R posterior</li> <li>↑ R posterior STS</li> <li>notes: based on figure and table; larger activations are compelling; smaller activations are not due to lenient correction approach</li> </ul>
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): Vox 3	Semantic decision vs tone decision	CC Aphasia Covariate: BNT	UNR	UNR	Vox <u>CCTB</u>	Search volume: whole brain; software: SPM12/in-house; voxelwise p: .01; cluster extent cutoff: 126 voxels (size not stated); lesion volume covariate	<ul> <li>↑ L IFG pars orbitalis</li> <li>↑ L SMA/medial prefrontal</li> <li>↑ L angular gyrus</li> <li>↑ L precuneus</li> <li>↑ L posterior cingulate</li> <li>↑ L</li> <li>↑ L hippocampus/MTL</li> <li>↑ R IFG pars orbitalis</li> <li>↑ R SMA/medial prefrontal</li> <li>↑ R precuneus</li> <li>↑ R anterior temporal</li> <li>↑ R posterior cingulate</li> <li>↑ R cerebellum notes: based on figure and table;</li> </ul>

							larger activations are compelling; smaller activations are not due to lenient correction approach
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): Vox 4	Semantic decision vs tone decision	CC Aphasia Covariate: lesion volume	UNR	UNR	Vox <u>CCTB</u>	Search volume: R hemisphere; software: SPM12/in-house; voxelwise p: .01; cluster extent cutoff: 126 voxels (size not stated)	<ul> <li>↑ R IFG pars</li> <li>opercularis</li> <li>↑ R dorsolateral</li> <li>prefrontal cortex</li> <li>↑ R dorsal</li> <li>precentral</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↓ R orbitofrontal</li> <li>↓ R anterior</li> <li>temporal</li> <li>↓ R thalamus</li> <li>notes: based on</li> <li>figure and table;</li> <li>larger activations</li> <li>are compelling;</li> <li>smaller activations</li> <li>are not due to</li> <li>lenient correction</li> <li>approach</li> </ul>
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): ROI 1	Semantic decision vs tone decision	CAC Aphasia vs control	Ν	UNR	ROI Func FWE	Behavioral data notes: semantic decision accuracy not matched, but tone decision accuracy not reported; number of ROIs: 5; ROIs: (1) overall canonical semantic network (CSN); (2) L CSN; (3) R CSN; (4) mirror L CSN in R; (5) out-of-network CSN in R; how ROIs defined: control data; <u>circular because</u> <u>ROI defined in one group</u>	<ul> <li>L IFG</li> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L precuneus</li> <li>L mid temporal</li> <li>L anterior</li> <li>temporal</li> <li>L cocipital</li> <li>L posterior</li> <li>cingulate</li> <li>L cerebellum</li> <li>R IFG</li> <li>R dorsolateral</li> <li>prefrontal cortex</li> <li>R SMA/medial</li> <li>prefrontal</li> <li>R angular gyrus</li> <li>R anterior</li> <li>R anterior</li> <li>R occipital</li> <li>R cerebellum</li> <li>notes: results are</li> <li>for whole</li> <li>networks of</li> <li>regions, so</li> <li>individual regions</li> <li>cannot be</li> <li>assured; out-of-</li> <li>network R regions</li> </ul>

							not listed since they were not significant in ROI 5 (only in ROI 4)
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): ROI 2	Semantic decision vs tone decision	CC Aphasia Covariate: lesion volume	<u>UNR</u>	<u>UNR</u>	ROI Func FWE	Number of ROIs: 5; ROIs: (1) overall canonical semantic network (CSN); (2) L CSN; (3) R CSN; (4) mirror L CSN in R; (5) out-of-network CSN in R; how ROIs defined: control data	None
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): ROI 3	Semantic decision vs tone decision	CC Aphasia Covariate: semantic decision accuracy	C	UNR	ROI Func One	Number of ROIs: 1; ROI: CSN; how ROI defined: control data; lesion volume covariate	<ul> <li>L IFG</li> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L mid temporal</li> <li>L anterior</li> <li>temporal</li> <li>L posterior cingulate</li> <li>L cerebellum</li> <li>R IFG</li> <li>R dorsolateral prefrontal cortex</li> <li>R SMA/medial prefrontal</li> <li>R angular gyrus</li> <li>R anterior</li> <li>R anterior</li> <li>R anterior</li> <li>R anterior</li> <li>R anterior</li> <li>Cingulate</li> <li>R cerebellum</li> <li>notes: correlation</li> <li>calculated for the</li> <li>whole network of</li> <li>regions, so</li> <li>correlation of</li> <li>individual regions</li> <li>cannot be assured</li> </ul>
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): ROI 4	Semantic decision vs tone decision	CC Aphasia Covariate: average of semantic and phonemic fluency	UNR	UNR	ROI Func One	Number of ROIs: 1; ROI: CSN; how ROI defined: control data; lesion volume covariate	<ul> <li>↑ L IFG</li> <li>↑ L dorsolateral</li> <li>prefrontal cortex</li> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ L angular gyrus</li> <li>↑ L precuneus</li> <li>↑ L mid temporal</li> <li>↑ L anterior</li> <li>temporal</li> <li>↑ L posterior</li> <li>cingulate</li> <li>↑ L cerebellum</li> <li>↑ R IFG</li> <li>↑ R dorsolateral</li> <li>prefrontal cortex</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↑ R angular gyrus</li> <li>↑ R angular gyrus</li> <li>↑ R precuneus</li> </ul>

Griffic, Nenert, Vannest, et al. (2017):       Semantic decision       CC       LNR       LNR       ROI       Number of ROIs 11, ROI: CSN; how ROI regions, so orderidation of consolitation of source bases and covariate: BNT       LNR       ROI       Number of ROIs 11, ROI: CSN; how ROI regions, so orderidation of covariate: BNT       LNR       ROI Func covariate       Number of ROIs 11, ROI: CSN; how ROI regions, so orderidation of covariate       11, LGG 11, LG							
Nenert, Vannest, et al. (2017); ROI 5Semantic decision vs tone decisionAphasia Covariate: BNTFunc vs shaft shaft shaft shaftFunc covariate: shaft shaft shaft shaftFunc covariate: covariate:Func covariate: covariate:Func covariate: shaft shaft shaft shaftFunc shaft shaft shaftFunc covariate: shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaft shaftFunc shaft shaft shaft shaft shaft shaft shaft shaft </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>temporal ↑ R posterior cingulate ↑ R cerebellum notes: correlation calculated for the whole network of regions, so correlation of individual regions</td>							temporal ↑ R posterior cingulate ↑ R cerebellum notes: correlation calculated for the whole network of regions, so correlation of individual regions
Nenert, Allendorfer, Vannest, et al. (2017): Cplx 1vs tone decision ActivationAphasia vs controldecision accuracy not matched, but tone decision accuracy not reported; Correlations between activation magnitudes in the L and R canonical semantic network (CSN) were compared between groups. However, this analysis is circular because the CSN ROIs were defined based on controls only.Other: CorrelationsGriffis, Nenert, Allendorfer, Vannest, et al. (2017): Cplx 2Semantic decision vs tone decisionCAC Aphasia vs controlNUNR VCplx VBehavioral data notes: semantic decision accuracy not matched, but tone decision accuracy not matched, but controls only.Other: Correlations between controls only.Griffis, Nenert, Allendorfer, Vannest, et al. (2017): Cplx 2Semantic decision vs tone decision Aphasia vs controlNUNR VCplx VBehavioral data notes: semantic decision accuracy not matched, but tone decision accuracy not reported; Correlations between activation magnitudes in the L CSN and R mirrored LSN were compared between groups. However, thisCSN and the mirrored L CSN in the R hemisphere	Nenert, Allendorfer, Vannest, et al. (2017):	Aphasia	UNR	UNR	Func	defined: control data; lesion volume	<ul> <li>↑ L dorsolateral prefrontal cortex</li> <li>↑ L SMA/medial prefrontal</li> <li>↑ L angular gyrus</li> <li>↑ L precuneus</li> <li>↑ L precuneus</li> <li>↑ L mid temporal</li> <li>↑ L anterior</li> <li>temporal</li> <li>↑ L posterior</li> <li>cingulate</li> <li>↑ L cerebellum</li> <li>↑ R IFG</li> <li>↑ R dorsolateral</li> <li>prefrontal cortex</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↑ R angular gyrus</li> <li>↑ R precuneus</li> <li>↑ R anterior</li> <li>temporal</li> <li>↑ R posterior</li> <li>cingulate</li> <li>↑ R anterior</li> <li>temporal</li> <li>↑ R cerebellum</li> <li>↑ R cerebellum</li> <li>notes: correlation</li> <li>calculated for the</li> <li>whole network of</li> <li>regions, so</li> <li>correlation of</li> <li>individual regions</li> </ul>
Nenert, Allendorfer,vs tone decisionAphasia vs controldecision accuracy not matched, but tone decision accuracy not reported; betweenCorrelationsVannest, et al. (2017):Correlationsbetween activations in the LCorrelationsMagnitudes in the L CSN and RCSN and the mirrored CSN were compared between groups. However, thisCSN and the R hemisphere	Nenert, Allendorfer, Vannest, et al. (2017):		N	UNR	Cplx	decision accuracy not matched, but tone decision accuracy not reported; Correlations between activation magnitudes in the L and R canonical semantic network (CSN) were compared between groups. However, this analysis is circular because the CSN ROIs were defined based on	None
	Nenert, Allendorfer, Vannest, et al. (2017):		N	UNR	Cplx	Behavioral data notes: semantic decision accuracy not matched, but tone decision accuracy not reported; Correlations between activation magnitudes in the L CSN and R mirrored CSN were compared between groups. However, this	Correlations between activations in the L CSN and the mirrored L CSN in the R hemisphere

						<u>ROIs were defined based on controls</u> <u>only</u> .	patients than controls.
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): Cplx 3	Semantic decision vs tone decision	CAC Aphasia vs control	N	UNR	Cplx	Behavioral data notes: semantic decision accuracy not matched, but tone decision accuracy not reported; Correlations between activation magnitudes in the L CSN and R out-of- network homotopic regions were compared between groups. However, this analysis is circular because the CSN ROIs were defined based on controls only.	Other: Correlations between activations in the L CSN and R out-of- network homotopic regions were stronger in patients than controls.
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): Cplx 4	Semantic decision vs tone decision	CAC Aphasia vs control	N	UNR	Cplx	Behavioral data notes: semantic decision accuracy not matched, but tone decision accuracy not reported; The difference in activation between the L CSN and R CSN was compared between patients and controls. However, <u>this analysis is circular</u> <u>because the CSN ROIs were defined</u> <u>based on controls only</u> .	None
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): Cplx 5	Semantic decision vs tone decision	CAC Aphasia vs control	N	<u>UNR</u>	Cplx	Behavioral data notes: semantic decision accuracy not matched, but tone decision accuracy not reported; The difference in activation between the L CSN and mirror L CSN in the R was compared between patients and controls. However, this analysis is circular because the CSN ROIs were defined based on controls only.	Other: The difference was smaller in patients.
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): Cplx 6	Semantic decision vs tone decision	CAC Aphasia vs control	N	<u>UNR</u>	Cplx	Behavioral data notes: semantic decision accuracy not matched, but tone decision accuracy not reported; The difference in activation between the R CSN and out-of-network homotopic regions in the R was compared between patients and controls. However, this analysis is circular because the CSN ROIs were defined based on controls only.	Other: The difference was smaller in patients.
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): Cplx 7	Semantic decision vs tone decision	CC Aphasia Covariate: interactions of semantic fluency and naming measures by lesion size	UNR	UNR	Cplx	For the 4 R hemisphere regions that were more activated in patients with larger lesions (SPM analysis 4), analyses were carried out to determine whether the semantic fluency or naming measures were differentially impacted by activation depending on whether lesions were larger or smaller.	Other: For 1 of the 4 regions (R SMA), there were significant interactions such that in patients with larger lesions, more activation was associated with higher semantic fluency scores and higher BNT scores, while in patients with smaller lesions, more activation was associated with lower fluency and BNT scores. There was a similar

							relationship with semantic fluency in the R IFG pars opercularis but only at p(FDR) = 0.07.
Harvey et al. (2017): Vox 1	Picture naming vs viewing patterns	LA Aphasia T3 vs T1	UNR	UNR	Vox NDC	Search volume: voxels spared in all patients; software: SPM8; qualitative comparison on pp. 138-9	<ul> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ L posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> <li>↑ L occipital</li> <li>↑ L anterior</li> <li>cingulate</li> <li>↑ R IFG pars</li> <li>opercularis</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↓ L dorsolateral</li> <li>prefrontal cortex</li> <li>↓ R IFG pars</li> <li>triangularis</li> <li>↓ R posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> <li>↓ R occipital</li> <li>↓ R</li> <li>hippocampus/MTL</li> <li>notes: based on</li> <li>Figure 5 and Table</li> <li>4</li> </ul>
Nardo et al. (2017): Vox 1	Picture naming (all conditions, correct trials) vs rest	LA Aphasia T2 vs T1	ҮСТ	N	Vox VFWE	Behavioral data notes: RT faster at T2; search volume: whole brain; software: SPM12; voxelwise p: FWE p < .05	None
Nardo et al. (2017): ROI 1	Picture naming (untrained items, no cue, correct trials) vs picture naming (trained items, no cue, correct trials)	CC Aphasia T2 Covariate: "a change in un-cued naming RT" (exact measure unclear) <u>Somewhat valid</u> (unclear whether behavioral measure is longitudinal)	YCT	UNR	ROI Func <u>NC</u>	Number of ROIs: 4; ROIs: (1) R anterior insula; (2) R IFG; (3) dorsal anterior cingulate; (4) L premotor cortex; how ROIs defined: peaks (only with SVC) for the main effect of untrained (4 conditions) vs trained (4 conditions) in T2 aphasia; <u>unclear what the</u> <u>behavioral measure was exactly</u>	↑ R IFG pars opercularis ↑ R insula
Nenert et al. (2017): Vox 1	Semantic decision vs tone decision	CAA Aphasia CIAT T2 (n = 11) vs untreated T2 (n = 8) <u>Somewhat valid</u> (no treatment effect)	AS	UNR	Vox <u>CA</u>	Search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	<ul> <li>↑ L somato-motor</li> <li>↑ L superior</li> <li>parietal</li> <li>↑ L brainstem</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R somato-motor</li> <li>↑ R superior</li> <li>parietal</li> <li>notes: based on</li> <li>coordinates in</li> <li>Table 4</li> </ul>
Nenert et al. (2017):	Semantic decision vs tone decision	CAA Aphasia CIAT T3 (n =	<u>UNT</u>	<u>UNR</u>	Vox <u>CA</u>	Search volume: voxels spared in all patients; software: SPM12; voxelwise	↑ L superior parietal

Vox 2       11/s untreated 73 (n = 8)       p. 0.1; duster enter u.dr.ff. 50 voxels       11 anterior         Somewhat valid (no       Somewhat valid (no       Somewhat valid (no       Somewhat valid (no         Nemer ter       Applase CATT 7 (n = 1)       MAR       UAR       UAR       Vox       Samewhat valid (no       Buse not stated)       It anterior         Nemer ter       Vox 30       CAA       MAR       UAR       Vox       Samewhat valid (no       Buse not stated)       It precimes water in the precime precimprecime precimprecimprecime precime precimprecime precime precime								
al. (2017):       finger tapping       Aphasia CLAT 12 (n = 1):       CA       patients: software: SPM12; voxelwise (size not stated)       I. R dorsolateral preformatic cortex (size not stated)         Nenert et al. (2017):       Verb generation vs al Aphasia CLAT T3 (n = 1) vs untreasted T3 (n = 8) Somewhat valid (no treatment effect)       UNR       UNR       Vox al Somewhat valid (no treatment effect)       Somewhat valid (no treatment effect)       Finger tapping       CAC Aphasia CLAT T1 (n = 1) vs untreasted T3 (n = 1) vs untreas on the tone decision at tated)       I. Rota	Vox 2		= 8) <u>Somewhat valid</u> (no				-	temporal ↑ L hippocampus/MTL ↑ R orbitofrontal ↓ L dorsolateral prefrontal cortex ↓ L posterior inferior temporal gyrus/fusiform gyrus ↓ R IFG pars orbitalis ↓ R ventral precentral/inferior frontal junction ↓ R posterior STS notes: based on coordinates in
al. (2017): Vox 4finger tapping In yos untreated T3 (n = 8) Somewhat valid (no treatment effect)Aphasia CIAT T3 (n = 11) vs untreated T3 (n = 8) Somewhat valid (no treatment effect)CA somewhat valid (no treatment effect)patients; software: SPM12; voxelwise (size not stated)prefrontal T R basal ganglia L Anterior temporal gyrus/fusiform gyrus/fusiform gyrus/fusiform gyrus/fusiform gyrus/fusiform gyrus/fusiform inferior temporal accurate than controls on both tasks, search volume: voxels spared in all patients; software: SPM12; voxelwise p. 01; cluster extent cutoff: 50 voxels (size not stated)the potention is the potention STS the posterior STS 	al. (2017):	-	Aphasia CIAT T2 (n = 11) vs untreated T2 (n = 8) <u>Somewhat valid</u> (no	UNR	<u>UNR</u>		patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels	↓ L precuneus ↓ R dorsolateral prefrontal cortex ↓ R posterior STS ↓ R anterior temporal ↓ R posterior inferior temporal gyrus/fusiform gyrus notes: based on coordinates in
al. (2017): vs tone decision Vox 5 Vox 5 Aphasia CIAT T1 (n = 11) vs control 11) vs control 11) vs control Aphasia CIAT T1 (n = 11) vs control 11) vs control 11] vs control 11] vs control 11] vs control 12] vs contr	al. (2017):	-	Aphasia CIAT T3 (n = 11) vs untreated T3 (n = 8) <u>Somewhat valid</u> (no	UNR	<u>UNR</u>		patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels	<ul> <li>prefrontal</li> <li>↑ R basal ganglia</li> <li>↓ L anterior</li> <li>temporal</li> <li>↓ R posterior STS</li> <li>↓ R Heschl's gyrus</li> <li>↓ R posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> </ul>
	al. (2017):		Aphasia CIAT T1 (n =	AM	UNR		accurate than controls on both tasks, but more so on the tone decision task; search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels	<ul> <li>↓ L</li> <li>hippocampus/MTL</li> <li>↑ R IFG pars</li> <li>opercularis</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↑ R supramarginal</li> <li>gyrus</li> <li>↑ R posterior</li> <li>STG/STS/MTG</li> <li>↑ R anterior</li> <li>temporal</li> <li>↑ R anterior</li> <li>cingulate</li> <li>↓ R dorsolateral</li> </ul>
	Nenert et	Semantic decision	CAC	AM	UNR	Vox	Behavioral data notes: patients less	•

al. (2017): Vox 6	vs tone decision	Aphasia CIAT T2 (n = 11) vs control				accurate than controls on both tasks, but more so on the tone decision task; search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	<pre>cingulate ↑ R IFG pars opercularis ↑ R insula ↑ R ventral precentral/inferior frontal junction ↑ R supramarginal gyrus ↑ R Heschl's gyrus ↓ L dorsolateral prefrontal cortex ↓ L SMA/medial prefrontal ↓ L cerebellum ↓ R dorsolateral prefrontal cortex</pre>
Nenert et al. (2017): Vox 7	Semantic decision vs tone decision	CAC Aphasia CIAT T3 (n = 11) vs control	AM	UNR	Vox <u>CA</u>	Behavioral data notes: patients less accurate than controls on both tasks, but more so on the tone decision task; search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	<ul> <li>↑ L orbitofrontal</li> <li>↑ L anterior</li> <li>↑ L</li> <li>hippocampus/MTL</li> <li>↑ R superior</li> <li>parietal</li> <li>↓ L cerebellum</li> <li>↓ R dorsolateral</li> <li>prefrontal cortex</li> <li>↓ R anterior</li> <li>temporal</li> <li>↓ R cerebellum</li> </ul>
Nenert et al. (2017): Vox 8	Semantic decision vs tone decision	CAC Aphasia untreated T1 (n = 8) vs control	AM	UNR	Vox <u>CA</u>	Behavioral data notes: patients less accurate than controls on both tasks, but more so on the tone decision task; search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	<ul> <li>↑ L dorsolateral prefrontal cortex</li> <li>↑ R dorsolateral prefrontal cortex</li> <li>↑ R SMA/medial prefrontal</li> <li>↑ R somato-motor</li> <li>↓ L IFG pars</li> <li>orbitalis</li> <li>↓ L dorsolateral prefrontal cortex</li> <li>↓ L SMA/medial prefrontal cortex</li> <li>↓ L SMA/medial prefrontal</li> <li>↓ L angular gyrus</li> <li>↓ L anterior</li> <li>temporal</li> <li>↓ R IFG pars</li> <li>orbitalis</li> <li>↓ R angular gyrus</li> <li>↓ R anterior</li> <li>temporal</li> <li>↓ R anterior</li> <li>temporal</li> <li>↓ R posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> </ul>
Nenert et al. (2017): Vox 9	Semantic decision vs tone decision	CAC Aphasia untreated T2 (n = 8) vs control	<u>AM</u>	<u>UNR</u>	Vox <u>CA</u>	Behavioral data notes: patients less accurate than controls on both tasks, but more so on the tone decision task; search volume: voxels spared in all patients; software: SPM12; voxelwise	↑ L posterior inferior temporal gyrus/fusiform gyrus ↑ R dorsolateral
							prefrontal cortex

Nenert et	Semantic decision	CAC	АМ	UNR	Vox	p: .01; cluster extent cutoff: 50 voxels (size not stated)	<pre>↑ R orbitofrontal ↑ R mid temporal ↓ L IFG pars orbitalis ↓ L SMA/medial prefrontal ↓ L orbitofrontal ↓ L orbitofrontal ↓ L intraparietal sulcus ↓ L superior parietal ↓ L anterior cingulate ↓ L brainstem ↓ R IFG pars orbitalis ↓ R dorsolateral prefrontal cortex ↓ R inferior parietal lobule ↓ R supramarginal gyrus ↓ R anterior temporal ↓ R posterior inferior temporal gyrus/fusiform gyrus ↓ R hippocampus/MTL ↑ L dorsolateral</pre>
al. (2017): Vox 10	vs tone decision	Aphasia untreated T3 (n = 8) vs control				accurate than controls on both tasks, but not significantly for the semantic decision task, and more so on the tone decision task; search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	<ul> <li>↓ Lorisolateral</li> <li>prefrontal cortex</li> <li>↑ R dorsolateral</li> <li>prefrontal cortex</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↑ R orbitofrontal</li> <li>↑ R superior</li> <li>parietal</li> <li>↑ R cerebellum</li> <li>↓ L orbitofrontal</li> <li>↓ L anterior</li> <li>temporal</li> <li>↓ L posterior</li> <li>cingulate</li> <li>↓ L cerebellum</li> <li>↓ L cerebellum</li> <li>↓ L cerebellum</li> <li>↓ L angular gyrus</li> <li>↓ R angular gyrus</li> <li>↓ R anterior</li> <li>temporal</li> </ul>
Nenert et al. (2017): Vox 11	Verb generation vs finger tapping	CAC Aphasia CIAT T1 (n = 11) vs control	UNR	<u>UNR</u>	Vox <u>CA</u>	Search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	<ul> <li>↑ L dorsal</li> <li>precentral</li> <li>↑ L superior</li> <li>parietal</li> <li>↑ R cerebellum</li> <li>↓ L dorsolateral</li> <li>prefrontal cortex</li> <li>↓ L SMA/medial</li> <li>prefrontal</li> <li>↓ R posterior</li> </ul>

							inferior temporal gyrus/fusiform gyrus
Nenert et al. (2017): Vox 12	Verb generation vs finger tapping	CAC Aphasia CIAT T2 (n = 11) vs control	UNR	UNR	Vox <u>CA</u>	Search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	<ul> <li>↑ L dorsal</li> <li>precentral</li> <li>↑ L anterior</li> <li>cingulate</li> <li>↓ L IFG pars</li> <li>orbitalis</li> <li>↓ L dorsolateral</li> <li>prefrontal cortex</li> <li>↓ L SMA/medial</li> <li>prefrontal</li> <li>↓ L superior</li> <li>parietal</li> <li>↓ L posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> <li>↓ L occipital</li> <li>↓ R IFG pars</li> <li>orbitalis</li> </ul>
Nenert et al. (2017): Vox 13	Verb generation vs finger tapping	CAC Aphasia CIAT T3 (n = 11) vs control	UNR	UNR	Vox <u>CA</u>	Search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	<ul> <li>↑ L somato-motor</li> <li>↑ L anterior</li> <li>cingulate</li> <li>↑ L posterior</li> <li>cingulate</li> <li>↓ L IFG pars</li> <li>orbitalis</li> <li>↓ L dorsolateral</li> <li>prefrontal cortex</li> <li>↓ L superior</li> <li>parietal</li> <li>↓ L posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> <li>↓ R dorsolateral</li> <li>prefrontal cortex</li> <li>↓ R mid temporal</li> </ul>
Nenert et al. (2017): Vox 14	Verb generation vs finger tapping	CAC Aphasia untreated T1 (n = 8) vs control	UNR	UNR	Vox <u>CA</u>	Search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	<ul> <li>↑ L superior</li> <li>parietal</li> <li>↑ L occipital</li> <li>↑ L cerebellum</li> <li>↑ R dorsolateral</li> <li>prefrontal cortex</li> <li>↑ R cerebellum</li> <li>↓ L IFG pars</li> <li>orbitalis</li> <li>↓ L SMA/medial</li> <li>prefrontal</li> <li>↓ L posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> <li>↓ L cerebellum</li> <li>↓ R superior</li> <li>parietal</li> </ul>
Nenert et al. (2017): Vox 15	Verb generation vs finger tapping	CAC Aphasia untreated T2 (n = 8) vs control	<u>UNR</u>	<u>UNR</u>	Vox <u>CA</u>	Search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	↑ L dorsolateral prefrontal cortex ↑ R SMA/medial prefrontal

							<ul> <li>↑ R angular gyrus</li> <li>↑ R posterior STG</li> <li>↑ R posterior</li> <li>cingulate</li> <li>↑ R cerebellum</li> <li>↓ L dorsolateral</li> <li>prefrontal cortex</li> <li>↓ L SMA/medial</li> <li>prefrontal</li> <li>↓ L superior</li> <li>parietal</li> <li>↓ L posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> <li>↓ L occipital</li> <li>↓ R superior</li> <li>parietal</li> <li>↓ R superior</li> </ul>
Nenert et al. (2017): Vox 16	Verb generation vs finger tapping	CAC Aphasia untreated T3 (n = 8) vs control	UNR	UNR	Vox <u>CA</u>	Search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	<ul> <li>↑ L superior</li> <li>parietal</li> <li>↑ L anterior</li> <li>temporal</li> <li>↑ L occipital</li> <li>↑ R insula</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R orbitofrontal</li> <li>↑ R occipital</li> <li>↑ R cerebellum</li> <li>↓ L IFG pars</li> <li>orbitalis</li> <li>↓ L SMA/medial</li> <li>prefrontal</li> <li>↓ L SUPErior</li> <li>parietal</li> <li>↓ L occipital</li> <li>↓ R insula</li> <li>↓ R dorsolateral</li> <li>prefrontal cortex</li> <li>↓ R cerebellum</li> <li>↓ R cerebellum</li> </ul>
Nenert et al. (2017): Vox 17	Semantic decision vs tone decision	LC Aphasia T2 vs T1 Covariate: ∆ BNT	<u>UNR</u>	<u>UNR</u>	Vox <u>CA</u>	Search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	↑ R insula ↑ R anterior cingulate ↑ R cerebellum ↑ R brainstem ↑ R basal ganglia
Nenert et al. (2017): Vox 18	Semantic decision vs tone decision	LC Aphasia T3 vs T2 Covariate: Δ BNT <u>Somewhat valid</u> (no treatment effect)	<u>UNR</u>	<u>UNR</u>	Vox <u>CA</u>	Search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	↑ R somato-motor ↑ R posterior MTG ↑ R thalamus
Nenert et al. (2017): Vox 19	Verb generation vs finger tapping	LC Aphasia T2 vs T1 Covariate: Δ BNT	<u>UNR</u>	<u>UNR</u>	Vox <u>CA</u>	Search volume: voxels spared in all patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	↑ R orbitofrontal ↑ R mid temporal
Nenert et	Verb generation vs	LC	<u>UNR</u>	<u>UNR</u>	Vox	Search volume: voxels spared in all	↑ L dorsolateral

al. (2017): Vox 20	finger tapping	Aphasia T3 vs T2 Covariate: Δ BNT <u>Somewhat valid</u> (no treatment effect)			<u>CA</u>	patients; software: SPM12; voxelwise p: .01; cluster extent cutoff: 50 voxels (size not stated)	prefrontal cortex ↑ R dorsolateral prefrontal cortex ↑ R orbitofrontal
Nenert et al. (2017): ROI 1	Semantic decision vs tone decision	LA Aphasia ANOVA including T1, T2, T3	<u>AS</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 5; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) cerebellar LI; (4) fronto-parietal LI; (5) Broca's LI	None
Nenert et al. (2017): ROI 2	Semantic decision vs tone decision	LAA (Aphasia CIAT (n = 11) T1 $\neq$ T2 $\neq$ T3) vs (untreated (n = 8) T1 $\neq$ T2 $\neq$ T3) Somewhat valid (no treatment effect)	<u>AS</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 5; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) cerebellar LI; (4) fronto-parietal LI; (5) Broca's LI	None
Nenert et al. (2017): ROI 3	Verb generation vs finger tapping	LA Aphasia ANOVA including T1, T2, T3	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 5; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) cerebellar LI; (4) fronto-parietal LI; (5) Broca's LI	None
Nenert et al. (2017): ROI 4	Verb generation vs finger tapping	LAA (Aphasia CIAT (n = 11) T1 $\neq$ T2 $\neq$ T3) vs (untreated (n = 8) T1 $\neq$ T2 $\neq$ T3) Somewhat valid (no treatment effect)	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 5; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) cerebellar LI; (4) fronto-parietal LI; (5) Broca's LI	None
Qiu et al. (2017): Vox 1	Picture naming vs rest	CAC Aphasia vs control	UNR	UNR	Vox <u>CA</u>	Search volume: whole brain; software: SPM8; voxelwise p: .05; cluster extent cutoff: 10 voxels (size not stated); in the footnote to Table 2, there is a reference to FWE correction with Monte Carlo simulation, but <u>this is not</u> <u>described in the text, and the values in</u> <u>the table appear to be inconsistent</u> with that	<ul> <li>↑ L intraparietal sulcus</li> <li>↑ L posterior inferior temporal gyrus/fusiform gyrus</li> <li>↑ L occipital</li> <li>↑ L thalamus</li> <li>↑ R inferior parietal lobule</li> <li>↑ R intraparietal sulcus</li> <li>↑ R precuneus</li> <li>↑ R anterior temporal</li> <li>↓ L IFG</li> <li>↓ L orbitofrontal</li> <li>↓ L somato-motor</li> <li>↓ R ventral precentral/inferior frontal junction notes: findings are based on coordinates, which in many cases do not match the labels assigned in the paper</li> </ul>
Skipper- Kallal et al. (2017a): Vox 1	Picture naming (silently name, correct trials) vs rest	CAC Aphasia vs control	ҮСТ	<u>UNR</u>	Vox <u>C-</u>	Behavioral data notes: covert phase but accuracy derived from overt phase; search volume: whole brain gray matter; software: FSL 5.0.6; voxelwise p: ~.01 ( $z > 2.3$ ); cluster extent cutoff: based on GRFT; threshold of $z > 3.1$ mentioned in results, but presume 2.3 based on methods and figure	↑ R precuneus ↓ L occipital
						U U U U U U U U U U U U U U U U U U U	

Skipper- Kallal et al. (2017a): Vox 2	Picture naming (produce the name, correct trials) vs rest	CAC Aphasia vs control	YCT	UNR	Vox <u>C-</u>	Search volume: whole brain gray matter; software: FSL 5.0.6; voxelwise p: ~.01 (z > 2.3); cluster extent cutoff: based on GRFT; threshold of z > 3.1 mentioned in results, but presume 2.3 based on methods and figure	↑ L SMA/medial prefrontal ↑ L orbitofrontal ↑ L precuneus ↑ R insula ↑ R ventral precentral/inferior frontal junction ↑ R SMA/medial prefrontal ↑ R orbitofrontal ↑ R orbitofrontal ↑ R somato-motor ↑ R supramarginal gyrus ↑ R posterior STS ↓ L IFG ↓ L insula ↓ L ventral precentral/inferior frontal junction ↓ L intraparietal sulcus ↓ L anterior temporal ↓ L hippocampus/MTL ↓ R intraparietal sulcus notes: labels based largely on text with some adjustments based on figures; overall pattern of decreased L activity and increased R activity is quite convincing
Skipper- Kallal et al. (2017a): Vox 3	Picture naming (silently name, correct trials) vs rest	CC Aphasia Covariate: PNT	YCT	<u>UNR</u>	Vox <u>C-</u>	Behavioral data notes: covert phase but accuracy derived from overt phase; search volume: whole brain gray matter; software: FSL 5.0.6; voxelwise p: ~.01 (z > 2.3); cluster extent cutoff: based on GRFT	<ul> <li>↑ L anterior</li> <li>temporal</li> <li>↓ L SMA/medial</li> <li>prefrontal</li> <li>↓ L supramarginal</li> <li>gyrus</li> <li>↓ R SMA/medial</li> <li>prefrontal</li> <li>↓ R somato-motor</li> <li>notes: L anterior</li> <li>temporal</li> <li>correlation</li> <li>remained</li> <li>significant after</li> <li>accounting for</li> <li>lesion load and</li> <li>other factors</li> </ul>
Skipper- Kallal et al. (2017a): Vox 4	Picture naming (produce the name, correct trials) vs rest	CC Aphasia Covariate: PNT	YCT	<u>UNR</u>	Vox <u>C-</u>	Search volume: whole brain gray matter; software: FSL 5.0.6; voxelwise p: ~.01 (z > 2.3); cluster extent cutoff: based on GRFT	<ul> <li>↑ L posterior STG</li> <li>↑ R somato-motor</li> <li>↑ R posterior STS</li> <li>↑ R occipital</li> <li>↓ L IFG pars</li> <li>orbitalis</li> </ul>

							↓ L dorsolateral prefrontal cortex ↓ L angular gyrus notes: L IFG pars orbitalis, R pSTS, and R somato- motor correlations remained remained significant after accounting for lesion load and other factors; note that the pars orbitalis region is described as frontal pole in the paper but the coordinates and image support pars orbitalis
Skipper- Kallal et al. (2017a): Vox 5	Picture naming (both phases, correct trials) vs picture naming (both phases, incorrect trials)	CB Aphasia with naming < 80% (n = 24)	NBD	<u>UNR</u>	Vox <u>C-</u>	Search volume: whole brain gray matter; software: FSL 5.0.6; voxelwise p: ~.01 (z > 2.3); cluster extent cutoff: based on GRFT	None
Skipper- Kallal et al. (2017a): ROI 1	Picture naming (produce the name, correct trials) vs rest	CC Aphasia Covariate: PNT	YCT	UNR	ROI Func FWE	Number of ROIs: 11; ROIs: (1) right IPS; (2) left IPS; (3) left PTr; (4) left dPOp; (5) right superior motor cortex; (6) right ventral motor cortex; (7) right supramarginal sulcus; (8) left medial SMA; (9) right marginal sulcus; (10) left dorsal motor cortex; (11) right STS; how ROIs defined: regions that were activated for control > aphasia (ROIs 1- 4) or aphasia > control (ROIs 5-11)	<ul> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R posterior STS</li> <li>↓ L IFG pars</li> <li>opercularis</li> <li>notes: the L IFG</li> <li>pars opercularis</li> <li>and the R</li> <li>posterior STS also</li> <li>contributed to</li> <li>predicting PNT</li> <li>scores even when</li> <li>lesion load on</li> <li>critical areas for</li> <li>picture naming,</li> <li>and several other</li> <li>variables, were</li> <li>included in</li> <li>multiple</li> <li>regression models</li> </ul>
Skipper- Kallal et al. (2017a): ROI 2	Picture naming (silently name, correct trials) vs rest	CAC Aphasia vs control	ҮСТ	<u>UNR</u>	ROI Func One	Number of ROIs: 1; ROI: L anterior temporal; how ROI defined: activity for covert naming correlated with naming ability in patients, after controlling for lesion and demographic factors	None
Skipper- Kallal et al. (2017a): ROI 3	Picture naming (produce the name, correct trials) vs rest	CAC Aphasia vs control	YCT	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 3; ROIs: (1) L frontal pole; (2) R postcentral gyrus; (3) R STS; how ROIs defined: activity for overt naming correlated with naming ability in patients, after controlling for lesion and demographic factors	↑ R somato-motor ↑ R posterior STS
Skipper- Kallal et al.	Picture naming (produce the	CC Aphasia Covariate: lesion	ҮСТ	<u>UNR</u>	Cplx	SVR-LSM was used to identify regions of damage associated with activation of R pSTS ROI (defined based on SPM	Other: Damage to the L IFG pars

(2017a): Cplx 1	name, correct trials) vs rest	patterns identified with SVR-LSM				analysis 2). <u>The results were</u> <u>thresholded at voxelwise p &lt; .01 (CDT),</u> <u>cluster extent &gt; 500 voxels.</u>	opercularis was associated with more activity in the R pSTS. Damage to the L pSTS was associated with less activity in the R pSTS.
Skipper- Kallal et al. (2017a): Cplx 2	Picture naming (produce the name, correct trials) vs rest	CC Aphasia without IFG POp damage (n = 26) Covariate: lesion patterns identified with SVR-LSM	YCT	UNR	Cplx	SVR-LSM was used to identify regions of damage associated with activation of L IFG pars opercularis ROI (defined based on SPM analysis 2). <u>The results</u> were thresholded at voxelwise p < .01 (CDT), cluster extent > 500 voxels.	Other: Damage to the L pSTG, L pSTS, and white matter underlying the L precuneus was associated with more activity in the L IFG pars opercularis. There were no regions associated with less activity.
Skipper- Kallal et al. (2017b): Vox 1	Picture naming (prepare to name, correct trials) vs rest	CAC Aphasia vs control	YCT	UNR	Vox <u>C-</u>	Behavioral data notes: covert phase but accuracy derived from overt phase; search volume: whole brain; software: FSL 5.0.6; voxelwise p: .01; cluster extent cutoff: based on GRFT	<ul> <li>↑ L cerebellum</li> <li>↑ L thalamus</li> <li>↑ L thalamus</li> <li>↑ L thalamus</li> <li>↑ L basal ganglia</li> <li>↑ R IFG pars</li> <li>○ opercularis</li> <li>↑ R insula</li> <li>↑ R cerebellum</li> <li>↑ R basal ganglia</li> <li>↓ L dorsolateral</li> <li>prefrontal cortex</li> <li>↓ L orbitofrontal</li> <li>↓ L intraparietal</li> <li>sulcus</li> <li>↓ L anterior</li> <li>cingulate</li> <li>↓ R dorsolateral</li> <li>prefrontal cortex</li> <li>notes: based on</li> <li>Table 2</li> </ul>
Skipper- Kallal et al. (2017b): Vox 2	Picture naming (produce the name, correct trials) vs rest	CAC Aphasia vs control	YCT	UNR	Vox <u>C-</u>	Search volume: whole brain; software: FSL 5.0.6; voxelwise p: .01; cluster extent cutoff: based on GRFT	<ul> <li>↑ L somato-motor</li> <li>↑ L intraparietal</li> <li>sulcus</li> <li>↑ L anterior</li> <li>cingulate</li> <li>↑ R insula</li> <li>↑ R dorsal</li> <li>precentral</li> <li>↑ R somato-motor</li> <li>↑ R somato-motor</li> <li>↑ R supramarginal</li> <li>gyrus</li> <li>↑ R Posterior MTG</li> <li>↑ R Heschl's gyrus</li> <li>↓ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↓ L somato-motor</li> <li>↓ L posterior</li> <li>STG/STS/MTG</li> <li>↓ L mid temporal</li> <li>↓ L anterior</li> </ul>

							temporal ↓ L cerebellum ↓ L thalamus ↓ L hippocampus/MTL notes: based on Table 3
Skipper- Kallal et al. (2017b): Vox 3	Picture naming (prepare to name, correct trials) vs rest	CC Aphasia Covariate: lesion volume	YCT	UNR	Vox <u>C-</u>	Behavioral data notes: covert phase but accuracy derived from overt phase; search volume: whole brain; software: FSL 5.0.6; voxelwise p: .01; cluster extent cutoff: based on GRFT	<ul> <li>↑ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ L intraparietal</li> <li>sulcus</li> <li>↑ L superior</li> <li>parietal</li> <li>↑ L occipital</li> <li>↑ L basal ganglia</li> <li>↑ R IFG</li> <li>↑ R insula</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↑ R somato-motor</li> <li>↑ R intraparietal</li> <li>sulcus</li> <li>↑ R occipital</li> <li>↑ R cerebellum</li> <li>↑ R basal ganglia</li> <li>notes: based on</li> <li>Table 4, except for</li> <li>R frontal</li> <li>activations which</li> <li>are missing from</li> <li>the table, and</li> <li>were added based</li> <li>on the figure</li> </ul>
Skipper- Kallal et al. (2017b): Vox 4	Picture naming (produce the name, correct trials) vs rest	CC Aphasia Covariate: lesion volume	YCT	UNR	Vox <u>C</u> -	Search volume: whole brain; software: FSL 5.0.6; voxelwise p: .01; cluster extent cutoff: based on GRFT	<ul> <li>↑ L somato-motor</li> <li>↑ L precuneus</li> <li>↑ L occipital</li> <li>↑ L cerebellum</li> <li>↑ R IFG pars</li> <li>↑ riangularis</li> <li>↑ R ventral</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↑ R posterior</li> <li>STG/STS/MTG</li> <li>↑ R mid temporal</li> <li>↑ R cerebellum</li> <li>↑ R basal ganglia</li> <li>↑ R</li> <li>hippocampus/MTL</li> <li>notes: based on</li> <li>Table 4, except for</li> <li>bilateral occipital</li> <li>activations which</li> </ul>

							are missing from the table, and were added based on the figure
Skipper- Kallal et al. (2017b): Vox 5	Picture naming (prepare to name, correct trials) vs rest	CAA Aphasia with IPS damage (n not stated) vs without IPS damage (n not stated)	YCT	<u>UNR</u>	Vox <u>C-</u>	Behavioral data notes: covert phase but accuracy derived from overt phase; search volume: whole brain; software: FSL 5.0.6; voxelwise p: .01; cluster extent cutoff: based on GRFT; lesion volume covariate	None
Skipper- Kallal et al. (2017b): Vox 6	Picture naming (prepare to name, correct trials) vs rest	CAA Aphasia with insula damage (n = 18) vs without insula damage (n = 21)	YCT	<u>UNR</u>	Vox <u>C-</u>	Behavioral data notes: covert phase but accuracy derived from overt phase; search volume: whole brain; software: FSL 5.0.6; voxelwise p: .01; cluster extent cutoff: based on GRFT; lesion volume covariate	↓ R IFG pars triangularis ↓ R dorsolateral prefrontal cortex
Skipper- Kallal et al. (2017b): Vox 7	Picture naming (prepare to name, correct trials) vs rest	CAA Aphasia with IFG POp damage (n = 16) vs without IFG POp damage (n = 23)	YCT	<u>UNR</u>	Vox <u>C-</u>	Behavioral data notes: covert phase but accuracy derived from overt phase; search volume: whole brain; software: FSL 5.0.6; voxelwise p: .01; cluster extent cutoff: based on GRFT; lesion volume covariate	↓ R IFG pars triangularis ↓ R dorsolateral prefrontal cortex
Skipper- Kallal et al. (2017b): Vox 8	Picture naming (produce the name, correct trials) vs rest	CAA Aphasia with motor cortex damage (n = 24) vs without motor cortex damage (n = 15)	YCT	<u>UNR</u>	Vox <u>C-</u>	Search volume: whole brain; software: FSL 5.0.6; voxelwise p: .01; cluster extent cutoff: based on GRFT; lesion volume covariate	None
Skipper- Kallal et al. (2017b): Vox 9	Picture naming (produce the name, correct trials) vs rest	CAA Aphasia with STS damage (n not stated) vs without STS damage (n not stated)	YCT	<u>UNR</u>	Vox <u>C-</u>	Search volume: whole brain; software: FSL 5.0.6; voxelwise p: .01; cluster extent cutoff: based on GRFT; lesion volume covariate	None
Skipper- Kallal et al. (2017b): ROI 1	Picture naming (prepare to name, correct trials) vs rest	CC Aphasia with IFG POp damage (n = 16) Covariate: PNT	YCT	<u>UNR</u>	ROI Func One	Behavioral data notes: covert phase but accuracy derived from overt phase; number of ROIs: 1; ROI: R DLPFC; how ROI defined: peak location for decreased activation for patients with left insula and left POp lesions compared to patients without said damage; lesion volume covariate	None
Skipper- Kallal et al. (2017b): ROI 2	Picture naming (prepare to name, correct trials) vs rest	CC Aphasia without IFG POp damage (n = 23) Covariate: PNT	YCT	<u>UNR</u>	ROI Func One	Behavioral data notes: covert phase but accuracy derived from overt phase; number of ROIs: 1; ROI: R DLPFC; how ROI defined: peak location for decreased activation for patients with left insula and left POp lesions compared to patients without said damage; lesion volume covariate	None
Skipper- Kallal et al. (2017b): ROI 3	Picture naming (prepare to name, correct trials) vs rest	CC Aphasia with insula damage (n = 18) Covariate: PNT	ҮСТ	UNR	ROI Func One	Behavioral data notes: covert phase but accuracy derived from overt phase; number of ROIs: 1; ROI: R DLPFC; how ROI defined: peak location for decreased activation for patients with left insula and left POp lesions compared to patients without said damage; lesion volume covariate	None
Skipper- Kallal et al. (2017b): ROI 4	Picture naming (prepare to name, correct trials) vs rest	CC Aphasia without insula damage (n =	YCT	<u>UNR</u>	ROI Func One	Behavioral data notes: covert phase but accuracy derived from overt phase; number of ROIs: 1; ROI: R DLPFC; how ROI defined: peak location	None

		21) Covariate: PNT				for decreased activation for patients with left insula and left POp lesions compared to patients without said damage; lesion volume covariate	
Skipper- Kallal et al. (2017b): ROI 5	Picture naming (prepare to name, correct trials) vs rest	CAA Aphasia with IPS damage (n not stated) vs without IPS damage (n not stated)	YCT	<u>UNR</u>	ROI Func <u>NC</u>	Behavioral data notes: covert phase but accuracy derived from overt phase; number of ROIs: 5; ROIs: (1) L IPS; (2) L insula; (3) L IFG pars opercularis; (4) R IPS; (5) R insula; how ROIs defined: 5 mm spheres around control peaks; lesion volume covariate	None
Skipper- Kallal et al. (2017b): ROI 6	Picture naming (prepare to name, correct trials) vs rest	CAA Aphasia with insula damage (n = 18) vs without insula damage (n = 21)	YCT	<u>UNR</u>	ROI Func <u>NC</u>	Behavioral data notes: covert phase but accuracy derived from overt phase; number of ROIs: 5; ROIs: (1) L IPS; (2) L insula; (3) L IFG pars opercularis; (4) R IPS; (5) R insula; how ROIs defined: 5 mm spheres around control peaks; lesion volume covariate	None
Skipper- Kallal et al. (2017b): ROI 7	Picture naming (prepare to name, correct trials) vs rest	CAA Aphasia with IFG POp damage (n = 16) vs without IFG POp damage (n = 23)	YCT	<u>UNR</u>	ROI Func <u>NC</u>	Behavioral data notes: covert phase but accuracy derived from overt phase; number of ROIs: 5; ROIs: (1) L IPS; (2) L insula; (3) L IFG pars opercularis; (4) R IPS; (5) R insula; how ROIs defined: 5 mm spheres around control peaks; lesion volume covariate	None
Skipper- Kallal et al. (2017b): ROI 8	Picture naming (produce the name, correct trials) vs rest	CAA Aphasia with motor cortex damage (n = 24) vs without motor cortex damage (n = 15)	YCT	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 4; ROIs: (1) L motor; (2) L pSTS; (3) R motor; (4) R pSTS; how ROIs defined: 5 mm spheres around control peaks; lesion volume covariate	↑ R somato-motor
Skipper- Kallal et al. (2017b): ROI 9	Picture naming (produce the name, correct trials) vs rest	CAA Aphasia with STS damage (n not stated) vs without STS damage (n not stated)	YCT	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 4; ROIs: (1) L motor; (2) L pSTS; (3) R motor; (4) R pSTS; how ROIs defined: 5 mm spheres around control peaks; lesion volume covariate	↓ R somato-motor
Skipper- Kallal et al. (2017b): ROI 10	Picture naming (produce the name, correct trials) vs rest	CC Aphasia without motor cortex damage (n = 15) Covariate: PNT	YCT	<u>UNR</u>	ROI Func One	Number of ROIs: 1; ROI: R motor; how ROI defined: 5 mm sphere around control peak; lesion volume covariate	None
Skipper- Kallal et al. (2017b): ROI 11	Picture naming (produce the name, correct trials) vs rest	CC Aphasia with motor cortex damage (n = 24) Covariate: PNT	YCT	<u>UNR</u>	ROI Func One	Number of ROIs: 1; ROI: R motor; how ROI defined: 5 mm sphere around control peak; lesion volume covariate	↑ R somato-motor
Dietz et al. (2018): ROI 1	Verb generation (overt) vs noun repetition	CAA Aphasia with AAC treatment (n = 6) T2 vs usual care T2 (n = 6) <u>Somewhat valid</u> (marginal treatment effect)	<u>UNR</u>	<u>UNR</u>	ROI LI One	Number of ROIs: 1; ROI: frontal LI; <u>temporal LI calculated but not</u> <u>reported</u>	None
Dietz et al. (2018): ROI 2	Verb generation (overt) vs noun repetition	LC Aphasia (both groups) T2 vs T1 Covariate: Δ WAB AQ <u>Somewhat valid</u> (gain in AQ not tested for significance)	UNR	<u>UNR</u>	ROI LI One	Number of ROIs: 1; ROI: frontal LI; temporal LI calculated but not reported	↑ LI (frontal)

Hallam et al. (2018): ROI 1	Listening to high or low ambiguity sentences vs listening to spectrally rotated speech	CAC Aphasia vs control	<u>NANB</u>	NANT	ROI Func <u>NC</u>	Number of ROIs: 2; ROIs: (1) L vATL; (2) L pMTG; how ROIs defined: functional coordinates in literature; ANOVA revealed main effect of group (patient vs control), confirmed in follow-up tests for each ROI	↑ L posterior MTG ↑ L anterior temporal
Hallam et al. (2018): ROI 2	Listening to high ambiguity sentences vs listening to low ambiguity sentences	CAC Aphasia vs control	<u>NANB</u>	NANT	ROI Func <u>NC</u>	Number of ROIs: 2; ROIs: (1) L vATL; (2) L pMTG; how ROIs defined: functional coordinates in literature; no interaction of group by condition	None
Hallam et al. (2018): Cplx 1	Listening to high ambiguity sentences vs listening to low ambiguity sentences	CAC Aphasia (subset with resting state data, n = 10) vs control (subset with resting state data, n = 10)	NANB	NANT	Cplx	A whole brain analysis was carried out to identify regions where the groups differed in the extent to which the strength of functional connectivity at rest from L pMTG was associated with the difference in signal between the high ambiguity and low ambiguity conditions in the same ROI. <u>Thresholding is not described and</u> <u>cluster extent is not reported.</u>	Other: There was a functional activation by group interaction in the L aSTG. For controls, there was a positive association between L pMTG activity and functional connectivity to aSTG, while for the patients, there was a negative association.
Hallam et al. (2018): Cplx 2	Listening to high ambiguity sentences vs listening to low ambiguity sentences	CAC Aphasia (subset with resting state data, n = 10) vs control (subset with resting state data, n = 10)	NANB	NANT	Cplx	A whole brain analysis was carried out to identify regions where the groups differed in the extent to which the strength of functional connectivity at rest from L pMTG was associated with the difference in signal between the high ambiguity and low ambiguity conditions in the same ROI. Thresholding is not described.	None notes: no interaction is reported; both groups showed a correlation between L vATL activity and functional connectivity to a ventral IFG region
Nenert et al. (2018): Vox 1	Semantic decision vs tone decision	CAC Aphasia T1 vs control	<u>AM</u>	<u>UNR</u>	Vox VP	Behavioral data notes: patients less accurate than controls on both tasks, but more so on the tone decision task; search volume: whole brain; software: SPM12/SnPM13; voxelwise p: FWE p < .05	↑ L Heschl's gyrus
Nenert et al. (2018): Vox 2	Semantic decision vs tone decision	CAC Aphasia T2 vs control	<u>AM</u>	<u>UNR</u>	Vox VP	Behavioral data notes: patients less accurate than controls on both tasks, but more so on the tone decision task; search volume: whole brain; software: SPM12/SnPM13; voxelwise p: FWE p < .05	None
Nenert et al. (2018): Vox 3	Semantic decision vs tone decision	CAC Aphasia T3 vs control	<u>AM</u>	<u>UNR</u>	Vox VP	Behavioral data notes: patients less accurate than controls on both tasks, but more so on the tone decision task; search volume: whole brain; software: SPM12/SnPM13; voxelwise p: FWE p < .05	None
Nenert et al. (2018): Vox 4	Semantic decision vs tone decision	CAC Aphasia T4 vs control	<u>AM</u>	<u>UNR</u>	Vox VP	Behavioral data notes: patients less accurate than controls on both tasks, but more so on the tone decision task;	None

Netret re al. (2018)         Semantic decision vs. tone decision         CAC Aphasia T5 vs. control         AM         UM         Vark Vs         Vark Vs         None           Netret re al. (2018)         vs. tone decision vs. tone decision         CAC Aphasia T1 vs. control         AM         UM         Vark         Betravoral data notes: patients less accurate than controls on the tones on the tone so not tone whole brain; software: SPM1256/M13; voxelwise p. FWE p - Software         None           Neteret et (1, (2018); Vox 7         Tinger tapping         CAC Aphasia T3 vs. control         UM         UM         Vark         Search volume: whole brain; software: SPM1256/M13; voxelwise p. FWE p - Software         None           Neteret et (1, (2018); Vox 8         Tinger tapping         CAC Aphasia T3 vs. control         UM         UM         Vark         Search volume: whole brain; software: SPM1256/M13; voxelwise p. FWE p - Software         None           Neteret et (1, (2018); Vox 10         Search volume: whole brain; software: Search volume: whole brain; software: SPM1256/M13; voxelwise p. FWE p - Software							
I. (2018):     vs tone decision     Aphasia T5 vs control     Image: Second controls on both sacks, search volume: whole brain; software:       Vox 5     Verb generation vs     CAC     UNB     UNB     Vvs     Search volume: whole brain; software:     None       Al, (2018):     ringer tapping     CAC     UNB     UNB     Vvs     Search volume: whole brain; software:     None       Al, (2018):     ringer tapping     CAC     UNB     UNB     Vvs     Search volume: whole brain; software:     None       Al, (2018):     ringer tapping     CAC     UNB     UNB     Vvs     Search volume: whole brain; software:     None       Al, (2018):     ringer tapping     CAC     UNB     UNB     Vvs     Search volume: whole brain; software:     None       Al, (2018):     ringer tapping     CAC     Aphasia T4 vs control     UNB     Vvs     Search volume: whole brain; software:     None       Al, (2018):     ringer tapping     CAC     Aphasia T4 vs control     UNB     Vvs     Search volume: whole brain; software:     None       Al, (2018):     ringer tapping     CAC     Aphasia T4 vs control     UNB     Vvs     Search volume: whole brain; software:     Interior       Al, (2018):     vs tone decision     CC     CAC     Aphasia T4 vs aphasin     Vv     S						SPM12/SnPM13; voxelwise p: FWE p <	
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al. (2018):       finger tapping       Aphasia T2 vs control       VP       SPM12/SPM13; voxelwise p: FWE p <         Nenertet al. (2018):       Verb generation vs (finger tapping)       CAC Aphasia T3 vs control       UNR       UNR       VP       Spm12/SPM13; voxelwise p: FWE p <	al. (2018):			<u>UNR</u>	<u>UNR</u>	SPM12/SnPM13; voxelwise p: FWE p <	None
al. (2018):       finger tapping       Aphasia T3 vs control       VP       SPM12/SnPM13; voxelwise p: FWE p <	al. (2018):	-		<u>UNR</u>	<u>UNR</u>	SPM12/SnPM13; voxelwise p: FWE p <	None
I.I. Coll31: Vox 9finger tapping (DVx 9Aphasia T4 vs controlVP VP (DSSPM12/SnPM13; voxelwise p: FWE p < (DSNoneNenert et al. (2018): Vox 10Verb generation vs finger tappingCAC Aphasia T5 vs controlUNR (DN Aphasia T1 Covariate: semantic decision accuracyUNR VVV V SPM12/SnPM13; voxelwise p: FWE p < SPM12/SnPM13; voxelwise p: FWE p SPM12/SnPM13; voxelwise p: FWE p <br< td=""><td>al. (2018):</td><td>-</td><td></td><td><u>UNR</u></td><td><u>UNR</u></td><td>SPM12/SnPM13; voxelwise p: FWE p &lt;</td><td>None</td></br<>	al. (2018):	-		<u>UNR</u>	<u>UNR</u>	SPM12/SnPM13; voxelwise p: FWE p <	None
al. (2018): Vox 10finger tapping Nenert et al. (2018):Aphasia T5 vs controlVPSPM12/SnPM13; voxelwise p: FWE p < .051 Lanterior temporal nowline: whole brain; software: temporal nowlinis ws tone decision decision accuracy1 Lanterior temporal nowline: whole brain; software: SPM12/SnPM13; voxelwise p: FWE p < .051 Lanterior temporal nowline: whole brain; software: monthy this type of analysis was run onty for semantic decision accuracyUNR Aphasia T1 Covariate: Δ BNTUNR VPVPSearch volume: whole brain; software: Now SPM12/SnPM13; voxelwise p: FWE p < .05NoneNenert et al. (2018): Vox 13Semantic decision stone decision al. (2018): vs tone decisionLC Aphasia T4 vs aphasia T1 Covariate: Δ BNTUNR VPUNR VPVPX Search volume: whole brain; software: .05NoneNenert et al. (2018): Vox 13Semantic decision vs tone decision vs tone decisionLC Aphasia T4 vs aphasia 	al. (2018):			<u>UNR</u>	<u>UNR</u>	SPM12/SnPM13; voxelwise p: FWE p <	None
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al. (2018): Vox 12vs tone decision r1 Covariate: Δ BNTAphasia T4 vs aphasia T1 Covariate: Δ BNTVP VPSPM12/SnPM13; voxelwise p: FWE p < .05NoneNenert et al. (2018): Vox 13Semantic decision vs tone decision vs tone decision al. (2018): Vox 14LC Aphasia T4 vs aphasia T1 Covariate: Δ semantic fluencyUNR VPVP VPSearch volume: whole brain; software: SPM12/SnPM13; voxelwise p: FWE p < .05NoneNenert et al. (2018): vox 14Semantic decision vs tone decision al. (2018): vox 15LC Aphasia T4 vs aphasia T1 Covariate: Δ PPVTUNR VPVP VPSearch volume: whole brain; software: SPM12/SnPM13; voxelwise p: FWE p < .05NoneNenert et al. (2018): vox 15Semantic decision vs tone decision al. (2018): vs tone decision vs tone decision al. (2018): vox 16LC Aphasia T4 vs aphasia T1 Covariate: Δ phonemic fluencyUNR VPVox VPSearch volume: whole brain; software: SPM12/SnPM13; voxelwise p: FWE p < .05NoneNenert et al. (2018): vox 16Semantic decision vs tone decision vs tone decisionLC Aphasia T4 vs aphasia T1 Covariate: Δ phonemic fluencyUNR VPVox VPSearch volume: whole brain; software: SPM12/SnPM13; voxelwise p: FWE p < .05NoneNenert et al. (2018): vox 16Semantic decision vs tone decision vox 16LC Aphasia T4 vs aphasia T1 Covariate: Δ BDAE complex ideation subtestUNR VPVox Search volume: whole brain; software: .05NoneNenert et al. (2	al. (2018):		Aphasia T1 Covariate: semantic	С	<u>UNR</u>	SPM12/SnPM13; voxelwise p: FWE p <	temporal notes: unclear why this type of analysis was run only for semantic task, and only at
al. (2018): Vox 13vs tone decision Covariate: Δ semantic fluencyAphasia T4 vs aphasia T1 Covariate: Δ semantic fluencyVPSPM12/SnPM13; voxelwise p: FWE p < .05NoneNenert et al. (2018): Vox 14Semantic decision vs tone decision Vox 14LC Aphasia T4 vs aphasia T1 Covariate: Δ PPVTUNR VPVN VPSearch volume: whole brain; software: SPM12/SnPM13; voxelwise p: FWE p < .05NoneNenert et 	al. (2018):		Aphasia T4 vs aphasia T1	<u>UNR</u>	<u>UNR</u>	SPM12/SnPM13; voxelwise p: FWE p <	None
al. (2018): Vox 14vs tone decision T1 Covariate: Δ PPVTAphasia T4 vs aphasia 	al. (2018):		Aphasia T4 vs aphasia T1 Covariate: Δ semantic	<u>UNR</u>	<u>UNR</u>	SPM12/SnPM13; voxelwise p: FWE p <	None
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al. (2018): Vox 16vs tone decision the covariate: Δ BDAE complex ideation 	al. (2018):		Aphasia T4 vs aphasia T1 Covariate: Δ	<u>UNR</u>	<u>UNR</u>	SPM12/SnPM13; voxelwise p: FWE p <	None
al. (2018):finger tappingAphasia T4 vs aphasiaVPSPM12/SnPM13; voxelwise p: FWE p <Vox 17T1.05	al. (2018):		Aphasia T4 vs aphasia T1 Covariate: Δ BDAE complex ideation	<u>UNR</u>	UNR	SPM12/SnPM13; voxelwise p: FWE p <	None
	al. (2018):		Aphasia T4 vs aphasia T1	<u>UNR</u>	<u>UNR</u>	SPM12/SnPM13; voxelwise p: FWE p <	None

Neteret et (2016): Nor 18         Vort generation vs miger tapping         LC Aphasia T4 vs aphasia T1 covriate: 4 semantic numery         UNE Ver Semantic Neteret (2017): Nor 19         UNE Semantic Science Sci								
III. (2018):       Inger Tapping       Aphasia T4 vs. aphasia       VP       SPM 12/SnPM13; voxelwise p: PWE p <	al. (2018):	-	Aphasia T4 vs aphasia T1 Covariate: Δ semantic	<u>UNR</u>	<u>UNR</u>		SPM12/SnPM13; voxelwise p: FWE p <	prefrontal cortex ↑ L SMA/medial prefrontal ↑ R somato-motor ↑ R anterior
al. (2018):       finger topping       Aphabaia T4 vs aphabaia       VP       SPM12/SnPM13; voxelwise p: FWE p <	al. (2018):		Aphasia T4 vs aphasia T1	<u>UNR</u>	<u>UNR</u>		SPM12/SnPM13; voxelwise p: FWE p <	None
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al. (2018):       vs tone decision       Aphasia (comparisons between all pairs of time points)       NC       NC       (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI         Nenert et al. (2018):       Verb generation vs finger tapping       LA       Aphasia (comparisons between all pairs of time points)       NUME       ROI       Number of ROIs: 4; ROIs: (1) frontal LI; (3) language network LI; (4) cerebellar LI       None         ROI 2       Semantic decision       CAC       Aphasia 11 vs control       ML       UNR       ROI       Behavioral data notes: patients less accurate than controls on both tasks, but more so on the tone decision task; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI       None         Nenert et al. (2018):       Semantic decision al. (2018):       CAC       APhasia 12 vs control       AM       LNR       ROI       Behavioral data notes: patients less accurate than controls on both tasks, number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI       None         ROI 4       vs tone decision al. (2018):       CAC       APhasia T2 vs control       AM       LNR       ROI       Behavioral data notes: patients less accurate than controls on both tasks, number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language       None         ROI 4       vs tone decision al. (2018);       vs tone decision       CAC       Aphasia T3 vs control       ML       NL	al. (2018):	-	Aphasia T4 vs aphasia T1 Covariate: Δ BDAE complex ideation	<u>UNR</u>	<u>UNR</u>		SPM12/SnPM13; voxelwise p: FWE p <	None
al. (2018): ROI 2finger tapping between all pairs of time points)Aphasia (comparisons between all pairs of time points)LI NC(2) temporo-parietal LI; (3) language network LI; (4) cerebellar LINoneNenert et al. (2018): V s tone decision al. (2018):Semantic decision Aphasia T1 vs controlAM Aphasia T1 vs controlMM V NNoneBehavioral data notes; patients less but more so on the tone decision task; number of ROIs: 4; ROIs; (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LINoneNenert et al. (2018): V stone decision Al. (2018):CAC Aphasia T2 vs controlAM AM Aphasia T2 vs controlMM AM NCNoneNenert et al. (2018): V stone decision Al. (2018): V stone decisionCAC Aphasia T3 vs controlAM Aphasia T3 vs controlUNR AM NCROI Behavioral data notes; patients less but more so on the tone decision task; number of ROIs; 4; ROIs; (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LINoneNenert et al. (2018): N vs tone decision Al. (2018): N vs tone decisionCAC Aphasia T3 vs controlAM AM Aphasia T4 vs controlMM AM APhasia T4 vs controlNoneNenert et al. (2018): N vs tone decision Al. (2018): N vs tone decisionCAC Aphasia T4 vs controlAM APhasia T4 vs controlLI APhasia T4 vs controlCAC Aphasia T4 vs controlAM APhasia T4 vs controlNoneNenert et al. (2018): N vs tone decision Al. (2018): N vs tone decisionCAC Aphasia T4 vs controlA	al. (2018):		Aphasia (comparisons between all pairs of	<u>AS</u>	<u>UNR</u>	LI	(2) temporo-parietal LI; (3) language	None
al. (2018): RO13vs tone decision classical decisionAphasia T1 vs controlL NCNC NCaccurate than controls on both tasks, hut more so on the tone decision task; number of ROIs: 4; ROIs(1) (1) fornal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LINenert et al. (2018): RO14Semantic decision Aphasia T2 vs controlAM Aphasia T2 vs controlMM AM Phasia T2 vs controlROI AM Phasia T2 vs controlBehavioral data notes: patients less but more so on the tone decision task; number of ROIs: 4; ROIs: (1) fornal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LINoneNenert et al. (2018): ROI 5Semantic decision Aphasia T3 vs controlAM Aphasia T3 vs controlMM AM Aphasia T3 vs controlROI AM Aphasia T3 vs controlROI Aphasia T3 vs controlNone Aphasia T3 vs control NCNoneNenert et al. (2018): Vs tone decision ROI 6Semantic decision sy tone decision Aphasia T4 vs controlAM Aphasia T4 vs controlMM Aphasia T4 vs control Aphasia T4 vs controlAM Aphasia T4 vs control Aphasia T5 vs controlAM Aphasia T5 vs control <td>al. (2018):</td> <td>-</td> <td>Aphasia (comparisons between all pairs of</td> <td><u>UNR</u></td> <td><u>UNR</u></td> <td>LI</td> <td>(2) temporo-parietal LI; (3) language</td> <td>None</td>	al. (2018):	-	Aphasia (comparisons between all pairs of	<u>UNR</u>	<u>UNR</u>	LI	(2) temporo-parietal LI; (3) language	None
al. (2018): ROI 4vs tone decision ROI 4Aphasia T2 vs controlLI NCaccurate than controls on both tasks, but more so on the tone decision task; number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LINoneNenert et al. (2018): ROI 5Semantic decision vs tone decision ROI 5CAC Aphasia T3 vs controlAM Aphasia T3 vs controlUNR Aphasia T3 vs controlROI Aphasia T3 vs controlBehavioral data notes: patients less accurate than controls on both tasks, hur more so on the tone decision task; number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LINoneNenert et al. (2018): ROI 6Semantic decision vs tone decision ROI 6CAC Aphasia T4 vs controlAM Aphasia T4 vs controlUNR Aphasia T4 vs controlROI Aphasia T4 vs controlNoneNenert et al. (2018): ROI 6Semantic decision vs tone decision al. (2018): vs tone decisionCAC Aphasia T4 vs controlAM Aphasia T5 vs controlUNR Aphasia T5 vs controlROI Aphasia T5 vs controlAM Aphasia T5 vs controlUNR Aphasia T5 vs controlROI Aphasia T5 vs controlAM Aphasia T5 vs controlUNR Aphasia T5 vs controlBehavioral data notes: patients less accurate than controls on both tasks, hur more so on the tone decision task; number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LINoneNone (2) Comport (2) temporo-parietal LI; (3) languageCAC Aphasia T5 vs controlAM Aphasia T5 vs control	al. (2018):			<u>AM</u>	<u>UNR</u>	LI	accurate than controls on both tasks, but more so on the tone decision task; number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language	None
al. (2018): ROI 5vs tone decision ROI 5Aphasia T3 vs controlL L Neaccurate than controls on both tasks, but more so on the tone decision task; number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LINoneNenert et al. (2018): ROI 6Semantic decision vs tone decision vs tone decisionCAC Aphasia T4 vs controlAM AP Aphasia T4 vs controlUNR AP NeROI LI NCBehavioral data notes: patients less accurate than controls on both tasks, humber of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LINoneNenert et al. (2018): ROI 7Semantic decision vs tone decisionCAC Aphasia T5 vs controlAM AP APhasia T5 vs controlVNR ROI AP Aphasia T5 vs controlROI AP AP AP APBehavioral data notes: patients less accurate than controls on both tasks, humber of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LINoneNenert et al. (2018): ROI 7Semantic decision vs tone decisionCAC Aphasia T5 vs controlAM AP AP APUNR AP AP APROI Behavioral data notes: patients less accurate than controls on both tasks, but more so on the tone decision task; number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI	al. (2018):			<u>AM</u>	<u>UNR</u>	LI	accurate than controls on both tasks, but more so on the tone decision task; number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language	None
al. (2018): ROI 6vs tone decision scienceAphasia T4 vs controlLI Neaccurate than controls on both tasks, but more so on the tone decision task; number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LINenert et al. (2018): ROI 7Semantic decision vs tone decision vs tone decisionCAC Aphasia T5 vs controlAM APhasia T5 vs controlUNR Aphasia T5 vs controlROI LI NEBehavioral data notes: patients less accurate than controls on both tasks, but more so on the tone decision task; number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LINone	al. (2018):			<u>AM</u>	<u>UNR</u>	LI	accurate than controls on both tasks, but more so on the tone decision task; number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language	None
al. (2018): vs tone decision Aphasia T5 vs control LI accurate than controls on both tasks, ROI 7 NC but more so on the tone decision task; number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI	al. (2018):			<u>AM</u>	<u>UNR</u>	LI	accurate than controls on both tasks, but more so on the tone decision task; number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language	None
	al. (2018):			<u>AM</u>	<u>UNR</u>	LI	accurate than controls on both tasks, but more so on the tone decision task; number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language	None
	Nenert et	Verb generation vs	CAC	UNR	UNR	ROI		None

al. (2018): ROI 8	finger tapping	Aphasia T1 vs control			LI <u>NC</u>	(2) temporo-parietal Ll; (3) language network Ll; (4) cerebellar Ll	
Nenert et al. (2018): ROI 9	Verb generation vs finger tapping	CAC Aphasia T2 vs control	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI	↓ Ll (language network) ↓ Ll (frontal)
Nenert et al. (2018): ROI 10	Verb generation vs finger tapping	CAC Aphasia T3 vs control	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI	↓ Ll (language network) ↓ Ll (frontal)
Nenert et al. (2018): ROI 11	Verb generation vs finger tapping	CAC Aphasia T4 vs control	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI	None
Nenert et al. (2018): ROI 12	Verb generation vs finger tapping	CAC Aphasia T5 vs control	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 4; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI	None
Nenert et al. (2018): Cplx 1	Semantic decision vs tone decision	LA Aphasia (comparisons between all pairs of time points)	<u>AS</u>	<u>UNR</u>	Cplx	PPI analyses were carried out to investigate potential changes over time in how connectivity from L and R IFG was modulated by the semantic decision task. The resultant SPM was thresholded at FWE p < .05 using permutation testing implemented in SnPM 13.	None
Nenert et al. (2018): Cplx 2	Verb generation vs finger tapping	LA Aphasia (comparisons between all pairs of time points)	<u>UNR</u>	<u>UNR</u>	Cplx	PPI analyses were carried out to investigate potential changes over time in how connectivity from L and R IFG was modulated by the verb generation task. The resultant SPM was thresholded at FWE p < .05 using permutation testing implemented in SnPM 13.	None
Pillay et al. (2018): Vox 1	Reading nouns aloud (correct trials) vs reading nouns aloud (incorrect trials)	CB Aphasia	NBD	Y	Vox <u>CCS</u>	Search volume: whole brain; software: AFNI; voxelwise p: .01; cluster extent cutoff: 1.609 cc; regarding correction for multiple comparisons, addition of monoexponential function reduces but does not eliminate inflation of p values (Cox et al., 2017)	<ul> <li>↑ L angular gyrus</li> <li>↓ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↓ L SMA/medial</li> <li>prefrontal</li> <li>↓ R insula</li> <li>↓ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↓ R SMA/medial</li> <li>prefrontal</li> <li>notes: positive</li> <li>region (L AG) was</li> <li>part of the</li> <li>semantic network,</li> <li>while many</li> <li>negative regions</li> <li>were positively</li> <li>modulated by</li> <li>reaction time in</li> <li>the aphasia group</li> </ul>
Szaflarski et al. (2018): Vox 1	Semantic decision vs tone decision	LA Aphasia T2 vs T1	UNR	<u>UNR</u>	Vox <u>CCTB</u>	Search volume: whole brain; software: SPM12; voxelwise p: .05; cluster extent cutoff: 0.928 cc	<ul> <li>↑ L supramarginal gyrus</li> <li>↑ L intraparietal sulcus</li> <li>↑ L precuneus</li> <li>↑ L posterior STG</li> <li>↑ L Heschl's gyrus</li> <li>↑ L mid temporal</li> <li>↑ L anterior</li> </ul>

							temporal ↑ R supramarginal gyrus ↑ R superior parietal ↑ R precuneus ↑ R mid temporal ↑ R anterior cingulate ↓ L IFG pars opercularis ↓ L dorsolateral prefrontal cortex ↓ L ventral precentral/inferior frontal junction ↓ L dorsal precentral ↓ L SMA/medial prefrontal ↓ L somato-motor ↓ L superior parietal ↓ L occipital
Szaflarski et al. (2018): Vox 2	Semantic decision vs tone decision	LA Aphasia T3 vs T2	UNR	UNR	Vox <u>CCTB</u>	Search volume: whole brain; software: SPM12; voxelwise p: .05; cluster extent cutoff: 0.928 cc	<ul> <li>L dorsolateral prefrontal cortex</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L posterior STS</li> <li>L SMA/medial prefrontal</li> <li>L anterior temporal</li> <li>L anterior cingulate</li> <li>R lFG</li> <li>R dorsolateral prefrontal cortex</li> <li>R ventral precentral/inferior frontal junction</li> <li>R SMA/medial prefrontal</li> <li>R somato-motor</li> <li>R precuneus</li> <li>R osterior</li> <li>STG/STS/MTG</li> <li>R anterior</li> </ul>
Szaflarski et al. (2018): Vox 3	Semantic decision vs tone decision	LA Aphasia T3 vs T1	UNR	UNR	Vox <u>CCTB</u>	Search volume: whole brain; software: SPM12; voxelwise p: .05; cluster extent cutoff: 0.928 cc	<ul> <li>↑ L supramarginal gyrus</li> <li>↑ L angular gyrus</li> <li>↑ L precuneus</li> <li>↑ L posterior STG</li> <li>↑ L mid temporal</li> <li>↑ L anterior</li> <li>temporal</li> <li>↑ L posterior</li> <li>cingulate</li> <li>↓ L somato-motor</li> <li>↓ R dorsolateral</li> <li>prefrontal cortex</li> </ul>

Szaflarski et al. (2018): Vox 4	Semantic decision vs tone decision	LC Aphasia T3 vs aphasia T2 Covariate: Δ WAB AQ	<u>UNR</u>	<u>UNR</u>	Vox <u>CCTB</u>	Search volume: whole brain; software: SPM12; voxelwise p: .05; cluster extent cutoff: 0.928 cc; inclusive mask of voxels that differed between T2 and T3	↓ L inferior parietal lobule
Szaflarski et al. (2018): Vox 5	Semantic decision vs tone decision	LC Aphasia T3 vs aphasia T1 Covariate: Δ BNT	<u>UNR</u>	<u>UNR</u>	Vox <u>CCTB</u>	Search volume: whole brain; software: SPM12; voxelwise p: .05; cluster extent cutoff: 0.928 cc; inclusive mask of voxels that differed between T1 and T3	↓ R IFG
van de Sandt- Koenderman et al. (2018): ROI 1	Listening to narrative speech vs listening to reversed speech	CC Aphasia T1 Covariate: lesion volume	<u>NANB</u>	NANT	ROI LI One	Number of ROIs: 1; ROI: language network LI; how ROI defined: activations that were "not clearly related to known language areas" were excluded, but the basis for this determination is not clear	None
van de Sandt- Koenderman et al. (2018): ROI 2	Listening to narrative speech vs listening to reversed speech	LC Aphasia T2 vs T1 Covariate: lesion volume	<u>NANB</u>	NANT	ROI LI One	Number of ROIs: 1; ROI: language network LI; how ROI defined: activations that were "not clearly related to known language areas" were excluded, but <u>the basis for this</u> <u>determination is not clear</u>	None
van de Sandt- Koenderman et al. (2018): ROI 3	Listening to narrative speech vs listening to reversed speech	LC Aphasia T2 vs T1 Covariate: Δ AAT repetition score	<u>NANB</u>	NANT	ROI LI One	Number of ROIs: 1; ROI: language network LI; how ROI defined: activations that were "not clearly related to known language areas" were excluded, but <u>the basis for this</u> <u>determination is not clear</u>	None
van de Sandt- Koenderman et al. (2018): ROI 4	Listening to narrative speech vs listening to reversed speech	LC Aphasia T2 vs T1 Covariate: ∆ ANELT	<u>NANB</u>	NANT	ROI LI One	Number of ROIs: 1; ROI: language network LI; how ROI defined: activations that were "not clearly related to known language areas" were excluded, but <u>the basis for this</u> <u>determination is not clear</u>	None
van Oers et al. (2018): ROI 1	Written word- picture matching vs visual decision	CC Aphasia (subset who returned for follow- up) T1 (n = 10) Covariate: subsequent outcome (T4) overall language measure (average of AAT measures)	UNR	UNR	ROI Func FDR	Number of ROIs: 12; ROIs: (1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFG; how ROIs defined: control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected	↑ L posterior inferior temporal gyrus/fusiform gyrus notes: activation predicted later outcome even when initial language performance was included in the model
van Oers et al. (2018): ROI 2	Written word- picture matching vs visual decision	CC Aphasia (all time points) Covariate: overall language measure (average of AAT measures) all time points	UNR	UNR	ROI Func <u>FDR</u>	Number of ROIs: 12; ROIs: (1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFG; how ROIs defined: control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001,	↑ L posterior inferior temporal gyrus/fusiform gyrus

						uncorrected; mixed model; <u>minimal</u> <u>detail provided</u>	
van Oers et al. (2018): ROI 3	Written word- picture matching vs visual decision	CC Aphasia (all time points) Covariate: average of AAT comprehension score and BNT, all time points	UNR	UNR	ROI Func FDR	Number of ROIs: 12; ROIs: (1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFG; how ROIs defined: control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected; mixed model; minimal detail provided	↓ R IFG pars opercularis ↓ R IFG pars triangularis
van Oers et al. (2018): ROI 4	Written word- picture matching vs visual decision	CC Aphasia (all time points) Covariate: picture- word matching accuracy, all time points	C	UNR	ROI Func FDR	Number of ROIs: 12; ROIs: (1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFG; how ROIs defined: control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected; mixed model; minimal detail provided	↑ R posterior inferior temporal gyrus/fusiform gyrus
van Oers et al. (2018): ROI 5	Written word- picture matching vs visual decision	LA Aphasia: linear effect of time	UNR	UNR	ROI Func FDR	Number of ROIs: 12; ROIs: (1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFG; how ROIs defined: control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected; mixed model; minimal detail provided	<ul> <li>↑ L dorsolateral prefrontal cortex</li> <li>↑ L angular gyrus</li> <li>↑ L posterior inferior temporal gyrus/fusiform gyrus</li> <li>↑ L anterior cingulate</li> <li>↑ R dorsolateral prefrontal cortex</li> <li>↑ R angular gyrus</li> <li>↑ R anterior cingulate</li> <li>↑ R thalamus</li> <li>↓ L IFG pars opercularis</li> <li>↓ L IFG pars triangularis notes: similar numbers of findings are reported for controls</li> </ul>
van Oers et al. (2018): ROI 6	Semantic decision vs visual decision	CC Aphasia (subset who returned for follow- up) T1 (n = 10) Covariate: subsequent outcome	<u>UNR</u>	<u>UNR</u>	ROI Func <u>FDR</u>	Number of ROIs: 6; ROIs: (1) L angular gyrus; (2) L IFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; how ROIs defined:	None
						,	

	(T4) overall language measure (average of AAT measures) <u>Somewhat valid</u> (not appropriate to correlate T1 imaging with T4 behavior without T1 behavior in model)				control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected	
van Oers et Semanti al. (2018): vs visual ROI 7	c decision CC decision Aphasia (all time points) Covariate: overall language measure (average of AAT measures) all time points	<u>UNR</u>	<u>UNR</u>	ROI Func <u>FDR</u>	Number of ROIs: 6; ROIs: (1) L angular gyrus; (2) L IFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; how ROIs defined: control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected; mixed model; minimal detail provided	None
van Oers et Semantio al. (2018): vs visual ROI 8	c decision CC decision Aphasia (all time points) Covariate: average of AAT comprehension score and BNT, all time points	<u>UNR</u>	UNR	ROI Func <u>FDR</u>	Number of ROIs: 6; ROIs: (1) L angular gyrus; (2) L IFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; how ROIs defined: control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected; mixed model; minimal detail provided	None
van Oers et Semantio al. (2018): vs visual ROI 9	c decision CC decision Aphasia (all time points) Covariate: semantic decision accuracy, all time points	С	UNR	ROI Func FDR	Number of ROIs: 6; ROIs: (1) L angular gyrus; (2) L IFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; how ROIs defined: control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected; mixed model; minimal detail provided	None
van Oers et Semantie al. (2018): vs visual ROI 10	c decision LA decision Aphasia: linear effect of time	UNR	UNR	ROI Func FDR	Number of ROIs: 6; ROIs: (1) L angular gyrus; (2) L IFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; how ROIs defined: control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected; mixed model; minimal detail provided	<ul> <li>↑ L posterior</li> <li>inferior temporal</li> <li>gyrus/fusiform</li> <li>gyrus</li> <li>↑ R angular gyrus</li> <li>↓ L IFG pars</li> <li>opercularis</li> <li>↓ L IFG pars</li> <li>triangularis</li> <li>notes: similar</li> <li>numbers of</li> <li>findings are</li> <li>reported for</li> <li>controls</li> </ul>
al. (2019): picture v	sentence- LA erification Aphasia treated (n = ng to 13) T2 vs T1	<u>UNR</u>	<u>UNR</u>	Vox <u>CCS</u>	Behavioral data notes: out-of-scanner performance on passive sentences improved; software: SPM8; voxelwise	↑ L precuneus ↑ R ventral precentral/inferior

	reversed speech and viewing scrambled pictures					p: .001; cluster extent cutoff: 37 voxels (size not stated)	frontal junction ↑ R somato-motor ↑ R supramarginal gyrus ↑ R intraparietal sulcus ↑ R superior parietal ↑ R precuneus notes: based on Table 7 and Figure 8
Barbieri et al. (2019): Vox 2	Auditory sentence- picture verification vs listening to reversed speech and viewing scrambled pictures	LA Aphasia natural history (n = 5) T2 vs T1	<u>UNR</u>	<u>UNR</u>	Vox <u>CCS</u>	Software: SPM8; voxelwise p: .001; cluster extent cutoff: 37 voxels (size not stated)	None
Barbieri et al. (2019): ROI 1	Auditory sentence- picture verification vs listening to reversed speech and viewing scrambled pictures	LAA (Aphasia treated (n=13) T2 vs T1) vs (aphasia natural history (n=5) T2 vs T1)	UNR	UNR	ROI Anat NC	Number of ROIs: 4; ROIs: (1) L hemisphere sentence processing network (IFGpt, pMTG, pSTG, AG); (2) R hemisphere homotopic regions; (3) L dorsal attention network (MFG, PrCG, SPL, sLOC); (4) R dorsal attention network (same regions); how ROIs defined: sentence processing network based on Walenski et al. (2019); dorsal attention network based on Corbetta et al. (2008) and Vincent et al. (2008); ROIs were defined based on Harvard- Oxford atlas which would align imperfectly with these functional networks; dependent variable was number of active voxels (p < .001, uncorrected) divided by number of intact voxels; derivation of dependent measures from ROIs difficulty to follow, but it seems that ROIs with less than 5 voxels upregulated were excluded and deactivations were not considered, meaning that estimates of change may be biased	<ul> <li>L dorsolateral prefrontal cortex</li> <li>L ventral precentral/inferior</li> <li>frontal junction</li> <li>L dorsal precentral</li> <li>L angular gyrus</li> <li>L intraparietal sulcus</li> <li>L superior parietal</li> <li>R dorsolateral prefrontal cortex</li> <li>R ventral precentral/inferior</li> <li>frontal junction</li> <li>R dorsal precentral</li> <li>R angular gyrus</li> <li>R intraparietal sulcus</li> <li>R superior</li> <li>rarietal</li> <li>R superior</li> <li>rarietal</li> <li>traparietal</li> <li>sulcus</li> <li>R superior</li> <li>parietal</li> <li>notes: bilateral</li> <li>dorsal attention</li> <li>network; findings</li> <li>were for networks</li> <li>as a whole;</li> <li>regions coded</li> <li>correspond to</li> <li>atlas ROIs</li> </ul>
Barbieri et al. (2019): ROI 2	Auditory sentence- picture verification vs listening to reversed speech and viewing scrambled pictures	LC Aphasia T2 vs T1 Covariate: ∆ offline comprehension composite	UNR	UNR	ROI Anat <u>NC</u>	Number of ROIs: 4; ROIs: (1) L hemisphere sentence processing network (IFGpt, pMTG, pSTG, AG); (2) R hemisphere homotopic regions; (3) L dorsal attention network (MFG, PrCG, SPL, sLOC); (4) R dorsal attention network (same regions); how ROIs defined: sentence processing network based on Walenski et al. (2019); dorsal attention network based on Corbetta et al. (2008) and Vincent et al. (2008); ROIs were defined based on Harvard-	<ul> <li>↑ R IFG pars</li> <li>triangularis</li> <li>↑ R dorsolateral</li> <li>prefrontal cortex</li> <li>↑ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↑ R dorsal</li> <li>precentral</li> <li>↑ R angular gyrus</li> <li>↑ R intraparietal</li> <li>sulcus</li> </ul>

						Oxford atlas which would align imperfectly with these functional networks; dependent variable was number of active voxels (p < .001, uncorrected) divided by number of intact voxels; derivation of dependent measures from ROIs difficulty to follow, but it seems that <u>ROIs with less</u> than 5 voxels upregulated were excluded and deactivations were not considered, meaning that estimates of change may be biased	↑ R superior parietal ↑ R posterior STG/STS/MTG notes: R homotopic sentence processing network and R dorsal attention network; findings were for networks as a whole; regions coded correspond to atlas ROIs
Barbieri et al. (2019): ROI 3	Auditory sentence- picture verification vs listening to reversed speech and viewing scrambled pictures	LC Aphasia participants with eye tracking data (n = 16) T2 vs T1 Covariate: ∆ decrease in eye tracking online thematic prediction score	UNR	UNR	ROI Anat <u>NC</u>	Number of ROIs: 4; ROIs: (1) L hemisphere sentence processing network (IFGpt, pMTG, pSTG, AG); (2) R hemisphere homotopic regions; (3) L dorsal attention network (MFG, PrCG, SPL, sLOC); (4) R dorsal attention network (same regions); how ROIs defined: sentence processing network based on Walenski et al. (2019); dorsal attention network based on Corbetta et al. (2008) and Vincent et al. (2008); ROIs were defined based on Harvard- Oxford atlas which would align imperfectly with these functional networks; dependent variable was number of active voxels (p < .001, uncorrected) divided by number of intact voxels; derivation of dependent measures from ROIs difficulty to follow, but it seems that ROIs with less than 5 voxels upregulated were excluded and deactivations were not considered, meaning that estimates of change may be biased	↑ R IFG pars triangularis ↑ R angular gyrus ↑ R posterior STG/STS/MTG notes: R homotopic sentence processing network; findings were for networks as a whole; regions coded correspond to atlas ROIs
Barbieri et al. (2019): ROI 4	Auditory sentence- picture verification vs listening to reversed speech and viewing scrambled pictures	LC Aphasia participants with eye tracking data (n = 16) T2 vs T1 Covariate: ∆ eye tracking online thematic integragration score	UNR	UNR	ROI Anat <u>NC</u>	Number of ROIs: 4; ROIs: (1) L hemisphere sentence processing network (IFGpt, pMTG, pSTG, AG); (2) R hemisphere homotopic regions; (3) L dorsal attention network (MFG, PrCG, SPL, sLOC); (4) R dorsal attention network (same regions); how ROIs defined: sentence processing network based on Walenski et al. (2019); dorsal attention network based on Corbetta et al. (2008) and Vincent et al. (2008); ROIs were defined based on Harvard- Oxford atlas which would align imperfectly with these functional networks; dependent variable was number of active voxels (p < .001, uncorrected) divided by number of intact voxels; derivation of dependent measures from ROIs difficulty to follow, but it seems that <u>ROIs with less</u> than 5 voxels upregulated were excluded and deactivations were not	<ul> <li>↑ R dorsolateral prefrontal cortex</li> <li>↑ R ventral precentral/inferior frontal junction</li> <li>↑ R dorsal precentral</li> <li>↑ R angular gyrus</li> <li>↑ R intraparietal sulcus</li> <li>↑ R superior parietal notes: R dorsal attention network; findings were for networks as a whole; regions coded correspond to atlas ROIs</li> </ul>

						<u>considered, meaning that estimates of</u> <u>change may be biased</u>	
Johnson et al. (2019): ROI 1	Picture naming (trained items) vs rest	CAC Aphasia treated T1 (n = 26) vs control	N	UNR	ROI Anat <u>NC</u>	Number of ROIs: 16; ROIs: (1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9- 16) homotopic counterparts; how ROIs defined: AAL but lesioned voxels were excluded from ROIs on an individual basis	<ul> <li>↑ L IFG pars</li> <li>triangularis</li> <li>↑ R IFG pars</li> <li>triangularis</li> <li>↓ L angular gyrus</li> <li>notes: significant</li> <li>interaction of ROI</li> <li>by group</li> </ul>
Johnson et al. (2019): ROI 2	Picture naming (trained items) vs rest	CAC Aphasia treated T2 (n = 26) vs control	N	UNR	ROI Anat <u>NC</u>	Number of ROIs: 16; ROIs: (1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9- 16) homotopic counterparts; how ROIs defined: AAL but lesioned voxels were excluded from ROIs on an individual basis	<ul> <li>↑ L IFG pars</li> <li>triangularis</li> <li>↑ R IFG pars</li> <li>opercularis</li> <li>↑ R IFG pars</li> <li>triangularis</li> <li>notes: significant</li> <li>interaction of ROI</li> <li>by group; patients</li> <li>also showed more</li> <li>activity than</li> <li>controls across the</li> <li>average of all ROIs</li> </ul>
Johnson et al. (2019): ROI 3	Picture naming (trained items) vs rest	LA Aphasia untreated (n = 10) T2 vs T1	Y	<u>UNR</u>	ROI Anat <u>NC</u>	Number of ROIs: 16; ROIs: (1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9- 16) homotopic counterparts; how ROIs defined: AAL but lesioned voxels were excluded from ROIs on an individual basis	None notes: no main effect of time or interaction of time by ROI
Johnson et al. (2019): Cplx 1	Picture naming (trained items) vs rest	LA Aphasia treated (n = 26) T2 vs T1	Ν	UNR	Cplx	A linear model was constructed to examine the relationship between proportion of spared tissue in each L hemisphere ROI and changes in activation over time. <u>The model is not</u> <u>described in sufficient detail</u> .	Other: There was a significant 3-way interaction of time by ROI by spared tissue, such that in some regions (AG, MFG, IFG orb, SMG), less spared tissue was associated with greater increases in activation, while in others (PrCG, IFG op, IFG tri), less spared tissue was associated with greater decreases in activation.
Kristinsson et al. (2019): Vox 1	Picture naming vs viewing abstract pictures	CAA Aphasia with typical genotype (n = 53) vs atypical genotype (n = 34)	Y	<u>UNR</u>	Vox VFWE	Software: SPM12	None
Purcell et al. (2019): Vox 1	Spelling probe (training items) vs rest	LA Aphasia with both timepoints (n = 20) T2 vs T1	<u>AM</u>	<u>AM</u>	Vox <u>CCS</u>	Behavioral data notes: see section S2, but main effects include known items also; search volume: appears to be restricted to voxels spared in all patients; software: BrainVoyager QX 2.4 or SPM12; voxelwise p: .01; cluster	↑ L posterior cingulate ↑ R angular gyrus ↑ R posterior cingulate

						extent cutoff: 49 voxels (size not stated)	
Purcell et al. (2019): ROI 1	Spelling probe (training items) vs rest	LC Aphasia with both timepoints (n = 20) T2 vs T1 Covariate: ∆ spelling accuracy on training items	<u>UNR</u>	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 3; ROIs: (1) R AG; (2) L PCC; (3) R PCC; how ROIs defined: regions activated in SPM analysis 1	None
Purcell et al. (2019): ROI 2	Spelling probe (training items) vs rest	LC Aphasia with both timepoints (n = 20) T2 vs T1 Covariate: ∆ spelling accuracy on untrained items	<u>UNR</u>	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 3; ROIs: (1) R AG; (2) L PCC; (3) R PCC; how ROIs defined: regions activated in SPM analysis 1	None
Purcell et al. (2019): ROI 3	Spelling probe (training items) vs rest	CC Aphasia T1 Covariate: subsequent Δ spelling accuracy on training items (T2 vs T1) <u>Somewhat valid</u> (T1 behavioral measure should be included in model)	UNR	UNR	ROI Func One	Number of ROIs: 1; ROI: L ventral occipitotemporal cortex; how ROI defined: the region that showed an increase in Local-Hreg from T1 to T2	None
Purcell et al. (2019): ROI 4	Spelling probe (training items) vs rest	CC Aphasia with both timepoints T1 (n = 20) Covariate: subsequent $\Delta$ spelling accuracy on untrained items (T2 vs T1) <u>Somewhat valid</u> (T1 behavioral measure should be included in model)	UNR	UNR	ROI Func One	Number of ROIs: 1; ROI: L ventral occipitotemporal cortex; how ROI defined: the region that showed an increase in Local-Hreg from T1 to T2	None
Purcell et al. (2019): ROI 5	Spelling probe (training items) vs rest	LC Aphasia with both timepoints (n = 20) T2 vs T1 Covariate: ∆ spelling accuracy on training items	<u>UNR</u>	<u>UNR</u>	ROI Func One	Number of ROIs: 1; ROI: L ventral occipitotemporal cortex; how ROI defined: the region that showed an increase in Local-Hreg from T1 to T2	None
Purcell et al. (2019): ROI 6	Spelling probe (training items) vs rest	LC Aphasia with both timepoints (n = 20) T2 vs T1 Covariate: ∆ spelling accuracy on untrained items	<u>UNR</u>	<u>UNR</u>	ROI Func One	Number of ROIs: 1; ROI: L ventral occipitotemporal cortex; how ROI defined: the region that showed an increase in Local-Hreg from T1 to T2	None
Purcell et al. (2019): Cplx 1	Spelling probe (training items) vs rest	LA Aphasia with both timepoints (n = 20) T2 vs T1	<u>AM</u>	<u>AM</u>	Cplx	Behavioral data notes: see section S2, where Figures S1 and S2 appear to show differences; the main effects of time were not significant for accuracy or RT, but those analyses included known items also, which had smaller effects; Local Heterogeneity Regression Analysis (Local-Hreg) was used to identify brain regions where the heterogeneity of timecourses	Other: Only in L ventral occipitotemporal cortex, there was a significant increase in Local- Hreg from T1 to T2 (p = 0.028, corrected).

PurcellerSpelling probe (restI.A. A.<								
al. (2019): (2014): (2014): (2014): (2014):(from misens): (simpoints in = 20) T2, vs T1main effects were not significant and effects appears maller for known than trained: Local Heterogeneity and Regression Analysis (Local-Here) was suged to identify brain regions on Nawies the heterogeneity of timecourses between neighboring voxels. specifically for the known conditions, increased from T1 to T2. A workwise threase in the specifically for the region pre- thread of the specifical s							specifically for the trained condition, increased from T1 to T2. A voxelwise threshold of $p < 0.05$ was applied, followed by cluster correction based on permutation testing. The analysis appears to have been restricted to brain regions not damaged in any	
al. (2019):       (training items) vs       Aphasia 11       to investigate the relationship       There was a         Cplx 3       rest       Somewhat valid       between Local-Hreg at T1 in the L       significant positive         Somewhat valid       cruary on training       model was used in which every voxel       relationship       between Local-Hreg at T1       spelling accuracy         Purcell et       Spelling probe       CC       UNR       UNR       Cplx       Alinear mixed effects model was used       on training items.       on training items.         Cplx 4       Spelling probe       CC       UNR       UNR       Cplx       Alinear mixed effects model was used       Other:         al.(2019):       (training items) vs       Aphasia T1       Covariate:       vertral occipitotemporal region       relationship         Cplx 4       rest       Spelling accuracy on training       measure of spelling       accuracy on training       to investigate the relationship       there was a         Cplx 4       rest       Spelling accuracy on training       to investigate the relationship       there was a         covariate:       subsequent Aspelling       accuracy on training       to investigate the relationship       there was a         Cplx 4       rest       Spelling accuracy on training       to investigate	al. (2019): (	(known items) vs	Aphasia with both timepoints (n = 20) T2	Y	Y	Cplx	main effects were not significant and effects appear smaller for known than trained; Local Heterogeneity Regression Analysis (Local-Hreg) was used to identify brain regions where the heterogeneity of timecourses between neighboring voxels, specifically for the known condition, increased from T1 to T2. A voxelwise threshold of p < 0.05 was applied, followed by cluster correction based on permutation testing. The analysis appears to have been restricted to brain regions not damaged in any	None
Purcell et al. (2019): Cplx 4Spelling probe (training items) vs restCC Aphasia T1 Covariate: subsequent A spelling accuracy on training items (T2 vs T1) Somewhat valid (T1) behavioral measure should be included in model)UNRCplxA linear mixed effects model was used to investigate the relationship between Local-Hreg at T1 in the L ventral occipitotemporal region previously identified and subsequent improvement in spelling accuracy of training items from T1 to T2. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, between Local-Hreg at T1 in the LOther: There was a significant positive relationship between T1 Local- Hreg and subsequent improvement in spelling accuracy on training items from T1 to T2. APurcell et al. (2019): Cplx 5Spelling probe (training items) vs restCCUNRUNRUNRCplxA linear mixed effects model was used to investigate the relationship on training itemsOther: moreveny patient was considered an observation, with random effects of voxel and patient, between Local-Hreg at T1 in the LSpelling accuracy significant positive relationshipPurcell et al. (2019): Cplx 5Spelling probe (training items) vs restCCUNRUNRCplxCplxA linear mixed effects model was used to investigate the relationship between T1 to T2.Other: There was a significant positive relationshipPurcell et al. (2019): Cplx 5Spelling accuracy on untrained items (T2 vs T1) Somewhat valid (T1 behavioral measure should be included in model)	al. (2019): (	(training items) vs	Aphasia T1 Covariate: T1 spelling accuracy on training items Somewhat valid (training items were selected for individual patients, so training item accuracy is not an appropriate measure of spelling	UNR	UNR	Cplx	to investigate the relationship between Local-Hreg at T1 in the L ventral occipitotemporal region previously identified and T1 spelling accuracy of training items. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but this is not	There was a significant positive relationship between T1 Local- Hreg and T1 spelling accuracy
al. (2019): Cplx 5(training items) vs restAphasia with both timepoints T1 (n = 20) Covariate: subsequent Δ spelling accuracy on untrained items (T2 vs T1)to investigate the relationship between Local-Hreg at T1 in the L ventral occipitotemporal region mprovement in spelling accuracy of untrained items from T1 to T2. Atime on trained subsequent between T1 Local- Hreg and subsequent between T1 to T2. Atime on trained subsequent between T1 to T2. ASomewhat valid (T1 behavioral measure should be included in model)considered an observation, with random effects of voxel and patient,on untrained items from T1 to	al. (2019): (	(training items) vs	CC Aphasia T1 Covariate: subsequent Δ spelling accuracy on training items (T2 vs T1) <u>Somewhat valid</u> (T1 behavioral measure should be included in	UNR	UNR	Cplx	to investigate the relationship between Local-Hreg at T1 in the L ventral occipitotemporal region previously identified and subsequent improvement in spelling accuracy of training items from T1 to T2. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient,	There was a significant positive relationship between T1 Local- Hreg and subsequent improvement in spelling accuracy on training items
	al. (2019): (	(training items) vs	Aphasia with both timepoints T1 (n = 20) Covariate: subsequent $\Delta$ spelling accuracy on untrained items (T2 vs T1) Somewhat valid (T1 behavioral measure should be included in	<u>UNR</u>	UNR	Cplx	A linear mixed effects model was used to investigate the relationship between Local-Hreg at T1 in the L ventral occipitotemporal region previously identified and subsequent improvement in spelling accuracy of untrained items from T1 to T2. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient,	There was a significant positive relationship between T1 Local- Hreg and subsequent improvement in spelling accuracy on untrained items from T1 to

Purcell et al. (2019): Cplx 6	Spelling probe (training items) vs rest	LC Aphasia with both timepoints (n = 20) T2	<u>UNR</u>	<u>UNR</u>	Cplx	A linear mixed effects model was used to investigate the relationship between change in Local-Hreg in the L	Other: There was a significant
		vs T1 Covariate: ∆ spelling accuracy on training items				ventral occipitotemporal region previously identified and change in spelling accuracy of training items. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but this is not described in detail.	negative relationship between change in Local-Hreg and change in spelling accuracy on training items.
Purcell et al. (2019): Cplx 7	Spelling probe (training items) vs rest	LC Aphasia with both timepoints (n = 20) T2 vs T1 Covariate: Δ spelling accuracy on untrained items	UNR	UNR	Cplx	A linear mixed effects model was used to investigate the relationship between change in Local-Hreg in the L ventral occipitotemporal region previously identified and change in spelling accuracy of untrained items. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but this is not described in detail.	Other: There was a significant negative relationship between change in Local-Hreg and change in spelling accuracy on untrained items.
Purcell et al. (2019): Cplx 8	Spelling probe (training items) vs rest	CC Aphasia with both timepoints T2 (n = 20) Covariate: T2 spelling accuracy on training items	UNR	UNR	Cplx	A linear mixed effects model was used to investigate the relationship between Local-Hreg at T2 in the L ventral occipitotemporal region previously identified and T2 spelling accuracy of training items. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but <u>this is not</u> <u>described in detail</u> .	None
Purcell et al. (2019): Cplx 9	Spelling probe (training items) vs rest	LC Aphasia with both timepoints (n = 20) T2 vs T1 Covariate: previous T1 Local-Hreg in L ventral occipitotemporal ROI Not valid (the ROI was defined based on change in Local-Hreg, so spurious findings could arise in the absence of a real effect)	UNR	UNR	Cplx	A linear mixed effects model was used to investigate the relationship between change in Local-Hreg in the L ventral occipitotemporal region previously identified and T1 Local- Hreg. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but <u>this is not described in detail</u> .	Other: There was a significant negative relationship between change in Local-Hreg and T1 Local-Hreg.
Purcell et al. (2019): Cplx 10	Spelling probe (training items) vs rest	LC Aphasia with both timepoints (n = 20) T2 vs T1 Covariate: Δ spelling accuracy on training items	<u>UNR</u>	UNR	Cplx	A linear mixed effects model was used to investigate the relationship between change in Local-Hreg in the R AG, L PCC, and R PCC and change in spelling accuracy of training items. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but this is not described in detail.	None
Purcell et al. (2019): Cplx 11	Spelling probe (training items) vs rest	LC Aphasia with both timepoints (n = 20) T2 vs T1 Covariate: Δ spelling	<u>UNR</u>	<u>UNR</u>	Cplx	A linear mixed effects model was used to investigate the relationship between change in Local-Hreg in the R AG, L PCC, and R PCC and change in spelling accuracy of untrained items. A	None

		accuracy on untrained items				complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but <u>this is not described in detail</u> .	
Sreedharan, Chandran, et al. (2019): ROI 1	Neurofeedback (try to activate language areas) vs rest	CAC Aphasia mean of T1, T2, T3, T4, T5, T6 (neurofeedback patients) or T1, T2 (no training patients) vs control mean	<u>NANB</u>	NANT	ROI Func <u>NDC</u>	Number of ROIs: 4; ROIs: (1) L Broca's area (IFG pars opercularis and triangularis); (2) L Wernicke's area (pSTG); (3-4) homotopic counterparts; how ROIs defined: individual activations within AAL ROIs on a separate word generation localizer	↓ L IFG pars opercularis ↓ L IFG pars triangularis ↓ L posterior STG ↓ R IFG pars opercularis ↓ R IFG pars triangularis ↓ R posterior STG
Sreedharan, Chandran, et al. (2019): ROI 2	Neurofeedback (try to activate language areas) vs rest	CAA Aphasia with neurofeedback training (n = 4) mean of T4, T5, T6 vs no training (n = 4) T2 <u>Somewhat valid</u> (no treatment effect; second half measures rather than measures of change)	NANB	NANT	ROI Func <u>NC</u>	Number of ROIs: 15; ROIs: (1) L Broca's area (IFG pars opercularis and triangularis); (2) L Wernicke's area (pSTG); (3-4) homotopic counterparts; (5) L MFG; (6) L PrCG; (7) L Rolandic operculum; (8) L insula; (9) L IFG pars orbitalis; (10) L MFG orbital; (11) L SMG; (12) L MTG; (13) L PoCG; (14) L AG; (15) L HG; how ROIs defined: (1-4) individual activations within AAL ROIs on a separate word generation localizer; (5-15) AAL	↑ L ventral precentral/inferior frontal junction ↑ L somato-motor
Sreedharan, Chandran, et al. (2019): Cplx 1	Neurofeedback (try to activate language areas) vs rest	CAC Aphasia mean of T1, T2, T3, T4, T5, T6 (neurofeedback patients) or T1, T2 (no training patients) vs control mean	NANB	NANT	Cplx	Signal change in L IFG and L pSTG ROIs was computed, along with functional connectivity between these ROIs. Neurofeedback values were calculated based on signal change as well as correlation between the ROIs. Group differences in neurofeedback values were compared, but <u>not quantified</u> <u>statistically</u> .	Other: Patients received lower neurofeedback values than controls, due to lower signal changes and lower functional connectivity.
Hartwigsen et al. (2020): Vox 1	Syllable count decision vs rest	CAA Aphasia after cTBS to posterior IFG vs sham; same patients, repeated measures	Y	N	Vox C+	Behavioral data notes: significantly slower response times when cTBS was applied over pIFG relative to when sham cTBS was applied; search volume: voxels spared in all patients; software: SPM12; voxelwise p: .001; cluster extent cutoff: based on GRFT	↓ L IFG pars opercularis ↓ L SMA/medial prefrontal ↓ R SMA/medial prefrontal ↓ R basal ganglia notes: based on Figure 4A and Table 3
Hartwigsen et al. (2020): Vox 2	Syllable count decision vs rest	CAA Aphasia after cTBS to posterior IFG vs after cTBS to anterior IFG; same patients, repeated measures	Y	N	Vox C+	Behavioral data notes: significantly slower response times when cTBS was applied over pIFG relative to when cTBS was applied over aIFG; search volume: voxels spared in all patients; software: SPM12; voxelwise p: .001; cluster extent cutoff: based on GRFT	↓ L IFG pars opercularis notes: based on Table 3
Hartwigsen et al. (2020): Vox 3	Semantic decision vs rest	CAA Aphasia after cTBS to anterior IFG vs sham; same patients, repeated measures <u>Somewhat valid</u> (no behavioral difference)	Y	Υ	Vox C+	Behavioral data notes: difference in reaction time did not survive correction; search volume: voxels spared in all patients; software: SPM12; voxelwise p: .001; cluster extent cutoff: based on GRFT	↓ L insula ↓ L dorsolateral prefrontal cortex ↓ R insula ↓ R dorsolateral prefrontal cortex ↓ R SMA/medial

							<b>C</b>
							prefrontal notes: based on Figure 4B and Table 3
Hartwigsen et al. (2020): Vox 4	Semantic decision vs rest	CAA Aphasia after cTBS to anterior IFG vs after cTBS to posterior IFG ; same patients, repeated measures	Y	N	Vox C+	Behavioral data notes: significantly slower response times when cTBS was applied over aIFG relative to when cTBS was applied over pIFG; search volume: voxels spared in all patients; software: SPM12; voxelwise p: .001; cluster extent cutoff: based on GRFT	↓ L insula ↓ R insula ↓ R dorsolateral prefrontal cortex notes: based on Table 3
Hartwigsen et al. (2020): Cplx 1	Syllable count decision vs rest	CC Aphasia after cTBS to posterior IFG vs sham; same patients, repeated measures Covariate: Δ RT for syllable decision (cTBS to posterior IFG timepoint vs sham timepoint)	UNR	<u>C</u>	Cplx	Whole brain correlations were computed between the difference in functional activity after cTBS to posterior IFG versus sham stimulation, and the difference in reaction times on the syllable counting task under these two conditions. The resulting SPM was thresholded at voxelwise p < .001 (CDT) followed by correction for multiple comparisons based on cluster extent and GRFT using SPM12.	Other: Upregulation of the R supramarginal gyrus after cTBS was significantly associated with slowing of RT after cTBS. This finding remained significant after including lesion volume as covariate.
Hartwigsen et al. (2020): Cplx 2	Semantic decision vs rest	CC Aphasia after cTBS to anterior IFG vs sham; same patients, repeated measures Covariate: $\Delta$ RT for semantic decision (cTBS to posterior IFG timepoint vs sham timepoint)	UNR	C	Cplx	Whole brain correlations were computed between the difference in functional activity after cTBS to anterior IFG versus sham stimulation, and the difference in reaction times on the semantic decision task under these two conditions. The resulting SPM was thresholded at voxelwise p < .001 (CDT) followed by correction for multiple comparisons based on cluster extent and GRFT using SPM12.	None
Stockert et al. (2020): ROI 1	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LA Aphasia T2 vs T1	UNR	UNR	ROI Func <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; post- hoc tests comparing 2 out of the 3 time points were corrected using the Bonferroni-Holm procedure, but there is no indication that that multiple comparisons across ROIs were accounted for	<ul> <li>↑ L IFG pars</li> <li>orbitalis</li> <li>↑ L insula</li> <li>↑ L dorsolateral</li> <li>prefrontal cortex</li> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ R insula</li> <li>notes: based on</li> <li>Figure 3; several</li> <li>additional regions</li> <li>are mentioned in</li> <li>text and/or Table 1</li> </ul>
Stockert et al. (2020): ROI 2	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal	LA Aphasia T3 vs T1	UNR	UNR	ROI Func <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L	<ul> <li>↑ L IFG pars</li> <li>orbitalis</li> <li>↑ L dorsolateral</li> <li>prefrontal cortex</li> <li>↑ L posterior</li> <li>STG/STS/MTG</li> <li>↑ L anterior</li> </ul>

	sentences (paradigm 2) vs listening to reversed speech					PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; post- hoc tests comparing 2 out of the 3 time points were corrected using the Bonferroni-Holm procedure, but there is no indication that that multiple comparisons across ROIs were accounted for	temporal notes: based on Figure 3; several additional regions are mentioned in text and/or Table 1
Stockert et al. (2020): ROI 3	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LA Aphasia T3 vs T2	UNR	UNR	ROI Func <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; post- hoc tests comparing 2 out of the 3 time points were corrected using the Bonferroni-Holm procedure, but there is no indication that that multiple comparisons across ROIs were accounted for	None notes: based on Figure 3; several additional regions are mentioned in text and/or Table 1
Stockert et al. (2020): ROI 4	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAA Aphasia frontal mean of T1, T2, T3 (n = 17) vs temporo-parietal mean of T1, T2, T3 (n = 17)	UNR	UNR	ROI Func <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints	<ul> <li>↑ L posterior</li> <li>STG/STS/MTG</li> <li>↑ R IFG pars</li> <li>orbitalis</li> <li>↑ R anterior</li> <li>temporal</li> <li>↓ L IFG pars</li> <li>opercularis</li> <li>↓ L IFG pars</li> <li>triangularis</li> <li>↓ L dorsolateral</li> <li>prefrontal cortex</li> <li>notes: based on</li> <li>Table 1</li> </ul>
Stockert et al. (2020): ROI 5	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LAA (Aphasia frontal (n = 17) T2 vs T1) vs (temporo-parietal (n = 17) T2 vs T1)	UNR	UNR	ROI Func <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; interactions were significant in model with all 3 time points; post-hoc sub- interactions not reported but the patterns appear clear	<ul> <li>↓ L IFG pars</li> <li>opercularis</li> <li>↓ L IFG pars</li> <li>triangularis</li> <li>↓ R IFG pars</li> <li>triangularis</li> <li>↓ R dorsolateral</li> <li>prefrontal cortex</li> </ul>

Stockert et al. (2020): ROI 6	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LAA (Aphasia frontal (n = 17) T3 vs T1) vs (temporo-parietal (n = 17) T3 vs T1)	UNR	UNR	ROI Func <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; interactions were significant in model with all 3 time points; <u>post-hoc sub- interactions not reported and patterns are not clear</u>	↓ L IFG pars opercularis ↓ L IFG pars triangularis ↓ R IFG pars triangularis ↓ R dorsolateral prefrontal cortex
Stockert et al. (2020): ROI 7	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LAA (Aphasia frontal (n = 17) T3 vs T2) vs (temporo-parietal (n = 17) T3 vs T2)	UNR	UNR	ROI Func <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; post- hoc sub-interactions not reported but there do not appear to be any T2/T3 effects	None
Stockert et al. (2020): ROI 8	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LA Aphasia T2 vs T1	UNR	UNR	ROI Oth <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: (1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals; how ROIs defined: (1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions; test of group by time interaction not reported	Other: there was a significant increase in activation in perilesional ROIs
Stockert et al. (2020): ROI 9	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LA Aphasia T3 vs T1	UNR	UNR	ROI Oth <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: (1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals; how ROIs defined: (1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped	Other: there was a significant increase in activation in perilesional ROIs

						lesions; <u>test of group by time</u> interaction not reported	
Stockert et al. (2020): ROI 10	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LA Aphasia T3 vs T2	UNR	UNR	ROI Oth <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: (1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals; how ROIs defined: (1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions; test of group by time interaction not reported	None
Stockert et al. (2020): ROI 11	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAA Aphasia frontal mean of T1, T2, T3 (n = 17) vs temporo-parietal mean of T1, T2, T3 (n = 17)	UNR	UNR	ROI Oth NC	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: (1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals; how ROIs defined: (1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions; test of group by time interaction not reported; this comparison is somewhat questionable given the differing extent to which frontal and temporal regions are activated in controls	Other: frontal patients showed relatively greater activation in regions homotopic to their lesions
Stockert et al. (2020): ROI 12	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAC Aphasia frontal T1 (n = 17) vs control	UNR	UNR	ROI Func <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; <u>circular</u> <u>because patients but not controls</u> <u>used to define ROIs</u>	↓ L IFG pars triangularis ↓ L insula ↓ L dorsolateral prefrontal cortex
Stockert et al. (2020): ROI 13	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAC Aphasia temporo- parietal T1 (n = 17) vs control	UNR	UNR	ROI Func <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain	<ul> <li>↓ L IFG pars</li> <li>triangularis</li> <li>↓ L insula</li> <li>↓ L dorsolateral</li> <li>prefrontal cortex</li> <li>↓ L SMA/medial</li> <li>prefrontal</li> <li>↓ L posterior</li> <li>STG/STS/MTG</li> <li>↓ R IFG pars</li> <li>triangularis</li> </ul>

						analysis of all patients collapsing across groups and timepoints; <u>circular</u> <u>because patients but not controls</u> <u>used to define ROIs</u>	
Stockert et al. (2020): ROI 14	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAA Aphasia frontal T1 (n = 17) vs temporo- parietal T1 (n = 17)	UNR	UNR	ROI Func <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints	<ul> <li>↑ L anterior</li> <li>temporal</li> <li>↑ R IFG pars</li> <li>triangularis</li> <li>↑ R anterior</li> <li>temporal</li> </ul>
Stockert et al. (2020): ROI 15	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAC Aphasia frontal T2 (n = 17) vs control	UNR	UNR	ROI Func <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; <u>circular</u> <u>because patients but not controls</u> <u>used to define ROIs</u>	↓ L IFG pars triangularis
Stockert et al. (2020): ROI 16	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAC Aphasia temporo- parietal T2 (n = 17) vs control	UNR	UNR	ROI Func <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; <u>circular</u> <u>because patients but not controls</u> <u>used to define ROIs</u>	None
Stockert et al. (2020): ROI 17	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAA Aphasia frontal T2 (n = 17) vs temporo- parietal T2 (n = 17)	UNR	UNR	ROI Func <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints	↓ L IFG pars opercularis ↓ L IFG pars triangularis ↓ L dorsolateral prefrontal cortex
Stockert et al. (2020):	Listening to normal sentences	CAC Aphasia frontal T3 (n	<u>UNR</u>	<u>UNR</u>	ROI Func	Behavioral data notes: no differences in proportion of expected button	↓ L IFG pars triangularis

RO118       and making a pickubility judgment (garadigm 1) or is between to commol with the sense is grandigm 2) is between to commol with the sense is grandigm 2) is between to commol with the sense is grandigm 2) is between the sense is grandingment is grandigm 2) is between the sense is grandingment is								
al. (2202):       normal sentences       Aphasia temporo-       Func       In proportion of expected button         ROI 19       and making a plausibility judgment       parietal T3 (n = 17) vs. control       NE       Func       In proportion of expected button         ROI 19       and making a plausibility judgment       control       Sentences       Control       Proportion of expected button         ROI 20       isteming to normal sentences       (D) LPFC (13 (L) RG (17) (11) R motion (12) R       Control       Proportion (10) R (17) (11) R motion (12) R       Proportion (12) R (12) R	ROI 18	plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to	= 17) vs control			<u>NC</u>	behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; <u>circular</u> <u>because patients but not controls</u>	↓ L insula
al. (2020): RO1 20normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to normal sentences (paradigm 1) or listening to al. (2020):Aphasia frontal T3 (n = 17) parietal T3 (n = 17)Func parietal T3 (n = 17) parietal T3 (n = 17)Func presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (1) L IFG orb; 	al. (2020):	normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to	Aphasia temporo- parietal T3 (n = 17) vs	UNR	UNR	Func	in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; <u>circular</u> <u>because patients but not controls</u>	None
al. (2020): ROI 21normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speechAphasia frontal T1 (n = 17) vs controlOth NC NC NC NC NC NC NC NC Presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: (1) perilesional tissue; (2) regions homotopic to lesions; each unique to individual; how ROIs defined: (1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesionsOther: frontal patients showed reduced activation in perilesional tissue; (2) homotopic ROIs were flipped lesionsStockert et al. (2020): ROI 22Listening to normal sentences and making a plausibility judgment (paradigm 1) orCAC Aphasia frontal T2 (n = 17) vs controlNRROI NC Presses by group or time, but behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: presses by group or time, but 	al. (2020):	normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to	Aphasia frontal T3 (n = 17) vs temporo-	UNR	<u>UNR</u>	Func	in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 13; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; how ROIs defined: spheres around peaks of whole brain analysis of all patients collapsing	opercularis ↓ L IFG pars triangularis ↓ L IFG pars orbitalis ↓ L dorsolateral
al. (2020):       normal sentences       Aphasia frontal T2 (n       Oth       in proportion of expected button       frontal patients         ROI 22       and making a       = 17) vs control       NC       presses by group or time, but       showed reduced         plausibility       judgment       conditions; number of ROIs: 2; ROIs:       perilesional tissue       perilesional tissue; (2) regions	al. (2020):	normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to	Aphasia frontal T1 (n	UNR	UNR	Oth	in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: (1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals; how ROIs defined: (1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped	frontal patients showed reduced activation in
	al. (2020):	normal sentences and making a plausibility judgment (paradigm 1) or	Aphasia frontal T2 (n	UNR	UNR	Oth	in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: (1) perilesional tissue; (2) regions	frontal patients showed reduced activation in

	sentences (paradigm 2) vs listening to reversed speech					individuals; how ROIs defined: (1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions	
Stockert et al. (2020): ROI 23	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAC Aphasia frontal T3 (n = 17) vs control	UNR	UNR	ROI Oth <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: (1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals; how ROIs defined: (1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions	Other: frontal patients showed reduced activation in perilesional tissue
Stockert et al. (2020): ROI 24	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAC Aphasia temporo- parietal T1 (n = 17) vs control	UNR	UNR	ROI Oth NC	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: (1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals; how ROIs defined: (1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions	Other: temporal patients showed reduced activation in perilesional tissue and in regions homotopic to their lesions
Stockert et al. (2020): ROI 25	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAC Aphasia temporo- parietal T2 (n = 17) vs control	UNR	UNR	ROI Oth NC	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: (1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals; how ROIs defined: (1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions	None
Stockert et al. (2020): ROI 26	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAC Aphasia temporo- parietal T3 (n = 17) vs control	<u>UNR</u>	UNR	ROI Oth <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 2; ROIs: (1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals; how ROIs defined: (1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls;	None

						(2) homotopic ROIs were flipped lesions	
Stockert et al. (2020): ROI 27	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CC Aphasia T1 Covariate: comprehension composite	UNR	UNR	ROI Mix <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	<ul> <li>↑ L IFG pars</li> <li>opercularis</li> <li>↑ L IFG pars</li> <li>triangularis</li> <li>↑ L IFG pars</li> <li>orbitalis</li> <li>other:</li> <li>L IFG pars</li> <li>opercularis and</li> <li>orbitalis did not</li> <li>remain significant</li> <li>when lesion</li> <li>volume was</li> <li>included as a</li> <li>covariate; there</li> <li>was a significant</li> <li>correlation</li> <li>between</li> <li>perilesional</li> <li>activation and</li> <li>LRScomp; this did</li> <li>not remain</li> <li>significant when</li> <li>lesion volume was</li> <li>included as a</li> </ul>
Stockert et al. (2020): ROI 28	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CC Aphasia T2 Covariate: comprehension composite	UNR	UNR	ROI Mix <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	↑ L IFG pars triangularis other: there was a significant correlation between perilesional activation and LRScomp
Stockert et al. (2020): ROI 29	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CC Aphasia T3 Covariate: comprehension composite	UNR	UNR	ROI Mix <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain	↑ L IFG pars triangularis notes: did not remain significant when lesion volume was included as a covariate

						analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	
Stockert et al. (2020): ROI 30	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LC Aphasia T2 vs T1 Covariate: Δ comprehension composite	UNR	UNR	ROI Mix NC	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	↑ L insula ↑ R dorsolateral prefrontal cortex notes: R dorsolateral prefrontal cortex did not remain significant when lesion volume was included as a covariate
Stockert et al. (2020): ROI 31	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LC Aphasia T3 vs T1 Covariate: Δ comprehension composite	UNR	UNR	ROI Mix NC	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	None
Stockert et al. (2020): ROI 32	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LC Aphasia T3 vs T2 Covariate: Δ comprehension composite	UNR	UNR	ROI Mix NC	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13)	None

					spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	
Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CC Aphasia frontal T1 (n = 17) Covariate: comprehension composite	UNR	UNR	ROI Mix NC	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	None
Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CC Aphasia frontal T2 (n = 17) Covariate: comprehension composite	UNR	UNR	ROI Mix <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	None
Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CC Aphasia frontal T3 (n = 17) Covariate: comprehension composite	<u>UNR</u>	UNR	ROI Mix <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to	None
	normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech Listening to reversed speech	normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speechAphasia frontal T1 (n = 17) Covariate: comprehension compositeListening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to normal sentences (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to normal sentences (paradigm 1) or listening to normal sentences (paradigm 1) or listening to normal sentences (paradigm 1) or listening to normal sentences (paradigm 1) or listening to normal sentences (paradigm 1) or listening to normal sentences (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to normal sentences (paradigm 2) vs listening toCC Aphasia frontal T3 (n = 17) Covariate: comprehension composite	normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speechAphasia frontal T1 (n = 17) Covariate: compositeListening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to normal sentences and making a plausibility judgment comprehension compositeUNRListening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speechCC Covariate: comprehension compositeUNRListening to normal sentences (paradigm 2) vs listening to reversed speechCC Covariate: compositeUNR	normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to normal sentences and making a plausibility judgment normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to normal sentences (paradigm 2) vs listening to normal sentences (paradigm 2) vs listening to normal sentences (paradigm 2) vs listening to normal sentences (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to normal sentences (paradigm 1) or listening to 	normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speechAphasia frontal T1 (n = 17) Covariate: compositeMix NCListening to normal sentences and making a plausibility judgment (paradigm 2) vs listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to normal sentences (paradigm 2) vs listening to normal sentences (paradigm 1) or listening to normal sentences (paradigm 1) or listening to normal sentences (paradigm 1) or listening to normal sentences (paradigm 1) or listening to reversed speechCC C Aphasia frontal T2 (n = 17) Covariate: compositeUNR UNR VINR VINR VINR NCNC NCListening to normal sentences (paradigm 1) or listening to normal sentences (paradigm 1) or listening to normal sentences (paradigm 1) or listening to normal sentencesAphasia frontal T3 (n = 17) Covariate: comprehension compositeUNR UNR NCMIX NCNormal sentences (paradigm 1) or listening to normal sentencesCC Aphasia frontal T3	IsseeniesCCUNRUNRROIIsseeniesCCUNRUNRCOInstanting to paradigm 1 or itstening to normalCCUNRUNRCOIsseeniesCOUNRUNRCOIsseeniesCOUNRUNRCOIsseeniesCOUNRUNRCOIsseeniesCOUNRUNRCOIsseeniesCOUNRUNRCOIsseeniesCOUNRUNRCOIsseeniesCOUNRUNRCOIsseeniesCOUNRUNRCOIsseeniesCOUNRUNRCOIsseeniesCOUNRUNRCOIsseeniesCCUNRUNRCOIsseeniesCCUNRUNRCOIsseeniesCCUNRUNRCOIsseeniesCCUNRUNRCOIsseeniesCCUNRUNRCOIsseeniesCCUNRUNRCOIsseeniesCCUNRUNRCOIsseeniesCCUNRUNRCOIsseeniesCCUNRUNRCOIsseeniesCCUNRUNRCOIsseeniesCCUNRUNRCOIsseeniesCCUNRUNRCOIsseeniesCCUNRUNRCOIsseeniesCCUNRUNRCOIsseenies

						lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	
Stockert et al. (2020): ROI 36	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LC Aphasia frontal (n = 17) T2 vs T1 Covariate: Δ comprehension composite	UNR	UNR	ROI Mix NC	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	None
Stockert et al. (2020): ROI 37	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LC Aphasia frontal (n = 17) T3 vs T1 Covariate: Δ comprehension composite	UNR	UNR	ROI Mix NC	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	None
Stockert et al. (2020): ROI 38	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs	LC Aphasia frontal (n = 17) T3 vs T2 Covariate: Δ comprehension composite	UNR	UNR	ROI Mix <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional	None

Isteeling to reversed speechCC aphasia temporo- paraler 11 (n = 17) covariateMB composite <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>								
al. (220):       normal Sentences       Aphasia temporo-         R01 39       and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs. listening to normal sentences (paradigm 2) vs. listening to normal sentences (paradigm 2) vs. listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences and making a plausibility plausibility paraleta 172 (n = 177).       VMR       VM		_					lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped	
al. (2020): ROI 40normal sentences and making a plausibility (paradigm 1) or (paradigm 2) vs listening to normal sentences (paradigm 1) or istening to normal sentences (paradigm 1) or istening to normal 	al. (2020):	normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to	Aphasia temporo- parietal T1 (n = 17) Covariate: comprehension	UNR	UNR	Mix	in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped	
al. (2020):normal sentencesAphasia temporo- parietal T3 (n = 17)Mixin proportion of expected buttonROI 41and making a plausibilityparietal T3 (n = 17)NCpresses by group or time, butplausibilityCovariate: judgmentbehavioral data pooled across(paradigm 1) or listening to normal sentencescomposite(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb;	al. (2020):	normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to	Aphasia temporo- parietal T2 (n = 17) Covariate: comprehension	UNR	UNR	Mix	in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped	opercularis ↑ L posterior
	al. (2020):	normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences	Aphasia temporo- parietal T3 (n = 17) Covariate: comprehension	<u>UNR</u>	<u>UNR</u>	Mix	in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb;	None

	listening to reversed speech					DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	
Stockert et al. (2020): ROI 42	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LC Aphasia temporo- parietal (n = 17) T2 vs T1 Covariate: Δ comprehension composite	UNR	UNR	ROI Mix NC	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	↑ L insula
Stockert et al. (2020): ROI 43	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LC Aphasia temporo- parietal (n = 17) T3 vs T1 Covariate: Δ comprehension composite	UNR	UNR	ROI Mix <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	None
Stockert et al. (2020): ROI 44	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences	LC Aphasia temporo- parietal (n = 17) T3 vs T2 Covariate: Δ comprehension composite	UNR	UNR	ROI Mix <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb;	None

	(paradigm 2) vs listening to reversed speech					(10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	
Stockert et al. (2020): ROI 45	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CC Aphasia T1 Covariate: lesion volume	UNR	UNR	ROI Mix <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	↓ L IFG pars triangularis notes: lesion volume negatively correlated with activation
Stockert et al. (2020): ROI 46	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CC Aphasia T2 Covariate: lesion volume	UNR	UNR	ROI Mix <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	None
Stockert et al. (2020): ROI 47	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal	CC Aphasia T3 Covariate: lesion volume	UNR	UNR	ROI Mix <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L	None

	sentences (paradigm 2) vs listening to reversed speech					PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	
Stockert et al. (2020): ROI 48	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LC Aphasia T2 vs T1 Covariate: lesion volume	UNR	UNR	ROI Mix <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	None
Stockert et al. (2020): ROI 49	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LC Aphasia T3 vs T1 Covariate: lesion volume	UNR	UNR	ROI Mix <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	None
Stockert et al. (2020): ROI 50	Listening to normal sentences and making a plausibility judgment (paradigm 1) or	LC Aphasia T3 vs T2 Covariate: lesion volume	<u>UNR</u>	UNR	ROI Mix <u>NC</u>	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; number of ROIs: 15; ROIs: (1) L IFG orb; (2) L IFG tri; (3) L IFG op;	None

	listening to normal sentences (paradigm 2) vs listening to reversed speech					(4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions; how ROIs defined: (1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions	
Stockert et al. (2020): Cplx 1	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAA Aphasia frontal T1 (n = 17) vs temporo- parietal T1 (n = 17)	UNR	UNR	Cplx	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; Correlations between activity in 15 ROIs and LRScomp were compared between patients with frontal and temporal lesions, using interaction terms as well as the Fisher r-to-z transformation. <u>There was no</u> <u>correction for multiple comparisons</u> <u>across the 15 ROIs.</u>	Other: Correlations were higher in the temporal group in the R ATL.
Stockert et al. (2020): Cplx 2	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAA Aphasia frontal T2 (n = 17) vs temporo- parietal T2 (n = 17)	<u>UNR</u>	UNR	Cplx	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; Correlations between activity in 15 ROIs and LRScomp were compared between patients with frontal and temporal lesions, using interaction terms as well as the Fisher r-to-z transformation. <u>There was no</u> <u>correction for multiple comparisons</u> across the 15 ROIs.	Other: Correlations were higher in the temporal group in L posterior temporal cortex and L IFG op.
Stockert et al. (2020): Cplx 3	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAA Aphasia frontal T3 (n = 17) vs temporo- parietal T3 (n = 17)	<u>UNR</u>	UNR	Cplx	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; Correlations between activity in 15 ROIs and LRScomp were compared between patients with frontal and temporal lesions, using interaction terms. There was no correction for multiple comparisons across the 15 ROIs.	Other: Correlations were different between groups in the R ATL, but the correlation is not reported as significant in the temporo-parietal group alone.
Stockert et al. (2020): Cplx 4	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LAA (Aphasia frontal (n = 17) T2 vs T1) vs (aphasia temporo- parietal (n = 17) T2 vs T1)	UNR	UNR	Cplx	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; Correlations between changes in activity in 15 ROIs and changes in LRScomp were compared between patients with frontal and temporal lesions, using interaction terms as well as the Fisher r-to-z transformation. <u>There was no</u>	Other: In the L insula, the temporo-parietal group showed a stronger correlation than the frontal group between changes in activation and changes in LRScomp.

						correction for multiple comparisons across the 15 ROIs.	
Stockert et al. (2020): Cplx 5	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LAA (Aphasia frontal (n = 17) T3 vs T1) vs (temporo-parietal (n = 17) T3 vs T1)	UNR	UNR	Cplx	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; Correlations between changes in activity in 15 ROIs and changes in LRScomp were compared between patients with frontal and temporal lesions, using interaction terms as well as the Fisher r-to-z transformation. <u>There was no</u> <u>correction for multiple comparisons</u> <u>across the 15 ROIs.</u>	Other: In the L insula, the temporo-parietal group showed a stronger correlation than the frontal group between changes in activation and changes in LRScomp.
Stockert et al. (2020): Cplx 6	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LAA (Aphasia frontal (n = 17) T3 vs T2) vs (temporo-parietal (n = 17) T3 vs T2)	UNR	UNR	Cplx	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; Correlations between changes in activity in 15 ROIs and changes in LRScomp were compared between patients with frontal and temporal lesions, using interaction terms as well as the Fisher r-to-z transformation. <u>There was no</u> <u>correction for multiple comparisons</u> <u>across the 15 ROIs.</u>	None
Stockert et al. (2020): Cplx 7	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAA Aphasia frontal T1 (n = 17) vs temporo- parietal T1 (n = 17)	UNR	UNR	Cplx	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; Correlations between activity in 15 ROIs and lesion extent were compared between patients with frontal and temporal lesions. There was no correction for multiple comparisons across the 15 ROIs.	None
Stockert et al. (2020): Cplx 8	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAA Aphasia frontal T2 (n = 17) vs temporo- parietal T2 (n = 17)	<u>UNR</u>	<u>UNR</u>	Cplx	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; Correlations between activity in 15 ROIs and lesion extent were compared between patients with frontal and temporal lesions. There was no correction for multiple comparisons across the 15 ROIs.	None
Stockert et al. (2020): Cplx 9	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CAA Aphasia frontal T3 (n = 17) vs temporo- parietal T3 (n = 17)	<u>UNR</u>	<u>UNR</u>	Cplx	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; Correlations between activity in 15 ROIs and lesion extent were compared between patients with frontal and temporal lesions. <u>There</u> was no correction for multiple comparisons across the 15 ROIs.	None

Stockert et al. (2020): Cplx 10	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LAA (Aphasia frontal (n = 17) T2 vs T1) vs (temporo-parietal (n = 17) T2 vs T1)	UNR	UNR	Cplx	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; Correlations between changes in activity in 15 ROIs and lesion extent were compared between patients with frontal and temporal lesions. <u>There was no correction for</u> <u>multiple comparisons across the 15</u> <u>ROIs.</u>	None
Stockert et al. (2020): Cplx 11	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LAA (Aphasia frontal (n = 17) T3 vs T1) vs (temporo-parietal (n = 17) T3 vs T1)	<u>UNR</u>	UNR	Cplx	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; Correlations between changes in activity in 15 ROIs and lesion extent were compared between patients with frontal and temporal lesions. <u>There was no correction for</u> <u>multiple comparisons across the 15</u> <u>ROIs.</u>	None
Stockert et al. (2020): Cplx 12	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LAA (Aphasia frontal (n = 17) T3 vs T2) vs (temporo-parietal (n = 17) T3 vs T2)	<u>UNR</u>	<u>UNR</u>	Cplx	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; Correlations between changes in activity in 15 ROIs and lesion extent were compared between patients with frontal and temporal lesions. <u>There was no correction for</u> <u>multiple comparisons across the 15</u> <u>ROIs.</u>	None
Stockert et al. (2020): Cplx 13	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	CC Aphasia T1 Covariate: interaction of comprehension composite by lesion size	UNR	UNR	Cplx	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; To investigate why some activation-behavior relationships did not remain significant when lesion extent was included as a covariate, models were constructed looking at the relationship between activation and behavior in patients with larger and smaller lesions.	Other: The three regions where this applied at T1, namely perilesional cortex, L IFG op, and L IFG orb, all showed positive correlations between activation and LRScomp in patients with larger lesions, but no correlations in patients with smaller lesions.
Stockert et al. (2020): Cplx 14	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech	LC Aphasia T2 vs T1 Covariate: interaction of ∆ comprehension composite by lesion size	<u>UNR</u>	<u>UNR</u>	Cplx	Behavioral data notes: no differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions; To investigate why some activation-behavior relationships did not remain significant when lesion extent was included as a covariate, models were constructed looking at the relationship between activation and behavior in patients with larger and smaller lesions.	Other: This applied to the R DLPFC in the T2 vs T1 analysis. This region showed a positive correlation between activation and LRScomp in patients with larger lesions, but no correlation in

Second level contrast = Which of the 8 relevant classes of analyses is this? Which group or groups of participants are included? If there is a covariate, what is it?; Acc = Is accuracy matched across the second level contrast?; RT = Is reaction time matched across the second level contrast?; Stats = Does the analysis involve voxelwise statistics, region(s) of interest (ROI), or something else (complex)? If voxelwise, how are multiple comparisons across voxels accounted for? If ROI, were the ROI(s) anatomical, functional, laterality indices, mixed, or something else? If there was more than one ROI, how were the ROIs corrected for multiple comparions?; Yellow underline = minor limitation; Orange underline = moderate limitation; Red underline = major limitation; CAC = Cross-sectional aphasia vs control; CAA = Cross-sectional between two groups with aphasia; CC = Cross-sectional correlation with language or other measure; CB = Cross-sectional performance-defined conditions; LA = Longitudinal change in aphasia; LAC = Longitudinal aphasia vs control; LAA = Longitudinal between two groups with aphasia; LC = Longitudinal correlation with language or other measure; Y = Yes, matched; YCT = Yes, correct trials only; NBD = No, by design; NAM = No, but attempt made; N = No, different; C = Accuracy or RT is covariate; UNT = Unknown, no test; AS = Appear similar; AM = Appear mismatched; UNR = Unknown, not reported; NANB = N/A, no behavioral measure; NANT = N/A, no timeable task; Vox = Voxelwise; VP = Voxelwise correction based on permutation testing; VFWE = Voxelwise FWE correction; C+ = Clusterwise correction with with GRFT and stringent voxelwise p; VFWC = Voxelwise FWE correction and additional arbitrary cluster correction; C- = Clusterwise correction with with GRFT and lenient voxelwise p; CCS = Clusterwise correction based on 3dClustSim; SVC = Small volume correction; CCTB = Clusterwise correction based on cluster threshold beta; CA = Clusterwise correction based on arbitrary cluster extent; NC = No correction; NDC = No direct comparison; M\*\* = Mixed\*\* (major limitation); U = Unclear or not stated; ROI = Region(s) of interest; Anat = Anatomical; Func = Functional; Oth = Other; LI = Laterality indi(ces); Mix = Mixed; FWE = Familywise error (FWE); FDR = False discovery rate (FDR); NC = No correction; One = One only; NDC = No direct comparison; Cplx = Complex.

## Supplementary Table S11. Cross-sectional aphasia compared to control: Methodologically robust analyses

Analysis	First level contrast	Second level contrast	Matche Acc	ed for RT	Stats	Notes	Findings
Leff et al. (2002): ROI 1	Higher word rates vs lower word rates	CAC Aphasia with pSTS damage (n = 6) vs control (n = 8)		NANT	ROI Func One	Number of ROIs: 1; ROI: R pSTS; how ROI defined: the peak voxel for the contrast in the R pSTS from each subject's individual analysis, but <u>the</u> <u>search region is not stated</u> ; the controls and patients without pSTS damage were combined, however it is stated in the caption to Figure 2 that the patients with pSTS damage were significantly different to both	↑ R posterior STS
Blank et al. (2003): Vox 1	Propositional speech production vs rest	CAC Aphasia with IFG POp damage (n = 7) vs control	N	NANT	Vox <u>SVC</u>	Behavioral data notes: word rates not reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R pars opercularis	↑ R IFG pars opercularis notes: no voxels survived FWE correction without SVC
Blank et al. (2003): Vox 2	Propositional speech production vs rest	CAC Aphasia without IFG POp damage (n = 7) vs control	N	NANT	Vox <u>SVC</u>	Behavioral data notes: word rates not reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R pars opercularis	↑ R IFG pars opercularis
Blank et al. (2003): Vox 4	Propositional speech production vs counting	CAC Aphasia with IFG POp damage (n = 7) vs control	N	NANT	Vox <u>SVC</u>	Behavioral data notes: word rates not reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R pars opercularis	None
Blank et al. (2003): Vox 5	Propositional speech production vs counting	CAC Aphasia without IFG POp damage (n = 7) vs control	N	NANT	Vox <u>SVC</u>	Behavioral data notes: word rates not reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R pars opercularis	None
Sharp et al. (2004): Vox 1	Semantic decision vs syllable count decision	CAC Aphasia vs control (clear speech)	<u>AM</u>	Y	Vox <u>SVC</u>	Behavioral data notes: interaction of group by task not reported for accuracy; search volume: whole brain; software: SPM99; voxelwise p: FWE p < .05 with SVC in fusiform gyri, temporal poles, L IFG, L orbitofrontal and L SFG	↓ L posterior inferior temporal gyrus/fusiform gyrus
Sharp et al. (2004): ROI 1	Semantic decision vs syllable count decision	CAC Aphasia vs control (clear speech)	<u>AM</u>	Y	ROI Anat One	Behavioral data notes: interaction of group by task not reported for accuracy; number of ROIs: 1; ROI: L fusiform gyrus; how ROI defined: probabilistic brain atlas	↓ L posterior inferior temporal gyrus/fusiform gyrus
Sharp et al. (2004): ROI 2	Semantic decision vs syllable count decision	CAC Aphasia vs control (noise vocoded)	NAM	Y	ROI Anat One	Behavioral data notes: patients were more accurate on semantic decisions than syllable decisions, whereas controls were less accurate on noise vocoded semantic decisions than clear syllable decisions (which were the baseline for this analysis); number of ROIs: 1; ROI: L fusiform gyrus; how ROI defined: probabilistic brain atlas	None notes: this analysis suggests that the difference between groups in the L fusiform gyrus disappears when the controls perform a

							semantic task that is similarly challenging
Zahn et al. (2004): ROI 1	Semantic decision vs phonetic decision and lexical decision (conjunction)	CAC Aphasia vs control	<u>UNT</u>	<u>UNR</u>	ROI LI One	Behavioral data notes: relative performance on language and control tasks unclear; number of ROIs: 1; ROI: language network LI; <u>conjunction</u> <u>analyses not clearly described</u> ; in two patients, a different conjunction was used (lexical decision vs phonetic decision & semantic decision vs phonetic decision)	None notes: LI > 0 in 12 out of 14 controls and 5 out of 7 patients; no significant difference
Crinion & Price (2005): Vox 1	Listening to narrative speech vs listening to reversed speech	CAC Aphasia without temporal lobe damage (n = 9) vs control	<u>NANB</u>	NANT		Search volume: whole brain; software: SPM2; voxelwise p: FWE p < .05; cluster extent cutoff: 5 voxels (size not stated)	↓ L dorsal precentral ↓ R somato-motor
Crinion & Price (2005): Vox 2	Listening to narrative speech vs listening to reversed speech	CAC Aphasia with temporal lobe damage (n = 8) vs control	<u>NANB</u>	NANT		Search volume: whole brain; software: SPM2; voxelwise p: FWE p < .05; cluster extent cutoff: 5 voxels (size not stated)	↓ L posterior STS ↓ L mid temporal
Crinion & Price (2005): Cplx 2	Listening to narrative speech vs listening to reversed speech	CAC Aphasia without temporal damage (n = 9) vs control	NANB	NANT	Cplx	Correlations were computed between activity in each voxel, and post-scan story recall, and were compared between patients without temporal damage and controls, in regions with a main effect of story comprehension. The threshold was p < 0.05 corrected, plus a minimum cluster size of 5 voxels.	None
Crinion & Price (2005): Cplx 3	Listening to narrative speech vs listening to reversed speech	CAC Aphasia with temporal damage (n = 8) vs control	<u>NANB</u>	NANT	Cplx	Correlations were computed between activity in each voxel, and post-scan story recall, and were compared between patients with temporal damage and controls, in regions with a main effect of story comprehension. The threshold was p < 0.05 corrected, plus a minimum cluster size of 5 voxels.	None
Crinion et al. (2006): Vox 1	Listening to narrative speech vs listening to reversed speech	CAC Aphasia vs control	<u>NANB</u>	NANT		Search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05	None
Crinion et al. (2006): Vox 2	Listening to narrative speech vs listening to reversed speech	CAC Aphasia without temporal lobe damage (n = 6) vs control	<u>NANB</u>	NANT		Search volume: voxels spared in all included patients; software: SPM99; voxelwise p: FWE p < .05	None
Crinion et al. (2006): Vox 3	Listening to narrative speech vs listening to reversed speech	CAC Aphasia with temporal lobe damage (n = 18) vs control	<u>NANB</u>	NANT		Search volume: voxels spared in all included patients; software: SPM99; voxelwise p: FWE p < .05	None
Warren et al. (2009): ROI 1	Listening to narrative speech vs listening to reversed speech	CAC Aphasia vs control	<u>NANB</u>	NANT	ROI Anat <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with	None notes: L IFG pars triangularis almost reached significance (p = .053) for more

						L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6); <u>somewhat circular because ROIs</u> were defined only in regions where controls showed significant <u>connectivity (even though ROIs were</u> <u>anatomical)</u>	activation in patients
Warren et al. (2009): ROI 9	Listening to narrative speech vs listening to reversed speech	CAC Aphasia with positive anterior temporal interconnectivity (n = 8) vs control	NANB	NANT	ROI Anat NC	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6); somewhat circular because ROIs were defined only in regions where controls showed significant connectivity (even though ROIs were anatomical); excluded 3 patients with L IFG damage	↑ L IFG pars triangularis
Warren et al. (2009): ROI 10	Listening to narrative speech vs listening to reversed speech	CAC Aphasia with negative anterior temporal interconnectivity (n = 8) vs control	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6); somewhat circular because ROIs were defined only in regions where controls showed significant connectivity (even though ROIs were anatomical); excluded 1 patient with L IFG damage	None
Fridriksson et al. (2010): Vox 2	Picture naming (correct trials) vs viewing abstract pictures	CAC Aphasia vs control	YCT	<u>UNR</u>	Vox <u>C-</u>	Search volume: whole brain; software: FSL 4.1; voxelwise p: ~.02 (z > 2); cluster extent cutoff: based on GRFT	None
van Oers et al. (2010): ROI 3	Verb generation vs rest	CAC Aphasia vs control	<u>UNR</u>	<u>UNR</u>	ROI Mix <u>NC</u>	Number of ROIs: 7; ROIs: (1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs defined: WFU pickatlas	↓ L IFG ↓ LI (language network) ↓ LI (frontal)
Allendorfer et al. (2012): ROI 2	Verb generation (overt, event- related) vs noun repetition (event- related)	CAC Aphasia vs control	N	<u>UNR</u>	ROI LI <u>NC</u>	Behavioral data notes: patients less accurate and produced less responses on both conditions, but the difference between groups was greater for verb generation; number of ROIs: 2; ROIs: (1) frontal LI; (2) temporal LI	↓ LI (frontal)
Szaflarski et al. (2014): ROI 1	Verb generation vs finger tapping	CAC Aphasia vs control	<u>UNR</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 3; ROIs: (1) frontal LI; (2) temporal LI; (3) language network LI	↓ LI (language network) ↓ LI (frontal) notes: temporal LI was also marginally

							significantly reduced (p = .08)
Griffis, Nenert, Allendorfer, & Szaflarski (2017): Cplx 1	Semantic decision vs tone decision	CAC Aphasia vs control	N	UNR	Cplx	Behavioral data notes: semantic decision accuracy not matched, but tone decision accuracy not reported; Multimodal canonical correlation analysis (mCCA) and joint ICA were used to identify 3 joint ICs (structural/functional) that were differently represented in the patient and control groups. Although there was <u>no</u> correction for multiple <u>comparisons</u> when the functional <u>maps</u> were thresholded, the maps for the three networks each appeared to relate to coherent parts of the semantic network.	Other: The first joint IC comprised preservation of tissue in L posterior temporo-parietal region, activity in the L AG and bilateral midline components of the canonical semantic network, and reduced activity in R frontal, temporal and parietal regions. The second joint IC comprised preservation of tissue in the the L basal ganglia/insula region, and activity predominantly in the IFG pars orbitalis bilaterally. The third joint IC comprised preservation of tissue in the the L basal ganglia/insula region, and activity predominantly in the IFG pars orbitalis bilaterally. The third joint IC comprised preservation of the L IFG and activity in the L IFG and DLPFC along with bilateral midline regions. The first joint IC was considered to provide more robust evidence for structure- function relationships than the other two, because it was the only one where individual structural and functional mixing coefficients remained correlated even when lesion volume was

Second level contrast = Which of the 8 relevant classes of analyses is this? Which group or groups of participants are included? If there is a covariate, what is it?; Acc = Is accuracy matched across the second level contrast?; RT = Is reaction time matched across the second level contrast?; Stats = Does the analysis involve voxelwise statistics, region(s) of interest (ROI), or something else (complex)? If voxelwise, how are multiple comparisons across

included as a covariate.

voxels accounted for? If ROI, were the ROI(s) anatomical, functional, laterality indices, mixed, or something else? If there was more than one ROI, how were the ROIs corrected for multiple comparions?; Yellow underline = minor limitation; Orange underline = moderate limitation; Red underline = major limitation; CAC = Cross-sectional aphasia vs control; Y = Yes, matched; YCT = Yes, correct trials only; NAM = No, but attempt made; N = No, different; UNT = Unknown, no test; AM = Appear mismatched; UNR = Unknown, not reported; NANB = N/A, no behavioral measure; NANT = N/A, no timeable task; Vox = Voxelwise; VFWE = Voxelwise FWE correction; VFWC = Voxelwise FWE correction and additional arbitrary cluster correction; C- = Clusterwise correction with with GRFT and lenient voxelwise p; SVC = Small volume correction; ROI = Region(s) of interest; Anat = Anatomical; Func = Functional; LI = Laterality indi(ces); Mix = Mixed; NC = No correction; One = One only; Cplx = Complex.

## Supplementary Table S12. Cross-sectional correlation with language or other measure: Methodologically robust analyses

Analysis	First level contrast	Second level contrast	Match Acc	ed for RT	Stats	Notes	Findings
Blank et al. (2003): ROI 1	Propositional speech production vs rest	CC Aphasia with IFG POp damage (n = 7) Covariate: speech rate during scan	UNR	NANT	ROI Func One	Number of ROIs: 1; ROI: R IFG pars opercularis; how ROI defined: defined by flipping L IFG pars opercularis activation in controls	None
Blank et al. (2003): ROI 2	Propositional speech production vs rest	CC Aphasia without IFG POp damage (n = 7) Covariate: speech rate during scan	<u>UNR</u>	NANT	ROI Func One	Number of ROIs: 1; ROI: R IFG pars opercularis; how ROI defined: defined by flipping L IFG pars opercularis activation in controls	None
Blank et al. (2003): ROI 3	Propositional speech production vs rest	CC Aphasia with IFG POp damage (n = 7) Covariate: four different QPA measures	<u>UNR</u>	NANT	ROI Func One	Number of ROIs: 1; ROI: R IFG pars opercularis; how ROI defined: defined by flipping L IFG pars opercularis activation in controls	None
Crinion & Price (2005): Vox 4	Listening to narrative speech vs listening to reversed speech	CC Aphasia without temporal lobe damage (n = 9) Covariate: sentence comprehension (CAT)	NANB	NANT		Search volume: whole brain; software: SPM2; voxelwise p: FWE p < .05; cluster extent cutoff: 5 voxels (size not stated); conjunction with main effect of story comprehension (details hard to follow); this was a multiple regression also involving patients with temporal lobe damage	↑ L posterior STS ↑ R mid temporal notes: patients with better sentence comprehension had more activation in the L posterior STS and R mid STS
Crinion & Price (2005): Vox 5	Listening to narrative speech vs listening to reversed speech	CC Aphasia with temporal lobe damage (n = 8) Covariate: sentence comprehension (CAT)	<u>NANB</u>	NANT		Search volume: whole brain; software: SPM2; voxelwise p: FWE p < .05; cluster extent cutoff: 5 voxels (size not stated); conjunction with main effect of story comprehension (details hard to follow); this was a multiple regression also involving patients without temporal lobe damage	↑ R mid temporal notes: patients with better sentence comprehension had more activation in the R mid STS
Crinion et al. (2006): ROI 1	Listening to narrative speech vs listening to reversed speech	CC Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13) Covariate: auditory sentence comprehension (CAT)	NANB	NANT	ROI Func One	Number of ROIs: 1; ROI: L ATL; how ROI defined: activation in the control group; same result obtained with or without excluding one outlier; two other ROIs are described in the methods, but never used in any analyses	↑ L anterior temporal notes: more activity in patients with better auditory sentence comprehension
Crinion et al. (2006): ROI 2	Listening to narrative speech vs listening to reversed speech	CC Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal	<u>NANB</u>	NANT	ROI Func One	Number of ROIs: 1; ROI: L ATL; how ROI defined: activation in the control group; two other ROIs are described in the methods, but never used in any analyses	None

		damage sparing anterior temporal cortex (n = 13) Covariate: time post onset					
Crinion et al. (2006): ROI 5	Listening to narrative speech vs listening to reversed speech	CC Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13) Covariate: auditory single word comprehension (CAT)	NANB	NANT	ROI Func One	Number of ROIs: 1; ROI: L ATL; how ROI defined: activation in the control group; two other ROIs are described in the methods, but never used in any analyses	None notes: r = 0.39; p > 0.1; seems to be a clear trend so lack of significance may reflect only lack of power
Warren et al. (2009): ROI 2	Listening to narrative speech vs listening to reversed speech	CC Aphasia Covariate: auditory sentence comprehension	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)	↑ L anterior temporal
Warren et al. (2009): ROI 3	Listening to narrative speech vs listening to reversed speech	CC Aphasia Covariate: written sentence comprehension	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)	None
Warren et al. (2009): ROI 4	Listening to narrative speech vs listening to reversed speech	CC Aphasia Covariate: auditory single word comprehension	NANB	NANT	Anat	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)	None notes: L anterior temporal p = .08
Warren et al. (2009): ROI 5	Listening to narrative speech vs listening to reversed speech	CC Aphasia Covariate: auditory syntactic comprehension	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)	None notes: L anterior temporal p = .09
Warren et al. (2009): ROI 6	Listening to narrative speech	CC Aphasia Covariate:	<u>NANB</u>	NANT	ROI Anat <u>NC</u>	Number of ROIs: 2; ROIs: (1) L anterior superior temporal cortex; (2) R anterior superior temporal cortex;	None

	vs listening to reversed speech	connectivity between L and R ATL				how ROIs defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)	
Warren et al. (2009): ROI 7	Listening to narrative speech vs listening to reversed speech	CC Aphasia Covariate: time post onset	NANB	NANT	ROI Anat One	Number of ROIs: 1; ROI: L anterior superior temporal cortex; how ROI defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)	None
Warren et al. (2009): ROI 8	Listening to narrative speech vs listening to reversed speech	CC Aphasia Covariate: lesion volume	NANB	NANT	ROI Anat One	Number of ROIs: 1; ROI: L anterior superior temporal cortex; how ROI defined: ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)	None
Warren et al. (2009): Cplx 1	Listening to narrative speech vs listening to reversed speech	CC Aphasia Covariate: lesion status of each voxel	<u>NANB</u>	NANT	Cplx	VLSM with <u>FDR correction</u> was used to identify any regions in which damage was predictive of L anterior temporal activation.	None
Fridriksson et al. (2010): Vox 1	Picture naming (correct trials) vs viewing abstract pictures	CC Aphasia Covariate: picture naming accuracy	YCT	UNR	Vox C-	Search volume: whole brain; software: FSL 4.1; voxelwise p: ~.02 (z > 2); cluster extent cutoff: based on GRFT	<ul> <li>↑ L IFG pars orbitalis</li> <li>↑ L occipital</li> <li>↑ L anterior</li> <li>cingulate</li> <li>notes: greater</li> <li>activation was</li> <li>associated with</li> <li>better picture</li> <li>naming; L IFG pars</li> <li>orbitalis activation</li> <li>classified as</li> <li>middle frontal</li> <li>gyrus in the paper,</li> <li>but coordinates</li> <li>suggest otherwise</li> </ul>
Fridriksson et al. (2010): ROI 1	Picture naming (correct trials) vs viewing abstract pictures	CC Aphasia Covariate: picture naming accuracy	YCT	UNR	ROI Func One	Number of ROIs: 1; ROI: a single ROI comprising 3 regions where activation in patients was correlated with picture naming accuracy: the L IFG pars orbitalis, occipital lobe, and anterior cingulate; how ROI defined: based on SPM analysis 1; the purpose of this analysis was to determine whether these regions were recruited in the patients with better naming, or not activated in the patients with worse naming, relative to the control mean	Other: patients with better naming showed greater activation than controls, while the patients with poorer naming showed less activation than controls.
van Oers et al. (2010): ROI 4	Written word- picture matching vs visual decision	CC Aphasia Covariate: picture- word matching accuracy	С	UNR	ROI Mix <u>NC</u>	Number of ROIs: 7; ROIs: (1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal Ll; (6) temporal Ll; (7) whole network Ll; how ROIs defined: WFU pickatlas	None
van Oers et al. (2010):	Semantic decision vs visual decision	CC Aphasia	С	<u>UNR</u>	ROI Mix	Number of ROIs: 7; ROIs: (1) L anterior language region (IFG); (2) L posterior	None

ROI 5		Covariate: semantic decision accuracy			<u>NC</u>	language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs defined: WFU pickatlas	
van Oers et al. (2010): ROI 8	Verb generation vs rest	CC Aphasia Covariate: overall language measure	<u>UNR</u>	<u>UNR</u>	ROI Mix <u>NC</u>	Number of ROIs: 7; ROIs: (1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI; how ROIs defined: WFU pickatlas	None
van Oers et al. (2010): ROI 11	Verb generation vs rest	CC Aphasia Covariate: lesion volume	<u>UNR</u>	<u>UNR</u>	ROI Anat <u>NC</u>	Number of ROIs: 2; ROIs: (1) R anterior language region (IFG); (2) R posterior language region (AG, SMG, STG, MTG); how ROIs defined: WFU pickatlas	None
van Oers et al. (2010): ROI 14	Verb generation vs rest	CC Aphasia Covariate: damage to L hemisphere language regions	<u>UNR</u>	<u>UNR</u>	ROI Anat <u>NC</u>	Number of ROIs: 2; ROIs: (1) R anterior language region (IFG); (2) R posterior language region (AG, SMG, STG, MTG); how ROIs defined: WFU pickatlas	None
Papoutsi et al. (2011): Vox 1	Listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to ambiguous sentences with dominant resolution ("dominant")	CC Aphasia Covariate: difference in percent of unacceptable judgments between subordinate and dominant sentences (dominance effect)	NANB	NANT	Vox <u>C-</u>	Search volume: whole brain; software: SPM8; voxelwise p: .01; cluster extent cutoff: based on GRFT	↑ L insula ↑ L posterior STG/STS/MTG ↑ L mid temporal
Papoutsi et al. (2011): Cplx 1	Listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to ambiguous sentences with dominant resolution ("dominant")	CC Aphasia Covariate: modulation of L IFG connectivity by dominance effect	NANB	NANT	Cplx	A PPI analysis was carried out with the L IFG as the seed region. Correlations were computed between voxelwise modulation of connectivity with this region, and a behavioral measure of syntactic processing, which was the dominance effect: the difference in percent of unacceptable judgments between subordinate and dominant sentences. The resultant SPM was thresholded at voxelwise p < .01 (CDT), then corrected for multiple corrections based on cluster extent and GRFT using SPM8.	Other: patients with better syntactic performance had more connectivity from the L IFG seed region to L pMTG and adjacent areas (including the insula); pMTG also significant at voxelwise p < .001 in Figure 2B, corrected for multiple comparisons with GRFT
Papoutsi et al. (2011): Cplx 2	Listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to ambiguous	CC Aphasia Covariate: modulation of L pMTG connectivity by dominance effect	NANB	NANT	Cplx	A similar PPI analysis was carried out with the L pMTG as the seed region. <u>Thresholding was the same as in the</u> <u>previous analysis.</u>	None

	sentences with dominant resolution ("dominant")						
Sebastian & Kiran (2011): ROI 2	Semantic decision (correct trials) vs visual decision	CC Aphasia Covariate: lesion volume	ҮСТ	<u>UNR</u>	ROI Mix <u>NC</u>	Number of ROIs: 4; ROIs: (1) L IFG (oper/tri); (2) L posterior perisylvian (pSTG, pMTG, AG, SMG); (3) R IFG (oper/tri); (4) R posterior perisylvian (pSTG, pMTG, AG, SMG); (5) language network LI; how ROIs defined: Harvard-Oxford atlas	None
Tyler et al. (2011): Vox 5	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")	CC Aphasia Covariate: performance on acceptability judgment task (difference in percent of unacceptable judgments between ambiguous and unambiguous sentences)	<u>NANB</u>	NANT	Vox <u>C-</u>	Search volume: plausible fronto- temporo-parietal language regions; software: SPM5; voxelwise p: .01; cluster extent cutoff: based on GRFT	<ul> <li>↑ L IFG pars</li> <li>triangularis</li> <li>↑ L IFG pars</li> <li>orbitalis</li> <li>↑ R insula</li> <li>↑ R mid temporal</li> <li>notes: also L pMTG</li> <li>but this did not</li> <li>reach significance</li> </ul>
Tyler et al. (2011): Vox 8	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")	CC Aphasia Covariate: difference in percent of unacceptable judgments between subordinate and dominant sentences (dominance effect)	<u>NANB</u>	NANT	Vox <u>C-</u>	Search volume: plausible fronto- temporo-parietal language regions; software: SPM5; voxelwise p: .01; cluster extent cutoff: based on GRFT	None
Tyler et al. (2011): ROI 1	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")	CC Aphasia Covariate: performance on acceptability judgment task (difference in percent of unacceptable judgments between ambiguous and unambiguous sentences)	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 3; ROIs: (1) IFG pars opercularis; (2) IFG pars triangularis; (3) IFG pars orbitalis; how ROIs defined: AAL	↑ L IFG pars triangularis ↑ L IFG pars orbitalis
Tyler et al. (2011): ROI 2	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")	CC Aphasia Covariate: difference in percentage of unacceptable judgments between subordinate and dominant sentences (dominance effect)	NANB	NANT	ROI Anat <u>NC</u>	Number of ROIs: 3; ROIs: (1) IFG pars opercularis; (2) IFG pars triangularis; (3) IFG pars orbitalis; how ROIs defined: AAL	None
Allendorfer et al. (2012): ROI 4	Verb generation (overt, event- related) vs noun repetition (event- related)	CC Aphasia Covariate: overt verb generation accuracy	С	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 3; ROIs: (1) L MTG; (2) L SFG/CG; (3) left MFG; how ROIs defined: regions activated by the contrast of overt verb generation vs noun repetition in patients	↑ L dorsolateral prefrontal cortex ↑ L SMA/medial prefrontal
Allendorfer et al.	Verb generation (overt, event- related) vs verb	CC Aphasia	С	<u>UNR</u>	ROI Func <u>NC</u>	Number of ROIs: 2; ROIs: (1) R insula/IFG; (2) R STG; how ROIs defined: prominent R hemisphere	None

(2012): ROI 5	generation (covert, event-related)	Covariate: overt verb generation accuracy				activations for the contrast of overt and covert verb generation in patients	
Griffis, Nenert, Allendorfer, & Szaflarski (2017): ROI 1	Semantic decision vs tone decision	CC Aphasia Covariate: semantic decision accuracy	C	UNR	ROI Oth FWE	Number of ROIs: 3; ROIs: (1) L AG and bilateral midline components of the canonical semantic network, along with reduced activity in R frontal, temporal and parietal regions; (2) bilateral IFG pars orbitalis; (3) L IFG and DLPFC along with bilateral midline regions; how ROIs defined: ROIs are mixing coefficients of functional networks arising from mCCA + jICA that were differently represented in the patient and control groups	<ul> <li>L IFG</li> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L posterior cingulate</li> <li>R IFG pars orbitalis</li> <li>R SMA/medial prefrontal</li> <li>R precuneus</li> <li>R posterior cingulate</li> <li>L insula</li> <li>R IFG pars opercularis</li> <li>R IFG pars</li> <li>R IFG pars</li> <li>opercularis</li> <li>R IFG pars</li> <li>triangularis</li> <li>R dorsal precentral</li> <li>R supramarginal gyrus</li> <li>R mid temporal notes: all 3</li> <li>networks were significantly correlated; analysis of networks so involvement of each individual region cannot be assured</li> </ul>
Griffis, Nenert, Allendorfer, & Szaflarski (2017): ROI 2	Semantic decision vs tone decision	CC Aphasia Covariate: average of semantic and phonemic fluency	UNR	UNR	ROI Oth FWE	Number of ROIs: 3; ROIs: (1) L AG and bilateral midline components of the canonical semantic network, along with reduced activity in R frontal, temporal and parietal regions; (2) bilateral IFG pars orbitalis; (3) L IFG and DLPFC along with bilateral midline regions; how ROIs defined: ROIs are mixing coefficients of functional networks arising from mCCA + jICA that were differently represented in the patient and control groups	<ul> <li>↑ L IFG</li> <li>↑ L dorsolateral</li> <li>prefrontal cortex</li> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ L angular gyrus</li> <li>↑ L precuneus</li> <li>↑ L posterior</li> <li>cingulate</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↑ R precuneus</li> <li>↑ R posterior</li> <li>cingulate</li> <li>↓ L insula</li> <li>↓ R IFG pars</li> <li>opercularis</li> <li>↓ R insula</li> <li>↓ R insula</li> <li>↓ R dorsal</li> <li>precentral</li> </ul>

							<ul> <li>↓ R supramarginal gyrus</li> <li>↓ R posterior STG</li> <li>↓ R mid temporal notes: networks 1</li> <li>and 3 were</li> <li>significantly</li> <li>correlated;</li> <li>analysis of</li> <li>networks so</li> <li>involvement of</li> <li>each individual</li> <li>region cannot be</li> <li>assured</li> </ul>
Griffis, Nenert, Allendorfer, & Szaflarski (2017): ROI 3	Semantic decision vs tone decision	CC Aphasia Covariate: BNT	UNR	UNR	ROI Oth FWE	Number of ROIs: 3; ROIs: (1) L AG and bilateral midline components of the canonical semantic network, along with reduced activity in R frontal, temporal and parietal regions; (2) bilateral IFG pars orbitalis; (3) L IFG and DLPFC along with bilateral midline regions; how ROIs defined: ROIs are mixing coefficients of functional networks arising from mCCA + jICA that were differently represented in the patient and control groups	<ul> <li>↑ L IFG</li> <li>↑ L dorsolateral prefrontal cortex</li> <li>↑ L SMA/medial prefrontal</li> <li>↑ L angular gyrus</li> <li>↑ L precuneus</li> <li>↑ L posterior cingulate</li> <li>↑ R SMA/medial prefrontal</li> <li>↑ R precuneus</li> <li>↑ R precuneus</li> <li>↑ R posterior cingulate</li> <li>↓ L insula</li> <li>↓ R IFG pars opercularis</li> <li>↓ R IFG pars</li> <li>triangularis</li> <li>↓ R insula</li> <li>↓ R dorsal precentral</li> <li>↓ R supramarginal gyrus</li> <li>↓ R posterior STG</li> <li>↓ R mid temporal notes: networks 1 and 3 were</li> <li>significantly correlated; analysis of networks so involvement of each individual region cannot be assured</li> </ul>
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): ROI 2	Semantic decision vs tone decision	CC Aphasia Covariate: lesion volume	<u>UNR</u>	<u>UNR</u>	ROI Func FWE	Number of ROIs: 5; ROIs: (1) overall canonical semantic network (CSN); (2) L CSN; (3) R CSN; (4) mirror L CSN in R; (5) out-of-network CSN in R; how ROIs defined: control data	None
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): ROI 3	Semantic decision vs tone decision	CC Aphasia Covariate: semantic decision accuracy	С	<u>UNR</u>	ROI Func One	Number of ROIs: 1; ROI: CSN; how ROI defined: control data; lesion volume covariate	↑ L IFG ↑ L dorsolateral prefrontal cortex ↑ L SMA/medial prefrontal ↑ L angular gyrus

							<ul> <li>↑ L precuneus</li> <li>↑ L mid temporal</li> <li>↑ L anterior</li> <li>temporal</li> <li>↑ L posterior</li> <li>cingulate</li> <li>↑ L cerebellum</li> <li>↑ R IFG</li> <li>↑ R dorsolateral</li> <li>prefrontal cortex</li> <li>↑ R SMA/medial</li> <li>prefrontal</li> <li>↑ R angular gyrus</li> <li>↑ R precuneus</li> <li>↑ R anterior</li> <li>temporal</li> <li>↑ R cerebellum</li> <li>notes: correlation</li> <li>calculated for the</li> <li>whole network of</li> <li>regions, so</li> <li>correlation of</li> <li>individual regions</li> <li>cannot be assured</li> </ul>
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): ROI 4	Semantic decision vs tone decision	CC Aphasia Covariate: average of semantic and phonemic fluency	UNR	UNR	ROI One	Number of ROIs: 1; ROI: CSN; how ROI defined: control data; lesion volume covariate	<ul> <li>↑ L IFG</li> <li>↑ L orsolateral</li> <li>prefrontal cortex</li> <li>↑ L SMA/medial</li> <li>prefrontal</li> <li>↑ L angular gyrus</li> <li>↑ L precuneus</li> <li>↑ L precuneus</li> <li>↑ L mid temporal</li> <li>↑ L anterior</li> <li>temporal</li> <li>↑ L posterior</li> <li>cingulate</li> <li>↑ L cerebellum</li> <li>↑ R IFG</li> <li>↑ R dorsolateral</li> <li>prefrontal cortex</li> <li>↑ R SMA/medial</li> <li>prefrontal cortex</li> <li>↑ R Angular gyrus</li> <li>↑ R precuneus</li> <li>↑ R netrior</li> <li>temporal</li> <li>↑ R posterior</li> <li>cingulate</li> <li>↑ R cerebellum</li> <li>↑ R cerebellum</li> <li>notes: correlation</li> <li>calculated for the</li> <li>whole network of</li> <li>regions, so</li> <li>correlation of</li> <li>individual regions</li> <li>cannot be assured</li> </ul>
Nenert, Allendorfer, Vannest, et	vs tone decision	Aphasia Covariate: BNT	<u></u>	<u> </u>	Func One	defined: control data; lesion volume covariate	↑ L dorsolateral prefrontal cortex ↑ L SMA/medial

al. (2017): ROI 5							prefrontal ↑ L angular gyrus ↑ L precuneus ↑ L mid temporal ↑ L anterior temporal ↑ L posterior cingulate ↑ L cerebellum ↑ R IFG ↑ R dorsolateral prefrontal cortex ↑ R SMA/medial prefrontal ↑ R angular gyrus ↑ R precuneus ↑ R posterior cingulate ↑ R cerebellum notes: correlation calculated for the whole network of regions, so correlation of individual regions cannot be assured
Griffis, Nenert, Allendorfer, Vannest, et al. (2017): Cplx 7	Semantic decision vs tone decision	CC Aphasia Covariate: interactions of semantic fluency and naming measures by lesion size	UNR	UNR	Cplx	For the 4 R hemisphere regions that were more activated in patients with larger lesions (SPM analysis 4), analyses were carried out to determine whether the semantic fluency or naming measures were differentially impacted by activation depending on whether lesions were larger or smaller.	Other: For 1 of the 4 regions (R SMA), there were significant interactions such that in patients with larger lesions, more activation was associated with higher semantic fluency scores and higher BNT scores, while in patients with smaller lesions, more activation was associated with lower fluency and BNT scores. There was a similar relationship with semantic fluency in the R IFG pars opercularis but only at p(FDR) = 0.07.
Nenert et al. (2018): Vox 11	Semantic decision vs tone decision	CC Aphasia T1 Covariate: semantic decision accuracy	С	<u>UNR</u>	Vox VP	Search volume: whole brain; software: SPM12/SnPM13; voxelwise p: FWE p < .05	↑ L anterior temporal notes: unclear why this type of analysis was run only for semantic

							task, and only at T1
Hartwigsen et al. (2020): Cplx 1	Syllable count decision vs rest	CC Aphasia after cTBS to posterior IFG vs sham; same patients, repeated measures Covariate: $\Delta$ RT for syllable decision (cTBS to posterior IFG timepoint vs sham timepoint)	<u>UNR</u>	<u>C</u>	Cplx	Whole brain correlations were computed between the difference in functional activity after cTBS to posterior IFG versus sham stimulation, and the difference in reaction times on the syllable counting task under these two conditions. The resulting SPM was thresholded at voxelwise p < .001 (CDT) followed by correction for multiple comparisons based on cluster extent and GRFT using SPM12.	Other: Upregulation of the R supramarginal gyrus after cTBS was significantly associated with slowing of RT after cTBS. This finding remained significant after including lesion volume as covariate.
Hartwigsen et al. (2020): Cplx 2	Semantic decision vs rest	CC Aphasia after cTBS to anterior IFG vs sham; same patients, repeated measures Covariate: $\Delta$ RT for semantic decision (cTBS to posterior IFG timepoint vs sham timepoint)	<u>UNR</u>	<u>C</u>	Cplx	Whole brain correlations were computed between the difference in functional activity after cTBS to anterior IFG versus sham stimulation, and the difference in reaction times on the semantic decision task under these two conditions. The resulting SPM was thresholded at voxelwise p < .001 (CDT) followed by correction for multiple comparisons based on cluster extent and GRFT using SPM12.	None

tack and only at

Second level contrast = Which of the 8 relevant classes of analyses is this? Which group or groups of participants are included? If there is a covariate, what is it?; Acc = Is accuracy matched across the second level contrast?; RT = Is reaction time matched across the second level contrast?; Stats = Does the analysis involve voxelwise statistics, region(s) of interest (ROI), or something else (complex)? If voxelwise, how are multiple comparisons across voxels accounted for? If ROI, were the ROI(s) anatomical, functional, laterality indices, mixed, or something else? If there was more than one ROI, how were the ROIs corrected for multiple comparisons?; Yellow underline = minor limitation; Orange underline = moderate limitation; Red underline = major limitation; CC = Cross-sectional correlation with language or other measure; YCT = Yes, correct trials only; C = Accuracy or RT is covariate; UNR = Unknown, not reported; NANB = N/A, no behavioral measure; NANT = N/A, no timeable task; Vox = Voxelwise; VP = Voxelwise correction based on permutation testing; VFWC = Voxelwise FWE correction and additional arbitrary cluster correction; C- = Clusterwise correction with with GRFT and lenient voxelwise p; ROI = Region(s) of interest; Anat = Anatomical; Func = Functional; Oth = Other; Mix = Mixed; FWE = Familywise error (FWE); NC = No correction; One = One only; Cplx = Complex.

# Supplementary Table S13. Longitudinal change in aphasia: Methodologically robust analyses

Analysis	First level contrast	Second level contrast	Match Acc	ed for RT	Stats	Notes	Findings
Saur et al. (2006): ROI 1	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LA Aphasia T2 vs T1	<u>AM</u>	UNR	ROI Func FWE	Behavioral data notes: accuracy combines language and control conditions; number of ROIs: 6; ROIs: (1) L IFG pars orbitalis; (2) L IFG pars triangularis; (3) L MTG; (4) R insula; (5) R IFG pars triangularis; (6) R SMA; how ROIs defined: peak voxels of overall activation map based on all three time points in patients	↑ R insula ↑ R SMA/medial prefrontal notes: some other ROIs also significant prior to correction for multiple comparisons; n.b. performance confound
Saur et al. (2006): ROI 2	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LA Aphasia T3 vs T2	<u>AM</u>	UNR	ROI Func FWE	Behavioral data notes: accuracy combines language and control conditions; number of ROIs: 6; ROIs: (1) L IFG pars orbitalis; (2) L IFG pars triangularis; (3) L MTG; (4) R insula; (5) R IFG pars triangularis; (6) R SMA; how ROIs defined: peak voxels of overall activation map based on all three time points in patients	None notes: some other ROIs also significant prior to correction for multiple comparisons; n.b. performance confound
Saur et al. (2006): ROI 3	Listening to sentences and making a plausibility judgment vs listening to reversed speech	LA Aphasia T3 vs T1	<u>AM</u>	<u>UNR</u>	ROI Func FWE	Behavioral data notes: accuracy combines language and control conditions; number of ROIs: 6; ROIs: (1) L IFG pars orbitalis; (2) L IFG pars triangularis; (3) L MTG; (4) R insula; (5) R IFG pars triangularis; (6) R SMA; how ROIs defined: peak voxels of overall activation map based on all three time points in patients	↑ L posterior MTG notes: some other ROIs also significant prior to correction for multiple comparisons; n.b. performance confound
Nenert et al. (2017): ROI 1	Semantic decision vs tone decision	LA Aphasia ANOVA including T1, T2, T3	<u>AS</u>	<u>UNR</u>	ROI LI <u>NC</u>	Number of ROIs: 5; ROIs: (1) frontal LI; (2) temporo-parietal LI; (3) cerebellar LI; (4) fronto-parietal LI; (5) Broca's LI	None
Nenert et al. (2018): Cplx 1	Semantic decision vs tone decision	LA Aphasia (comparisons between all pairs of time points)	<u>AS</u>	<u>UNR</u>	Cplx	PPI analyses were carried out to investigate potential changes over time in how connectivity from L and R IFG was modulated by the semantic decision task. The resultant SPM was thresholded at FWE p < .05 using permutation testing implemented in SnPM 13.	None

Second level contrast = Which of the 8 relevant classes of analyses is this? Which group or groups of participants are included? If there is a covariate, what is it?; Acc = Is accuracy matched across the second level contrast?; RT = Is reaction time matched across the second level contrast?; Stats = Does the analysis involve voxelwise statistics, region(s) of interest (ROI), or something else (complex)? If voxelwise, how are multiple comparisons across voxels accounted for? If ROI, were the ROI(s) anatomical, functional, laterality indices, mixed, or something else? If there was more than one ROI, how were the ROIs corrected for multiple comparisons?; Yellow underline = minor limitation; Orange underline = moderate limitation; Red underline = major limitation; LA = Longitudinal change in aphasia; AS = Appear similar; AM = Appear mismatched; UNR = Unknown, not reported; ROI = Region(s) of interest; Func = Functional; LI = Laterality indi(ces); FWE = Familywise error (FWE); NC = No correction; Cplx = Complex.

# Supplementary Table S14. Cross-sectional between two groups with aphasia: Methodologically robust analyses

Analysis	First level contrast	Second level contrast	Match Acc	ed for RT	Stats	Notes	Findings
Leff et al. (2002): ROI 2	Higher word rates vs lower word rates	CAA Aphasia with pSTS damage (n = 6) vs aphasia without pSTS damage (n = 9)		NANT	ROI Func One	Number of ROIs: 1; ROI: R pSTS; how ROI defined: the peak voxel for the contrast in the R pSTS from each subject's individual analysis, but <u>the</u> <u>search region is not stated</u> ; the controls and patients without pSTS damage were combined, however it is stated in the caption to Figure 2 that the patients with pSTS damage were significantly different to both	↑ R posterior STS
Blank et al. (2003): Vox 3	Propositional speech production vs rest	CAA Aphasia with IFG POp damage (n = 7) vs without IFG POp damage (n = 7)	<u>N</u>	NANT	Vox <u>SVC</u>	Behavioral data notes: word rates not reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R pars opercularis	None notes: patients with L IFG POp damage showed numerically more signal in the R IFG POp
Blank et al. (2003): Vox 6	Propositional speech production vs counting	CAA Aphasia with IFG POp damage (n = 7) vs without IFG POp damage (n = 7)	N	NANT	Vox <u>SVC</u>	Behavioral data notes: word rates not reported, but offline speech sample differed; search volume: voxels spared in all patients; software: SPM99; voxelwise p: FWE p < .05 with SVC in R pars opercularis	None
Crinion & Price (2005): Vox 3	Listening to narrative speech vs listening to reversed speech	CAA Aphasia with temporal lobe damage (n = 8) vs without temporal lobe damage (n = 9)	<u>NANB</u>	NANT		Search volume: whole brain; software: SPM2; voxelwise p: FWE p < .05; cluster extent cutoff: 5 voxels (size not stated)	↓ L posterior STG/STS/MTG ↓ L mid temporal
Crinion & Price (2005): Cplx 4	Listening to narrative speech vs listening to reversed speech	CAA Aphasia with temporal damage (n = 8) vs without temporal damage (n = 9)	<u>NANB</u>	NANT	Cplx	Correlations were computed between activity in each voxel, and post-scan story recall, and were compared between the two aphasia groups, in regions with a main effect of story comprehension. The threshold was p < 0.05 corrected, <u>plus a minimum</u> <u>cluster size of 5 voxels</u> .	None
Crinion et al. (2006): ROI 3	Listening to narrative speech vs listening to reversed speech	CAA Aphasia with temporal damage excluding anterior temporal cortex (n = 9) vs with no temporal lobe damage (excluding 1 with missing behavioral data and 1 outlier) (n = 4)	NANB	NANT	ROI Func One	Number of ROIs: 1; ROI: L ATL; how ROI defined: activation in the control group; two other ROIs are described in the methods, but never used in any analyses	↓ L anterior temporal notes: patients with posterior temporal damage had less signal change
Warren et al. (2009): ROI 11	Listening to narrative speech vs listening to reversed speech	CAA Aphasia with positive anterior temporal interconnectivity (n = 8) vs with negative anterior temporal	<u>NANB</u>	NANT	ROI Anat <u>NC</u>	Number of ROIs: 6; ROIs: (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts; how ROIs defined: ROIs were defined anatomically in regions	↑ L IFG pars triangularis

		interconnectivity (n = 8)				that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6); excluded 4 patients with L IFG damage	
Hartwigsen et al. (2020): Vox 1	Syllable count decision vs rest	CAA Aphasia after cTBS to posterior IFG vs sham; same patients, repeated measures	Υ	N	Vox C+	Behavioral data notes: significantly slower response times when cTBS was applied over pIFG relative to when sham cTBS was applied; search volume: voxels spared in all patients; software: SPM12; voxelwise p: .001; cluster extent cutoff: based on GRFT	<ul> <li>↓ L IFG pars</li> <li>opercularis</li> <li>↓ L SMA/medial</li> <li>prefrontal</li> <li>↓ R SMA/medial</li> <li>prefrontal</li> <li>↓ R basal ganglia</li> <li>notes: based on</li> <li>Figure 4A and</li> <li>Table 3</li> </ul>
Hartwigsen et al. (2020): Vox 2	Syllable count decision vs rest	CAA Aphasia after cTBS to posterior IFG vs after cTBS to anterior IFG; same patients, repeated measures	Υ	N	Vox C+	Behavioral data notes: significantly slower response times when cTBS was applied over pIFG relative to when cTBS was applied over aIFG; search volume: voxels spared in all patients; software: SPM12; voxelwise p: .001; cluster extent cutoff: based on GRFT	↓ L IFG pars opercularis notes: based on Table 3
Hartwigsen et al. (2020): Vox 3	Semantic decision vs rest	CAA Aphasia after cTBS to anterior IFG vs sham; same patients, repeated measures <u>Somewhat valid</u> (no behavioral difference)	Y	Y	Vox C+	Behavioral data notes: difference in reaction time did not survive correction; search volume: voxels spared in all patients; software: SPM12; voxelwise p: .001; cluster extent cutoff: based on GRFT	<ul> <li>↓ L insula</li> <li>↓ L dorsolateral</li> <li>prefrontal cortex</li> <li>↓ R insula</li> <li>↓ R dorsolateral</li> <li>prefrontal cortex</li> <li>↓ R SMA/medial</li> <li>prefrontal</li> <li>notes: based on</li> <li>Figure 4B and</li> <li>Table 3</li> </ul>
Hartwigsen et al. (2020): Vox 4	Semantic decision vs rest	CAA Aphasia after cTBS to anterior IFG vs after cTBS to posterior IFG ; same patients, repeated measures	Υ	N	Vox C+	Behavioral data notes: significantly slower response times when cTBS was applied over alFG relative to when cTBS was applied over plFG; search volume: voxels spared in all patients; software: SPM12; voxelwise p: .001; cluster extent cutoff: based on GRFT	↓ L insula ↓ R insula ↓ R dorsolateral prefrontal cortex notes: based on Table 3

Second level contrast = Which of the 8 relevant classes of analyses is this? Which group or groups of participants are included? If there is a covariate, what is it?; Acc = Is accuracy matched across the second level contrast?; RT = Is reaction time matched across the second level contrast?; Stats = Does the analysis involve voxelwise statistics, region(s) of interest (ROI), or something else (complex)? If voxelwise, how are multiple comparisons across voxels accounted for? If ROI, were the ROI(s) anatomical, functional, laterality indices, mixed, or something else? If there was more than one ROI, how were the ROIs corrected for multiple comparisons?; Yellow underline = minor limitation; Orange underline = moderate limitation; Red underline = major limitation; CAA = Cross-sectional between two groups with aphasia; Y = Yes, matched; N = No, different; NANB = N/A, no behavioral measure; NANT = N/A, no timeable task; Vox = Voxelwise; C+ = Clusterwise correction with with GRFT and stringent voxelwise p; VFWC = Voxelwise FWE correction and additional arbitrary cluster correction; SVC = Small volume correction; ROI = Region(s) of interest; Anat = Anatomical; Func = Functional; NC = No correction; One = One only; Cplx = Complex.

# Supplementary Table S15. Cross-sectional performance-defined conditions: Methodologically robust analyses

Analysis	First level contrast	Second level contrast	Match Acc	ned for RT	Stats	Notes	Findings
Fridriksson et al. (2009): Vox 2	Picture naming (phonemic paraphasias) vs picture naming (correct trials)	CB Aphasia	NBD	UNR	Vox <u>C-</u>	Search volume: voxels spared in all patients; software: FSL (FEAT 5.4); voxelwise p: ~.01 (z > 2.3); cluster extent cutoff: based on GRFT	↑ L superior parietal ↑ L posterior inferior temporal gyrus/fusiform gyrus ↑ L occipital
Fridriksson et al. (2009): Vox 3	Picture naming (semantic paraphasias) vs picture naming (correct trials)	CB Aphasia	NBD	<u>UNR</u>	Vox <u>C-</u>	Search volume: voxels spared in all patients; software: FSL (FEAT 5.4); voxelwise p: ~.01 (z > 2.3); cluster extent cutoff: based on GRFT	↑ R posterior inferior temporal gyrus/fusiform gyrus ↑ R occipital
Skipper- Kallal et al. (2017a): Vox 5	Picture naming (both phases, correct trials) vs picture naming (both phases, incorrect trials)	CB Aphasia with naming < 80% (n = 24)	NBD	<u>UNR</u>	Vox <u>C-</u>	Search volume: whole brain gray matter; software: FSL 5.0.6; voxelwise p: ~.01 ( $z > 2.3$ ); cluster extent cutoff: based on GRFT	None
Pillay et al. (2018): Vox 1	Reading nouns aloud (correct trials) vs reading nouns aloud (incorrect trials)	CB Aphasia	NBD	Υ	Vox CCS	Search volume: whole brain; software: AFNI; voxelwise p: .01; cluster extent cutoff: 1.609 cc; regarding correction for multiple comparisons, addition of monoexponential function reduces but does not eliminate inflation of p values (Cox et al., 2017)	<ul> <li>↑ L angular gyrus</li> <li>↓ L ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↓ L SMA/medial</li> <li>prefrontal</li> <li>↓ R insula</li> <li>↓ R ventral</li> <li>precentral/inferior</li> <li>frontal junction</li> <li>↓ R SMA/medial</li> <li>prefrontal</li> <li>notes: positive</li> <li>region (L AG) was</li> <li>part of the</li> <li>semantic network,</li> <li>while many</li> <li>negative regions</li> <li>were positively</li> <li>modulated by</li> <li>reaction time in</li> <li>the aphasia group</li> </ul>

Second level contrast = Which of the 8 relevant classes of analyses is this? Which group or groups of participants are included? If there is a covariate, what is it?; Acc = Is accuracy matched across the second level contrast?; RT = Is reaction time matched across the second level contrast?; Stats = Does the analysis involve voxelwise statistics, region(s) of interest (ROI), or something else (complex)? If voxelwise, how are multiple comparisons across voxels accounted for? If ROI, were the ROI(s) anatomical, functional, laterality indices, mixed, or something else? If there was more than one ROI, how were the ROIs corrected for multiple comparisons?; Yellow underline = minor limitation; Orange underline = moderate limitation; Red underline = major limitation; CB = Cross-sectional performance-defined conditions; Y = Yes, matched; NBD = No, by design; UNR = Unknown, not reported; Vox = Voxelwise; C- = Clusterwise correction with with GRFT and lenient voxelwise p; CCS = Clusterwise correction based on 3dClustSim.

# Supplementary Table S16: Complete coding of all included studies

# Weiller et al. (1995)

#### Reference

Authors	Weiller C, Isensee C, Rijntjes M, Huber W, Müller S, Bier D, Dutschka K, Woods RP, Noth J, Diener HC
Title	Recovery from Wernicke's aphasia: a positron emission tomographic study
Reference	Ann Neurol 1995; 37: 723-732
PMID	7778845
DOI	10.1002/ana.410370605

#### Participants

Language	German
Inclusion criteria	Lesion including L pSTG; moderate-to-severe Wernicke's aphasia in the subacute period; now recovered and not aphasic per formal testing; able to perform verb generation task
Number of individuals with aphasia	<u>6</u>
Number of control participants	6
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	<u>No</u> (mean 58 years, range 50-66 years; controls were younger: mean 35 years; range 27-50 years)
Is sex reported for patients and controls, and matched?	Yes (males: 6; females: 0)
Is handedness reported for patients and controls, and matched?	Yes (right: 6; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 5-117 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	AAT
Aphasia severity	Recovered; not aphasic per formal testing
Aphasia type	Recovered, but all had moderate-severe Wernicke's aphasia in the subacute period
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Not stated
Lesion location	Posterior L MCA infarct, lesion to the L posterior STG usually extending to MTG and AG
Participants notes	6 patients were selected from a database of 600 carefully documented cases
Imaging	

#### Imaging

Modality	PET (rCBF)
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	-
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (CTI ECAT 953/15)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	PET
Total images acquired	6
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (axial; field of view = 5.4 cm; perisylvian only)

Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-

Yes

#### Conditions

demands?

Behavioral data notes

Is accuracy matched between the language and

Is reaction time matched between the language

control tasks for all relevant groups?

and control tasks for all relevant groups?

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
verb generation	Multiple words (covert)	2	Yes	Yes
pseudoword repetition	Multiple words (covert)	2	Yes	Yes
rest	None	2	<u>N/A</u>	<u>N/A</u>
Conditions notes	Auditory presentation; p	re-scan behavior	al data reported	
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: verb generation vs rest				
Language condition	Verb generation			
Control condition	Rest			
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	No			
Are the conditions matched for motor demands?	Yes			
Are the conditions matched for cognitive/executive demands?	No			
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparab</u>	<u>le</u>		
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparab</u>	<u>le</u>		
Behavioral data notes	_			
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>			
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes			
Are activations lateralized in the control data?	Yes			
Control activation notes	L posterior temporal, IFG hemisphere	and ventral pre	central gyrus, much smal	ler activations in the R
Contrast notes	_			
Contrast 2: pseudoword repetition vs rest				
Language condition	Pseudoword repetition			
Control condition	Rest			
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	No			
Are the conditions matched for motor demands?	Yes			

Are the conditions matched for cognitive/executive

N/A, tasks not comparable

N/A, tasks not comparable

Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	Somewhat
Control activation notes	L posterior temporal only; similar but less extensive activation in the R hemisphere
Contrast notes	_
nalyses	
Are the analyses clearly described?	Yes
oxelwise analysis 1	
First level contrast	Verb generation vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
ls accuracy matched across the second level contrast?	Appear mismatched
ls reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	In practice trials, patients produced 1.5 words on average per prompt, not all of which were verbs, while controls 2.3 words on average per prompt, almost all of which were verbs
Type of analysis	Voxelwise
Search volume	Perisylvian
Correction for multiple comparisons	No direct comparison
Software	SPM
Voxelwise p	_
Cluster extent	_
Statistical details	Qualitative comparison on p. 729 (the word "significant" is used)
Findings	↑ R IFG ↑ R posterior STG/STS/MTG ↓ L posterior STG/STS/MTG
Findings notes	Based more on Figure 2 than the text
oxelwise analysis 2	
First level contrast	Pseudoword repetition vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
ls accuracy matched across the second level contrast?	Appear similar
ls reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	All participants are reported to have had no difficulties in performing the repetition task
Type of analysis	Voxelwise
Search volume	Perisylvian
Correction for multiple comparisons	No direct comparison
Software	SPM
Voxelwise p	_
Cluster extent	_
	Qualitative comparison on p. 729 (the word "significant" is used)
Statistical details	Qualitative compansion on p. 725 (the word significant is used)

	↑ R IFG ↑ R posterior STG/STS/MTG ↓ L posterior STG/STS/MTG	
Findings notes	Based more on Figure 2 than the text	
Notes		

Excluded analyses

# Belin et al. (1996)

#### Reference

Authors	Belin P, Van Eeckhout P, Zilbovicius M, Remy P, François C, Guillaume S, Chain F, Rancurel G, Samson Y
Title	Recovery from nonfluent aphasia after melodic intonation therapy: a PET study
Reference	<i>Neurology</i> 1996; 47: 1504-1511
PMID	8960735
DOI	10.1212/wnl.47.6.1504

# Participants

Language	French
Inclusion criteria	MCA; persistent severe non-fluent aphasia followed by marked improvement with MIT
Number of individuals with aphasia	<u>7</u>
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 49.7 years, range 40-58 years)
ls sex reported for patients and controls, and matched?	No
Is handedness reported for patients and controls, and matched?	Yes (right: 7; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 15-149 months; including MIT for the most recent 1-108 months)
To what extent is the nature of aphasia characterized?	Severity and type
Language evaluation	BDAE
Aphasia severity	Persistent severe non-fluent aphasia followed by marked improvement with MIT
Aphasia type	5 global, 2 Broca's
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Not stated, but note that hypoperfusion greatly exceeded the infarct in all but 1 patient
Lesion location	L MCA; 2 also had ACA
Participants notes	_

# Imaging

Modality	PET (rCBF)
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between	_

the time points?

Is the scanner described?	Yes (CEA LETI-TTV03)			
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes			
Design type	PET			
Total images acquired	4			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (7 transaxial slices	s 12 mm apart)		
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	Yes			
Is intersubject normalization adequately described and appropriate?	Yes			
Imaging notes	-			
Conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
word repetition with MIT-like intonation	Word (overt)	1	Yes	Unknown
word repetition	Word (overt)	1	Yes	Unknown
listening to words	None	1	N/A	N/A
rest	None	1	N/A	N/A
Conditions notes	_			
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: word repetition with MIT-like inton	ation vs word repetit	ion		
Language condition	Word repetition with	MIT-like intonation		
Control condition	Word repetition			
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	Yes			
Are the conditions matched for motor demands?	Yes			
Are the conditions matched for cognitive/executive demands?	Yes			
Is accuracy matched between the language and control tasks for all relevant groups?	No, by design			
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reporte</u>	<u>ed</u>		
Behavioral data notes	More words were cor	rectly repeated with	n MIT (16.3 $\pm$ 8) than with	out (12.4 ± 8; p < 0.03)
Are control data reported in this paper or another that is referenced?	N/A			
Does the contrast selectively activate plausible relevant language regions in the control group?	N/A			
Are activations lateralized in the control data?	N/A			
Control activation notes	_			
Contrast notes	_			
Analyses				
Are the analyses clearly described?	Yes			
ROI analysis 1				
First level contrast	Word repetition with	MIT-like intonation	vs word repetition	
Analysis class	Cross-sectional performance-defined conditions			

Group(s)	Aphasia
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	No, by design
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	More words were correctly repeated with MIT (16.3 $\pm$ 8) than without (12.4 $\pm$ 8; p < 0.03)
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	18
What are the ROI(s)?	(1) L Broca's area; (2) L prefrontal; (3) L sensorimotor mouth; (4) L parietal; (5) L Wernicke's area; (6) L Heschl's gyrus; (7) L anterior STG; (8) L MTG; (9) L temporal pole; (10-18) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images; activation quantified as mean rCBF, not including any intersection of the infarct with the ROI
Correction for multiple comparisons	No correction
Statistical details	Three left hemisphere ROIs were excluded (3, 6, 9) because they were completely infarcted in 4 or more patients
Findings	↑ L IFG ↑ L dorsolateral prefrontal cortex ↓ R posterior STG
Findings notes	-
Notes	
Excluded analyses	Two other contrasts are also reported, but do not fall within the scope of this review

# Ohyama et al. (1996)

#### Reference

Authors	Ohyama M, Senda M, Kitamura S, Ishii K, Mishina M, Terashi A
Title	Role of the nondominant hemisphere and undamaged area during word repetition in poststroke aphasics: a PET activation study
Reference	Stroke 1996; 27: 897-903
PMID	8623110
DOI	10.1161/01.str.27.5.897

# Participants

Language	Japanese
Inclusion criteria	Able to repeat single words
Number of individuals with aphasia	<u>16</u>
Number of control participants	6
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 56.6 ± 11.8 years, range 38-75 years)
Is sex reported for patients and controls, and matched?	Yes (males: 12; females: 4)
Is handedness reported for patients and controls, and matched?	Yes (right: 16; left: 0)
Is time post stroke onset reported and appropriate to the study design?	<u>No* (moderate limitation)</u> (mean 15.1 ± 16.7 months, range 1.1-50.3 months; a mix of subacute and chronic participants; 8 of each)

To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	WAB
Aphasia severity	AQ mean 74.3 ± 12.2, range 53.8-92.4
Aphasia type	6 anomic, 4 atypical, 4 mild Broca's, 1 mild Wernicke's, 1 transcortical sensory; alternately: 10 fluent, 6 non-fluent
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Extent and location
Lesion extent	Mean 33.9 ± 26.3 cc, range 8.1-113.2 cc
Lesion location	L perisylvian
Participants notes	-

# Imaging

Modality	PET (rCBF)
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (Headtome IV tomograph)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	PET
Total images acquired	6
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	<u>No</u> (91 mm field of view; coverage limitations not stated)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	<u>No</u> (lesion impact not addressed)
Imaging notes	-

#### Conditions

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
word repetition	Word (overt)	2	Yes	Yes
counting	Multiple words (overt)	2	Yes	Yes
rest	None	2	<u>N/A</u>	N/A
Conditions notes	Patients were able to repeat words well, with phonemic errors on no more than 4 out of 48 words; counting condition not analyzed in this paper			

Yes

Yes

#### Contrasts

Are the contrasts clearly described?

# Contrast 1: word repetition vs rest

Language condition	Word repetition
Control condition	Rest
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No

Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	No
Control activation notes	Bilateral auditory and motor activations are prominent, only slightly L-lateralized
Contrast notes	-
Analyses	
Are the analyses clearly described?	No (see specific limitation(s) below)
ROI analysis 1	
First level contrast	Word repetition vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Some of the patients made a few errors, so as a group they may have been less accurate than controls
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	7
What are the ROI(s)?	(1) L posterior inferior frontal; (2) R posterior inferior frontal; (3) L posterior superior temporal; (4) R posterior superior temporal; (5) L rolandic; (6) R rolandic; (7) SMA
How are the ROI(s) defined?	Spheres around control peaks
Correction for multiple comparisons	No correction
Statistical details	The rCBF increase in R PIF was also significant at p < 0.005 for nonfluent patients with Fisher's protected least-significant difference
Findings	↑ R IFG ↑ R posterior STG/STS/MTG
Findings notes	_
ROI analysis 2	
First level contrast	Word repetition vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia fluent (n = 10) vs non-fluent (n = 6)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-

Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	7
What are the ROI(s)?	(1) L posterior inferior frontal; (2) R posterior inferior frontal; (3) L posterior superior temporal; (4) R posterior superior temporal; (5) L rolandic; (6) R rolandic; (7) SMA
How are the ROI(s) defined?	Spheres around control peaks
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↓ R IFG
Findings notes	-
ROI analysis 3	
First level contrast	Word repetition vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Spontaneous speech (WAB)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_

(1) L posterior inferior frontal; (2) R posterior inferior frontal; (3) L posterior superior temporal;

(4) R posterior superior temporal; (5) L rolandic; (6) R rolandic; (7) SMA

No correction for multiple comparisons across WAB subscores

Regions of interest (ROI)

Spheres around control peaks

Functional

No correction

↑ L IFG

7

# Findings notes **ROI analysis 4**

Findings

Statistical details

Type of analysis

How many ROIs are there?

How are the ROI(s) defined?

Correction for multiple comparisons

What are the ROI(s)?

ROI type

,	
First level contrast	Word repetition vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Comprehension (WAB)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	7
What are the ROI(s)?	(1) L posterior inferior frontal; (2) R posterior inferior frontal; (3) L posterior superior temporal; (4) R posterior superior temporal; (5) L rolandic; (6) R rolandic; (7) SMA
How are the ROI(s) defined?	Spheres around control peaks
Correction for multiple comparisons	No correction
Statistical details	This non-significant finding is implied but not stated explicitly
Findings	None

#### Findings notes

#### **ROI** analysis 5

First level contrast	Word repetition vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Repetition (WAB)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
ls accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	7
What are the ROI(s)?	(1) L posterior inferior frontal; (2) R posterior inferior frontal; (3) L posterior superior temporal; (4) R posterior superior temporal; (5) L rolandic; (6) R rolandic; (7) SMA
How are the ROI(s) defined?	Spheres around control peaks
Correction for multiple comparisons	No correction
Statistical details	This non-significant finding is implied but not stated explicitly
Findings	None
Findings notes	-

# ROI analysis 6

First level contrast	Word repetition vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Naming (WAB)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	7
What are the ROI(s)?	(1) L posterior inferior frontal; (2) R posterior inferior frontal; (3) L posterior superior temporal; (4) R posterior superior temporal; (5) L rolandic; (6) R rolandic; (7) SMA
How are the ROI(s) defined?	Spheres around control peaks
Correction for multiple comparisons	No correction
Statistical details	This non-significant finding is implied but not stated explicitly
Findings	None
Findings notes	-
Notes	

Excluded analyses

Separate analyses for fluent and non-fluent patients revealed essentially similar results

#### Reference

Authors	Heiss WD, Kessler J, Karbe H, Fink GR, Pawlik G
Title	Speech-induced cerebral metabolic activation reflects recovery from aphasia
Reference	J Neurol Sci 1997; 145: 213-217
PMID	9094051
DOI	10.1016/s0022-510x(96)00252-3

#### Participants

Language	German
Inclusion criteria	-
Number of individuals with aphasia	<u>6</u>
Number of control participants	6
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (range 33-66 years)
Is sex reported for patients and controls, and matched?	Yes (males: 4; females: 2)
Is handedness reported for patients and controls, and matched?	Yes (right: 6; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (T1: ~4 weeks; T2: ~12-18 months)
To what extent is the nature of aphasia characterized?	<u>Severity only</u>
Language evaluation	Verbal repetition, confrontation naming, oral and written comprehension, reading abilities, TT, phonemic fluency, clinical impression, family interview
Aphasia severity	T1: TT range 37-48; T2: TT range 3-39 (1 missing)
Aphasia type	T1: 5 global, 1 Wernicke's; T2: not stated
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Range 27.2-133.2 cc
Lesion location	L MCA; 5 patients had superior temporal damage and 1 had subcortical damage underlying posterior superior temporal cortex
Participants notes	-

# Imaging

Modality	
Modality	PET (rCMRgl)
Is the study cross-sectional or longitudinal?	Longitudinal—recovery
If longitudinal, at what time point(s) were imaging data acquired?	T1: ~4 weeks; T2: ~12-18 months
If longitudinal, was there any intervention between the time points?	Not stated
Is the scanner described?	Yes (Siemens ECAT EXACT HR)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	PET
Total images acquired	2
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described	N/A—no intersubject normalization

Imaging notes —	and appropriate?		
	Imaging notes	_	

#### Conditions

Are the conditions clearly described?

No (no information about repetition rate, or whether repetition was overt or covert)

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
word repetition	Word (overt)	1	Unknown	Unknown
rest	None	1	N/A	N/A
			<u></u>	<u></u>
Conditions notes	_			
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: word repetition vs rest				
Language condition	Word repetition			
Control condition	Rest			
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	No			
Are the conditions matched for motor demands?	No			
Are the conditions matched for cognitive/executive demands?	No			
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>	<u>e</u>		
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>	e		
Behavioral data notes	_			
Are control data reported in this paper or another that is referenced?	Somewhat			
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Unknown</u>			
Are activations lateralized in the control data?	No			
Control activation notes	The only control data is ex temporal cortex; both of t			
Contrast notes	_		0,	
Analyses				
Are the analyses clearly described?	Yes			
Voxelwise analysis 1				
First level contrast	Word repetition vs rest			
Analysis class	Longitudinal between two	groups with ap	hasia	
Group(s)	(Aphasia with good recov	•		recoverv (n = 3) T2 vs T1)
Covariate	_	, _,5	,	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (TT not optima	I measure of ove	erall language function)	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>			
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>			
Behavioral data notes	_			
	Voxelwise			
Type of analysis				
Type of analysis Search volume	Whole brain			

Software	not stated
Voxelwise p	-
Cluster extent	-
Statistical details	Qualitative generalization across individuals on pp. 214-6
Findings	↑ L posterior STG/STS/MTG ↓ R posterior STG/STS/MTG
Findings notes	The consistent aspects of the findings were that there was an emergence of L posterior temporal activation in patients with better recovery, and R posterior temporal activation in patients with worse recovery
ROI analysis 1	
First level contrast	Word repetition vs rest
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia with good recovery (n = 3) T2 vs T1) vs (aphasia with poor recovery (n = 3) T2 vs T1)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (TT not optimal measure of overall language function)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	2
What are the ROI(s)?	(1) L superior temporal cortex; (2) R superior temporal cortex
How are the ROI(s) defined?	Individual anatomical images; activation quantified in terms of extent exceeding 10% signal change, and mean % increase over the activation
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative generalization across individuals on pp. 214, 216
Findings	↑ L posterior STG/STS/MTG ↑ L Heschl's gyrus
Findings notes	_
Notes	
Excluded analyses	_
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# Karbe et al. (1998)

#### Reference

TitleBrain plasticity in poststroke aphasia: what is the contribution of the right hemisphere?ReferenceBrain Lang 1998; 64: 215-230PMID9710490DOI10.1006/brln.1998.1961	Authors	Karbe H, Thiel A, Weber-Luxenburger G, Herholz K, Kessler J, Heiss WD
PMID 9710490	Title	Brain plasticity in poststroke aphasia: what is the contribution of the right hemisphere?
	Reference	<i>Brain Lang</i> 1998; 64: 215-230
DOI 10.1006/brln.1998.1961	PMID	9710490
	DOI	10.1006/brln.1998.1961

# Participants

Language	German
Inclusion criteria	MCA; able to repeat single words
Number of individuals with aphasia	<u>12</u>
Number of control participants	10
Were any of the participants included in any previous studies?	No

Is age reported for patients and controls, and matched?	<u>No</u> (mean 57 years, rang	ge 34-78 years; co	ntrols not matched for ag	(e)
Is sex reported for patients and controls, and matched?	Yes (males: 7; females: 5; stated to be not matched, but difference not significant)			
Is handedness reported for patients and controls, and matched?	Yes (right: 12; left: 0)			
Is time post stroke onset reported and appropriate to the study design?	Yes (T1: mean 24 $\pm$ 11 days, ~3-4 weeks; T2: mean 19 $\pm$ 2 months, > 1 year)			1 year)
To what extent is the nature of aphasia characterized?	Severity and type			
Language evaluation	TT			
Aphasia severity	T1: 9 severe; 2 mild; 1 no	ot stated; TT rang	e 3-47 errors; T2: not stat	ed
Aphasia type	T1: 8 global, 3 anomic, 1	Wernicke's; T2: n	ot stated	
First stroke only?	Yes			
Stroke type	Ischemic only			
To what extent is the lesion distribution characterized?	Extent and location			
Lesion extent	Range 2-133 cc			
Lesion location	L MCA			
Participants notes	Only 7 of the 12 patients	s took part at T2		
Imaging				
Modality	PET (rCMRgl)			
Is the study cross-sectional or longitudinal?	Longitudinal—recovery			
If longitudinal, at what time point(s) were imaging data acquired?	T1: mean 24 ± 11 days, ~	-3-4 weeks; T2: m	ean 19 ± 2 months, > 1 ye	ear
If longitudinal, was there any intervention between the time points?	Not stated			
Is the scanner described?	Yes (CTI-Siemens ECAT EXACT HR)			
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	No* (moderate limitation number of acquisitions r		control images not acqui ped)	red on the same day;
Design type	PET			
Total images acquired	8			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	Yes			
Is intersubject normalization adequately described and appropriate?	N/A—no intersubject no	rmalization		
Imaging notes	_			
Conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
word repetition	Word (overt)	4 (?)	Unknown	Unknown
rest	None	4 (?)	N/A	N/A
Conditions notes	Inability to repeat single words was an exclusion criterion, but many patients had severe aphasia so it is unclear how they would have performed			
Contrasts				
Are the contrasts clearly described?				
Are the contrasts clearly described:	Yes			

#### Contrast 1: word repetition vs rest

contrast 1. word repetition vs rest	
Language condition	Word repetition
Control condition	Rest
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	No
Control activation notes	ROIs only; negligible evidence of lateralization
Contrast notes	-
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
ROI analysis 1	
First level contrast	Word repetition vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T1 vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	8
What are the ROI(s)?	(1) L IFG; (2) L STG/HG; (3) L SMA; (4) L ventral precentral; (5-8) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 219, but only the L SMA comparison is explicitly quantified
Findings	↑ L SMA/medial prefrontal ↑ R SMA/medial prefrontal ↓ L posterior STG ↓ L Heschl's gyrus
Findings notes	-
ROI analysis 2	
First level contrast	Word repetition vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia (subset who returned for follow-up) T1 (n = 7)
Covariate	ΤΤ Τ1
Is the second level contrast valid in terms of the	Somewhat (TT not optimal measure of overall language function)

group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	8
What are the ROI(s)?	(1) L IFG; (2) L STG/HG; (3) L SMA; (4) L ventral precentral; (5-8) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	-

# ROI analysis 3

First level contrast	Word repetition vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia (subset who returned for follow-up) T2 (n = 7)
Covariate	TT T2
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (TT not optimal measure of overall language function)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	8
What are the ROI(s)?	(1) L IFG; (2) L STG/HG; (3) L SMA; (4) L ventral precentral; (5-8) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No correction
Statistical details	-
Findings	<ul> <li>↓ L SMA/medial prefrontal</li> <li>↓ R ventral precentral/inferior frontal junction</li> <li>↓ R SMA/medial prefrontal</li> <li>↓ R posterior STG</li> <li>↓ R Heschl's gyrus</li> </ul>
Findings notes	More activation in patients with more severe aphasia per TT
ROI analysis 4	
First level contrast	Word repetition vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia (subset who returned for follow-up) (n = 7) T2 vs T1
Covariate	Subsequent outcome (T2) TT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>No</u> (the logic behind correlating activation changes and language outcome is unclear; TT not optimal measure of overall language function)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Anatomical

How many ROIs are there?	1
What are the ROI(s)?	L STG/HG
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	One only
Statistical details	-
Findings	↑ L posterior STG ↑ L Heschl's gyrus
Findings notes	Increase in activation for repetition was correlated with better aphasia outcome per TT $\!\!\!\!$
ROI analysis 5	
First level contrast	Word repetition vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia (subset who returned for follow-up) T2 (n = 7)
Covariate	Previous $\Delta$ (T2 vs T1) activation in L STG/HG
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>No</u> (logically problematic because patients with less severe initial aphasia would also be expected to show little L temporal increase, but would not be expected to show R temporal recruitment)
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	4
What are the ROI(s)?	(1) R IFG; (2) R STG/HG; (3) R SMA; (4) R ventral precentral
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↓ R IFG ↓ R ventral precentral/inferior frontal junction ↓ R SMA/medial prefrontal ↓ R posterior STG ↓ R Heschl's gyrus
Findings notes	Patients with more increase in L STG/HG activation showed less activation of R hemisphere regions at T2
Notes	
Excluded analyses	The "Initial study" columns of table 3, because <u>they are not described in the text and it is not</u> <u>clear exactly what is being correlated with what</u>

# Cao et al. (1999)

#### Reference

Authors	Cao Y, Vikingstad EM, George KP, Johnson AF, Welch KM
Title	Cortical language activation in stroke patients recovering from aphasia with functional MRI
Reference	Stroke 1999; 30: 2331-2340
PMID	10548667
DOI	10.1161/01.str.30.11.2331

# Participants

Language	US English
Inclusion criteria	Aphasia with significant recovery over months to years (ADPASS > 70th percentile)

Number of individuals with aphasia	<u>6</u> (plus 2 excluded: 1 unable to reliably describe performance post-scan; 1 due to head motion)
Number of control participants	37
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (range 20-56 years)
Is sex reported for patients and controls, and matched?	Yes (males: 1; females: 5)
Is handedness reported for patients and controls, and matched?	Yes (right: 6; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 5-32 months)
To what extent is the nature of aphasia characterized?	Severity and type
Language evaluation	ADP
Aphasia severity	ADPASS percentile range 73-99
Aphasia type	3 anomic, 1 conduction, 1 recovered, 1 transcortical sensory
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Extents are reported in three dimensions
Lesion location	4 L MCA, 2 L ICA
Participants notes	-
Imaging	

#### Modality fMRI Is the study cross-sectional or longitudinal? Cross-sectional If longitudinal, at what time point(s) were imaging \_ data acquired? If longitudinal, was there any intervention between the time points? Is the scanner described? Yes (Magnex Scientific 3 Tesla) Is the timing of stimulus presentation and image Yes acquisition clearly described and appropriate? Design type Block Total images acquired 40 Are the imaging acquisition parameters, including Yes (axial, perisylvian only) coverage, adequately described and appropriate? Is preprocessing and intrasubject coregistration Yes adequately described and appropriate? Is first level model fitting adequately described and No (first level cross-correlation analysis unclear) appropriate? Is intersubject normalization adequately described N/A—no intersubject normalization and appropriate? Imaging notes

#### Conditions

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming	Word (covert)	4	Yes	Yes
viewing nonsense drawings	None	4	N/A	N/A

Yes

Conditions notes

#### Contrasts

Contrasts	
Are the contrasts clearly described?	Yes
Contrast 1: picture naming vs viewing nonsens	e drawings
Language condition	Picture naming
Control condition	Viewing nonsense drawings
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Somewhat
Control activation notes	Insufficient data to assess the control activation pattern
Contrast notes	_
Analyses	
Are the analyses clearly described?	Yes
ROI analysis 1	
First level contrast	Picture naming vs viewing nonsense drawings
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	6
What are the ROI(s)?	(1) L IFG and MFG; (2) L pSTG, AG and SMG; (3) R IFG and MFG; (4) R pSTG, AG and SMG; (5) frontal Ll; (6) temporal Ll
How are the ROI(s) defined?	(1-4) individual anatomical images; activation quantified in terms of extent
Correction for multiple comparisons	No correction
Statistical details	_
Findings	<ul> <li>↑ R IFG</li> <li>↑ R dorsolateral prefrontal cortex</li> <li>↑ R supramarginal gyrus</li> <li>↑ R angular gyrus</li> <li>↑ R posterior STG</li> <li>↓ LI (frontal)</li> <li>↓ LI (temporal)</li> </ul>
Findings notes	• · · · · · · · · · · · · · · · · · · ·

# ROI analysis 2

First level contrast	Picture naming vs viewing nonsense drawings
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Picture naming (outside scanner)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	6
What are the ROI(s)?	(1) L IFG and MFG; (2) L pSTG, AG and SMG; (3) R IFG and MFG; (4) R pSTG, AG and SMG; (5) frontal Ll; (6) temporal Ll
How are the ROI(s) defined?	(1-4) individual anatomical images; activation quantified in terms of extent
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↑ LI (frontal)
Findings notes	_
Notes	

Excluded analyses

(1) verb generation study with n = 4 patients; (2) individual patient results; (3) whole brain and whole hemisphere activation measures

# Heiss et al. (1999)

#### Reference

Authors	Heiss WD, Kessler J, Thiel A, Ghaemi M, Karbe H
Title	Differential capacity of left and right hemispheric areas for compensation of poststroke aphasia
Reference	Ann Neurol 1999; 45: 430-438
PMID	10211466
DOI	10.1002/1531-8249(199904)45:4<430::aid-ana3>3.0.co;2-p

#### Participants

Language	German
Inclusion criteria	AAT repetition ≥ 50
Number of individuals with aphasia	23
Number of control participants	11
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 56 $\pm$ 12 years, range 31-77 years; assume patient's age of 5.6 years is a typo for 56 years)
ls sex reported for patients and controls, and matched?	Yes (males: 15; females: 8)
Is handedness reported for patients and controls, and matched?	Yes (right: 23; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (T1: ~2 weeks; T2: ~8 weeks)
To what extent is the nature of aphasia	Severity and type

characterized?	
Language evaluation	AAT, phonemic fluency
Aphasia severity	T1: subcortical: TT median 8 errors, range 0-17 errors; frontal: TT median 21 errors, range 4-40 errors; temporal: TT median 39 errors, range 1-47 errors; T2: subcortical: TT median 1 error, range 0-14 errors; frontal: TT median 8 errors, range 0-34; temporal: TT median 34 errors, range 0-44 errors
Aphasia type	T1: 6 Wernicke's, 5 Broca's, 5 residual aphasia, 4 anomic, 2 transcortical sensory, 1 conduction; T2: not stated
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Extent and location
Lesion extent	Range 4.3-154.3 cc (probably; units not stated)
Lesion location	L MCA; 9 subcortical, 7 frontal, 7 temporal
Participants notes	_
maging	
Modality	PET (rCBF)
Is the study cross-sectional or longitudinal?	Longitudinal—recovery
If longitudinal, at what time point(s) were imaging data acquired?	T1: ~2 weeks; T2: ~8 weeks
If longitudinal, was there any intervention between the time points?	Not stated
Is the scanner described?	Yes (CTI-Siemens ECAT EXACT HR)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	PET
Total images acquired	8
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)

coverage, adequately described and appropriate? Is preprocessing and intrasubject coregistration adequately described and appropriate? Is first level model fitting adequately described and appropriate? Is intersubject normalization adequately described and appropriate?

N/A—no intersubject normalization

#### Conditions

Imaging notes

Are the conditions clearly described?

Yes

Yes

Yes

Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
noun repetition	Word (overt)	4	<u>Unknown</u>	Unknown
rest	None	4	N/A	N/A
Conditions notes	Inclusion criterion would	suggest all patie	nts could do the task, but	this is not stated
Contracts				

#### Contrasts

Are the contrasts clearly described?

#### Contrast 1: noun repetition vs rest

Language condition	Noun repetition
Control condition	Rest
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No

Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	Somewhat
Control activation notes	L frontal and bilateral temporal
Contrast notes	_
Analyses	
Are the analyses clearly described?	Yes
ROI analysis 1	
First level contrast	Noun repetition vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with subcortical damage (n = 9) T2 vs T1
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
ls accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 434
Findings	↑ L mid temporal ↑ R Heschl's gyrus ↓ R IFG pars opercularis
Findings notes	_
ROI analysis 2	
First level contrast	Noun repetition vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with frontal damage (n = 7) T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_

Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 434
Findings	↑ L posterior STG ↑ L mid temporal ↑ R Heschl's gyrus ↓ R IFG pars opercularis
Findings notes	—
ROI analysis 3	
First level contrast	Noun repetition vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with temporal damage (n = 7) T2 vs T1
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 434
Findings	<ul> <li>↑ L ventral precentral/inferior frontal junction</li> <li>↑ L SMA/medial prefrontal</li> <li>↑ R ventral precentral/inferior frontal junction</li> <li>↑ R mid temporal</li> <li>↓ R SMA/medial prefrontal</li> </ul>
Findings notes	-
ROI analysis 4	
First level contrast	Noun repetition vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with temporal damage T1 (n = 7) vs with subcortical damage T1 (n = 9)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)

POLtrop	Anatomical
ROI type How many ROIs are there?	14
What are the ROI(s)?	<ul> <li>(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L</li> <li>Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior</li> <li>STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts</li> </ul>
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 434
Findings	<ul> <li>↑ L IFG pars opercularis</li> <li>↑ R SMA/medial prefrontal</li> <li>↓ L posterior STG</li> <li>↓ R IFG pars opercularis</li> <li>↓ R posterior STG</li> <li>↓ R mid temporal</li> </ul>
Findings notes	_
ROI analysis 5	
First level contrast	Noun repetition vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with temporal damage T1 (n = 7) vs with frontal damage T1 (n = 7)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 434
Findings	<ul> <li>↑ L IFG pars opercularis</li> <li>↑ R SMA/medial prefrontal</li> <li>↓ R IFG pars opercularis</li> <li>↓ R posterior STG</li> <li>↓ R mid temporal</li> </ul>
Findings notes	—
ROI analysis 6	
First level contrast	Noun repetition vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with temporal damage T2 (n = 7) vs with subcortical damage T2 (n = 9)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)

POltma	Anotomical
ROI type How many ROIs are there?	Anatomical 14
What are the ROI(s)?	14 (1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L
	Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 434
Findings	<ul> <li>↑ L IFG pars opercularis</li> <li>↑ L ventral precentral/inferior frontal junction</li> <li>↑ L SMA/medial prefrontal</li> <li>↑ R ventral precentral/inferior frontal junction</li> <li>↓ L posterior STG</li> <li>↓ L mid temporal</li> <li>↓ R posterior STG</li> <li>↓ R Heschl's gyrus</li> </ul>
Findings notes	-
ROI analysis 7	
First level contrast	Noun repetition vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with temporal damage T2 (n = 7) vs with frontal damage T2 (n = 7)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 434
Findings	<ul> <li>↑ L IFG pars opercularis</li> <li>↑ L ventral precentral/inferior frontal junction</li> <li>↑ L SMA/medial prefrontal</li> <li>↑ R ventral precentral/inferior frontal junction</li> <li>↓ L posterior STG</li> <li>↓ L mid temporal</li> <li>↓ R posterior STG</li> <li>↓ R Heschl's gyrus</li> </ul>
Findings notes	-
ROI analysis 8	
First level contrast	Noun repetition vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia with subcortical damage T1 (n = 9) vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level	Unknown, not reported

Is accuracy matched across the second level Unknown, not reported

contrast?	
Is reaction time matched across the second level	Unknown, not reported
contrast?	
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 434
Findings	↑ R IFG pars opercularis ↓ L IFG ↓ L ventral precentral/inferior frontal junction ↓ L HeschI's gyrus ↓ L mid temporal ↓ R HeschI's gyrus
Findings notes	-
ROI analysis 9	
First level contrast	Noun repetition vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia with frontal damage T1 (n = 7) vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 434
Findings	<ul> <li>↑ R IFG pars opercularis</li> <li>↓ L IFG pars opercularis</li> <li>↓ L ventral precentral/inferior frontal junction</li> <li>↓ L posterior STG/STS/MTG</li> <li>↓ L Heschl's gyrus</li> <li>↓ L mid temporal</li> <li>↓ R Heschl's gyrus</li> </ul>
Findings notes	_
ROI analysis 10	
First level contrast	Noun repetition vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia with temporal damage T1 (n = 7) vs control
Covariate	-
Is the second level contrast valid in terms of the	Yes

group(s) time point(s) and moasures involved?	
group(s), time point(s), and measures involved? Is accuracy matched across the second level	Linknown not reported
contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 434; L IFG pars opercularis noted as different in text despite being significant in both groups
Findings	<ul> <li>↑ L IFG pars opercularis</li> <li>↑ R SMA/medial prefrontal</li> <li>↓ L ventral precentral/inferior frontal junction</li> <li>↓ L posterior STG</li> <li>↓ L Heschl's gyrus</li> <li>↓ L mid temporal</li> <li>↓ R posterior STG</li> <li>↓ R mid temporal</li> <li>↓ R mid temporal</li> </ul>
Findings notes	-
ROI analysis 11	
First level contrast	Noun repetition vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia with subcortical damage T2 (n = 9) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 434
Findings	↓ L IFG pars opercularis ↓ L ventral precentral/inferior frontal junction ↓ L Heschl's gyrus
Findings notes	_
ROI analysis 12	
First level contrast	Noun repetition vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia with frontal damage T2 (n = 7) vs control

Covariata	
Covariate Is the second level contrast valid in terms of the	— Vac
group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 434
Findings	↓ L IFG pars opercularis ↓ L ventral precentral/inferior frontal junction ↓ L Heschl's gyrus
Findings notes	-
ROI analysis 13	
First level contrast	Noun repetition vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia with temporal damage T2 (n = 7) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 434
Findings	<ul> <li>↑ L IFG pars opercularis</li> <li>↑ L SMA/medial prefrontal</li> <li>↑ R ventral precentral/inferior frontal junction</li> <li>↓ L posterior STG</li> <li>↓ L Heschl's gyrus</li> <li>↓ L mid temporal</li> <li>↓ R posterior STG</li> <li>↓ R Heschl's gyrus</li> </ul>
Findings notes	_
ROI analysis 14	
First level contrast	Noun repetition vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with subcortical or frontal damage and good recovery (n = 11) T2 vs T1

Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on pp. 434-5
Findings	<ul> <li>↑ L SMA/medial prefrontal</li> <li>↑ L Heschl's gyrus</li> <li>↑ R ventral precentral/inferior frontal junction</li> <li>↑ R SMA/medial prefrontal</li> <li>↑ R Heschl's gyrus</li> <li>↓ R IFG pars opercularis</li> </ul>
Findings notes	
ROI analysis 15	
First level contrast	Noun repetition vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with subcortical or frontal damage and poor recovery (n = 5) T2 vs T1
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on pp. 434-5
Findings	↑ L ventral precentral/inferior frontal junction ↑ R Heschl's gyrus ↓ R IFG pars opercularis
Findings notes	_

# ROI analysis 16

First level contrast	Noun repetition vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with subcortical and frontal damage and good recovery T1 (n = 11) vs with subcortical and frontal damage and poor recovery T1 (n = 5)

Covariate	
Is the second level contrast valid in terms of the	— Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 435
Findings	↑ L posterior STG ↑ L mid temporal
Findings notes	-
ROI analysis 17	
First level contrast	Noun repetition vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with subcortical and frontal damage and good recovery T2 (n = 11) vs with subcortical and frontal damage and poor recovery T2 (n = 5)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L IFG pars opercularis; (2) L IFG pars triangularis; (3) L ventral precentral gyrus; (4) L Heschl's gyrus; (5) L temporal plane (posterior to HG, coded as posterior STG); (6) L posterior STG (coded as mid STG per Fig. 2); (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No direct comparison
Statistical details	Qualitative comparison on p. 435
Findings	<ul> <li>↑ L SMA/medial prefrontal</li> <li>↑ L posterior STG</li> <li>↑ L Heschl's gyrus</li> <li>↑ L mid temporal</li> <li>↑ R ventral precentral/inferior frontal junction</li> <li>↑ R SMA/medial prefrontal</li> <li>↓ L ventral precentral/inferior frontal junction</li> </ul>
Findings notes	_
Notes	
Excluded analyses	-

# Kessler et al. (2000)

## Reference

Authors	Kessler J, Thiel A, Karbe H, Heiss WD
Title	Piracetam improves activated blood flow and facilitates rehabilitation of poststroke aphasic patients
Reference	Stroke 2000; 31: 2112-2116
PMID	10978039
DOI	10.1161/01.str.31.9.2112

# Participants

	German
Language	
Inclusion criteria	Mild to moderate aphasia on TT; at least 50 out of 150 on AAT repetition
Number of individuals with aphasia	24
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (piracetam group: mean 57.4 $\pm$ 13.5 years; placebo group: mean 56.3 $\pm$ 10.0 years)
Is sex reported for patients and controls, and matched?	Yes (males: 13; females: 11)
Is handedness reported for patients and controls, and matched?	Yes (right: 24; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (T1: ~2 weeks; T2: ~8 weeks)
To what extent is the nature of aphasia characterized?	Severity only
Language evaluation	AAT
Aphasia severity	T1: piracetam group: TT 17.16 ± 14.31 errors; placebo group: TT 17.91 ± 15.47 errors; T2: piracetam group: TT 9.66 ± 12.62 errors; placebo group: TT 12.50 ± 16.88 errors
Aphasia type	Not stated
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Location only
Lesion extent	Not stated
Lesion location	10 L frontal, 6 L subcortical, 8 L temporal
Participants notes	_

## Imaging

Modality	PET (rCBF)
Is the study cross-sectional or longitudinal?	Longitudinal—mixed
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment, ~2 weeks post onset; T2: post-treatment, ~8 weeks post onset
If longitudinal, was there any intervention between the time points?	SLT, 1 hour/day, 5 days/week, 6 weeks; 12 patients received piracetam and 12 received placebo; note that the two groups are not directly compared in any imaging or behavioral analyses
Is the scanner described?	Yes (CTI-Siemens ECAT EXACT HR)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	PET
Total images acquired	8
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes

Is first level model fitting adequately described and appropriate?	Yes			
Is intersubject normalization adequately described and appropriate?	N/A—no intersubject nor	malization		
Imaging notes	—			
Conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
word repetition	Word (overt)	4	Yes	Yes
rest	None	4	N/A	N/A
			_	_
Conditions notes	Inclusion criterion was ap	oplied to ensure	that the task could be pe	rformed
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: word repetition vs rest				
Language condition	Word repetition			
Control condition	Rest			
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	No			
Are the conditions matched for motor demands?	No			
Are the conditions matched for cognitive/executive demands?	No			
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparab</u>	le		
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparab</u>	le		
Behavioral data notes	—			
Are control data reported in this paper or another that is referenced?	No			
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Unknown</u>			
Are activations lateralized in the control data?	<u>Unknown</u>			
Control activation notes	No control data are repo studies by this group	rted or cited, how	wever the same task was	used in several previous
Contrast notes	_			
Analyses				
Are the analyses clearly described?	Yes			
ROI analysis 1				
First level contrast	Word repetition vs rest			
Analysis class	Longitudinal change in a	ohasia		
Group(s)	Aphasia treated with pire	ecetam (n = 12) T	2 vs T1	
Covariate	_			
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes			
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>			
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>			
Behavioral data notes	_			
Type of analysis	Regions of interest (ROI)			

ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L BA 44; (2) L BA 45; (3) L ventral PrCG; (4) L HG; (5) L BA 41 and 42; (6) L BA 22; (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↑ L IFG pars triangularis ↑ L posterior STG ↑ L Heschl's gyrus
Findings notes	-
ROI analysis 2	

First level contrast	Word repetition vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia treated with placebo (n = 12) T2 vs T1
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	14
What are the ROI(s)?	(1) L BA 44; (2) L BA 45; (3) L ventral PrCG; (4) L HG; (5) L BA 41 and 42; (6) L BA 22; (7) L SMA; (8-14) homotopic counterparts
How are the ROI(s) defined?	Individual anatomical images
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↑ L ventral precentral/inferior frontal junction
Findings notes	-
Notes	
Excluded analyses	-

Rosen et al. (2000)

Number of control participants

## Reference

Authors	Rosen HJ, Petersen SE, Linenweber MR, Snyder AZ, White DA, Chapman L, Dromerick AW, Fiez JA, Corbetta M
Title	Neural correlates of recovery from aphasia after damage to left inferior frontal cortex
Reference	<i>Neurology</i> 2000; 55: 1883-1894
PMID	11134389
DOI	10.1212/wnl.55.12.1883
Participants	
Language	US English
Inclusion criteria	L IFG, possibly extending to neighboring regions
Number of individuals with aphasia	<u>6</u>

14

Were any of the participants included in any previous studies?	Yes (1 participant was reported in a previous case study)
Is age reported for patients and controls, and matched?	No (mean 47 years, range 32-72 years; control participants not age-matched)
Is sex reported for patients and controls, and matched?	Yes (males: 3; females: 3)
Is handedness reported for patients and controls, and matched?	Yes (right: 6; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 0.5-7.6 years)
To what extent is the nature of aphasia characterized?	Severity and type
Language evaluation	WAB (except BDAE in 1 patient), reading pseudowords, word stem completion, verb generation, reading single words
Aphasia severity	AQ range 74-97 (missing in 1 patient)
Aphasia type	3 anomic, 1 Broca's, 1 not stated, 1 recovered
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Range 10.7-117.5 cc
Lesion location	L IFG, extending to neighboring areas in most cases
Participants notes	Of the 14 controls, 6 were studied with PET and 8 with fMRI
Imaging	
Modality	PET and fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (Siemens 961 EXACT HR; Siemens Vision 1.5 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	No (fMRI timing description is inconsistent)
Design type	Mixed
Total images acquired	PET: 10; fMRI: 384-768
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	1 patient scanned on different PET scanner, and not scanned with fMRI; controls had different fMRI sequence to patients
Conditions	
Are the conditions clearly described?	Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
word stem completion (PET)	Word (overt)	4	Yes	Yes
reading pseudowords aloud (PET)	Word (overt)	4	Yes	No
rest (PET)	None	2	N/A	<u>N/A</u>
word stem completion (fMRI)	Word (covert)	15-30 (?)	Yes	Yes
rest (fMRI)	None	15-30 (?)	N/A	<u>N/A</u>

Conditions notes

Pseudoword reading condition not analyzed in this paper

#### Contrasts

Are the contrasts clearly described?

Yes

## Contrast 1: word stem completion (PET) vs rest (PET)

Language condition	Word stem completion (PET)
Control condition	Rest (PET)
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	Yes
Control activation notes	L IFG, L ITG, L anterior fusiform
Contrast notes	-

## Contrast 2: word stem completion (fMRI) vs rest (fMRI)

······································	
Language condition	Word stem completion (fMRI)
Control condition	Rest (fMRI)
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	Yes
Control activation notes	L IFG, L intraparietal sulcus
Contrast notes	-
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Word stem completion (PET) vs rest (PET)
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_

Behavioral data notes	_
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Is accuracy matched across the second level contrast?	Unknown, not reported
group(s), time point(s), and measures involved?	
Is the second level contrast valid in terms of the	— Yes
Covariate	
Group(s)	Aphasia (n = 5) vs control
Analysis class	Cross-sectional aphasia vs control
First level contrast	Word stem completion (fMRI) vs rest (fMRI)
ROI analysis 1	
Findings notes	↓ L IFG —
Findings	↑ R IFG
Statistical details	Qualitative comparison on p. 1888
Cluster extent	_
Voxelwise p	-
Software	not stated
Correction for multiple comparisons	No direct comparison
Search volume	Whole brain
Type of analysis	Voxelwise
Behavioral data notes	_
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Covariate	<u> </u>
Group(s)	Aphasia (n = 5) vs control
Analysis class	Cross-sectional aphasia vs control
First level contrast	Word stem completion (fMRI) vs rest (fMRI)
/oxelwise analysis 2	
Findings notes	—
	↑ R Heschl's gyrus ↓ L IFG
-	↑ R IFG
Findings	number of regions that seemed to show differences
Statistical details	Correction for multiple comparisons unclear; there may be circularity in only correcting for the
Cluster extent	_
Voxelwise p	_
Software	not stated
Correction for multiple comparisons	<u>Unclear or not stated</u>
Search volume	Whole brain
Type of analysis	Voxelwise
Behavioral data notes	_
Is reaction time matched across the second level contrast?	Yes, matched
contrast?	
is accuracy matched across the second level	<u>No, different</u>

Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	2
What are the ROI(s)?	(1) R IFG; (2) SMA
How are the ROI(s) defined?	Not stated but seem to be functional
Correction for multiple comparisons	No correction
Statistical details	Possibly circular because not clear how ROIs defined
Findings	↑ R IFG
Findings notes	_

#### Notes

Excluded analyses

(1) the authors also observe that the two patients with the best language outcomes retained perilesional activation in the L IFG; (2) two non-significant correlational analyses involving only 5 patients, but note that the main fMRI analyses have been included even though n = 5

# Blasi et al. (2002)

#### Reference

Authors	Blasi V, Young AC, Tansy AP, Petersen SE, Snyder AZ, Corbetta M
Title	Word retrieval learning modulates right frontal cortex in patients with left frontal damage
Reference	Neuron 2002; 36: 159-170
PMID	12367514
DOI	10.1016/s0896-6273(02)00936-4

•	
Language	US English
Inclusion criteria	L IFG, possibly extending to neighboring regions
Number of individuals with aphasia	8
Number of control participants	14
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	<u>No</u> (mean 48.6 years; patients and controls not closely matched for age, unclear if difference significant)
Is sex reported for patients and controls, and matched?	Yes (males: 2; females: 6)
Is handedness reported for patients and controls, and matched?	Yes (right: 8; left: 0)
Is time post stroke onset reported and appropriate to the study design?	<u>No</u> (> 6 months; actual TPO not stated)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	WAB or BDAE
Aphasia severity	AQ range 66.5-89.0 in 6 participants, BDAE aphasia severity of 4 in 1 participant, no formal evaluation in 1 participant
Aphasia type	3 anomic, 3 transcortical motor, 1 Broca's, 1 not stated; most were Broca's or global acutely
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Not stated
Lesion location	L IFG and operculum, extending to adjacent cortex and white matter in several cases
Participants notes	-

#### Imaging

Modality	fMRI			
Is the study cross-sectional or longitudinal?	Cross-sectional			
If longitudinal, at what time point(s) were imaging data acquired?	—			
If longitudinal, was there any intervention between the time points?	—			
Is the scanner described?	Yes (Siemens Vision 1.5	Tesla)		
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes			
Design type	Event-related			
Total images acquired	1024			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	Yes			
Is intersubject normalization adequately described and appropriate?	<u>No</u> (not described)			
Imaging notes	_			
Conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
word stem completion (novel items)	Word (covert)	196	Yes	Unknown

Condition	Response type	Repetitions	All groups could do?	All mulviduals could do?
word stem completion (novel items)	Word (covert)	196	Yes	<u>Unknown</u>
word stem completion (repeated items)	Word (covert)	196	Yes	<u>Unknown</u>
rest	None	implicit	N/A	<u>N/A</u>
		baseline		

Yes

Conditions notes

Novel items were presented in runs 1, 6, 7, and 8; repeated items were presented in runs 2, 3, 4, and 5; of the four repeated runs, only run 5 was analyzed.

#### Contrasts

Are the contrasts clearly described?

## Contrast 1: word stem completion (novel items) vs rest

Language condition	Word stem completion (novel items)
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	Somewhat
Control activation notes	Activation of language areas but also other areas; frontal activation is somewhat lateralized

#### Contrast notes

## Contrast 2: word stem completion (novel items) vs word stem completion (repeated items)

Language condition	Word stem completion (novel items)
Control condition	Word stem completion (repeated items)
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	Yes, matched
Is reaction time matched between the language and control tasks for all relevant groups?	<u>No, different</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Somewhat
Control activation notes	No whole brain analysis of this contrast, but somewhat lateralized in the sense that L but not R frontal areas showed a learning effect
Contrast notes	_
Analyses	
Are the analyses clearly described?	<u>No** (major limitation)</u> (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Word stem completion (novel items) vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>No, different</u>
Behavioral data notes	Covert task but overt data acquired separately; patients less accurate and slower than controls
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	<u>Unclear or not stated</u>
Software	not stated
Voxelwise p	~.001 (z > 3)
Cluster extent	45 voxels (size not stated)
Statistical details	Monte Carlo analysis not described in detail; rather than fitting a HRF, the authors looked at the shape of the signal in the 8 volumes following each stimulus
Findings	<ul> <li>↑ R IFG pars opercularis</li> <li>↑ R IFG pars triangularis</li> <li>↑ R insula</li> <li>↑ R ventral precentral/inferior frontal junction</li> </ul>
	↑ R dorsal precentral ↓ L IFG pars opercularis ↓ L ventral precentral/inferior frontal junction
Findings notes	↓ L IFG pars opercularis

## ROI analysis 1

-	
First level contrast	Word stem completion (novel items) vs word stem completion (repeated items)
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	Yes, matched
Behavioral data notes	Covert task but overt data acquired separately; no interaction of group by practice for accuracy or RT
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	14
What are the ROI(s)?	(1) L dorsal IFG; (2) L ventral IFG; (3) R MFG; (4) L anterior fusiform; (5) R anterior fusiform; (6) R posterior fusiform; (7) R lateral occipital; (8) R lateral cerebellum; (9) L SMA; (10) R dorsal IFG; (11) R posterior fusiform; (12) R lateral occipital; (13) R lingual; (14) L MTG
How are the ROI(s) defined?	Regions that were active for the main effect of word stem completion (irrespective of practice) in either group and modulated by practice in that group
Correction for multiple comparisons	No correction
Statistical details	<u>Circular because ROIs defined in one group or the other;</u> the L ROIs showed repetition suppression in controls but not in patients, and <u>this difference is interpreted by the authors,</u> but not supported statistically
Findings	<ul> <li>↑ R ventral precentral/inferior frontal junction</li> <li>↑ R posterior inferior temporal gyrus/fusiform gyrus</li> <li>↓ L IFG</li> <li>↓ L ventral precentral/inferior frontal junction</li> <li>↓ L posterior inferior temporal gyrus/fusiform gyrus</li> </ul>
Findings notes	Labels based on coordinates reported
Notes	
Excluded analyses	(1) the ROI results were replicated in a whole brain SPM analysis, but that analysis is not reported; (2) the authors observe that patients with smaller L frontal lesions, and perilesional activation, performed better on word stem completion overall, but did not differ in rate of learning

# Leff et al. (2002)

### Reference

Authors	Leff A, Crinion J, Scott S, Turkheimer F, Howard D, Wise R
Title	A physiological change in the homotopic cortex following left posterior temporal lobe infarction
Reference	Ann Neurol 2002; 51: 553-558
PMID	12112100
DOI	10.1002/ana.10181

Language	UK English
Inclusion criteria	_
Number of individuals with aphasia	<u>15</u>
Number of control participants	8
Were any of the participants included in any	No

previous studies?	
Is age reported for patients and controls, and matched?	Yes (range 43-76 years)
Is sex reported for patients and controls, and matched?	Yes (males: 11; females: 4)
Is handedness reported for patients and controls, and matched?	Yes (right: 11; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 5-76 months)
To what extent is the nature of aphasia characterized?	Not at all
Language evaluation	PPT (Dutch), British picture vocabulary scale, Action for Dysphasic Adults lexical decision battery, auditory maximal pairs (an offline phoneme discrimination test)
Aphasia severity	Not stated
Aphasia type	Not stated, but all 6 patients with pSTS damage had single word comprehension deficits acutely
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Extent and location
Lesion extent	Range 0.5-14% of total brain volume
Lesion location	9 L but sparing pSTS, 6 L including pSTS
Participants notes	_
Imaging	
Modality	PET (rCBF)
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (CTI-Siemens ECAT EXACT HR++/966)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	PET
Total images acquired	16
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-

## Conditions

Are the conditions clearly described?

Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
listening to words at 10 wpm	None	2	<u>N/A</u>	<u>N/A</u>
listening to words at 35 wpm	None	2	N/A	<u>N/A</u>
listening to words at 55 wpm	None	2	N/A	<u>N/A</u>
listening to words at 70 wpm	None	2	N/A	<u>N/A</u>
listening to words at 85 wpm	None	2	N/A	<u>N/A</u>
listening to words at 95 wpm	None	2	<u>N/A</u>	<u>N/A</u>

listening to words at 115 wpm	None	2	N/A	<u>N/A</u>
listening to words at 130 wpm	None	2	<u>N/A</u>	N/A
Conditions notes	_			
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: higher word rates vs lower word ra	tes			
Language condition	Higher word rates			
Control condition	Lower word rates			
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	No			
Are the conditions matched for motor demands?	Yes			
Are the conditions matched for cognitive/executive demands?	Yes			
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, no behavioral measu</u>	ure		
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task			
Behavioral data notes	_			
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>			
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Somewhat</u>			
Are activations lateralized in the control data?	Somewhat			
Control activation notes	Control activation is bilateral in primary auditory cortex and the lateral STG (Fig. 1, labels 1 and 2), but there is a left-lateralized activation in the pSTS (label 3); the scatter plots in Fig. 1 show activity-word rate curves for peak pSTS voxels in individual subjects; slopes were steeper in the left hemisphere ( $p < 0.05$ ), however, the identification of these voxels is not described in sufficient detail (i.e. what was the search region?)			
Contrast notes	_			
Analyses				
Are the analyses clearly described?	No* (moderate limitation	<u>)</u> (see specific lim	itation(s) below)	
Voxelwise analysis 1				
First level contrast	Higher word rates vs low	er word rates		
Analysis class	Cross-sectional aphasia v	s control		
Group(s)	Aphasia with pSTS damage	ge (n = 6) vs conti	rol	
Covariate	_			
Is the second level contrast valid in terms of the	Yes			
group(s), time point(s), and measures involved?				
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measu</u>	ure		
Is reaction time matched across the second level contrast?	N/A, no timeable task			
Behavioral data notes	_			
Type of analysis	Voxelwise			
Search volume	Whole brain			
Correction for multiple comparisons	No direct comparison			
Software	SPM99			
Voxelwise p	_			
Cluster extent	_			
Statistical details			corrected SPM is reported ever it is masked in a way	of the relationship in the 6 that is not explained (see

	figure caption), and there is no direct comparison between patients with L pSTS damage and controls
Findings	↑ R posterior STS
Findings notes	_

## Voxelwise analysis 2

First level contrast

VOXENVISE analysis 2	
First level contrast	Higher word rates vs lower word rates
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with pSTS (n = 6) damage vs without pSTS damage (n = 9)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	N/A, no behavioral measure
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No direct comparison
Software	SPM99
Voxelwise p	-
Cluster extent	-
Statistical details	Qualitative comparison on p. 555; a FWE-corrected SPM is reported of the relationship in the 6 patients with L pSTS damage (Fig. 2), however it is masked in a way that is not explained (see figure caption), and there is no direct comparison between patients with L pSTS damage and patients with R pSTS damage
Findings	↑ R posterior STS
Findings notes	_
ROI analysis 1	
First level contrast	Higher word rates vs lower word rates
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia with pSTS damage (n = 6) vs control (n = 8)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	R pSTS
How are the ROI(s) defined?	The peak voxel for the contrast in the R pSTS from each subject's individual analysis, but <u>the</u> search region is not stated
Correction for multiple comparisons	One only
Statistical details	The controls and patients without pSTS damage were combined, however it is stated in the caption to Figure 2 that the patients with pSTS damage were significantly different to both
Findings	↑ R posterior STS
Findings notes	_
ROI analysis 2	

Higher word rates vs lower word rates

Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with pSTS damage (n = 6) vs aphasia without pSTS damage (n = 9)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	R pSTS
How are the ROI(s) defined?	The peak voxel for the contrast in the R pSTS from each subject's individual analysis, but <u>the</u> <u>search region is not stated</u>
Correction for multiple comparisons	One only
Statistical details	The controls and patients without pSTS damage were combined, however it is stated in the caption to Figure 2 that the patients with pSTS damage were significantly different to both
Findings	↑ R posterior STS
Findings notes	-
Notes	

Excluded analyses

# Blank et al. (2003)

#### Reference

Authors	Blank SC, Bird H, Turkheimer F, Wise RJ
Title	Speech production after stroke: the role of the right pars opercularis
Reference	Ann Neurol 2003; 54: 310-320
PMID	12953263
DOI	10.1002/ana.10656

Language	UK English
Inclusion criteria	Initial non-fluent aphasia due to anterior perisylvian lesion; subsequently recovered the ability to speak in sentences; patients were divided into those with and without damage to the IFG pars opercularis (POp+: n = 7; POp-: n = 7)
Number of individuals with aphasia	<u>14</u>
Number of control participants	12
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (POp+: median 50 years, range 36-72 years; POp-: median 61 years, range 39-70 years)
Is sex reported for patients and controls, and matched?	Yes (males: 8; females: 6)
Is handedness reported for patients and controls, and matched?	Yes (right: 14; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (POp+: median 39 months, range 19-134 months; POp-: median 17 months, range 6-240 months)
To what extent is the nature of aphasia characterized?	<u>Type only</u>

Language evaluation	CAT, QPA
Aphasia severity	Not stated
Aphasia type	POp+: 4 non-fluent but not agrammatic, 2 agrammatic, 1 recovered; POp-: 4 non-fluent but not agrammatic, 3 recovered
First stroke only?	No
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Not stated
Lesion location	L frontal, occasionally extending into temporal
Participants notes	8 of 12 controls included in Blank et al. (2002)
Imaging	
Modality	PET (rCBF)
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	-
If longitudinal, was there any intervention between the time points?	-
Is the scanner described?	Yes (CTI-Siemens ECAT EXACT HR++ (966))
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	PET
Total images acquired	15 (patients); 12 (controls)
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-
Conditions	
Are the conditions clearly described?	Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
propositional speech production	Sentence (overt)	aphasia: 5; control: 4	Yes	Yes
counting	Multiple words (overt)	aphasia: 5; control: 4	Yes	Yes
rest	None	aphasia: 5; control: 4	<u>N/A</u>	<u>N/A</u>
Conditions notes	Alertness maintained in rest by asking participants to listen to environmental sounds that were presented before and after data acquisition; speech was recorded and rate was measured, also QPA was done of a separate speech sample outside the scanner			

### Contrasts

Are the contrasts clearly described?

Yes

# Contrast 1: propositional speech production vs rest

Language condition	Propositional speech production
Control condition	Rest
Are the conditions matched for visual demands?	Yes

Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	Somewhat
Control activation notes	Much bilateral activation due to overt speech but pars opercularis and supratemporal plane L- lateralized
Contrast notes	_

## Contrast 2: propositional speech production vs counting

Language condition	Propositional speech production
Control condition	Counting
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	Somewhat
Control activation notes	Extrasylvian; somewhat L-lateralized
Contrast notes	-
Analyses	
Are the analyses clearly described?	Yes
Voxelwise analysis 1	
First level contrast	Propositional speech production vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia with IFG POp damage (n = 7) vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	Word rates not reported, but offline speech sample differed
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients

Correction for multiple comparisons	Small volume correction
Software	SPM99
Voxelwise p	FWE p < .05 with SVC in R pars opercularis
Cluster extent	
Statistical details	_
Findings	↑ R IFG pars opercularis
Findings notes	No voxels survived FWE correction without SVC
Voxelwise analysis 2	
First level contrast	Propositional speech production vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia without IFG POp damage (n = 7) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	Word rates not reported, but offline speech sample differed
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Small volume correction
Software	SPM99
Voxelwise p	FWE p < .05 with SVC in R pars opercularis
Cluster extent	_
Statistical details	_
Findings	↑ R IFG pars opercularis
Findings notes	
Voxelwise analysis 3	
First level contrast	Dropositional speech production us rest
	Propositional speech production vs rest Cross-sectional between two groups with aphasia
Analysis class	Aphasia with IFG POp damage (n = 7) vs without IFG POp damage (n = 7)
Group(s) Covariate	Aphasia with FG POp damage (II = 7) vs without FG POp damage (II = 7)
Is the second level contrast valid in terms of the	— Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	Word rates not reported, but offline speech sample differed
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Small volume correction
Software	SPM99
Voxelwise p	FWE p < .05 with SVC in R pars opercularis
Cluster extent	-
Statistical details	—
Findings	None
Findings notes	Patients with L IFG POp damage showed numerically more signal in the R IFG POp
Voxelwise analysis 4	
•	
First level contrast	Propositional speech production vs counting

Group(s)	Aphasia with IFG POp damage (n = 7) vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	Word rates not reported, but offline speech sample differed
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Small volume correction
Software	SPM99
Voxelwise p	FWE p < .05 with SVC in R pars opercularis
Cluster extent	-
Statistical details	-
Findings	None
Findings notes	-
Voxelwise analysis 5	
First level contrast	Propositional speech production vs counting
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia without IFG POp damage (n = 7) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	Word rates not reported, but offline speech sample differed
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Small volume correction
Software	SPM99
Voxelwise p	FWE p < .05 with SVC in R pars opercularis
Cluster extent	-
Statistical details	— 
Findings	None
Findings notes	
Voxelwise analysis 6	
<b>Voxelwise analysis 6</b> First level contrast	Propositional speech production vs counting
	Propositional speech production vs counting Cross-sectional between two groups with aphasia
First level contrast	
First level contrast Analysis class Group(s) Covariate	Cross-sectional between two groups with aphasia
First level contrast Analysis class Group(s)	Cross-sectional between two groups with aphasia
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the	Cross-sectional between two groups with aphasia Aphasia with IFG POp damage (n = 7) vs without IFG POp damage (n = 7) —
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level	Cross-sectional between two groups with aphasia Aphasia with IFG POp damage (n = 7) vs without IFG POp damage (n = 7) — Yes
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level	Cross-sectional between two groups with aphasia Aphasia with IFG POp damage (n = 7) vs without IFG POp damage (n = 7)  Yes No, different
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast?	Cross-sectional between two groups with aphasia Aphasia with IFG POp damage (n = 7) vs without IFG POp damage (n = 7) 
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes	Cross-sectional between two groups with aphasia Aphasia with IFG POp damage (n = 7) vs without IFG POp damage (n = 7)  Yes No, different N/A, no timeable task Word rates not reported, but offline speech sample differed

Correction for multiple comparisons	Small volume correction		
Software	SPM99		
Voxelwise p	FWE p < .05 with SVC in R pars opercularis		
Cluster extent	_		
Statistical details	_		
Findings	None		
Findings notes	_		
ROI analysis 1			
First level contrast	Propositional speech production vs rest		
Analysis class	Cross-sectional correlation with language or other measure		
Group(s)	Aphasia with IFG POp damage (n = 7)		
Covariate	Speech rate during scan		
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes		
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>		
Is reaction time matched across the second level contrast?	N/A, no timeable task		
Behavioral data notes	_		
Type of analysis	Region of interest (ROI)		
ROI type	Functional		
How many ROIs are there?	1		
What are the ROI(s)?	R IFG pars opercularis		
How are the ROI(s) defined?	Defined by flipping L IFG pars opercularis activation in controls		
Correction for multiple comparisons	One only		
Statistical details			
Findings	None		
Findings notes			
ROI analysis 2			
First level contrast	Propositional space production vs rost		
	Propositional speech production vs rest Cross-sectional correlation with language or other measure		
Analysis class	Aphasia without IFG POp damage (n = 7)		
Group(s) Covariate			
Is the second level contrast valid in terms of the	Speech rate during scan Yes		
group(s), time point(s), and measures involved?			
Is accuracy matched across the second level contrast?	Unknown, not reported		
Is reaction time matched across the second level contrast?	N/A, no timeable task		
Behavioral data notes	-		
Type of analysis	Region of interest (ROI)		
ROI type	Functional		
How many ROIs are there?	1		
What are the ROI(s)?	R IFG pars opercularis		
How are the ROI(s) defined?	Defined by flipping L IFG pars opercularis activation in controls		
Correction for multiple comparisons	One only		
Statistical details	-		
Findings	None		
Findings notes	-		
ROI analysis 3			

#### ROI analysis 3

First level contrast	Propositional speech production vs rest
Analysis class	Cross-sectional correlation with language or other measure

Group(s)	Aphasia with IFG POp damage (n = 7)
Covariate	Four different QPA measures
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	R IFG pars opercularis
How are the ROI(s) defined?	Defined by flipping L IFG pars opercularis activation in controls
Correction for multiple comparisons	One only
Statistical details	_
Findings	None
Findings notes	_
Notes	

Notes

Excluded analyses

ROI analyses may have been carried out for both contrasts, but this is not stated

# Cardebat et al. (2003)

#### Reference

Authors	Cardebat D, Démonet JF, De Boissezon X, Marie N, Marié RM, Lambert J, Baron JC, Puel M
Title	Behavioral and neurofunctional changes over time in healthy and aphasic subjects: a PET language activation study
Reference	<i>Stroke</i> 2003; 34: 2900-2906
PMID	14615626
DOI	10.1161/01.str.0000099965.99393.83

Language	French
Inclusion criteria	No severe aphasia; no leukoaraiosis
Number of individuals with aphasia	<u>8</u>
Number of control participants	6
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 58.4 ± 11.9 years, range 37-73 years)
Is sex reported for patients and controls, and matched?	Yes (males: 7; females: 1)
Is handedness reported for patients and controls, and matched?	Yes (right: 8; left: 0)
Is time post stroke onset reported and appropriate to the study design?	No* (moderate limitation) (T1: 58 ± 35 days, range 11-113 days; T2: 11.7 ± 1.6 months, range 320-460 days; T1 varies considerably from early to late subacute)
To what extent is the nature of aphasia characterized?	Not at all
Language evaluation	Not stated
Aphasia severity	Not stated
Aphasia type	T1: some prominent symptoms are listed for each patient; T2: not stated
First stroke only?	Yes

Stroke type	Mixed etiologies
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Not stated
Lesion location	4 L subcortical, 2 L prerolandic, 2 L postrolandic
Participants notes	-

#### Imaging

Modality	PET (rCBF)
Is the study cross-sectional or longitudinal?	Longitudinal—recovery
If longitudinal, at what time point(s) were imaging data acquired?	T1: 58 ± 35 days, range 11-113 days; T2: 11.7 ± 1.6 months, range 320-460 days; T1 varies considerably from early to late subacute
If longitudinal, was there any intervention between the time points?	Not stated
Is the scanner described?	Yes (Siemens ECAT HR+)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	PET
Total images acquired	6
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	No (lesion impact not addressed)
Imaging notes	-

#### Conditions

Aro tho	conditions	cloarly	described?	
Arethe	CONTINUED IS	Clearly	uescribeu:	

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
word generation	Word (overt)	4	Yes	<u>Unknown</u>
rest	None	2	<u>N/A</u>	<u>N/A</u>

Yes

Yes

Conditions notes

Participants were asked to generate words that were semantically related to binaurally presented stimuli; 2 runs involved nouns and 2 involved verbs

#### Contrasts

Are the contrasts clearly described?

#### Contrast 1: word generation vs rest

Language condition	Word generation
Control condition	Rest
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Are control data reported in this paper or another	Somewhat

that is referenced?		
Does the contrast selectively activate plausible	Somewhat	
relevant language regions in the control group?	Somewhat	
Are activations lateralized in the control data?	No	
Control activation notes	Bilateral fronto-temporal and some other regions per text	
Contrast notes	-	
Analyses		
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)	
Voxelwise analysis 1		
First level contrast	Word generation vs rest	
Analysis class	Longitudinal change in aphasia	
Group(s)	Aphasia T2 vs T1	
Covariate		
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes	
Is accuracy matched across the second level contrast?	<u>No, different</u>	
Is reaction time matched across the second level contrast?	Unknown, not reported	
Behavioral data notes	_	
Type of analysis	Voxelwise	
Search volume	Whole brain	
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent	
Software	SPM99	
Voxelwise p	.05	
Cluster extent	50 voxels (size not stated)	
Statistical details	Nature of inclusive masks unclear	
Findings	<ul> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L somato-motor</li> <li>L posterior STG/STS/MTG</li> <li>L cerebellum</li> <li>R IFG pars opercularis</li> <li>R dorsolateral prefrontal cortex</li> <li>R SMA/medial prefrontal</li> <li>R somato-motor</li> <li>R posterior STG/STS/MTG</li> <li>R cerebellum</li> </ul>	
Findings notes	Based on Figure 2	
Voxelwise analysis 2		
First level contrast	Word generation vs rest	
Analysis class	Longitudinal correlation with language or other measure	
Group(s)	Aphasia T2 vs T1	
Covariate	$\Delta$ word generation accuracy	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes	
Is accuracy matched across the second level contrast?	Accuracy is covariate	
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>	
Behavioral data notes	_	
Type of analysis	Voxelwise	
Search volume	Whole brain	

Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM99
Voxelwise p	.001
Cluster extent	100 voxels (size not stated)
Statistical details	Nature of inclusive masks unclear
Findings	<ul> <li>L posterior STG/STS/MTG</li> <li>R posterior STG/STS/MTG</li> <li>R cerebellum</li> <li>L occipital</li> <li>L hippocampus/MTL</li> <li>R dorsolateral prefrontal cortex</li> <li>R occipital</li> </ul>
Findings notes	_
Notes	
Excluded analyses	Aphasia vs control SPM analyses at each time point, because they are not reported in sufficient detail to determine activated regions

# Sharp et al. (2004)

## Reference

Authors	Sharp DJ, Scott SK, Wise RJ
Title	Retrieving meaning after temporal lobe infarction: the role of the basal language area
Reference	Ann Neurol 2004; 56: 836-846
PMID	15514975
DOI	10.1002/ana.20294

Language	UK English
Inclusion criteria	Lesion in vicinity of L STG; no extensive frontal damage; no inferior temporal damage; able to perform tasks
Number of individuals with aphasia	<u>9</u>
Number of control participants	18
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (median 58 years, range 39-72 years)
Is sex reported for patients and controls, and matched?	Yes (males: 8; females: 1)
Is handedness reported for patients and controls, and matched?	Yes (right: 9; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 45 months, range 14-145 months)
To what extent is the nature of aphasia characterized?	<u>Severity only</u>
Language evaluation	Subtests from CAT, subtests from PALPA, Action for dysphasic adults, TROG, PPT
Aphasia severity	Mild
Aphasia type	Not stated
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	Lesion in vicinity of L STG; no extensive frontal damage; no inferior temporal damage

#### Participants notes

#### Imaging

Modality	PET (rCBF)
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (Siemens HR++ 966)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	PET
Total images acquired	16
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-
Conditions	
Are the conditions clearly described?	Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
semantic decision	Word (overt)	aphasia: 8; control: 4	Yes	Yes
syllable count decision	Word (overt)	aphasia: 8; control: 4	Yes	Yes
semantic decision (noise vocoded) (control only)	Word (overt)	4 (control)	Yes	Yes
syllable count decision (noise vocoded) (control only)	Word (overt)	4 (control)	Yes	Yes

Conditions notes

Seems the response was a spoken word, but this is not stated explicitly; assuming all individuals could do the tasks because this was an inclusion criterion and behavioral data supports

#### Contrasts

Are the contrasts clearly described?

Yes

## Contrast 1: semantic decision vs syllable count decision

Language condition	Semantic decision
Control condition	Syllable count decision
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>No, different</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>No, different</u>
Behavioral data notes	-

relevant language regions in the control group? Are activations lateralized in the control data?	Yes
Control activation notes	The control data provided also include the noise vocoded conditions; only ventral temporal activations are shown, which are L-lateralized
Contrast notes Analyses	_
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)

First loval contract	Compartie devision us cullable count desision
First level contrast	Semantic decision vs syllable count decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control (clear speech)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	Yes, matched
Behavioral data notes	Interaction of group by task not reported for accuracy
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Small volume correction
Software	SPM99
Voxelwise p	FWE p < .05 with SVC in fusiform gyri, temporal poles, L IFG, L orbitofrontal and L SFG
Cluster extent	_
Statistical details	-
Findings	↓ L posterior inferior temporal gyrus/fusiform gyrus
Findings notes	_

#### Voxelwise analysis 2

First level contrast	Semantic decision vs syllable count decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Semantic decision accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Small volume correction
Software	SPM99
Voxelwise p	FWE p < .05 with SVC in fusiform gyri, temporal poles, L IFG, L orbitofrontal and L SFG
Cluster extent	-
Statistical details	Fixed effects; this analysis is not clearly described
Findings	↑ R posterior inferior temporal gyrus/fusiform gyrus
Findings notes	Patients who were more accurate had more activity in R anterior fusiform gyrus

## ROI analysis 1

First level contrast	Semantic decision vs syllable count decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control (clear speech)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	Yes, matched
Behavioral data notes	Interaction of group by task not reported for accuracy
Type of analysis	Region of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	1
What are the ROI(s)?	L fusiform gyrus
How are the ROI(s) defined?	Probabilistic brain atlas
Correction for multiple comparisons	One only
Statistical details	_
Findings	↓ L posterior inferior temporal gyrus/fusiform gyrus
Findings notes	-

# ROI analysis 2

First level contrast	Semantic decision vs syllable count decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control (noise vocoded)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, but attempt made</u>
Is reaction time matched across the second level contrast?	Yes, matched
Behavioral data notes	Patients were more accurate on semantic decisions than syllable decisions, whereas controls were less accurate on noise vocoded semantic decisions than clear syllable decisions (which were the baseline for this analysis)
Type of analysis	Region of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	1
What are the ROI(s)?	L fusiform gyrus
How are the ROI(s) defined?	Probabilistic brain atlas
Correction for multiple comparisons	One only
Statistical details	-
Findings	None
Findings notes	This analysis suggests that the difference between groups in the L fusiform gyrus disappears when the controls perform a semantic task that is similarly challenging
Notes	
Excluded analyses	(1) combined analysis of patients and controls (Figure 4); (2) correlation with syllable decision

(1) combined analysis of patients and controls (Figure 4); (2) correlation with syllable decision making <u>not described in sufficient detail</u>

## Reference

Authors	Zahn R, Drews E, Specht K, Kemeny S, Reith W, Willmes K, Schwarz M, Huber W
Title	Recovery of semantic word processing in global aphasia: a functional MRI study
Reference	Cogn Brain Res 2004; 18: 322-336
PMID	14741318
DOI	10.1016/j.cogbrainres.2003.10.021

## Participants

Inclusion criteriaGlobal aphasia in the first three months; some improvement of comprehension within 6-12 monthsNumber of individuals with aphasiaZNumber of control participants14Were any of the participants included in any previous studies?NoIs age reported for patients and controls, and matched?Yes (range 29-67 years)Is sex reported for patients and controls, and matched?Yes (range 29-67 years)Is handedness reported for patients and controls, and matched?Yes (range 29-67 years)Is handedness reported for patients and controls, and matched?Yes (range 29-67 years)Is handedness reported for patients and controls, and matched?Yes (range 10)Is time post stroke onset reported and appropriate to the study design?Yes (range 6 months-4 years)To what extent is the nature of aphasia characterized?Comprehensive batteryLanguage evaluationAABT, AATAphasia severityT1 percentile range 28-63Aphasia type First stroke only?S global, 2 Broca's, 2 unclassifiable; all had been global initiallyFirst stroke polyNot statedTo what extent is the lesion distributionLesion overlay		
monthsNumber of individuals with aphasiaZNumber of control participants14Were any of the participants included in any previous studies?NoIs age reported for patients and controls, and matched?Yes (range 29-67 years)Is sex reported for patients and controls, and matched?Yes (males: 6; females: 1)Is handedness reported for patients and controls, and matched?Yes (right: 7; left: 0)Is handedness reported for patients and controls, and matched?Yes (right: 7; left: 0)Is time post stroke onset reported and appropriate characterized?Yes (range 6 months-4 years)To what extent is the nature of aphasia characterized?Comprehensive batteryAphasia severityT percentile range 28-63Aphasia severityYesStroke only?YesStroke only?YesStroke typeNot statedTo what extent is the lesion distribution characterized?Scion overlayLesion extentNot statedLosion extentNot statedLosion extentNot statedLosion extentNot statedLesion extentLocaceLesion locationLocaceLesion locationLocaceLesion locationLocaceLocaceLocaceLesion locationLocaceLocaceLocaceLocaceLocaceLocaceLocaceLocaceLocaceLocaceLocaceLocaceLocaceLocaceLocaceLocace<	Language	German
Number of control participants14Were any of the participants included in any previous studies?NoIs age reported for patients and controls, and matched?Yes (range 29-67 years)Is sex reported for patients and controls, and matched?Yes (range 29-67 years)Is handedness reported for patients and controls, and matched?Yes (right: 7; left: 0)Is handedness reported for patients and controls, and matched?Yes (right: 7; left: 0)Is thandedness reported for patients and controls, and matched?Yes (range 6 months-4 years)Is the post stroke onset reported and appropriate to the study design?Yes (range 6 months-4 years)To what extent is the nature of aphasia characterized?Comprehensive batteryLanguage evaluationAABT, AATAphasia severityTI percentile range 28-63Aphasia type3 global, 2 Broca's, 2 unclassifiable; all had been global initiallyFirst stroke only?YesStorke typeNot statedTo what extent is the lesion distribution characterized?Lesion overlayLesion extentNot stated	Inclusion criteria	
Were any of the participants included in any previous studies?NoIs age reported for patients and controls, and matched?Yes (range 29-67 years)Is sex reported for patients and controls, and matched?Yes (males: 6; females: 1)Is handedness reported for patients and controls, and matched?Yes (right: 7; left: 0)Is handedness reported for patients and controls, and matched?Yes (range 6 months-4 years)Is time post stroke onset reported and appropriate to the study design?Yes (range 6 months-4 years)To what extent is the nature of aphasia characterized?Comprehensive batteryLanguage evaluationAABT, AATAphasia severityT percentile range 28-63Aphasia type3 global, 2 Broca's, 2 unclassifiable; all had been global initiallyFirst stroke only?YesStroke typeNot statedTo what extent is the lesion distribution characterized?Not statedLesion vertentNot statedLesion locationLMCA	Number of individuals with aphasia	<u>7</u>
previous studies?Is age reported for patients and controls, and matched?Yes (range 29-67 years)Is sex reported for patients and controls, and matched?Yes (males: 6; females: 1)Is handedness reported for patients and controls, and matched?Yes (right: 7; left: 0)Is time post stroke onset reported and appropriate to the study design?Yes (range 6 months-4 years)To what extent is the nature of aphasia characterized?Comprehensive batteryIs aphasia severityAABT, AATAphasia severityT percentile range 28-63Aphasia type3 global, 2 Broca's, 2 unclassifiable; all had been global initiallyFirst stroke only?YesTo what extent is the lesion distribution characterized?Not statedTo what extent is the lesion distribution characterized?Not statedLesion extentNot statedLesion locationLesion locationLesion locationLMCA	Number of control participants	14
matched?Is sex reported for patients and controls, and matched?Yes (males: 6; females: 1)Is handedness reported for patients and controls, and matched?Yes (right: 7; left: 0)Is time post stroke onset reported and appropriate to the study design?Yes (range 6 months-4 years)To what extent is the nature of aphasia characterized?Comprehensive batteryLanguage evaluationAABT, AATAphasia severityT percentile range 28-63Aphasia severityYesFirst stroke only?YesStroke typeNot statedTo what extent is the lesion distribution characterized?Lesion overlayLesion extentNot statedLesion locationNot stated	Were any of the participants included in any previous studies?	No
matched?Is handedness reported for patients and controls, and matched?Yes (right: 7; left: 0)Is time post stroke onset reported and appropriate to the study design?Yes (range 6 months-4 years)To what extent is the nature of aphasia characterized?Comprehensive batteryLanguage evaluationAABT, AATAphasia severityT percentile range 28-63Aphasia type3 global, 2 Broca's, 2 unclassifiable; all had been global initiallyFirst stroke only?YesStroke typeNot statedTo what extent is the lesion distribution characterized?Lesion overlayLesion extentNot statedLesion extentIn testedLesion locationLMCA	Is age reported for patients and controls, and matched?	Yes (range 29-67 years)
and matched? Is time post stroke onset reported and appropriate to the study design? To what extent is the nature of aphasia characterized? Language evaluation AABT, AAT Aphasia severity Aphasia severity Aphasia type Stroke only? Stroke only? Stroke type Not stated To what extent is the lesion distribution characterized? Lesion extent Lesion overlay Automatication Mot stated Lesion location Lesion location	Is sex reported for patients and controls, and matched?	Yes (males: 6; females: 1)
to the study design? To what extent is the nature of aphasia characterized? Language evaluation AABT, AAT Aphasia severity T percentile range 28-63 Aphasia type 3 global, 2 Broca's, 2 unclassifiable; all had been global initially First stroke only? First stroke only? Stroke type Not stated Stroke type Not stated To what extent is the lesion distribution characterized? Lesion extent Not stated Lesion location L MCA	Is handedness reported for patients and controls, and matched?	Yes (right: 7; left: 0)
characterized? Language evaluation AABT, AAT Aphasia severity Tr percentile range 28-63 Aphasia type 3 global, 2 Broca's, 2 unclassifiable; all had been global initially First stroke only? Yes Stroke type Not stated To what extent is the lesion distribution Characterized? Lesion extent Lesion extent Lesion location Lesion locati Les	Is time post stroke onset reported and appropriate to the study design?	Yes (range 6 months-4 years)
Aphasia severityTT percentile range 28-63Aphasia type3 global, 2 Broca's, 2 unclassifiable; all had been global initiallyFirst stroke only?YesStroke typeNot statedTo what extent is the lesion distribution characterized?Lesion overlayLesion extentNot statedLesion locationLot statedLot stated <t< td=""><td>To what extent is the nature of aphasia characterized?</td><td>Comprehensive battery</td></t<>	To what extent is the nature of aphasia characterized?	Comprehensive battery
Aphasia type3 global, 2 Broca's, 2 unclassifiable; all had been global initiallyFirst stroke only?YesStroke typeNot statedTo what extent is the lesion distribution characterized?Lesion overlayLesion extentNot statedLesion locationL MCA	Language evaluation	AABT, AAT
First stroke only?     Yes       Stroke type     Not stated       To what extent is the lesion distribution characterized?     Lesion overlay       Lesion extent     Not stated       Lesion location     L MCA	Aphasia severity	TT percentile range 28-63
Stroke type     Not stated       To what extent is the lesion distribution characterized?     Lesion overlay       Lesion extent     Not stated       Lesion location     L MCA	Aphasia type	3 global, 2 Broca's, 2 unclassifiable; all had been global initially
To what extent is the lesion distribution     Lesion overlay       characterized?     Not stated       Lesion location     LMCA	First stroke only?	Yes
characterized?     Not stated       Lesion extent     Not stated       Lesion location     L MCA	Stroke type	Not stated
Lesion location L MCA	To what extent is the lesion distribution characterized?	Lesion overlay
	Lesion extent	Not stated
Participants notes —	Lesion location	L MCA
	Participants notes	_

# Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	-
If longitudinal, was there any intervention between the time points?	-
Is the scanner described?	Yes (Philips ACS NT Gyroscan 1.5 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No* (moderate limitation)</u> (insufficient blocks per experimental condition (3) because blocks were too long (44 s))
Design type	Block
Total images acquired	198
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	N/A—no intersubject normalization

#### Imaging notes

#### Conditions

Are the conditions clearly described?

Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
phonetic decision (reversed words vs sounds)	Button press	3	Yes	No
lexical decision (words vs reversed words)	Button press	3	Yes	Yes
semantic decision	Button press	3	Yes	No
rest	None	9	N/A	<u>N/A</u>
Conditions notes	_			

#### Contrasts

Are the contrasts clearly described?

No (see specific limitation(s) below)

## Contrast 1: semantic decision vs phonetic decision and lexical decision (conjunction)

Language condition	Semantic decision
Control condition	Phonetic decision and lexical decision (conjunction)
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Appear similar</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	Tasks were matched in controls, but no statistics reported for patients
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Yes
Control activation notes	L-lateralized frontal activation, as well as temporal and parietal to a lesser extent
Contrast notes	Conjunction of baseline conditions not described in sufficient detail
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
ROI analysis 1	
First level contrast	Semantic decision vs phonetic decision and lexical decision (conjunction)
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, no test</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
	Unknown, not reported Relative performance on language and control tasks unclear
contrast?	
contrast? Behavioral data notes	Relative performance on language and control tasks unclear

What are the ROI(s)?	Language network LI
How are the ROI(s) defined?	
Correction for multiple comparisons	One only
Statistical details	<u>Conjunction analyses not clearly described</u> ; in two patients, a different conjunction was used (lexical decision vs phonetic decision & semantic decision vs phonetic decision)
Findings	None
Findings notes	Ll > 0 in 12 out of 14 controls and 5 out of 7 patients; no significant difference
Notes	
Excluded analyses	Individual patient analyses

# Crinion & Price (2005)

#### Reference

Authors	Crinion J, Price CJ
Title	Right anterior superior temporal activation predicts auditory sentence comprehension following aphasic stroke
Reference	Brain 2005; 128: 2858-2871
PMID	16234297
DOI	10.1093/brain/awh659

## Participants

Language	UK English
Inclusion criteria	_
Number of individuals with aphasia	<u>17</u>
Number of control participants	18
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 62 ± 2.7 SEM years, range 34-75 years)
Is sex reported for patients and controls, and matched?	Yes (males: 12; females: 5)
Is handedness reported for patients and controls, and matched?	Yes (right: 17; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 4-125 months; aphasia with temporal damage (n=8) mean 41 months; aphasia without temporal damage (n=9) mean 48 months)
To what extent is the nature of aphasia	Comprehensive battery
characterized?	
characterized? Language evaluation	CAT
	CAT Not stated
Language evaluation	
Language evaluation Aphasia severity	Not stated
Language evaluation Aphasia severity Aphasia type	Not stated Not stated
Language evaluation Aphasia severity Aphasia type First stroke only?	Not stated Not stated Yes
Language evaluation Aphasia severity Aphasia type First stroke only? Stroke type To what extent is the lesion distribution	Not stated Not stated Yes Not stated
Language evaluation Aphasia severity Aphasia type First stroke only? Stroke type To what extent is the lesion distribution characterized?	Not stated Not stated Yes Not stated Lesion overlay
Language evaluation Aphasia severity Aphasia type First stroke only? Stroke type To what extent is the lesion distribution characterized? Lesion extent	Not stated Not stated Yes Not stated Lesion overlay Not stated

#### Modality

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging	_

data acquired?	
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	<u>No</u> (Siemens 1.5 Tesla; model not stated)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No</u> (the calculated duration of the stimuli, the calculated duration of the acquisitions, and the stated duration of the acquisitions yield three different numbers)
Design type	Block
Total images acquired	460
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-

#### Conditions

Are the conditions clearly described?

Yes	

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
listening to narrative speech	None	32	<u>N/A</u>	<u>N/A</u>
listening to reversed speech	None	8	<u>N/A</u>	<u>N/A</u>

Conditions notes

A post-scan surprise recognition test asked whether or not 38 phrases had occurred in any story; patients answered 12-33 of these questions correctly; controls answered 24-37 correctly; also note that all patients performed above chance on CAT auditory sentence comprehension (73%+ accuracy)

#### Contrasts

Are the contrasts clearly described?	Yes

### Contrast 1: listening to narrative speech vs listening to reversed speech

Language condition	Listening to narrative speech
Control condition	Listening to reversed speech
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, no behavioral measure
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Somewhat
Control activation notes	Bilateral (L > R) temporal, L IFG and L dorsal precentral
Contrast notes	-
Anstron	

#### Analyses

Are the analyses clearly described?

Yes

## Voxelwise analysis 1

Voxelwise analysis 1	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia without temporal lobe damage (n = 9) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise FWE correction and additional arbitrary cluster correction
Software	SPM2
Voxelwise p	FWE p < .05
Cluster extent	5 voxels (size not stated)
Statistical details	-
Findings	↓ L dorsal precentral ↓ R somato-motor
Findings notes	_
Voxelwise analysis 2	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia with temporal lobe damage (n = 8) vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise FWE correction and additional arbitrary cluster correction
Software	SPM2
Voxelwise p	FWE p < .05
Cluster extent	5 voxels (size not stated)
Statistical details	-
Findings	↓ L posterior STS ↓ L mid temporal
Findings notes	-
Voxelwise analysis 3	

First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with temporal lobe damage (n = 8) vs without temporal lobe damage (n = 9)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level	<u>N/A, no behavioral measure</u>

Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise FWE correction and additional arbitrary cluster correction
Software	SPM2
Voxelwise p	FWE p < .05
Cluster extent	5 voxels (size not stated)
Statistical details	_
Findings	↓ L posterior STG/STS/MTG ↓ L mid temporal
Findings notes	_
Voxelwise analysis 4	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia without temporal lobe damage (n = 9)
Covariate	Sentence comprehension (CAT)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level	<u>N/A, no behavioral measure</u>

First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia without temporal lobe damage (n = 9)
Covariate	Sentence comprehension (CAT)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise FWE correction and additional arbitrary cluster correction
Software	SPM2
Voxelwise p	FWE p < .05
Cluster extent	5 voxels (size not stated)
Statistical details	Conjunction with main effect of story comprehension (details hard to follow); this was a multiple regression also involving patients with temporal lobe damage
Findings	↑ L posterior STS ↑ R mid temporal
Findings notes	Patients with better sentence comprehension had more activation in the L posterior STS and R mid STS
Voxelwise analysis 5	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia with temporal lobe damage (n = 8)

Group(s)	Aphasia with temporal lobe damage (n = 8)
Covariate	Sentence comprehension (CAT)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	N/A, no behavioral measure
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise FWE correction and additional arbitrary cluster correction
Software	SPM2
Voxelwise p	FWE p < .05

Cluster extent	5 voxels (size not stated)
Statistical details	Conjunction with main effect of story comprehension (details hard to follow); this was a multiple regression also involving patients without temporal lobe damage
Findings	↑ R mid temporal
Findings notes	Patients with better sentence comprehension had more activation in the R mid STS
Complex analysis 1	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with temporal damage (n = 8) vs without temporal damage (n = 9)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Complex
Statistical details	Correlations were computed between activity in each voxel, and the sentence comprehension measure from the CAT, and were compared between the two aphasia groups, in regions with a main effect of story comprehension. <u>The voxelwise threshold was p &lt; .001, uncorrected for multiple comparisons.</u>
Findings	Other
Findings notes	Activity in the L posterior STS was positively correlated with sentence comprehension in patients without temporal lobe damage, but not in patients with temporal lobe damage
Complex analysis 2	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia without temporal damage (n = 9) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Complex
Statistical details	Correlations were computed between activity in each voxel, and post-scan story recall, and were compared between patients without temporal damage and controls, in regions with a main effect of story comprehension. The threshold was p < 0.05 corrected, <u>plus a minimum</u> <u>cluster size of 5 voxels</u> .
Findings	None
Findings notes	_
Complex analysis 3	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia with temporal damage (n = 8) vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>

Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Complex
Statistical details	Correlations were computed between activity in each voxel, and post-scan story recall, and were compared between patients with temporal damage and controls, in regions with a main effect of story comprehension. The threshold was p < 0.05 corrected, <u>plus a minimum cluster</u> size of 5 voxels.
Findings	None
Findings notes	_
Complex analysis 4	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with temporal damage (n = 8) vs without temporal damage (n = 9)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Complex
Statistical details	Correlations were computed between activity in each voxel, and post-scan story recall, and were compared between the two aphasia groups, in regions with a main effect of story comprehension. The threshold was p < 0.05 corrected, <u>plus a minimum cluster size of 5</u> <u>voxels</u> .
Findings	None
Findings notes	-
Notes	
Excluded analyses	An analysis involving associations between activations and story recognition memory because it included both controls and patients

# de Boissezon et al. (2005)

#### Reference

Authors	de Boissezon X, Démonet JF, Puel M, Marie N, Raboyeau G, Albucher JF, Chollet F, Cardebat D
Title	Subcortical aphasia: a longitudinal PET study
Reference	<i>Stroke</i> 2005; 36: 1467-1473
PMID	15933252
DOI	10.1161/01.str.0000169947.08972.4f

Language	French
Inclusion criteria	Subcortical stroke; no severe aphasia
Number of individuals with aphasia	<u>Z</u>
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 52.4 ± 13 years, range 31-69 years)

Is sex reported for patients and controls, and matched?	Yes (males: 7; females: 0)
Is handedness reported for patients and controls, and matched?	Yes (right: 7; left: 0)
Is time post stroke onset reported and appropriate to the study design?	<u>No* (moderate limitation)</u> (T1: mean 53 $\pm$ 35 days, range 11-108 days; T2: mean 12.2 $\pm$ 1.4 months; T1 varies considerably from early to late subacute)
To what extent is the nature of aphasia characterized?	<u>Type only</u>
Language evaluation	Montreal-Toulouse Aphasia Battery
Aphasia severity	Not stated
Aphasia type	T1: 2 Broca's, 2 transcortical sensory, 1 anomic, 1 transcortical motor, 1 Wernicke's; T2: 4 recovered, 1 anomic, 1 transcortical motor; 1 transcortical sensory
First stroke only?	Yes
Stroke type	Mixed etiologies
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Not stated
Lesion location	5 L non-thalamic subcortical, 2 L thalamic
Participants notes	-

## Imaging

Condition	Response type Repetitions All groups could do? All individuals could do?
Are the conditions clearly described?	Yes
Conditions	
Imaging notes	—
Is intersubject normalization adequately described and appropriate?	No (lesion impact not addressed; minimal due to lesions being small and subcortical)
Is first level model fitting adequately described and appropriate?	Yes
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Total images acquired	6
Design type	PET
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Is the scanner described?	Yes (CTI-Siemens ECAT EXACT HR+)
If longitudinal, was there any intervention between the time points?	Not stated
If longitudinal, at what time point(s) were imaging data acquired?	T1: mean 53 $\pm$ 35 days, range 11-108 days; T2: mean 12.2 $\pm$ 1.4 months; T1 varies considerably from early to late subacute
Is the study cross-sectional or longitudinal?	Longitudinal—recovery
Modality	PET (rCBF)

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
word generation	Word (overt)	4	Yes	Yes
rest	None	2	<u>N/A</u>	N/A
Conditions notes	Nouns in two runs, v	erbs in two runs, cor	mbined here because the	y were combined in analysis
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: word generation vs rest				
Language condition	Word generation			

Are the conditions matched for usual demands?       Ne         Are the conditions matched for usual demands?       No         Baccuracy matched between the language and the comparable       No         Control tests for all relevant group?       No         Behavarial data notes       -         Are come data notes       -         Are the enalyses releval with the control group?       No <sup>4</sup> (moderate limitation) (see specific limitation)(see specific limitation) (see specific	Control condition	Rest
Are the conditions matched for match remarkeds         No           Are the conditions matched for control remarkeds         No           Are the conditions matched for control remarkeds         No           Control relations matched for match regarked remarkeds         No           Control relations matched for experiments         No           Exacutation method between the language and control tasks for all relevant groups?         No           Developed factors         -           Are control data reported in this paper or nontrol relevant groups regions in the control data?         Unknown           Developed factors         -           Are control data reported in the control data?         Unknown           Control activations biserial relevant groups?         No           Are control data reported in the control data?         Unknown           Control activation notes         -           Control activation notes         -           Control activation notes         No           Fist level contrast         No           Status biserial relevant groups?         No           Status biserial relevant groups?         No           Are control data reported in the control data?         Informatic           Control activation notes         No           Fist level contrast         Mo		
Are the conditions matched for mognitive/execution         Not           Are the conditions matched for cognitive/execution         Not           Are the conditions matched for cognitive/execution         Not           Are the conditions matched for cognitive/execution         Not           Are concol data for all relevant groups?         Not           Behavioral data notes         -           Are concol data for all relevant groups?         Not           Behavioral data notes         -           Are concol data for all relevant groups?         Not           Behavioral data notes         -           Are concol data stores ported in this paper or another trust is diverance?         Not           Does the contrast stores ported in this paper or another trust is diverance?         Infravor           Contrad atowaler notes         -           Are atowards back production that another of cond?         Infravor           Contrad atowaler notes         -           Are atowards back production that another operation the massive contrad store ported instance?         -           Contrad atowaler notes         Not (noderate limitation) (see specific limitation) (blow)           Verefive contrast         Not generation vs rest           Aradys is dis contrast notes         Not generation vs rest           Group (S)         Aphasis T		
Are the conditions matched for cognitive/executions         Not tasks not comparable           Is accurately matched between the language and control tasks for all relevant groups?         NA tasks not comparable           Is resction time matched between the language and control tasks for all relevant groups?         NA tasks not comparable           Is resction time matched between the language and control tasks for all relevant groups?         Na           Desities reported in this paper or another is the control state reference?         Na           Onces the contrast selectively activate plausibe         Inknown           Contrast notes         -           Contrast notes         -           Contrast notes         -           Contrast notes         -           Para task selectively activate plausibe         Inknown           Contrast notes         -           Contrast notes         -           Para task selectively activate plausibe         -           Contrast notes         No fronderate limitation (see specific limitation(s) below)           Stressel Contrast         No fronderate limitation (see specific limitation(s) below)           Values analyses clearly described?         No fronderate limitation (see specific limitation(s) below)           Stressecond level contrast         Yes           Stressecontrast         No significant correlation with langua	-	
demands         MA tasks not comparable           is accuracy mutched between the language and control tasks for all relevant groups?         MA tasks not comparable           is reaction time matched between the language and control tasks for all relevant groups?         MA tasks not comparable           Behavioral data notes         —           Are corrical data notes         —           Are corrical data notes         —           Are corrical data notes         Ma tasks not comparable           Des the contract scleritively cluster plausible relevant tanguage regions in the control gaze?         Micrown           Contrast tanguage regions in the control gaze?         Micrown           Contrast notes         —           Are activators balaxses clearly described?         Nor (moderate limitation) (see specific limitatio		_
control tasks for all relevant groups?         NA. tasks not comparable           servaction time marched between the language         NA. tasks not comparable           Behavioral data monched between the language         Na.           Are control data reported in this paper or another         Na.           Dest the contrast selectively activate plausible         Unknown           Contrast inducator notes         –           Are activations theralized in the control data?         Unknown           Contrast notes         –           Are the analysise cleanly described?         Unknown           Contrast notes         –           Are the analysis clany described?         No* (moderate limitation) (see specific limitation(s) below)           Vorelwise analysis         Cross sectional correlation with language or other measure           Group(s)         Aphasia T           Contrast         Vor generation vs rest           Analysis class         Cross sectional correlation with language or other measure           Group(s)         Aphasia T           Contrast num matched across the second level         Yes           Secture of matched across the second level         Yes           Dist of contrast value         Yes matched           Contrast num matched across the second level         Yes           Dist of c	0	No
and cortrol tasks for all relevant groups?       -         Behavioral data notes       -         Are cortrol data reported in this paper or another that is referenced?       Ma         Does the cortrol selectively activate plausble       Unknown         Control activation notes       -         Are activations selectively activate plausble       Unknown         Control activation notes       -         Control activation notes       -         Arabyses       -         Arabyses       No* (moderate limitation) (see specific limitation(s) below)         Vocelvise analysis class       Consessectional correlation with language or other measure         Group(s)       Aphasis class       Cross-sectional correlation with language or other measure         Group(s)       Aphasis f1       Yes         Courtate       Time past onset       Yes         State scond level contrast valid in terms of the scond level       Yes         Courtage matched across the second level       Yes         Courtage of analysis       Yes with the past on set or the scond second level         Courtage of analysis       Yos with the scond second second level         Courtage of analysis       Yes with the scond second second level         Courtage of analysis       Yos with the scond second second second second second second second		N/A, tasks not comparable
Are control data reported in this paper or another that is referenced?         Na           Dess the contrast selectively activate plausible relevant language regions in the control data?         Unknown           Contral activation notes            Contrast notes            Contrast notes            Analyses            Analyses            Contrast notes            Kar the analyses clearly described?         Note (moderate limitation) (see specific limitation(s) below)           Vescensional contrast         Mord generation vs rest           Group(s)         Aphasia 11           Covariate         Time post onset           Is the second level contrast valid in terms of the group(s). Ime point(s), and measures involved?         Yes           Is accutary matched across the second level         Unknown, not reported           Contrast?         Vosewise         Vosewise           Contrast?         Vosewise         Software           Contrast?	0 0	N/A, tasks not comparable
Ithis referenced <sup>1</sup> Information           Does the contrast selectively activate plausible relevant language regions in the control group?         Minknown           Are activations lateralized in the control data?         Unknown           Control activations nateralized in the control data?         —           Are activations lateralized in the control data?         —           Analyses         —           Are the analyses clearly described?         No* (moderate limitation) (see specific limitation(s) below)           Voxelise analysis 1         —           First level contrast         Word generation vs rest           Analysis Class         Cross-sectional correlation with language or other measure           Group(s)         Aphasia T1           Covariae         Time post onset           Is accurary matched across the second level         Yes.           Secure and matched across the second level         Vinknown, not reported           contrast?         No significant correlation between time post onset and accurary           Secure and matched across the second level         No significant correlation between time post onset and accurary           Type of analysis         Voxelwise           Secure and matched across the second level         Unknown not reported           Contrast         Significant correlation arbitrary cluster extent <td>Behavioral data notes</td> <td>_</td>	Behavioral data notes	_
relevant language regions in the control group?           Are activations lateralized in the control data?         Inknown           Control activation notes         –           Contrast notes         –           Analyses         –           Are the analyses clearly described?         Not (moderate limitation) (see specific limitation(s) below)           VoxeWise analysis 1         VoxeWise analysis 1           First level contrast         Cross sectional correlation with language or other measure           Group(s)         Aphasia 11           Contrast         Time post onset           Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?         Yes, matched           Is reaction lime matched across the second level contrast?         Vuknown, not reported           Correction for multiple comparisons         Clusterwise contrast on between time post onset and accuracy           Search volume         Whole brain           Correction for multiple comparisons         Solvasted           Search volume         Spin (sint correlation arbitrary cluster extent)           Correction for multiple comparisons         Solvasted           Search volume         Spin (cant correction based on arbitrary cluster extent)           Correction for multiple comparisons         Spin (cant correction based on arbitrary cluster extent) <td></td> <td>No</td>		No
Are activations lateralized in the control data?         Unknown           Control activation notes         –           Contrast notes         –           Contrast notes         –           Contrast notes         –           Arabyses         Karbana status activations (see specific limitations) (see		Unknown
Control activation notes       -         Contraist notes       -         Analyses       -         Are the analyses clearly described?       Not (moderate limitation) (see specific limitation(s) below)         VoxeWise analysis 1       -         First level contrast       Word generation vs rest         Analysis class       Cross-sectional correlation with language or other measure         Group(s)       Aphasia T1         Covariate       Time post onset         Is the second level contrast valid in terms of the       Yes         group(s), time point(s), and measures involved?       Yes         Is accuracy matched across the second level       Ves, matched         contrast       No significant correlation between time post onset and accuracy         Staction time matched across the second level       Voxelwise         Correction for multiple comparisons       Clusterwise correction based on arbitrary cluster extent         Software       SPM2         Voxelwise p       01         Cluster extent       S0 voxels (size not stated)         Statistical details       -         -       -         Findings       1 L orbitofrontal         1 L anterior temporal       1 L anterior temporal         1 L orbitofrontal       1 L anter		Linknown
Contrast notes       –         Analyses       No* (moderate limitation) (see specific limitation(s) below)         Vocelwise analysis 1       First level contrast         Analysis class       Cross-sectional correlation vs rest         Analysis class       Cross-sectional correlation with language or other measure         Covariate       Time post onset         Is the second level contrast valid in terms of the group(s), time point(s) and measures involved?       Yes, matched         Is reaction time matched across the second level contrast?       Ves, matched         Is reaction time matched across the second level contrast?       Unknown, not reported         Previous class       Voxelwise         Second love comparisons       Unknown, not reported         Coveration for multiple comparisons       Subservise correction based on arbitrary cluster extent         Software       SPM2         Voxelwise p       .01         Cluster extent       Software         Findings notes       L corbitofrontal 1 L anterior temporal 1 L corbitofrontal 1 L corbitofrontal 1 L corbitofrontal 1 L corbitofrontal 1 L anterior temporal 1 L corbitofrontal 1 L corbit		
Analyses       Analyses clearly described?       No*(moderate limitation) (see specific limitation(s) below)         Ker the analyses clearly described?       No*(moderate limitation) (see specific limitation(s) below)         First level contrast       Word generation vs rest         Analysis class       Cross-sectional correlation with language or other measure         Group(s)       Aphasia T1         Covariate       Time post onset         Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?       Yes, matched         Saccuracy matched across the second level contrast?       Yes, matched         Is reaction time matched across the second level contrast?       Yes, matched         Behavioral data notes       No significant correlation between time post onset and accuracy         Type of analysis       Voxelwise         Search onlume       Whole brain         Correction for multiple comparisons       Clusterwise correction based on arbitrary cluster extent         Software       Solvaels (size not stated)         Voxelwise p       .01         Cluster extent       Sol voxels (size not stated)         Statici details       -         Findings       1         I cortistort       .0 corpital         1 cortistortontal       1         1 cortistor		_
Are the analyses clearly described?         No* (moderate limitation) (see specific limitation(s) below)           Voxelwise analysis 1           First level contrast         Word generation vs rest           Analysis class         Cross-sectional correlation with language or other measure           Group(s)         Aphasia T1           Covariate         Time post onset           Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?         Yes           Is accuracy matched across the second level contrast?         Vnknown, not reported           Is reaction time matched across the second level contrast?         Unknown, not reported           Secore Volume         Voselwise           Correction for multiple comparisons         Clusterwise correction based on arbitrary cluster extent           Software         SPM2           Voselwise p         01           Cluster extent         S0 voxels (size not stated)           Statical details         —           I corbitorforntal 1 contrior         1 corbitorforntal 1 corbitorforntal 1 corbitorforntal 1 corbitorforntal 1 corbitorforntal 1 corbitorforntal 1 corbitorforntal 1 corbitorior temporal 1 corbitorior temporal 1 corbitorior           Findings notes         More activity with longer time post onset; based on coordinates in Table 3a           Voxelwise Locuritat         No degmeration vs rest Analysis class	Contrast HOLES	
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CovariateTime post onsetIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Yes, matchedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notesNo significant correlation between time post onset and accuracyType of analysisVoxelwiseCorrection for multiple comparisonsClusterwise correction based on arbitrary cluster extentSoftwareSPM2Voxelwise p.01Cluster extentSocies (size not stated))Statistical details-FindingsL orbitofrontal 1 L orbitofrontal 1 L coreiptal 1 L anterior temporal 1 L coreiptal 1 L coreiptal 1 L coreiptal 1 L coreiptal 1 L anterior temporal 1 L coreiptal 1 R coreiptal 1 R coreiptalFindings notesWord generation vs rest Analysis classFirst level contrastWord generation vs rest resterion corein acoust or other measure	Analysis class	Cross-sectional correlation with language or other measure
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?       Yes, matched         Is accuracy matched across the second level contrast?       Yes, matched         Is reaction time matched across the second level contrast?       Unknown, not reported         Behavioral data notes       No significant correlation between time post onset and accuracy         Type of analysis       Voxelwise         Search volume       Whole brain         Correction for multiple comparisons       Clusterwise correction based on arbitrary cluster extent         Software       SPM2         Voxelwise p       .01         Cluster extent       S0 voxels (size not stated)         Statistical details       -         Findings       1 L orbitofrontal 1 L anterior temporal 1 L anterior temporal 1 L cerebellum 1 L anterior temporal 1 L cerebellum 1 R anterior temporal 1 R occipital         Findings notes       More activity with longer time post onset; based on coordinates in Table 3a         Voxelwise analysis 2       First level contrast         First level contrast       Word generation vs rest         Analysis class       Cross-sectional correlation with language or other measure	Group(s)	Aphasia T1
group(s), time point(s), and measures involved?         Is accuracy matched across the second level contrast?       Yes, matched score across the second level is reaction time matched across the second level contrast?       Unknown, not reported who significant correlation between time post onset and accuracy         Behavioral data notes       No significant correlation between time post onset and accuracy         Type of analysis       Voxelwise         Correction for multiple comparisons       Clusterwise correction based on arbitrary cluster extent         Software       SPM2         Voxelwise p       .01         Cluster extent       S0 voxels (size not stated)         Statistical details       -         Findings       1 L orbitofrontal 1 L actrior temporal 1 L active rein poral 1 L accipital 1 L acterior cingulate 1 L cerebellum 1 R acterior temporal 1 R accipital         Findings notes       More activity with longer time post onset; based on coordinates in Table 3a	Covariate	Time post onset
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Type of analysisVoxelwiseSearch volumeWhole brainCorrection for multiple comparisonsClusterwise correction based on arbitrary cluster extentSoftwareSPM2Voxelwise p.01Cluster extent50 voxels (size not stated)Statistical details-Findings↑ L orbitofrontal ↑ L anterior temporal ↑ L anterior cingulate ↑ L cocipital ↑ L anterior cingulate ↑ L cocipital ↑ L anterior cingulate ↑ L cocipital ↑ L orbitofrontal ↑ L occipital ↑ L occipital ↑ L anterior cingulate ↑ L occipital ↑ L occipital ↑ L occipital ↑ L orbitofrontal ↑ L occipital ↑ L ontroit cemporal ↑ R anterior temporal ↑ R occipital ↑ R occipital 		<u>Unknown, not reported</u>
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SoftwareSPM2Voxelwise p.01Cluster extent50 voxels (size not stated)Statistical details-Findings1 L orbitofrontal 1 L anterior temporal 1 L cocipital 1 L anterior cingulate 1 L cerebellum 1 R anterior temporal 1 R occipitalFindings notesMore activity with longer time post onset; based on coordinates in Table 3aFirst level contrast Analysis classWord generation vs rest Cross-sectional correlation with language or other measure	Search volume	Whole brain
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Cluster extent50 voxels (size not stated)Statistical details—Findings↑ L orbitofrontal ↑ L anterior temporal ↑ L occipital ↑ L cerebellum ↑ R anterior temporal ↑ R occipitalFindings notesMore activity with longer time post onset; based on coordinates in Table 3aVoxelwise analysis 2First level contrast Analysis classWord generation vs rest Cross-sectional correlation with language or other measure	Software	
Statistical details       –         Findings       † L orbitofrontal         † L anterior temporal       † L anterior cingulate         † L anterior cingulate       † L cerebellum         † R anterior temporal       † R cocipital         Findings notes       More activity with longer time post onset; based on coordinates in Table 3a         Voxelwise analysis 2         First level contrast       Word generation vs rest         Analysis class       Cross-sectional correlation with language or other measure	Voxelwise p	.01
Findings              L orbitofrontal             L anterior temporal             L cocipital             L anterior cingulate             L cerebellum             R anterior temporal             L cerebellum             R anterior temporal             R occipital         Findings notesMore activity with longer time post onset; based on coordinates in Table 3aVoxelwise analysis 2         First level contrastWord generation vs rest Cross-sectional correlation with language or other measure	Cluster extent	50 voxels (size not stated)
* L anterior temporal † L occipital † L occipital † L anterior cingulate † L cerebellum † R anterior temporal † R occipitalFindings notesMore activity with longer time post onset; based on coordinates in Table 3aVoxelwise analysis 2First level contrastWord generation vs rest Cross-sectional correlation with language or other measure	Statistical details	_
Voxelwise analysis 2       First level contrast     Word generation vs rest       Analysis class     Cross-sectional correlation with language or other measure	Findings	<ul> <li>↑ L anterior temporal</li> <li>↑ L occipital</li> <li>↑ L anterior cingulate</li> <li>↑ L cerebellum</li> <li>↑ R anterior temporal</li> </ul>
First level contrast     Word generation vs rest       Analysis class     Cross-sectional correlation with language or other measure	Findings notes	More activity with longer time post onset; based on coordinates in Table 3a
Analysis class     Cross-sectional correlation with language or other measure	Voxelwise analysis 2	
Analysis class     Cross-sectional correlation with language or other measure	First level contrast	Word generation vs rest
		-
	Group(s)	Aphasia T1
Covariate     Word generation accuracy T1		
Is the second level contrast valid in terms of the Yes		

group(s), time point(s), and measures involved?	
Is accuracy matched across the second level	Accuracy is covariate
contrast?	
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM2
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	_
Findings	<ul> <li>↑ L IFG pars triangularis</li> <li>↑ L dorsolateral prefrontal cortex</li> <li>↑ L precuneus</li> <li>↑ L Heschl's gyrus</li> <li>↑ L anterior temporal</li> <li>↑ R insula</li> <li>↑ R posterior STG</li> </ul>
Findings notes	Based on coordinates in Table 3b
Voxelwise analysis 3	
First level contrast	Word generation vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM2
Voxelwise p	.001
Cluster extent	100 voxels (size not stated)
Statistical details	<u>Description of masking unclear</u> , but <u>seems to be inclusively masked with T1, which seems</u> <u>inappropriate</u>
Findings	↑ L insula ↑ L posterior STG ↑ R orbitofrontal ↑ R posterior STG ↑ R cerebellum
Findings notes	Based on coordinates in Table 2
Voxelwise analysis 4	
First level contrast	Word generation vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	Δ word generation accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes

Is accuracy matched across the second level	Accuracy is covariate
contrast?	
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM2
Voxelwise p	.01
Cluster extent	20 voxels (size not stated)
Statistical details	-
Findings	↑ L mid temporal
	↑ R anterior temporal
	↑ R cerebellum
Findings notes	Based on coordinates in Table 3c
Notes	

Excluded analyses

# Connor et al. (2006)

### Reference

Authors	Connor LT, DeShazo Braby T, Snyder AZ, Lewis C, Blasi V, Corbetta M
Title	Cerebellar activity switches hemispheres with cerebral recovery in aphasia
Reference	Neuropsychologia 2006; 44: 171-177
PMID	16019040
DOI	10.1016/j.neuropsychologia.2005.05.019

Language	US English
Inclusion criteria	L IFG, possibly extending to neighboring regions
Number of individuals with aphasia	<u>8</u>
Number of control participants	14
Were any of the participants included in any previous studies?	Yes (re-analysis of data from Blasi et al. (2002))
Is age reported for patients and controls, and matched?	<u>No</u> (mean 48.6 years; patients and controls not closely matched for age, unclear if difference significant)
Is sex reported for patients and controls, and matched?	Yes (males: 2; females: 6)
Is handedness reported for patients and controls, and matched?	Yes (right: 8; left: 0)
Is time post stroke onset reported and appropriate to the study design?	<u>No</u> (> 6 months; actual TPO not stated)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	WAB or BDAE
Aphasia severity	AQ range 66.5-89.0 in 6 participants, BDAE aphasia severity of 4 in 1 participant, no formal evaluation in 1 participant
Aphasia type	3 anomic, 3 transcortical motor, 1 Broca's, 1 not stated; most were Broca's or global acutely
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution	Individual lesions

characterized?	
Lesion extent	Not stated
Lesion location	L IFG and operculum, extending to adjacent cortex and white matter in several cases
Participants notes	_
Imaging	

00	
Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (Siemens Vision 1.5 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Event-related
Total images acquired	1024
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-
Conditions	

### Conditions

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
word stem completion (novel items)	Word (covert)	196	Yes	Unknown
word stem completion (repeated items)	Word (covert)	196	Yes	<u>Unknown</u>
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>
Conditions notes	Novel items were pre 4, and 5; of the four			were presented in runs 2, 3,
Contrasts				

# Are the contrasts clearly described?

Yes

Yes

### Contrast 1: word stem completion (novel items) vs word stem completion (repeated items)

Language condition	Word stem completion (novel items)
Control condition	Word stem completion (repeated items)
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	Yes, matched
Is reaction time matched between the language and control tasks for all relevant groups?	<u>No, different</u>
Behavioral data notes	-
Are control data reported in this paper or another	Somewhat

that is referenced?	
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Unknown</u>
Are activations lateralized in the control data?	Somewhat
Control activation notes	No whole brain analysis of this contrast, but somewhat lateralized in the sense that L but not R frontal areas showed a learning effect
Contrast notes	The only contrast analyzed in this paper is the "learning" contrast which corresponds to contrast 2 in Blasi et al. (2002)
Analyses	
Are the analyses clearly described?	<u>No* (moderate limitation)</u> (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Word stem completion (novel items) vs word stem completion (repeated items)
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	Yes, matched
Behavioral data notes	Covert task but overt data acquired separately; no interaction of group by practice for accuracy or RT
Type of analysis	Voxelwise
Search volume	Cerebellum
Correction for multiple comparisons	No direct comparison
Software	not stated
Voxelwise p	_
Cluster extent	_
Statistical details	Qualitative comparison on p. 174; <u>Monte Carlo-based thresholding not described</u> ; rather than fitting a HRF, the authors looked at the shape of the signal in the 8 volumes following each stimulus
Findings	↑ L cerebellum
Findings notes	↓ R cerebellum
0	↓R cerebellum —
	↓R cerebellum —
	↓ R cerebellum — Word stem completion (novel items) vs word stem completion (repeated items)
ROI analysis 1 First level contrast	— Word stem completion (novel items) vs word stem completion (repeated items)
ROI analysis 1 First level contrast Analysis class	Word stem completion (novel items) vs word stem completion (repeated items) Cross-sectional aphasia vs control
ROI analysis 1 First level contrast	— Word stem completion (novel items) vs word stem completion (repeated items)
ROI analysis 1 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the	Word stem completion (novel items) vs word stem completion (repeated items) Cross-sectional aphasia vs control
ROI analysis 1 First level contrast Analysis class Group(s) Covariate	<ul> <li>Word stem completion (novel items) vs word stem completion (repeated items)</li> <li>Cross-sectional aphasia vs control</li> <li>Aphasia vs control</li> </ul>
ROI analysis 1 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level	<ul> <li>Word stem completion (novel items) vs word stem completion (repeated items)</li> <li>Cross-sectional aphasia vs control</li> <li>Aphasia vs control</li> <li>Yes</li> </ul>
ROI analysis 1 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level	<ul> <li>Word stem completion (novel items) vs word stem completion (repeated items)</li> <li>Cross-sectional aphasia vs control</li> <li>Aphasia vs control</li> <li></li> <li>Yes</li> <li>Yes, matched</li> </ul>
ROI analysis 1 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast?	<ul> <li>–</li> <li>Word stem completion (novel items) vs word stem completion (repeated items)</li> <li>Cross-sectional aphasia vs control</li> <li>Aphasia vs control</li> <li>–</li> <li>Yes</li> <li>Yes, matched</li> <li>Yes, matched</li> <li>Covert task but overt data acquired separately; no interaction of group by practice for</li> </ul>
ROI analysis 1 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes	<ul> <li>–</li> <li>Word stem completion (novel items) vs word stem completion (repeated items)</li> <li>Cross-sectional aphasia vs control</li> <li>Aphasia vs control</li> <li></li> <li>Yes</li> <li>Yes, matched</li> <li>Covert task but overt data acquired separately; no interaction of group by practice for accuracy or RT</li> </ul>
ROI analysis 1 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there?	<ul> <li>—</li> <li>Word stem completion (novel items) vs word stem completion (repeated items)</li> <li>Cross-sectional aphasia vs control</li> <li>Aphasia vs control</li> <li>—</li> <li>Yes</li> <li>Yes, matched</li> <li>Yes, matched</li> <li>Covert task but overt data acquired separately; no interaction of group by practice for accuracy or RT</li> <li>Region of interest (ROI)</li> </ul>
ROI analysis 1 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type	<ul> <li></li> <li>Word stem completion (novel items) vs word stem completion (repeated items)</li> <li>Cross-sectional aphasia vs control</li> <li>Aphasia vs control</li> <li></li> <li>Yes</li> <li>Yes, matched</li> <li>Yes, matched</li> <li>Covert task but overt data acquired separately; no interaction of group by practice for accuracy or RT</li> <li>Region of interest (ROI)</li> <li>Functional</li> </ul>

Correction for multiple comparisons	One only
Statistical details	<u>Circular because ROIs defined in one group</u> ; rather than fitting a HRF, the authors looked at the shape of the signal in the 8 volumes following each stimulus
Findings	↑ L cerebellum
Findings notes	_
Notes	
Excluded analyses	(1) analysis of frontal changes is excluded since it appears to be identical to Blasi et al. (2002); (2) the analyses involving mirrored cerebellar regions are excluded since the groups were not compared directly

# Crinion et al. (2006)

### Reference

Authors	Crinion JT, Warburton EA, Lambon-Ralph MA, Howard D, Wise RJ
Title	Listening to narrative speech after aphasic stroke: the role of the left anterior temporal lobe
Reference	Cereb Cortex 2006; 16: 1116-1125
PMID	16251507
DOI	10.1093/cercor/bhj053

## Participants

Language	UK English
Inclusion criteria	-
Number of individuals with aphasia	24
Number of control participants	11
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (range 32-85 years)
Is sex reported for patients and controls, and matched?	Yes (males: 18; females: 6)
Is handedness reported for patients and controls, and matched?	Yes (right: 24; left: 0)
Is time post stroke onset reported and appropriate to the study design?	No (mean 32 months, range 2-204 months; combines subacute and chronic patients)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	CAT (missing in two participants)
Aphasia severity	Not stated
Aphasia type	Not stated
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	6 L but no temporal damage, 9 L temporal damage excluding anterior temporal cortex, 9 L temporal damage including anterior temporal cortex
Participants notes	Results of control participants previously reported in Crinion et al. (2003)
Imaging	
Modality	

Modality Is the study cross-sectional or longitudinal? If longitudinal, at what time point(s) were imaging PET (rCBF) Cross-sectional

\_

data acquired?				
If longitudinal, was there any intervention between the time points?	_			
Is the scanner described?	Yes (CTI-Siemens ECAT EXACT HR++/966 (16 patients and all controls) or GE Advance (8 patients))			
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes			
Design type	PET			
Total images acquired	12-16			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	Yes			
Is intersubject normalization adequately described and appropriate?	Yes			
Imaging notes	two different scanners us	ed for patients,	but not for controls	
Conditions				
Conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
listening to narrative speech	None	6-8	N/A	<u>N/A</u>
listening to reversed speech	None	6-8	N/A	<u>N/A</u>
Conditions notes	_			
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: listening to narrative speech vs list	ening to reversed speech	ı		
Language condition	Listening to narrative spe	ech		
Control condition	Listening to reversed spee	ech		
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	Yes			
Are the conditions matched for motor demands?	Yes			
Are the conditions matched for cognitive/executive demands?	Yes			
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, no behavioral measu</u>	<u>ire</u>		
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task			
Behavioral data notes	_			
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>			
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes			
Are activations lateralized in the control data?	Somewhat			
Control activation notes	11 participants; L-lateraliz	ed posterior ter	nporal, bilateral anterior t	emporal, no frontal
Contrast notes	_			
Analyses				
Are the analyses clearly described?	Yes			
Voxelwise analysis 1				

First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Voxelwise FWE correction
Software	SPM99
Voxelwise p	FWE p < .05
Cluster extent	_
Statistical details	_
Findings	None
Findings notes	_
Voxelwise analysis 2	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia without temporal lobe damage (n = 6) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all included patients
Correction for multiple comparisons	Voxelwise FWE correction
Software	SPM99
Voxelwise p	FWE p < .05
Cluster extent	_
Statistical details	_
Findings	None
Findings notes	_
Voxelwise analysis 3	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia with temporal lobe damage (n = 18) vs control
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_

Type of analysis	Voxelwise
Search volume	Voxels spared in all included patients
Correction for multiple comparisons	Voxelwise FWE correction
Software	SPM99
Voxelwise p	FWE p < .05
Cluster extent	_
Statistical details	_
Findings	None
Findings notes	_
Findings notes	—

## ROI analysis 1

First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13)
Covariate	Auditory sentence comprehension (CAT)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	LATL
How are the ROI(s) defined?	Activation in the control group
Correction for multiple comparisons	One only
Statistical details	Same result obtained with or without excluding one outlier; two other ROIs are described in the methods, but never used in any analyses
Findings	↑ L anterior temporal
Findings notes	More activity in patients with better auditory sentence comprehension
ROI analysis 2	
ROI analysis 2 First level contrast	Listening to narrative speech vs listening to reversed speech
	Listening to narrative speech vs listening to reversed speech Cross-sectional correlation with language or other measure
First level contrast	
First level contrast Analysis class	Cross-sectional correlation with language or other measure Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or
First level contrast Analysis class Group(s)	Cross-sectional correlation with language or other measure Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13)
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the	Cross-sectional correlation with language or other measure Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13) Time post onset
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level	Cross-sectional correlation with language or other measure Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13) Time post onset Yes
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level	Cross-sectional correlation with language or other measure Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13) Time post onset Yes <u>N/A, no behavioral measure</u>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast?	Cross-sectional correlation with language or other measure Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13) Time post onset Yes <u>N/A, no behavioral measure</u>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes	<ul> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13)</li> <li>Time post onset</li> <li>Yes</li> <li>N/A, no behavioral measure</li> <li>N/A, no timeable task</li> </ul>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there?	<ul> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13)</li> <li>Time post onset</li> <li>Yes</li> <li><u>N/A, no behavioral measure</u></li> <li>N/A, no timeable task</li> <li>—</li> <li>Region of interest (ROI)</li> </ul>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)?	<ul> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13)</li> <li>Time post onset</li> <li>Yes</li> <li>N/A, no behavioral measure</li> <li>N/A, no timeable task</li> <li>—</li> <li>Region of interest (ROI)</li> <li>Functional</li> </ul>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)?	<ul> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13)</li> <li>Time post onset</li> <li>Yes</li> <li><u>N/A, no behavioral measure</u></li> <li>N/A, no timeable task</li> <li>—</li> <li>Region of interest (ROI)</li> <li>Functional</li> <li>1</li> </ul>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)?	<ul> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13)</li> <li>Time post onset</li> <li>Yes</li> <li>N/A, no behavioral measure</li> <li>N/A, no timeable task</li> <li>—</li> <li>Region of interest (ROI)</li> <li>Functional</li> <li>1</li> <li>L ATL</li> </ul>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)?	<ul> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13)</li> <li>Time post onset</li> <li>Yes</li> <li>N/A, no behavioral measure</li> <li>N/A, no timeable task</li> <li>—</li> <li>Region of interest (ROI)</li> <li>Functional</li> <li>1</li> <li>L ATL</li> <li>Activation in the control group</li> </ul>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined?	<ul> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13)</li> <li>Time post onset</li> <li>Yes</li> <li>N/A, no behavioral measure</li> <li>N/A, no timeable task</li> <li>—</li> <li>Region of interest (ROI)</li> <li>Functional</li> <li>1</li> <li>LATL</li> <li>Activation in the control group</li> <li>One only</li> </ul>

#### Findings notes

#### **ROI analysis 3**

ROI allalysis 5	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with temporal damage excluding anterior temporal cortex (n = 9) vs with no temporal lobe damage (excluding 1 with missing behavioral data and 1 outlier) (n = 4)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	N/A, no behavioral measure
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	LATL
How are the ROI(s) defined?	Activation in the control group
Correction for multiple comparisons	One only
Statistical details	Two other ROIs are described in the methods, but never used in any analyses
Findings	↓ L anterior temporal
Findings notes	Patients with posterior temporal damage had less signal change
ROI analysis 4	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia with temporal damage excluding anterior temporal cortex (n = 9) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	N/A, no behavioral measure
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Region of interest (ROI)

### **ROI analysis 5**

Findings notes

ROI type

Findings

How many ROIs are there?

How are the ROI(s) defined?

Correction for multiple comparisons

What are the ROI(s)?

Statistical details

First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia with no temporal damage (excluding 1 with missing behavioral data and 1 outlier) or posterior temporal damage sparing anterior temporal cortex (n = 13)
Covariate	Auditory single word comprehension (CAT)

<u>Circular because ROI defined in one group</u>; two other ROIs are described in the methods, but

Large difference  $2.7 \pm 0.8$  (patients) vs  $6.3 \pm 1.4$  (controls) makes finding suggestive even in

Functional

Activation in the control group

never used in any analyses

↓ L anterior temporal

light of the circularity

1

L ATL

One only

Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	LATL
How are the ROI(s) defined?	Activation in the control group
Correction for multiple comparisons	One only
Statistical details	Two other ROIs are described in the methods, but never used in any analyses
Findings	None
Findings notes	R = 0.39; p > 0.1; seems to be a clear trend so lack of significance may reflect only lack of power
Nataa	

### Notes

Excluded analyses

# Saur et al. (2006)

### Reference

Authors	Saur D, Lange R, Baumgaertner A, Schraknepper V, Willmes K, Rijntjes M, Weiller C
Title	Dynamics of language reorganization after stroke
Reference	<i>Brain</i> 2006; 129: 1371-1384
PMID	16638796
DOI	10.1093/brain/awl090

Language	German
Inclusion criteria	MCA; age < 70 years; able to distinguish forward vs backward speech outside the scanner; no pronounced small vessel disease
Number of individuals with aphasia	<u>14</u> (plus 4 excluded: 1 health problems; 1 scanner noise; 2 did not tolerate fMRI)
Number of control participants	14
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 51.9 ± 14.2 years, range 16-68 years)
Is sex reported for patients and controls, and matched?	Yes (males: 11; females: 3)
Is handedness reported for patients and controls, and matched?	Yes (right: 12; left: 1; other: 1)
Is time post stroke onset reported and appropriate to the study design?	Yes (T1 acute: mean 1.8 days, range 0-4 days; T2 subacute: mean 12.1 days, range 3-16 days; T3 chronic: mean 321 days, range 102-513 days)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	AABT, AAT including TT, analysis of spontaneous speech, CETI, Language Recovery Score (LRS) derived from all these measures plus in-scanner task performance
Aphasia severity	T1: LRS mean 0.44, range 0.11-0.81; 1 mild, 1 mild-moderate, 7 moderate, 3 moderate-severe, 2 severe per AAT; T2: LRS mean 0.71, range 0.33-0.92; 2 recovered, 2 recovered-mild, 2 mild, 3 mild-moderate, 3 moderate, 2 severe per AAT; T3: LRS mean 0.91, range 0.66-1.00; 8 recovered, 2 recovered-mild, 3 mild, 1 moderate per AAT

Aphasia type	T1: 9 non-fluent, 5 fluent; T2: not stated; T3: 6 recovered, 4 minimal language impairment, 3 anomic, 1 global
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Not stated
Lesion location	L MCA; 4 frontal (2 extending to temporoparietal); 5 temporoparietal (2 extending to subcortical); 4 striatocapsular (2 extending to cortical); 1 frontoparietal
Participants notes	198 patients with aphasia were screened
maging	
Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—recovery
If longitudinal, at what time point(s) were imaging data acquired?	T1 acute: mean 1.8 days, range 0-4 days; T2 subacute: mean 12.1 days, range 3-16 days; T3 chronic: mean 321 days, range 102-513 days
If longitudinal, was there any intervention between the time points?	Standard SLT throughout the observation period including at least 3 weeks inpatient
Is the scanner described?	Yes (Siemens Trio 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Event-related
Total images acquired	660
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	_
Conditions	

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
listening to sentences and making a plausibility judgment	Button press	92	<u>Unknown</u>	No
listening to reversed speech	Button press	92	Yes	<u>Unknown</u>
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>

Conditions notes

In the auditory sentence comprehension condition, participants had to press a button to semantically anomalous sentences; in the reversed speech condition, they had to always press the button; the behavioral scores provided are not explained in the paper, but per a personal communication cited by Geranmayeh et al. (2014), 10% of the score reflects discrimination between intelligible and reversed speech, while 90% reflects semantic anomaly judgment; our coding of behavior is based on this limited information

### Contrasts

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Are the contrasts clearly described?
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### Contrast 1: listening to sentences and making a plausibility judgment vs listening to reversed speech

Yes

Yes

Language condition	Listening to sentences and making a plausibility judgment
Control condition	Listening to reversed speech

Are the conditions matched for viewal domanda?	Voc
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	Reported accuracy combines the two conditions in a way that is not explained
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Yes
Control activation notes	L temporal and L > R frontal
Contrast notes	_
Analyses	
	M
Are the analyses clearly described?	Yes
Voxelwise analysis 1	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM2
Voxelwise p	.001
Cluster extent	None
Statistical details	_
Findings	↑ L insula ↑ R IFG pars orbitalis ↑ R insula ↑ R SMA/medial prefrontal
Findings notes	R IFG/insula activation noted to survive FWE correction at $p < .05$
Voxelwise analysis 2	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T3 vs T2
Covariate	
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level	Unknown, not reported

contrast?	
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM2
Voxelwise p	.005
Cluster extent	None
Statistical details	Threshold was lowered to reveal the R frontal change in activation
Findings	↓ R IFG pars orbitalis ↓ R occipital
Findings notes	_

## Voxelwise analysis 3

First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T3 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM2
Voxelwise p	.001
Cluster extent	None
Statistical details	_
Findings	↑ L IFG pars orbitalis ↑ L SMA/medial prefrontal ↑ L posterior inferior temporal gyrus/fusiform gyrus ↑ R IFG pars orbitalis ↑ R insula
Findings notes	_

First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T1 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM2
Voxelwise p	.001

Cluster extent	None
Statistical details	-
Findings	↓ L IFG pars triangularis ↓ L IFG pars orbitalis ↓ L insula ↓ L posterior MTG ↓ L posterior inferior temporal gyrus/fusiform gyrus ↓ R IFG pars orbitalis ↓ R insula
Findings notes	L STG in table is actually MTG based on coordinates

## Voxelwise analysis 5

First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T2 vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM2
Voxelwise p	.005
Cluster extent	None
Statistical details	Threshold was lowered to reveal L IFG
Findings	↑ L IFG pars orbitalis ↑ L insula ↑ L SMA/medial prefrontal ↑ R IFG
Findings notes	-

First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T3 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear similar</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM2
Voxelwise p	.001
Cluster extent	None
Statistical details	_
Findings	None

Findings notes

voxerwise analysis /	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Language recovery score T1
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM2
Voxelwise p	.001
Cluster extent	None
Statistical details	
Findings	↑ L IFG ↑ L SMA/medial prefrontal ↑ R IFG pars triangularis
Findings notes	-
Voxelwise analysis 8	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T2
Covariate	Language recovery score T2
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, no test</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM2
Voxelwise p	.001
Cluster extent	None
Statistical details	
	— None
Findings	None
Findings notes	_
Voxelwise analysis 9	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T3
Covariate	Language recovery score T3
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes

Is accuracy matched across the second level contrast?	<u>Unknown, no test</u>	
Is reaction time matched across the second level contrast?	Unknown, not reported	
Behavioral data notes	Accuracy combines language and control conditions	
Type of analysis	Voxelwise	
Search volume	Whole brain	
Correction for multiple comparisons	No correction	
Software	SPM2	
Voxelwise p	.001	
Cluster extent	None	
Statistical details	_	
Findings	None	
Findings notes	_	
Voxelwise analysis 10		
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech	
Analysis class	Longitudinal correlation with language or other measure	
Group(s)	Aphasia T2 vs T1	
Covariate	% change in language recovery score	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes	
Is accuracy matched across the second level contrast?	<u>Unknown, no test</u>	
Is reaction time matched across the second level contrast?	Unknown, not reported	
Behavioral data notes	Accuracy combines language and control conditions	
Type of analysis	Voxelwise	
Search volume	Whole brain	
Correction for multiple comparisons	No correction	
Software	SPM2	
Voxelwise p	.001	
Cluster extent	None	
Statistical details	_	
Findings	↑ L SMA/medial prefrontal ↑ R insula ↑ R SMA/medial prefrontal	
Findings notes	_	
Verseheiter aus darie 44		

First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T3 vs T2
Covariate	% change in language recovery score
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
ls accuracy matched across the second level contrast?	<u>Unknown, no test</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM2

Voxelwise p	.001	
Cluster extent	None	
Statistical details	_	
Findings	None	
Findings notes	_	

## Voxelwise analysis 12

First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T3 vs T1
Covariate	% change in language recovery score
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, no test</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM2
Voxelwise p	.001
Cluster extent	None
Statistical details	-
Findings	None
Findings notes	-

### ROI analysis 1

First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	6
What are the ROI(s)?	(1) L IFG pars orbitalis; (2) L IFG pars triangularis; (3) L MTG; (4) R insula; (5) R IFG pars triangularis; (6) R SMA
How are the ROI(s) defined?	Peak voxels of overall activation map based on all three time points in patients
Correction for multiple comparisons	Familywise error (FWE)
Statistical details	_
Findings	↑ R insula ↑ R SMA/medial prefrontal
Findings notes	Some other ROIs also significant prior to correction for multiple comparisons; n.b. performance confound
ROI analysis 2	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech

Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T3 vs T2
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	6
What are the ROI(s)?	(1) L IFG pars orbitalis; (2) L IFG pars triangularis; (3) L MTG; (4) R insula; (5) R IFG pars triangularis; (6) R SMA
How are the ROI(s) defined?	Peak voxels of overall activation map based on all three time points in patients
Correction for multiple comparisons	Familywise error (FWE)
Statistical details	-
Findings	None
Findings notes	Some other ROIs also significant prior to correction for multiple comparisons; n.b. performance confound
ROI analysis 3	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T3 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>

Accuracy combines language and control conditions

(1) L IFG pars orbitalis; (2) L IFG pars triangularis; (3) L MTG; (4) R insula; (5) R IFG pars

Peak voxels of overall activation map based on all three time points in patients

Some other ROIs also significant prior to correction for multiple comparisons; n.b.

Regions of interest (ROI)

triangularis; (6) R SMA

Familywise error (FWE)

performance confound

↑ L posterior MTG

Functional

6

\_\_\_\_

Behavioral data notes Type of analysis ROI type How many ROIs are there?

What are the ROI(s)?

How are the ROI(s) defined? Correction for multiple comparisons Statistical details Findings Findings notes

### ROI analysis 4

First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T1 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level	Unknown, not reported

contrast?	
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	6
What are the ROI(s)?	(1) L IFG pars orbitalis; (2) L IFG pars triangularis; (3) L MTG; (4) R insula; (5) R IFG pars triangularis; (6) R SMA
How are the ROI(s) defined?	Peak voxels of overall activation map based on all three time points in patients
Correction for multiple comparisons	No correction
Statistical details	Circular because ROIs defined in one group
Findings	↓ L posterior MTG ↓ R IFG pars triangularis
Findings notes	R IFG difference described in text but not table
ROI analysis 5	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T2 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	6
What are the ROI(s)?	(1) L IFG pars orbitalis; (2) L IFG pars triangularis; (3) L MTG; (4) R insula; (5) R IFG pars triangularis; (6) R SMA
How are the ROI(s) defined?	Peak voxels of overall activation map based on all three time points in patients
Correction for multiple comparisons	No correction
Statistical details	Circular because ROIs defined in one group
Findings	None
Findings notes	-
ROI analysis 6	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T3 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear similar
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Accuracy combines language and control conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	6
What are the $DOI(c)$ ?	(1) LIFC pare exhitable (2) LIFC pare triangularies (2) LMTC: (4) Discular (5) DIFC pare

How are the ROI(s) defined?

What are the ROI(s)?

triangularis; (6) R SMA

(1) L IFG pars orbitalis; (2) L IFG pars triangularis; (3) L MTG; (4) R insula; (5) R IFG pars

Peak voxels of overall activation map based on all three time points in patients

Correction for multiple comparisons	No correction
Statistical details	Circular because ROIs defined in one group
Findings	None
Findings notes	-
Notes	
Excluded analyses	Additional analyses using absolute improvements in LRS instead of proportional improvements

# Meinzer et al. (2008)

### Reference

Authors	Meinzer M, Flaisch T, Breitenstein C, Wienbruch C, Elbert T, Rockstroh B
Title	Functional re-recruitment of dysfunctional brain areas predicts language recovery in chronic aphasia
Reference	NeuroImage 2008; 39: 2038-2046
PMID	18096407
DOI	10.1016/j.neuroimage.2007.10.008

## Participants

Language	German
Inclusion criteria	_
Number of individuals with aphasia	<u>11</u>
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (median 51.0 years, range 19-66 years)
Is sex reported for patients and controls, and matched?	Yes (males: 7; females: 4)
Is handedness reported for patients and controls, and matched?	Yes (right: 11; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (median 32 months; range 6-480 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	AAT, study-specific picture naming test with 150 items
Aphasia severity	6 moderate, 4 mild, 1 severe
Aphasia type	7 Broca's, 2 Wernicke's, 1 global, 1 unclassified
First stroke only?	Not stated
Stroke type	Mixed etiologies
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Range 31.0-236.0 cc
Lesion location	L
Participants notes	_

## Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, ~2 weeks later
If longitudinal, was there any intervention between	CIAT, 3 hours/day, 5 days/week, 2 weeks

the time points?	
Is the scanner described?	Yes (Philips Intera 1.5 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Block
Total images acquired	160
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	_

### Conditions

Are the co	nditions	clearly	described	2
7 11 C 11 C CO	nancionis	cicariy	acochoco	•

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming (trained items)	Word (overt)	8	Yes	No
picture naming (untrained items)	Word (overt)	8	Yes	No
rest	None	16	N/A	N/A
Conditions notes	One participant was <	10% on trained an	d untrained items at T1	
Contrasts				
Are the contrasts clearly described?	Yes			

Yes

### Contrast 1: picture naming (trained items) vs rest

Language condition	Picture naming (trained items)
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	-

## Contrast 2: picture naming (untrained items) vs rest

Language condition	Picture naming (untrained items)
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No

Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	
Contrast notes	_
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
ROI analysis 1	
First level contrast	Picture naming (trained items) vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	Δ picture naming (trained items)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Picture naming score (trained items) increased from $51.7 \pm 24.8$ to $78.8 \pm 22.1$ , which was statistically significant (p < 0.0001)
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	4
What are the ROI(s)?	(1) perilesional area of slow wave activity determined with MEG; (2) right hemisphere homotopic to lesion; (3) right hemisphere homotopic to slow wave area; (4) remainder of left hemisphere; for one patient, maximal slow wave activity was in the right hemisphere and it is not clear how this was handled
How are the ROI(s) defined?	The dependent measure was the number of voxels in each ROI exceeding certain thresholds that differed across subjects depending on their strength of activation; <u>it appears that</u> <u>increases and decreases may have been summed, though the description is hard to follow</u>
Correction for multiple comparisons	No correction
Statistical details	2 of the 11 patients were classified as outliers and excluded from analyses, however <u>no plots</u> <u>are provided to justify their status as outliers</u>
Findings	Other
Findings notes	Improved picture naming of trained items was correlated with increased signal in 3 of the 4 ROIs, the exception being the right hemisphere ROI homotopic to the slow wave area; after removing the two outliers, only the correlation in the left hemisphere area of slow wave activity remained significant
ROI analysis 2	
First level contrast	Picture naming (untrained items) vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	Δ picture naming (untrained items)

Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Picture naming score (untrained items) increased from 54.0 $\pm$ 24.3 to 70.5 $\pm$ 26.7, which was statistically significant (p= 0.002)
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	4
What are the ROI(s)?	(1) perilesional area of slow wave activity determined with MEG; (2) right hemisphere homotopic to lesion; (3) right hemisphere homotopic to slow wave area; (4) remainder of left hemisphere; for one patient, maximal slow wave activity was in the right hemisphere and it is not clear how this was handled
How are the ROI(s) defined?	The dependent measure was the number of voxels in each ROI exceeding certain thresholds that differed across subjects depending on their strength of activation; <u>it appears that increases and decreases may have been summed, though the description is hard to follow</u>
Correction for multiple comparisons	No correction
Statistical details	2 of the 11 patients were classified as outliers and excluded from analyses, however <u>no plots</u> <u>are provided to justify their status as outliers</u>
Findings	Other
Findings notes	Improved picture naming of untrained items was correlated with increased signal in all 4 ROIs; after removing the two outliers, none of the correlations remained significant
Notes	
Excluded analyses	Additional analyses correlating functional changes in the "delta ROI" with ROI extent, initial severity, duration of aphasia, overall speech activity, since <u>limited detail is provided and only</u> <u>one ROI is reported</u>

# Raboyeau et al. (2008)

### Reference

Authors	Raboyeau G, De Boissezon X, Marie N, Balduyck S, Puel M, Bézy C, Démonet JF, Cardebat D
Title	Right hemisphere activation in recovery from aphasia: lesion effect or function recruitment?
Reference	Neurology 2008; 70: 2900-298
PMID	18209203
DOI	10.1212/01.wnl.0000287115.85956.87

Language	French
Inclusion criteria	Naming deficit; good comprehension
Number of individuals with aphasia	<u>10</u>
Number of control participants	20
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	No (mean 53.8 ± 14.7 years; controls were younger)
ls sex reported for patients and controls, and matched?	Yes (males: 6; females: 4)
Is handedness reported for patients and controls, and matched?	Yes (right: 10; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 7-102 months)

To what extent is the nature of aphasia characterized?	Severity and type			
Language evaluation	Montreal-Toulouse Apha	sia Battery		
Aphasia severity	Mild (but had initially been severe)			
Aphasia type	4 anomic, 3 conduction, 2 Broca's, 1 AoS			
First stroke only?	Yes			
Stroke type	Not stated			
To what extent is the lesion distribution characterized?	Individual lesions			
Lesion extent	Range 29.9-195.2 cc			
Lesion location	L MCA			
Participants notes	_			
Imaging				
Modality	PET (rCBF)			
Is the study cross-sectional or longitudinal?	Longitudinal—chronic tre	atment		
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, ~4 weeks later			
If longitudinal, was there any intervention between the time points?			eek, 4 weeks; the control ; ed in school but since mos	
Is the scanner described?	Yes (Siemens ECAT HR+)			
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes			
Design type	PET			
Total images acquired	6			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	Yes			
Is intersubject normalization adequately described and appropriate?	<u>No</u> (lesion impact not add	dressed)		
Imaging notes	_			
Conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming (native language)	Word (overt)	aphasia: 4; control: 2	Yes	<u>Unknown</u>
picture naming (relearned foreign language) (controls only)	Word (overt)	2	Yes	<u>Unknown</u>
rest	None	2	N/A	<u>N/A</u>
Conditions notes	Picture naming in native	anguage in cont	rols not analyzed in this pa	aper
Contrasts				
Are the contrasts clearly described?	No (see specific limitation	n(s) below)		
Contrast 1: picture naming (native in patients;	relearned foreign in con	trols) vs rest		
Language condition	Picture naming (native in	patients; relearr	ned foreign in controls)	
Control condition	Rest		<u> </u>	
Are the conditions matched for visual demands?	No			
Are the conditions matched for auditory demands?	No			
Are the conditions matched for motor demands?	No			

Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	Presumably only the relearned foreign condition was used in controls (not the native condition), but <u>this is not stated explicitly</u>
Analyses	
Are the analyses clearly described?	No (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Picture naming (native in patients; relearned foreign in controls) vs rest
Analysis class	Longitudinal aphasia vs control
Group(s)	(Aphasia T2 vs T1) vs (control T2 vs T1)
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, but attempt made</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Relearned foreign language was an attempt to equate to recovery in patients; still, patients improved less than controls, as shown by a significant interaction of group by time (p < .0001)
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM2
Voxelwise p	.01
Cluster extent	30 voxels (size not stated)
Statistical details	Nature of control contrast not clear; negative tail of contrast was masked to exclude lesioned areas, but the mask may have been more extensive than that
Findings	↑ L orbitofrontal
Findings notes	-
Voxelwise analysis 2	
First level contrast	Picture naming (native in patients; relearned foreign in controls) vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	Δ picture naming accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Voxelwise

Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM2
Voxelwise p	.01
Cluster extent	30 voxels (size not stated)
Statistical details	Nature of control contrast not clear
Findings	<ul> <li>↑ R insula</li> <li>↑ R SMA/medial prefrontal</li> <li>↑ R orbitofrontal</li> <li>↑ R anterior cingulate</li> <li>↓ L intraparietal sulcus</li> <li>↓ L precuneus</li> <li>↓ L posterior cingulate</li> <li>↓ R dorsal precentral</li> <li>↓ R precuneus</li> </ul>
Findings notes	-
Notes	

Excluded analyses

Conjunction analysis, because it collapsed across patients and controls

# Richter et al. (2008)

### Reference

Authors	Richter M, Miltner WH, Straube T
Title	Association between therapy outcome and right-hemispheric activation in chronic aphasia
Reference	Brain 2008; 131: 1391-1401
PMID	18349055
DOI	10.1093/brain/awn043

Language	German
Inclusion criteria	Main deficits in production rather than comprehension
Number of individuals with aphasia	16 (plus 8 excluded: 5 completed only one of the two sessions; 3 unable to perform the tasks)
Number of control participants	8
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 58.3 years; range 42-73 years)
Is sex reported for patients and controls, and matched?	Yes (males: 12; females: 4)
Is handedness reported for patients and controls, and matched?	Yes (right: 16; left: 0)
Is time post stroke onset reported and appropriate to the study design?	<u>No</u> (> 12 months; actual TPO not stated)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	AAT, two subtests of ANELT
Aphasia severity	TT range 5-50
Aphasia type	7 anomic, 7 Broca's, 2 global; it was an inclusion criterion that the main deficits were in production
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Individual lesions

Lesion extent	Not stated
Lesion location	L
Participants notes	-
Imaging	
Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, ~2 weeks later
If longitudinal, was there any intervention between the time points?	CIAT, 3 hours/day, 10 days
Is the scanner described?	Yes (Siemens Vision plus 1.5 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	No (minor discrepancies in description of timing)
Design type	Block

134

Yes

Yes

Yes

Yes (whole brain)

## Conditions

appropriate?

and appropriate? Imaging notes

Total images acquired

Are the conditions clearly described?

adequately described and appropriate?

Are the imaging acquisition parameters, including

coverage, adequately described and appropriate? Is preprocessing and intrasubject coregistration

Is first level model fitting adequately described and

Is intersubject normalization adequately described

reading words silently Wor	rd (covert) 4	4	Yes	Unknown
word stem completion Wor	rd (covert) 4	4	Yes	Unknown
rest Non	ne 1	10 (?)	N/A	N/A

No (lesion impact not addressed)

Conditions notes

Preliminary data on the tasks suggests that patients would have been able to perform them, and patients were interviewed regarding the tasks after each fMRI session, however the outcomes of these interviews are not reported

#### Contrasts

Are the contrasts clearly described?	Yes
Contrast 1: reading words silently vs rest	
Language condition	Reading words silently
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Somewhat

Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Unknown</u>
Are activations lateralized in the control data?	Unknown
Control activation notes	Appears to be somewhat L-lateralized frontal, but not well visualized
Contrast notes	_
Contrast 2: word stem completion vs rest	
Language condition	Word stem completion
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Unknown</u>
Are activations lateralized in the control data?	No
Control activation notes	Bilateral frontal; other regions not well visualized
Contrast notes	_
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Reading words silently vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T1 vs control
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	R hemisphere
Correction for multiple comparisons	Mixed** (major limitation)
Software	BrainVoyager QX 1.7
	DIFC Provide DOM 0055 showshows 001

280

Word stem completion vs rest

R IFG/R insula ROI: .005; elsewhere: .001

\_

\_

↑ R IFG ↑ R insula

R IFG/R insula ROI: 0.108 cc; elsewhere: none

Voxelwise p

Findings

Cluster extent

Findings notes

Voxelwise analysis 2 First level contrast

Statistical details

Cross-sectional aphasia vs control
Aphasia T1 vs control
— Vac
Yes
<u>Unknown, not reported</u>
Unknown, not reported
_
Voxelwise
R hemisphere
Mixed** (major limitation)
BrainVoyager QX 1.7
R IFG/R insula ROI: .005; elsewhere: .001
R IFG/R insula ROI: 0.108 cc; elsewhere: none
_
↑ R dorsal precentral
Reading words silently vs rest
Cross-sectional correlation with language or other measure
Aphasia T1
Subsequent Δ (T2 vs T1) overall language measure (composite measure of AAT spontaneous speech, token test, ANELT auditory comprehensibility, ANELT semantic comprehensibility)
Somewhat (T1 behavioral measure should be included in model)
<u>Unknown, not reported</u>
Unknown, not reported
_
Voxelwise
R hemisphere
No correction
BrainVoyager QX 1.7
.05
None
Notice of thresholding not entirely clear, so coded according to best guess
<ul> <li>↑ R IFG</li> <li>↑ R insula</li> <li>↑ R ventral precentral/inferior frontal junction</li> <li>↑ R posterior MTG</li> </ul>
Increased activity correlated with more behavioral improvement
Word stem completion vs rest
Cross-sectional correlation with language or other measure
Aphasia T1
Subsequent $\Delta$ (T2 vs T1) overall language measure (composite measure of AAT spontaneous speech, token test, ANELT auditory comprehensibility, ANELT semantic comprehensibility)
<u>Somewhat</u> (T1 behavioral measure should be included in model)
Unknown, not reported

Is reaction time matched across the second level	<u>Unknown, not reported</u>
contrast? Behavioral data notes	
Type of analysis	— Voxelwise
Search volume	R hemisphere
Correction for multiple comparisons	No correction
Software	BrainVoyager QX 1.7
Voxelwise p Cluster extent	.05 None
Statistical details	
	Nature of thresholding not entirely clear, so coded according to best guess ↑ R IFG
Findings	↑ R insula
Findings notes	Increased activity correlated with more behavioral improvement
Voxelwise analysis 5	
First level contrast	Reading words silently vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
ls accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	R hemisphere
Correction for multiple comparisons	Mixed** (major limitation)
Software	BrainVoyager QX 1.7
Voxelwise p	R IFG/R insula ROI: .005; elsewhere: .001
Cluster extent	R IFG/R insula ROI: 0.108 cc; elsewhere: none
Statistical details	_
Findings	None
Findings notes	_
Voxelwise analysis 6	
First level contrast	Word stem completion vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	R hemisphere
Correction for multiple comparisons	Mixed** (major limitation)
Software	BrainVoyager QX 1.7
Voxelwise p	R IFG/R insula ROI: .005; elsewhere: .001
Cluster extent	R IFG/R insula ROI: 0.108 cc; elsewhere: none
Statistical details	_

Findings	None
Findings notes	
ROI analysis 1	
First level contrast	Reading words silently vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Subsequent $\Delta$ (T2 vs T1) overall language measure (composite measure of AAT spontaneous speech, token test, ANELT auditory comprehensibility, ANELT semantic comprehensibility)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (T1 behavioral measure should be included in model)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	L IFG/insula or L perilesional
How are the ROI(s) defined?	Peak activations in individual patients in L IFG/insula or L perilesional regions ( <u>somewhat</u> unclear)
Correction for multiple comparisons	One only
Statistical details	_
Findings	None
Findings notes	_
ROI analysis 2	
First level contrast	Word stem completion vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Subsequent $\Delta$ (T2 vs T1) overall language measure (composite measure of AAT spontaneous speech, token test, ANELT auditory comprehensibility, ANELT semantic comprehensibility)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (T1 behavioral measure should be included in model)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	L IFG/insula or L perilesional
How are the ROI(s) defined?	Peak activations in individual patients in L IFG/insula or L perilesional regions ( <u>somewhat</u> <u>unclear</u> )
Correction for multiple comparisons	One only
Statistical details	-
Findings	None
Findings notes	-
ROI analysis 3	
First level contrast	Reading words silently vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1

Indexpreviously defined left hemisphere ROICorrection for multiple comparisonsNo correctionStatiscial detailsCircular because functional ROIs based on related contrast on same dataFindingsI R posterior MTGFindings notesDecreased activity over time correlated with more behavioral improvementROI analysis AVord stem completion vs restAnalysis classLongitudinal correlation with language or other measureGroup(s)Aphasia T2 vs T1CovariateVersental Inguage measure (composite measure of AAT spontaneous speech, token test ANELT auditory comprehensibility, ANELT semantic comprehensibility)Is the second level contrast valid in terms of the group(s), time point(s), and measures involve?YesIs reaction time matched across the second levelUnknown, not reported contrast?RotardsRegions of interest (ROI)Behavioral data notes—Type of analysisRegions of interest (ROI)ROI typeFunctionalHow many ROIs are there?3What are the ROI(s?)(1,2) two clusters within R IFG/insula ROI; (3) L IFG/insula or L perilesional	Covariate	Δ overall language measure (composite measure of AAT spontaneous speech, token test, ANELT auditory comprehensibility, ANELT semantic comprehensibility)
is accuracy matched across the second level contrast?       Unknown, not reported         is reaction time matched across the second level contrast?       Unknown, not reported         Behavioral data notes       —         Type of analysis       Regions of interest (ROI)         ROI type       Functional         How may ROIs are there?       4         What are the ROI(s)?       (1) R IFG/insula; (2) R precentral; (3) R MTG; (4) L IFG/insula or L perilesional         How are the ROI(s) defined?       Regions where T1 activation was correlated with subsequent improvement, along with 1 previously defined left hemisphere ROI         Correction for multiple comparisons       Noc correction         Statistical details       Circular because functional ROIs based on related contrast on same data         Findings notes       Decorrection MTG         First level contrast       Vord stem completion vs rest         Analysis class       Longitudinal correlation with language or other measure of AAT spontaneous speech, token tes ANELT auditory comprehensibility, ANELT semantic comprehensibility)         Is the second level contrast valid in terms of the group(s).       Yes         Statistical detains       —         Structurary matched across the second level contrast?       Unknown, not reported         Second level contrast valid in terms of the group(s).       Yes         Is accurary matched across the seco		Yes
contrast?         —           Behavioral data notes         —           Behavioral data notes         —           Type of analysis         Regions of interest (ROI)           Rolt type         Functional           How many ROIs are there?         4           What are the ROI(s)?         (1) R IFG/insula (2) R precentral; (3) R MTG; (4) L IFG/insula or L perilesional           How are the ROI(s) defined?         Regions where T1 activation was correlated with subsequent improvement, along with 1 previously defined left hemisphere ROI           Correction for multiple comparisons         No correction           Statistical details         Circular because functional ROIs based on related contrast on same data           Findings         J R posterior MTG           Findings notes         Decreased activity over time correlated with more behavioral improvement.           ROI analysis 4         First level contrast           Vord stem completion vs rest         Analysis class           Group(s)         Aphasia T2 vs T1           Covariate         A overall language measure (composite measure of AAT spontaneous speech, token test ANELT auditory comprehensibility, ANELT semantic comprehensibility)           Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?         Juknown, not reported           Saccuracy matched across the second level         Unknown, no	Is accuracy matched across the second level	Unknown, not reported
Type of analysis         Regions of interest (ROI)           ROI type         Functional           How many ROIs are there?         4           What are the ROI(s)?         (1) R IFG/insula; (2) R precentral; (3) R MTG; (4) L IFG/insula or L perilesional           How are the ROI(s) defined?         Regions where T1 activation was correlated with subsequent improvement, along with t previously defined left hemisphere ROI           Correction for multiple comparisons         No correction           Statistical details         Circular because functional ROIs based on related contrast on same data           Findings         1 R posterior MTG           Findings notes         Decreased activity over time correlated with more behavioral improvement           KOI analysis 4         Word stem completion vs rest           First level contrast         Word stem completion vs rest           Analysis class         Longitudinal correlation with language or other measure           Group(s)         Aphasia T2 vs T1           Covariate         Overall inguage measure (composite measure of AAT spontaneous speech, token test antellity, time point(s), and measures involved?           Is reaction time matched across the second level         Unknown, not reported           contrast?         Unknown, not reported           Is reaction time matched across the second level         Unknown, not reported           Is reaction tim		<u>Unknown, not reported</u>
RO DisplayFunctionalHow mary ROIs are there?4What are the ROI(s)?(1) R IFG/insula; (2) R precentral; (3) R MTG; (4) L IFG/insula or L perlesionalHow are the ROI(s) defined?Regions where T1 activation was correlated with subsequent improvement, along with t previously defined left hemisphere ROICorrection for multiple comparisonsNo correctionStatistical detailsCircular because functional ROIs based on related contrast on same data (1) R posterior MTGFindings1 R posterior MTGFindings notesDecreased activity over time correlated with more behavioral improvementKO analysis 4First level contrastWord stem completion vs restAnalysis classLongitudinal correlation with language or other measureGroup(s)Aphasia T2 vs T1CovariateOverall language measure (composite measure of AAT spontaneous speech, token test ANELT auditory comprehensibility, ANELT semantic comprehensibility)Is second level contrast valid in terms of the group(s), time point(s), and measures involved?Unknown, not reportedIs accuracy matched across the second level contrast?Unknown, not reportedBehavioral data notes—Type of analysisRegions of interest (ROI)ROI typeIncursonalROI type3What are the ROI(s) defined?(1, 2) two clusters within R IFG/insula ROI; (3) L IFG/insula or L perilesionalHow are the ROI(s) defined?Regions where T1 activation was correlated with subsequent improvement, along with t previously defined left hemisphere ROICorrection for multiple comparis	Behavioral data notes	_
How many ROIs are there?       4         What are the ROI(s)?       (1) R IFG/insula; (2) R precentral; (3) R MTG; (4) L IFG/insula or L perilesional         How are the ROI(s) defined?       Regions where T1 activation was correlated with subsequent improvement, along with t previously defined left hemisphere ROI         Correction for multiple comparisons       No correction         Statistical details       Circular because functional ROIs based on related contrast on same data         Findings       1 R posterior MTG         Findings notes       Decreased activity over time correlated with more behavioral improvement <b>KOI analysis 4</b> First level contrast       Word stem completion vs rest         Analysis class       Longitudinal correlation with language or other measure         Group(s)       Aphasia 12 vs T1         Covariate       A overall language measure (composite measure of AAT spontaneous speech, token tes ANELT auditory comprehensibility, ANELT semantic comprehensibility)         Is accuracy matched across the second level       Unknown, not reported         contrast?       Engions of interest (ROI)         Behavioral data notes       —         Type of analysis       Regions of interest (ROI)         ROI type       Functional         How are the ROI(s)?       (1, 2) two clusters within R IFG/insula ROI; (3) L IFG/insula or L perilesional	Type of analysis	Regions of interest (ROI)
What are the ROI(s)?(1) R IFG/insula; (2) R precentral; (3) R MTG; (4) L IFG/insula or L perilesionalHow are the ROI(s) defined?Regions where T1 activation was correlated with subsequent improvement, along with t previously defined left hemisphere ROICorrection for multiple comparisonsNo correctionStatistical detailsCircular because functional ROIs based on related contrast on same dataFindingsL R posterior MTGEndings notesDecreased activity over time correlated with more behavioral improvementCOI analysis 4First level contrastWord stem completion vs restAnalysis classLongitudinal correlation with language or other measure Group(s)CovariateA overall language measure (composite measure of AAT spontaneous speech, token tes ANELT auditory comprehensibility, ANELT semantic comprehensibility)Is accuracy matched across the second level contrast?Unknown, not reportedStray of analysisRegions of interest (ROI)Rol speeceSContrast?PunchnownBehavioral data notesFunctionalRol speece3What are the ROI(s)?(1, 2) two clusters within RIFG/insula ROI; (3) L IFG/insula or L perilesionalHow are the ROI(s) defined?Regions where T1 at vivation was correlated with subsequent improvement, along with to previously defined left hemisphere ROICovariateUnknown, not reportedStacturacy matched across the second levelUnknown, not reportedContrast?PunctionalRol speeceRegions of interest (ROI)Rol speece1, 2) two clusters withi	ROI type	Functional
How are the ROI(s) defined?Regions where T1 activation was correlated with subsequent improvement, along with t previously defined left hemisphere ROICorrection for multiple comparisonsNo correctionStatistical detailsCircular because functional ROIs based on related contrast on same data I R posterior MTGFindingsI R posterior MTGFindings notesDecreased activity over time correlated with more behavioral improvementCol analysis 4First level contrastWord stem completion vs rest Longitudinal correlation with language or other measure Analysis classGroup(s)Aphasia T2 vs T1CovariateA overall language measure (composite measure of AAT spontaneous speech, token tes ANELT auditory comprehensibility, ANELT semantic comprehensibility)Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedType of analysisRegions of interest (ROI) ROI typeROI typeFunctionalHow many ROIs are there?3What are the ROI(s)?(1, 2) two clusters within R IFG/insula ROI; (3) L IFG/insula or L perlesional How are the ROI(s) defined? previously defined Ieft hemisphere ROI CorrectionCorrection from ultiple comparisonsNo correction	How many ROIs are there?	4
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contrast?Is reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes—Type of analysisRegions of interest (ROI)ROI typeFunctionalHow many ROIs are there?3What are the ROI(s)?(1, 2) two clusters within R IFG/insula ROI; (3) L IFG/insula or L perilesionalHow are the ROI(s) defined?Regions where T1 activation was correlated with subsequent improvement, along with the previously defined left hemisphere ROICorrection for multiple comparisonsNo correction		Yes
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How are the ROI(s) defined?       Regions where T1 activation was correlated with subsequent improvement, along with to previously defined left hemisphere ROI         Correction for multiple comparisons       No correction	How many ROIs are there?	3
previously defined left hemisphere ROI           Correction for multiple comparisons         No correction	What are the ROI(s)?	(1, 2) two clusters within R IFG/insula ROI; (3) L IFG/insula or L perilesional
Correction for multiple comparisons No correction	How are the ROI(s) defined?	Regions where T1 activation was correlated with subsequent improvement, along with the previously defined left hemisphere ROI
	Correction for multiple comparisons	
Findings ↓ R IFG ↓ R insula	Findings	↓ R IFG
Findings notes Decreased activity over time correlated with more behavioral improvement	Findings notes	
lotes	-	

Excluded analyses

# de Boissezon et al. (2009)

### Reference

Authors

de Boissezon X, Marie N, Castel-Lacanal E, Marque P, Bezy C, Gros H, Lotterie JA, Cardebat D, Puel M, Demonet JF

Title	Good recovery from aphasia is also supported by right basal ganglia: a longitudinal controlled PET study
Reference	<i>Eur J Phys Rehabil Med</i> 2009; 45: 547-558
PMID	20032914
DOI	N/A

## Participants

Language	French
Inclusion criteria	Only part of L MCA; able to perform word generation; no severe aphasia
Number of individuals with aphasia	<u>13</u>
Number of control participants	0
Were any of the participants included in any previous studies?	Yes (7 out of 13 patients appear to represent the same data reported in de Boissezon et al. (2005))
Is age reported for patients and controls, and matched?	Yes (range 31.2-74.2 years)
ls sex reported for patients and controls, and matched?	Yes (males: 12; females: 1)
Is handedness reported for patients and controls, and matched?	Yes (right: 13; left: 0)
Is time post stroke onset reported and appropriate to the study design?	<u>No* (moderate limitation)</u> (T1: mean 64 ± 32 days; T2: mean 11.8 ± 1.4 months; T1 varies considerably from early to late subacute)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	Montreal-Toulouse Aphasia Battery
Aphasia severity	Not stated
Aphasia type	T1: 3 transcortical motor, 2 anomic, 2 Broca's, 2 transcortical sensory, 2 Wernicke's, 1 conduction, 1 agrammatic; T2: not stated
First stroke only?	Yes
Stroke type	Mixed etiologies
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Range 0.9-43.4 cc
Lesion location	L MCA (7 subcortical, 6 cortical)
Participants notes	_

## Imaging

Modality	PET (rCBF)
Is the study cross-sectional or longitudinal?	Longitudinal—recovery
If longitudinal, at what time point(s) were imaging data acquired?	T1: mean 64 $\pm$ 32 days; T2: mean 11.8 $\pm$ 1.4 months; T1 varies considerably from early to late subacute
If longitudinal, was there any intervention between the time points?	Community SLT; 45 minutes/day, 1-3 days/week
Is the scanner described?	Yes (CTI-Siemens ECAT EXACT HR+)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	PET
Total images acquired	6
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	<u>No</u> (lesion impact not addressed)
Imaging notes	-

### Conditions

Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
word generation	Word (overt)	4	Yes	Yes
rest	None	2	N/A	N/A
		-		
Conditions notes	_			
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: word generation vs rest				
Language condition	Word generation			
Control condition	Rest			
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	No			
Are the conditions matched for motor demands?	No			
Are the conditions matched for cognitive/executive	No			
demands?				
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparab</u>	le		
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparab</u>	le		
Behavioral data notes	_			
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>			
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Somewhat</u>			
Are activations lateralized in the control data?	No			
Control activation notes		et al. (2003); bila	ateral fronto-temporal an	d some other regions per
Contrast notes	_			
Analyses				
Are the analyses clearly described?	No* (moderate limitation	<u>ı)</u> (see specific lir	mitation(s) below)	
/oxelwise analysis 1				
First level contrast	Word generation vs rest			
Analysis class	Longitudinal change in a	phasia		
Group(s)	Aphasia with "good reco		s T1	
Covariate	_			
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?			nowed more improvemen ut the distinction was not	t than the "poor recovery" borne out in behavioral
Is accuracy matched across the second level contrast?	Yes, matched			
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>			
	P = 0.07			
Behavioral data notes	1 = 0.07			
	Voxelwise			
Type of analysis				
Type of analysis Search volume	Voxelwise Whole brain	<u>ased on </u> arbitrary	y cluster extent	
Behavioral data notes Type of analysis Search volume Correction for multiple comparisons Software	Voxelwise	ased on arbitrary	<u>y cluster extent</u>	

Cluster extent	100 voxels (size not stated)
Statistical details	Contrast may not have included resting condition; inappropriate masking
Findings	<ul> <li>L ventral precentral/inferior frontal junction</li> <li>L SMA/medial prefrontal</li> <li>L posterior STG/STS/MTG</li> <li>R dorsolateral prefrontal cortex</li> <li>R SMA/medial prefrontal</li> <li>R angular gyrus</li> <li>R occipital</li> <li>R thalamus</li> <li>R basal ganglia</li> <li>L cerebellum</li> </ul>
Findings notes	Based on coordinates in Table 5
/oxelwise analysis 2	
First level contrast	Word generation vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with "poor recovery" (n = 7) T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the	Somewhat (the "poor recovery" group showed less improvement than the "good recovery"
group(s), time point(s), and measures involved?	group in terms of accuracy on the task, but the distinction was not borne out in behavioral data more generally)
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM2
Voxelwise p	.001
Cluster extent	100 voxels (size not stated)
Statistical details	Contrast may not have included resting condition; inappropriate masking
Findings	↑ L ventral precentral/inferior frontal junction ↑ R somato-motor ↑ R cerebellum ↓ R basal ganglia
Findings notes	-
/oxelwise analysis 3	
First level contrast	Word generation vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Word generation accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Consels and see	VOXEIWISE
Search volume	Whole brain
Search volume Correction for multiple comparisons	
	Whole brain

Cluster extent	100 voxels (size not stated)
Statistical details	Each patient's two sessions may be entered into the model without accounting for the dependence between them
Findings	<ul> <li>↑ L supramarginal gyrus</li> <li>↑ L occipital</li> <li>↑ L anterior cingulate</li> <li>↑ R insula</li> <li>↑ R SMA/medial prefrontal</li> <li>↑ R posterior STG</li> <li>↑ R anterior temporal</li> <li>↑ R occipital</li> <li>↓ L cerebellum</li> </ul>
Findings notes	-
Notes	

#### Notes

Excluded analyses

# Fridriksson et al. (2009)

### Reference

Authors	Fridriksson J, Baker JM, Moser D
Title	Cortical mapping of naming errors in aphasia
Reference	<i>Hum Brain Mapp</i> 2009; 30: 2487-2498
PMID	19294641
DOI	10.1002/hbm.20683

Language	US English
Inclusion criteria	-
Number of individuals with aphasia	<u>11</u>
Number of control participants	10
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 58.8 ± 14.7 years, range 33-78 years)
Is sex reported for patients and controls, and matched?	Yes (males: 6; females: 5)
Is handedness reported for patients and controls, and matched?	No
Is time post stroke onset reported and appropriate to the study design?	Yes (range 10-101 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	WAB; BNT
Aphasia severity	AQ range 31.8-91.5
Aphasia type	6 anomic, 4 Broca's, 1 transcortical motor; alternatively: 6 fluent, 5 non-fluent
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Range 3.0-342.2 cc
Lesion location	L MCA
Participants notes	-

### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	No (not stated)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	No (timing of picture presentation not clearly explained)
Design type	Event-related
Total images acquired	120
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	sparse sampling
Conditions	
Are the conditions clearly described?	Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming	Word (overt)	80	Yes	No
viewing scrambled images	None	40	<u>N/A</u>	<u>N/A</u>
Conditions notes	_			

#### Contrasts

Are the contrasts clearly described?

### Contrast 1: picture naming (correct trials) vs viewing scrambled images

Yes

Language condition	Picture naming (correct trials)
Control condition	Viewing scrambled images
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	Somewhat
Control activation notes	Control data in Fridriksson et al. (2007); motor activations are prominent; there is some L frontal activation but little temporal activation in either hemisphere
Contrast notes	-

### Contrast 2: picture naming (phonemic paraphasias) vs picture naming (correct trials)

Picture naming (phonemic paraphasias)
Picture naming (correct trials)
Yes
Yes
Yes
Yes
No, by design
<u>Unknown, not reported</u>
_
N/A
N/A
N/A
Control data N/A because controls do not typically make errors
control data N/A because controls do not typically make errors

### Contrast 3: picture naming (semantic paraphasias) vs picture naming (correct trials)

Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	<u>Clusterwise correction with with GRFT and lenient voxelwise p</u>
Software	FSL (FEAT 5.4)
Voxelwise p	~.01 (z > 2.3)
Cluster extent	Based on GRFT
Statistical details	_
Findings	None
Findings notes	_

### Voxelwise analysis 2

First level contrast	Picture naming (phonemic paraphasias) vs picture naming (correct trials)
Analysis class	Cross-sectional performance-defined conditions
Group(s)	Aphasia
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	No, by design
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	<u>Clusterwise correction with with GRFT and lenient voxelwise p</u>
Software	FSL (FEAT 5.4)
Voxelwise p	~.01 (z > 2.3)
Cluster extent	Based on GRFT
Statistical details	-
Findings	↑ L superior parietal ↑ L posterior inferior temporal gyrus/fusiform gyrus ↑ L occipital
Findings notes	-
Voxelwise analysis 3	
First level contrast	Picture naming (semantic paraphasias) vs picture naming (correct trials)
Analysis class	Cross-sectional performance-defined conditions
Group(s)	Aphasia
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	No, by design
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-

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- Search volume
- Correction for multiple comparisons
- Software
- Voxelwise p
- Cluster extent
- Statistical details
- Findings

↑ R posterior inferior temporal gyrus/fusiform gyrus

Clusterwise correction with with GRFT and lenient voxelwise p

Voxelwise

FSL (FEAT 5.4)

~.01 (z > 2.3) Based on GRFT

\_\_\_

Voxels spared in all patients

	↑ R occipital
Findings notes	—
ROI analysis 1	
First level contrast	Picture naming (correct trials) vs viewing scrambled images
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Picture naming accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	5
What are the ROI(s)?	(1) R IFG/insula; (2) R motor/premotor; (3) R SMA; (4) R inferior parietal; (5) R superior temporal
How are the ROI(s) defined?	Regions activated for picture naming vs viewing scrambled images in aphasia
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↑ R IFG ↑ R insula
Findings notes	R IFG showed more activation in patients who produced more correct responses
Notes	

Excluded analyses

### Menke et al. (2009)

### Reference

Authors	Menke R, Meinzer M, Kugel H, Deppe M, Baumgärtner A, Schiffbauer H, Thomas M, Kramer K, Lohmann H, Flöel A, Knecht S, Breitenstein C
Title	Imaging short- and long-term training success in chronic aphasia
Reference	<i>BMC Neurosci</i> 2009; 10: 118
PMID	19772660
DOI	10.1186/1471-2202-10-118

### Participants

Language	German
Inclusion criteria	Moderate to severe anomia
Number of individuals with aphasia	<u>8</u>
Number of control participants	9
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (range 34-67 years)
Is sex reported for patients and controls, and matched?	Yes (males: 5; females: 3)
Is handedness reported for patients and controls, and matched?	Yes (right: 8; left: 0)
Is time post stroke onset reported and appropriate	Yes (range 1.8-6.9 years)

to the study design?	
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	AAT
Aphasia severity	6 moderate-severe, 2 severe
Aphasia type	7 Broca's, 1 global
First stroke only?	Yes
Stroke type	Mixed etiologies
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Not stated
Lesion location	L
Participants notes	_
maging	

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, ~2 weeks later; T3: 8 months after the end of treatment
If longitudinal, was there any intervention between the time points?	Intensive anomia training; 3 hours/day; 2 weeks
Is the scanner described?	Yes (Philips Intera 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	No (total images acquired not stated)
Design type	Event-related
Total images acquired	probably ~360, but not stated
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-

### Conditions

Are the	conditions	clearly	/ described?	
ALC UIC	CONTIGUIUS	Clean	y describeu:	

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming (trained items)	Word (overt)	30	No	No
picture naming (untrained items)	Word (overt)	30	No	No
picture naming (already known items)	Word (overt)	30	Yes	<u>Unknown</u>
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>

#### Conditions notes

Patients could not name trained and untrained items at baseline

### Contrasts

Are the contrasts clearly described?

### Yes

Yes

### Contrast 1: picture naming (trained items) vs rest

Language condition	Picture naming (trained items)
Control condition	Rest
Are the conditions matched for visual demands?	No

Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Behavioral data notes Are control data reported in this paper or another that is referenced?	Somewhat
Are control data reported in this paper or another	
Are control data reported in this paper or another that is referenced? Does the contrast selectively activate plausible	
Are control data reported in this paper or another that is referenced? Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Unknown</u>

### Contrast 2: picture naming (untrained items) vs rest

Language condition	Picture naming (untrained items)
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	Table of coordinates only
Contrast notes	-
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Picture naming (trained items) vs rest
Analysis class	Longitudinal correlation with language or other measure
(roup(c)	Aphacia T2 vs T1

Group(s)	Aphasia T2 vs T1
Covariate	Subsequent outcome (T2) picture naming of trained items outside the scanner
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	No (the logic behind correlating activation changes and language outcome is unclear)
Is accuracy matched across the second level contrast?	<u>Unknown, no test</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain

Mixed\*\* (major limitation)

Software	SPM2
Voxelwise p	.05, but at least one voxel in the cluster had to be $p < .001$
Cluster extent	0.270 сс
Statistical details	There was an exclusive mask based on activation changes for untrained pictures, but <u>it is</u> unclear what the behavioral covariate was for the mask generation, nor were the regions in the mask reported
Findings	<ul> <li>↑ L occipital</li> <li>↑ L hippocampus/MTL</li> <li>↑ R precuneus</li> <li>↑ R occipital</li> <li>↑ R posterior cingulate</li> <li>↑ R hippocampus/MTL</li> </ul>
Findings notes	-

### Voxelwise analysis 2

First level contrast	Picture naming (untrained items) vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T3 vs T1
Covariate	Subsequent outcome (T3) picture naming of trained items outside the scanner
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	No (the logic behind correlating activation changes and language outcome is unclear)
Is accuracy matched across the second level contrast?	<u>Unknown, no test</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	<u>Mixed** (major limitation)</u>
Software	SPM2
Voxelwise p	.05, but at least one voxel in the cluster had to be p < .001
Cluster extent	0.270 сс
Statistical details	There was an exclusive mask based on activation changes for untrained pictures, but <u>it is</u> <u>unclear what the behavioral covariate was for the mask generation, nor were the regions in</u> <u>the mask reported</u>
Findings	↑ R posterior STG/STS/MTG ↓ L SMA/medial prefrontal ↓ R inferior parietal lobule ↓ R posterior inferior temporal gyrus/fusiform gyrus ↓ R basal ganglia
Findings notes	_
Notes	

Excluded analyses

### Specht et al. (2009)

#### Reference

Authors	Specht K, Zahn R, Willmes K, Weis S, Holtel C, Krause BJ, Herzog H, Huber W
Title	Joint independent component analysis of structural and functional images reveals complex patterns of functional reorganisation in stroke aphasia
Reference	NeuroImage 2009; 47: 2057-2063
PMID	19524049
DOI	10.1016/j.neuroimage.2009.06.011

### Participants

Language	German
Inclusion criteria	-
Number of individuals with aphasia	<u>12</u>
Number of control participants	12
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	No (mean 49 + 14 years, range 30-71 years; controls were younger)
Is sex reported for patients and controls, and matched?	Yes (males: 9; females: 3)
Is handedness reported for patients and controls, and matched?	No
Is time post stroke onset reported and appropriate to the study design?	No (mean 1.9 $\pm$ 1.4 years, range 0.2-3.7 years; one non-chronic patient is included)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	AAT
Aphasia severity	Not stated
Aphasia type	3 global, 3 Wernicke's, 2 amnestic, 2 Broca's, 2 unclassified
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L MCA, with greatest overlap in the posterior STG
Participants notes	15 controls were scanned but 3 were randomly excluded to match group sizes for jICA.

### Imaging

Modality	PET (rCBF)
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (CTI-Siemens HR+)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	PET
Total images acquired	9
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-
Constitution of	

### Conditions

Are the conditions clearly described?

Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
lexical decision (words vs pseudowords)	Button press	3	Yes	Yes
lexical decision (words vs reversed foreign words)	Button press	3	Yes	Yes

tone decision	Button press	3	Yes	Yes
Conditions notes	Behavioral data was lost, above chance; the tone c used in any contrast of ir	lecision task is no	t described in sufficient	detail, but since it is not
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: lexical decision (words vs pseudow	ords) vs lexical decision	(words vs rever	sed foreign words)	
Language condition	Lexical decision (words v	s pseudowords)		
Control condition	Lexical decision (words v		n words)	
Are the conditions matched for visual demands?	Yes	0	,	
Are the conditions matched for auditory demands?	Yes			
Are the conditions matched for motor demands?	Yes			
Are the conditions matched for cognitive/executive	Yes			
demands?	163			
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>			
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>			
Behavioral data notes	_			
Are control data reported in this paper or another that is referenced?	Yes			
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Somewhat</u>			
Are activations lateralized in the control data?	Yes			
Control activation notes	The contrast activated a	ventral part of the	LIFG, along with Lante	rior cingulate and L DLPFC
Contrast notes	_			
Analyses				
Are the analyses clearly described?	Yes			
Voxelwise analysis 1				
First level contrast	Lexical decision (words v	s pseudowords) v	s lexical decision (words	vs reversed foreign words)
Analysis class	Cross-sectional aphasia	/s control		
Group(s)	Aphasia vs control			
Covariate	_			
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes			
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>			
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>			
Behavioral data notes	_			
Type of analysis	Voxelwise			
Search volume	Whole brain			
Correction for multiple comparisons	Clusterwise correction ba	ased on arbitrary	cluster extent	
Software	SPM5	<u> </u>		
Voxelwise p	.001			
Cluster extent	0.64 cc			
Statistical details				
Findings	 ↑ R posterior STG			
	↑ R Heschl's gyrus			
Findings notes	Activation is 1105 voxels the patient group, this re		-	contrast was examined in

### Complex analysis 1

First level contrast	Lexical decision (words vs pseudowords) vs lexical decision (words vs reversed foreign words)
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Complex
Statistical details	Joint ICA was performed on structural and functional contrast images using FIT 1.1b. Only 1 of the 8 components differed between groups in its loadings and was interpretable. The structural part of this component related to the patients' lesions. The functional part was thresholded at voxelwise $p < .001$ (CDT), arbitrary minimum cluster extent = 0.64 cc.
Findings	Other
Findings notes	The component that differed between groups showed more activation for patients than controls in the L anterior temporal lobe, L cerebellum, R posterior STG, R anterior temporal lobe, R posterior inferior temporal gyrus/fusiform gyrus, R cerebellum, and R brainstem, and less activation in patients than controls in the L IFG, L anterior temporal lobe, L occipital lobe, L anterior cingulate, L cerebellum, L thalamus, and R IFG.
Notes	

Excluded analyses

### Warren et al. (2009)

### Reference

Title Anterior temporal lobe connectivity correlates with functional outcome after aphasic stroke
··· ··· ··· ··· ··· ··· ··· ··· ··· ··
Reference <i>Brain</i> 2009; 132: 3428-3442
PMID 19903736
DOI 10.1093/brain/awp270

### Participants

Language	UK English
Inclusion criteria	Comprehension deficit per CAT and TROG (1 patient did not meet this criterion); anterolateral superior temporal cortex spared
Number of individuals with aphasia	<u>16</u> (plus 8 excluded: lesions involved L anterolateral superior temporal cortex)
Number of control participants	11
Were any of the participants included in any previous studies?	Yes (reanalysis of subset of dataset from Crinion et al. (2006))
Is age reported for patients and controls, and matched?	No (mean 65.8 $\pm$ 2.0 SEM years; controls were younger)
Is sex reported for patients and controls, and matched?	Yes (males: 11; females: 5)
Is handedness reported for patients and controls, and matched?	Yes (right: 16; left: 0)
Is time post stroke onset reported and appropriate to the study design?	<u>No</u> (mean 28.8 ± 9.2 months SEM; minimum time post onset not reported, but some patients in Crinion et al. (2006) were subacute)
To what extent is the nature of aphasia characterized?	Not at all

Language evaluation	CAT, TROG			
Aphasia severity	Not stated			
Aphasia type	Not stated			
First stroke only?	Yes			
Stroke type	Ischemic only			
To what extent is the lesion distribution characterized?	Lesion overlay			
Lesion extent	Patients with positive ar negative anterior tempo		nterconnectivity: mean 93 vity: mean 96.1 + 27.6 cc	.3 ± 24.0 cc; patients with
Lesion location				erlap in posterior superior
Participants notes	—			
Imaging				
Modality	PET (rCBF)			
Is the study cross-sectional or longitudinal?	Cross-sectional			
If longitudinal, at what time point(s) were imaging data acquired?	_			
If longitudinal, was there any intervention between the time points?	-			
Is the scanner described?	Yes (CTI-Siemens ECAT E patients))	EXACT HR++/966 (	10 patients and all contro	ls) or GE Advance (6
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes			
Design type	PET			
Total images acquired	12-16			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	Yes			
Is intersubject normalization adequately described and appropriate?	Yes			
Imaging notes	two different scanners u	ised for patients,	but not for controls	
Conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
listening to narrative speech	None	6-8	N/A	N/A
listening to reversed speech	None	6-8	N/A	N/A
iscening to reversed speech	None	00	14/74	
Conditions notes	_			
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: listening to narrative speech vs list	ening to reversed speed	:h		
Language condition	Listening to narrative sp	eech		
Control condition	Listening to reversed sp			
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	Yes			
Are the conditions matched for motor demands?	Yes			
Are the conditions matched for cognitive/executive	Yes			
demands?				

ls accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, no behavioral measure</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task
Behavioral data notes	_
Are control data reported in this paper or another	Somewhat
that is referenced?	
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Somewhat
Control activation notes	11 participants; L-lateralized posterior temporal, bilateral anterior temporal, no frontal
Contrast notes	_
Analyses	
Are the analyses clearly described?	Yes
ROI analysis 1	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	—
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	6
What are the ROI(s)?	(1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts
How are the ROI(s) defined?	ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)
Correction for multiple comparisons	No correction
Statistical details	<u>Somewhat circular because ROIs were defined only in regions where controls showed</u> significant connectivity (even though ROIs were anatomical)
Findings	None
Findings notes	L IFG pars triangularis almost reached significance (p = .053) for more activation in patients
ROI analysis 2	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Auditory sentence comprehension
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	6

What are the ROI(s)?	(1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts
How are the ROI(s) defined?	ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↑ L anterior temporal
Findings notes	_
POL analycic 2	

First level contrast	Listening to parrative speech vs listening to reversed speech
	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Written sentence comprehension
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	6
What are the ROI(s)?	(1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts
How are the ROI(s) defined?	ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	_
ROI analysis 4	

Nor analysis i	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Auditory single word comprehension
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	6
What are the ROI(s)?	(1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts
How are the ROI(s) defined?	ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	L anterior temporal p = .08

First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Auditory syntactic comprehension
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	6
What are the ROI(s)?	(1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts
How are the ROI(s) defined?	ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	L anterior temporal p = .09

### ROI analysis 6

group(s), time point(s), and measures involved? Is accuracy matched across the second level

First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Connectivity between L and R ATL
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	2
What are the ROI(s)?	(1) L anterior superior temporal cortex; (2) R anterior superior temporal cortex
How are the ROI(s) defined?	ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-
ROI analysis 7	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Time post onset
Is the second level contrast valid in terms of the	Yes

N/A, no behavioral measure

contrast?	
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Region of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	1
What are the ROI(s)?	L anterior superior temporal cortex
How are the ROI(s) defined?	ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)
Correction for multiple comparisons	One only
Statistical details	-
Findings	None
Findings notes	-

First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
ls accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	1
What are the ROI(s)?	L anterior superior temporal cortex
How are the ROI(s) defined?	ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)
Correction for multiple comparisons	One only
Statistical details	_
Findings	None
Findings notes	_

### ROI analysis 9

First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia with positive anterior temporal interconnectivity (n = 8) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	N/A, no behavioral measure
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	6
What are the ROI(s)?	(1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts

How are the ROI(s) defined?	ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)
Correction for multiple comparisons	No correction
Statistical details	<u>Somewhat circular because ROIs were defined only in regions where controls showed</u> <u>significant connectivity (even though ROIs were anatomical);</u> excluded 3 patients with L IFG damage
Findings	↑ L IFG pars triangularis
Findings notes	-
ROI analysis 10	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia with negative anterior temporal interconnectivity (n = 8) vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	6
What are the ROI(s)?	(1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts
How are the ROI(s) defined?	ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6)
Correction for multiple comparisons	No correction
Statistical details	<u>Somewhat circular because ROIs were defined only in regions where controls showed</u> <u>significant connectivity (even though ROIs were anatomical);</u> excluded 1 patient with L IFG damage
Findings	None
Findings notes	-
ROI analysis 11	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia

Aphasia with positive anterior temporal interconnectivity (n = 8) vs with negative anterior Group(s) temporal interconnectivity (n = 8) Covariate Is the second level contrast valid in terms of the Yes group(s), time point(s), and measures involved? Is accuracy matched across the second level N/A, no behavioral measure contrast? Is reaction time matched across the second level N/A, no timeable task contrast? Behavioral data notes Type of analysis Regions of interest (ROI) ROI type Anatomical How many ROIs are there? 6 What are the ROI(s)? (1) L anterior superior temporal cortex; (2) L basal temporal language area; (3) L IFG pars triangularis; (4-6) homotopic counterparts How are the ROI(s) defined? ROIs were defined anatomically in regions that were functionally connected with L anterior superior temporal cortex in controls (1-4) or homotopic to these (5-6) Correction for multiple comparisons No correction

Statistical details	Excluded 4 patients with L IFG damage
Findings	↑ L IFG pars triangularis
Findings notes	_
Complex analysis 1	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Lesion status of each voxel
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Complex
Statistical details	VLSM with <u>FDR correction</u> was used to identify any regions in which damage was predictive of L anterior temporal activation.
Findings	None
Findings notes	-
Notes	
Excluded analyses	(1) all connectivity analyses because they were based on either both conditions (whole brain analysis) or only the narrative condition (ROI analyses), except where connectivity was investigated in relation to task-based activation differences; (2) correlation with age (covariate not language-related)

### Chau et al. (2010)

### Reference

Authors	Chau AC, Fai Cheung RT, Jiang X, Au-Yeung PK, Li LS
Title	An fMRI study showing the effect of acupuncture in chronic stage stroke patients with aphasia
Reference	<i>J Acupunct Meridian Stud</i> 2010; 30: 53-57
PMID	20633517
DOI	10.1016/s2005-2901(10)60009-x

### Participants

Language	Cantonese
Inclusion criteria	_
Number of individuals with aphasia	<u>7</u>
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 63 ± 10 years, range 56-79 years)
Is sex reported for patients and controls, and matched?	Yes (males: 5; females: 2)
Is handedness reported for patients and controls, and matched?	Yes (right: 7; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 17 ± 8 months, range 8-28 months)
To what extent is the nature of aphasia	Severity only

characterized?	
Language evaluation	Cantonese Aphasia Battery (modified WAB)
Aphasia severity	5 patients had AQ > 75, 2 had AQ < 30
Aphasia type	Not stated
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Location only
Lesion extent	Not stated
Lesion location	3 L MCA, 2 L frontal, 2 L basal ganglia
Participants notes	-

#### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, ~10 weeks later
If longitudinal, was there any intervention between the time points?	Acupuncture, 3 sessions/week, 8 weeks
Is the scanner described?	No (not stated)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	No (inconsistent information regarding timing)
Design type	Block
Total images acquired	90?
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	<u>No</u> (lesion impact not addressed)
Imaging notes	-
Candidiana	

### Conditions

Are the conditions clearly described?

<u>No\* (moderate limitation)</u> (nature of questions not described in detail)

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
answering questions from Cantonese Aphasia Battery	Button press	3	<u>Unknown</u>	<u>Unknown</u>
visual decision	Button press	3	<u>Unknown</u>	<u>Unknown</u>
Conditions notes	Responses involved rais	ng left or right fir	nger (not button press per	se)
Contrasts				
Are the contrasts clearly described?	Yes			

### Contrast 1: answering questions from Cantonese Aphasia Battery vs visual decision

Language condition	Answering questions from Cantonese Aphasia Battery
Control condition	Visual decision
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No

Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Unknown</u>
Are activations lateralized in the control data?	Unknown
Control activation notes	
Contrast notes	_
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Answering questions from Cantonese Aphasia Battery vs visual decision
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	Δ WAB AQ
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (no treatment effect)
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Unclear or not stated
Software	SPM2
Voxelwise p	_
Cluster extent	_
Statistical details	Stated to be corrected p < 0.05, but the nature of correction is not described; <u>it is not entirely</u> <u>clear whether the functional measure was the difference between T1 and T2 (we assume it is);</u> <u>it is also not clear whether or not 2 patients with low AQ were excluded (we assume not)</u>
Findings	↑ L posterior MTG
Findings notes	Finding based on table; additional small activations are shown in figure but not table
Notes	
Excluded analyses	_

### Fridriksson (2010)

### Reference

Authors	Fridriksson J
Title	Preservation and modulation of specific left hemisphere regions is vital for treated recovery from anomia in stroke
Reference	<i>J Neurosci</i> 2010; 30: 11558-11564
PMID	20810877
DOI	10.1523/jneurosci.2227-10.2010

### Participants

Participants	
Language	US English
Inclusion criteria	-
Number of individuals with aphasia	<u>19</u> (plus 7 excluded: 6 for making fewer than 5 correct responses in one or more sessions; 1 for excessive head motion)
Number of control participants	0
Were any of the participants included in any previous studies?	Yes ("several" patients overlapped with those reported by Fridriksson et al. (2009, 2010))
Is age reported for patients and controls, and matched?	Yes (mean 59.7 ± 12.3 years)
Is sex reported for patients and controls, and matched?	Yes (males: 12; females: 14)
Is handedness reported for patients and controls, and matched?	No
Is time post stroke onset reported and appropriate to the study design?	Yes (> 8 months; actual TPO not stated)
To what extent is the nature of aphasia characterized?	Severity and type
Language evaluation	WAB
Aphasia severity	AQ mean 60.4 ± 25.6 (including excluded patients)
Aphasia type	11 anomic, 10 Broca's, 3 conduction, 1 transcortical motor, 1 Wernicke's (including excluded patients)
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L MCA
Participants notes	Demographic data includes excluded patients
Imaging	
Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment/~4 weeks later; note that there were two separate sessions per time point, as well as another two sessions midway through treatment that are not analyzed in this paper
If longitudinal, was there any intervention between the time points?	Anomia treatment using a cueing hierarchy, 3 hours/day, 5 days/week, 2 weeks, with a 1-week gap between the two weeks
Is the scanner described?	Yes (Siemens Trio 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No</u> (timing of stimuli within the silent periods is unclear)
Design type	Event-related
Total images acquired	120
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	sparse sampling
Conditions	
Are the conditions clearly described?	Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming	Word (overt)	80	Yes	Unknown
viewing abstract pictures	None	40	N/A	<u>N/A</u>
Conditions notes		Patients with fewer than 5 correct responses in any session were excluded; there were probably some patients who made 5 or more correct responses but less than 10%, but this is not reported		
Contrasts				

Are the contrasts	clearly described?	
ALE LIE CUITIASIS	Clear IV described:	

### Contrast 1: picture naming (correct trials) vs viewing abstract pictures

Yes

•		
Language condition		Picture naming (correct trials)
Control condition		Viewing abstract pictures
Are the conditions matched	for visual demands?	Yes
Are the conditions matched	for auditory demands?	No
Are the conditions matched	for motor demands?	No
Are the conditions matched demands?	for cognitive/executive	No
Is accuracy matched betwee control tasks for all relevant		<u>N/A, tasks not comparable</u>
Is reaction time matched bet and control tasks for all relev		N/A, tasks not comparable
Behavioral data notes		_
Are control data reported in that is referenced?	this paper or another	Somewhat
Does the contrast selectively relevant language regions in		No
Are activations lateralized in	the control data?	Somewhat
Control activation notes		Control data in Fridriksson et al. (2007); motor activations are prominent; there is some L frontal activation but little temporal activation in either hemisphere.
Contrast notes		_
Analyses		
Are the analyses clearly desc	ribed?	Yes
Voxelwise analysis 1		
First level contrast		Picture naming (correct trials) vs viewing abstract pictures
Analysis class		Longitudinal correlation with language or other measure
Group(s)		Aphasia T2 vs T1
Covariate		Δ picture naming accuracy
Is the second level contrast v group(s), time point(s), and n		Yes
Is accuracy matched across t contrast?	the second level	Yes, correct trials only
Is reaction time matched acr contrast?	oss the second level	Unknown, not reported
Behavioral data notes		-
Type of analysis		Voxelwise
Search volume		Whole brain
Correction for multiple comp	parisons	Clusterwise correction with with GRFT and lenient voxelwise p
Software		FSL 4.1
Voxelwise p		~.01 (z > 2.3)
Cluster extent		Based on GRFT
Statistical details		-
Findings		↑ L dorsolateral prefrontal cortex

↑ L supramarginal gy ↑ L supramarginal gy ↑ L intraparietal sulcu ↑ L superior parietal ↑ L precuneus	
Findings notes Activated regions we	re on the borders on the lesion distribution in the 19 included patients
Notes	
Excluded analyses —	

### Fridriksson et al. (2010)

### Reference

TitleActivity in preserved left hemisphere regions predicts anomia severity in aphasiaReferenceCereb Cortex 2010; 20: 1013-1019	
Reference <i>Cereb Cortex</i> 2010; 20: 1013-1019	
PMID 19687294	
DOI 10.1093/cercor/bhp160	

### Participants

Language	US English
Inclusion criteria	-
Number of individuals with aphasia	<u>15</u>
Number of control participants	9
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 61.9 years, range 41-81 years)
ls sex reported for patients and controls, and matched?	<u>No</u> (males: 7; females: 8; not stated for controls)
Is handedness reported for patients and controls, and matched?	No
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 29.7 months, > 6 months)
To what extent is the nature of aphasia characterized?	Severity and type
Language evaluation	WAB
Aphasia severity	AQ mean 77.1, range 47.1-93.7
Aphasia type	10 anomic, 3 Broca's, 2 conduction
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L MCA
Participants notes	_

### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	-
If longitudinal, was there any intervention between	-

the time points?				
Is the scanner described?	Yes (Siemens Trio 3 Tes			
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No</u> (exact timing of pict	ure presentation	not specified)	
Design type	Event-related			
Total images acquired	120			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	Yes			
Is intersubject normalization adequately described and appropriate?	Yes			
Imaging notes	sparse sampling			
Conditions				
Are the conditions clearly described?	Yes			
Condition	Doctooned type	Dopotitie	All groups could do?	All individuals could do?
	Response type	Repetitions		Yes
picture naming	Word (overt) None	80 40	Yes N/A	Yes N/A
viewing abstract pictures	None	40	<u>IN/A</u>	<u>IN/A</u>
Conditions notes	_			
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: picture naming (correct trials) vs vi	ewing abstract picture	S		
Language condition	Picture naming (correct			
Control condition	Viewing abstract pictur			
Are the conditions matched for visual demands?	Yes	00		
Are the conditions matched for auditory demands?	No			
Are the conditions matched for motor demands?	No			
Are the conditions matched for cognitive/executive demands?	No			
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not compara</u>	able		
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not compara</u>	able		
Behavioral data notes	_			
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>			
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat			
Are activations lateralized in the control data?	Somewhat			
Control activation notes		d temporal activat	ions, but also bilateral vis	ual, motor and auditory
Contrast notes	_			
Analyses				
Are the analyses clearly described?	Yes			
Voxelwise analysis 1				
First level contrast	Dicture paming (correct	t trials) vs viewieg	abstract pictures	
	Picture naming (correct Cross-sectional correlat			
Analysis class	Appasia	uon with anguage		

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Aphasia

Group(s)

Covariate	Picture naming accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	<u>Clusterwise correction with with GRFT and lenient voxelwise p</u>
Software	FSL 4.1
Voxelwise p	~.02 (z > 2)
Cluster extent	Based on GRFT
Statistical details	_
Findings	↑ L IFG pars orbitalis ↑ L occipital ↑ L anterior cingulate
Findings notes	Greater activation was associated with better picture naming; L IFG pars orbitalis activation classified as middle frontal gyrus in the paper, but coordinates suggest otherwise
Voxelwise analysis 2	
First level contrast	Picture naming (correct trials) vs viewing abstract pictures
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	<u>Clusterwise correction with with GRFT and lenient voxelwise p</u>
Software	FSL 4.1
Voxelwise p	~.02 (z > 2)
Cluster extent	Based on GRFT
Statistical details	-
Findings	None
Findings notes	
ROI analysis 1	
First level contrast	Picture naming (correct trials) vs viewing abstract pictures
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Picture naming accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Region of interest (ROI)

ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	A single ROI comprising 3 regions where activation in patients was correlated with picture naming accuracy: the L IFG pars orbitalis, occipital lobe, and anterior cingulate
How are the ROI(s) defined?	Based on SPM analysis 1
Correction for multiple comparisons	One only
Statistical details	The purpose of this analysis was to determine whether these regions were recruited in the patients with better naming, or not activated in the patients with worse naming, relative to the control mean
Findings	Other
Findings notes	Patients with better naming showed greater activation than controls, while the patients with poorer naming showed less activation than controls.
Complex analysis 1	
First level contrast	Picture naming (correct trials) vs viewing abstract pictures
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Lesion status of each voxel
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Complex
Statistical details	VLSM was used to identify any regions in which damage was predictive of activation in the regions identified in SPM analysis 1, considered as a single ROI. <u>There was no correction for multiple comparisons</u> , and the analysis is appropriately presented as exploratory.
Findings	Other
Findings notes	Only in the L IFG pars opercularis was damage predictive of reduced activation in the potentially compensatory network.

### Notes

Excluded analyses

### Sharp et al. (2010)

### Reference

Authors	Sharp DJ, Turkheimer FE, Bose SK, Scott SK, Wise RJ
Title	Increased frontoparietal integration after stroke and cognitive recovery
Reference	Ann Neurol 2010; 68: 753-756
PMID	20687116
DOI	10.1002/ana.21866

### Participants

Language	UK English
Inclusion criteria	Lesion in vicinity of L STG; no extensive frontal damage; no inferior temporal damage; able to perform tasks
Number of individuals with aphasia	<u>9</u>
Number of control participants	18
Were any of the participants included in any previous studies?	Yes (additional analysis of same dataset as Sharp et al. (2004))

Is age reported for patients and controls, and matched?	Yes (median 58 years, range 39-72 years)
Is sex reported for patients and controls, and matched?	Yes (males: 8; females: 1)
Is handedness reported for patients and controls, and matched?	Yes (right: 9; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 45 months, range 14-145 months)
To what extent is the nature of aphasia characterized?	Severity only
Language evaluation	Subtests from CAT, subtests from PALPA, Action for dysphasic adults, TROG, PPT
Aphasia severity	Mild
Aphasia type	Not stated
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	Lesion in vicinity of L STG; no extensive frontal damage; no inferior temporal damage
Participants notes	_

### Imaging

PET (rCBF)
Cross-sectional
-
-
Yes (Siemens HR++ 966)
Yes
PET
16
Yes (whole brain)
Yes
Yes
Yes
_

### Conditions

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
semantic decision	Word (overt)	aphasia: 8; control: 4	Yes	Yes
syllable count decision	Word (overt)	aphasia: 8; control: 4	Yes	<u>Unknown</u>
semantic decision (noise vocoded) (control only)	Word (overt)	4 (control)	Yes	Yes
syllable count decision (noise vocoded) (control only)	Word (overt)	4 (control)	Yes	Yes

Yes

Conditions notes

Seems the response was a spoken word, but this is not stated explicitly; assuming all

individuals could do the semantic task because this was an inclusion criterion and behavioral data (PPT) supports, but not sure about the phonological task

#### Contrasts

Are the contrasts clearly described?

Yes

# Contrast 1: semantic decision (clear in patients; average of clear and noise vocoded in controls) vs syllable count decision (clear in patients; average of clear and noise vocoded in controls)

Language condition	Semantic decision (clear in patients; average of clear and noise vocoded in controls)
Control condition	Syllable count decision (clear in patients; average of clear and noise vocoded in controls)
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>No, different</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>No, different</u>
Behavioral data notes	Significant differences per Sharp et al. (2004)
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	Yes
Control activation notes	Not stated exactly what contrast was used in controls
Contrast notes	_
Analyses	
Are the analyses clearly described?	Yes
ROI analysis 1	
First level contrast	Semantic decision (clear in patients; average of clear and noise vocoded in controls) vs syllable count decision (clear in patients; average of clear and noise vocoded in controls)
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	No, but attempt made
Is reaction time matched across the second level contrast?	<u>Appear similar</u>
Behavioral data notes	Accuracy and RT were not significantly different for the semantic task; statistics are not reported for the syllable counting task, but the data provided suggest that accuracy was probably not matched, while RT probably was
Behavioral data notes Type of analysis	reported for the syllable counting task, but the data provided suggest that accuracy was
	reported for the syllable counting task, but the data provided suggest that accuracy was probably not matched, while RT probably was
Type of analysis	reported for the syllable counting task, but the data provided suggest that accuracy was probably not matched, while RT probably was Regions of interest (ROI)
Type of analysis ROI type	reported for the syllable counting task, but the data provided suggest that accuracy was probably not matched, while RT probably was Regions of interest (ROI) Other
Type of analysis ROI type How many ROIs are there?	reported for the syllable counting task, but the data provided suggest that accuracy was probably not matched, while RT probably was Regions of interest (ROI) Other 12 Functional connectivity between pairs of spared nodes of the L hemisphere semantic network and R hemisphere homotopic regions: (1) L SFG-L AG; (2) L SFG-L IFG; (3) L SFG-L IT; (4) L AG-L
Type of analysis ROI type How many ROIs are there? What are the ROI(s)?	<ul> <li>reported for the syllable counting task, but the data provided suggest that accuracy was probably not matched, while RT probably was</li> <li>Regions of interest (ROI)</li> <li>Other</li> <li>12</li> <li>Functional connectivity between pairs of spared nodes of the L hemisphere semantic network and R hemisphere homotopic regions: (1) L SFG-L AG; (2) L SFG-L IFG; (3) L SFG-L IT; (4) L AG-L IFG; (5) L AG-L IT; (6) L IFG-L IT; (7-12) homotopic counterparts</li> </ul>
Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined?	<ul> <li>reported for the syllable counting task, but the data provided suggest that accuracy was probably not matched, while RT probably was</li> <li>Regions of interest (ROI)</li> <li>Other</li> <li>12</li> <li>Functional connectivity between pairs of spared nodes of the L hemisphere semantic network and R hemisphere homotopic regions: (1) L SFG-L AG; (2) L SFG-L IFG; (3) L SFG-L IT; (4) L AG-L IFG; (5) L AG-L IT; (6) L IFG-L IT; (7-12) homotopic counterparts</li> <li>Partial correlations between nodes</li> </ul>
Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined? Correction for multiple comparisons	<ul> <li>reported for the syllable counting task, but the data provided suggest that accuracy was probably not matched, while RT probably was</li> <li>Regions of interest (ROI)</li> <li>Other</li> <li>12</li> <li>Functional connectivity between pairs of spared nodes of the L hemisphere semantic network and R hemisphere homotopic regions: (1) L SFG-L AG; (2) L SFG-L IFG; (3) L SFG-L IT; (4) L AG-L IFG; (5) L AG-L IT; (6) L IFG-L IT; (7-12) homotopic counterparts</li> <li>Partial correlations between nodes</li> </ul>

Findings notes	Patients showed greater connectivity between L SFG and L AG than controls while performing the semantic task; this was not the case for the syllable counting task, however connectivity during performance of the two tasks was not compared directly
Notes	
Excluded analyses	(1) correlations between connection strength of AG-IT and language performance, because there was no functional control condition; (2) controls showed greater connectivity between L SFG and L AG while performing the semantic task with noise vocoded speech relative to clear speech, supporting the interpretation that greater connectivity reflects effortful processing

### Thompson et al. (2010)

### Reference

Authors	Thompson CK, den Ouden DB, Bonakdarpour B, Garibaldi K, Parrish TB
Title	Neural plasticity and treatment-induced recovery of sentence processing in agrammatism
Reference	Neuropsychologia 2010; 48: 3211-3227
PMID	20603138
DOI	10.1016/j.neuropsychologia.2010.06.036

### Participants

Inclusion criteriaAgrammaticNumber of individuals with aphasia6Number of control participants12Were any of the participants included in anyNo	
Number of control participants 12	
· · · · · · · · · · · · · · · · · · ·	
Were any of the participants included in any No	
previous studies?	
Is age reported for patients and controls, and Yes (mean 54 years, range 38-66 years) Matched?	
Is sex reported for patients and controls, and Yes (males: 5; females: 1) matched?	
Is handedness reported for patients and controls, Yes (right: 6; left: 0) and matched?	
Is time post stroke onset reported and appropriate Yes (range 6-146 months) to the study design?	
To what extent is the nature of aphasia Comprehensive battery characterized?	
Language evaluation WAB, NAVS, narrative language sample	
Aphasia severity AQ range 66.8-85.0	
Aphasia type All agrammatic; per WAB scores provided: 3 Broca's, 3 unclassified	
First stroke only? Yes	
Stroke type Not stated	
To what extent is the lesion distribution Individual lesions characterized?	
Lesion extent Not stated	
Lesion location 5 L MCA, 1 R MCA with aphasia	
Participants notes —	

### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, 9-15 weeks later
If longitudinal, was there any intervention between	Treatment of underlying forms

the time points?	
Is the scanner described?	Yes (Siemens Trio 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No</u> (total images acquired not stated)
Design type	Event-related
Total images acquired	not stated
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	_

#### Conditions

Are the conditions clearly described?

Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
auditory sentence-picture matching (auditory; object cleft)	Button press	60	No	No
auditory sentence-picture matching (subject cleft)	Button press	60	Yes	Yes
auditory sentence-picture matching (simple past tense active)	Button press	60	Yes	No
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>
Conditions notes	_			

#### Contrasts

Are the contrasts clearly	v described?	Yes

### Contrast 1: auditory sentence-picture matching (all three sentence types) vs rest

Language condition	Auditory sentence-picture matching (all three sentence types)
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	-
Analyses	

Are the analyses clearly described?

Yes

•	
First level contrast	Auditory sentence-picture matching (all three sentence types) vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear similar</u>
Is reaction time matched across the second level contrast?	<u>Appear similar</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	18
What are the ROI(s)?	(1) L BA 7; (2) L BA 9; (3) L BA 13; (4) L BA 21; (5) L BA 22; (6) L BA 39; (7) L BA 40; (8) L BA 44; (9) L BA 45; (10-18) homotopic counterparts
How are the ROI(s) defined?	WFU pickatlas; proportion of patients who showed increases and decreases in (parts of) each ROI in individual fixed effects SPM analyses
Correction for multiple comparisons	No correction
Statistical details	_
Findings	<ul> <li>↑ L angular gyrus</li> <li>↑ L superior parietal</li> <li>↑ L mid temporal</li> <li>↑ R supramarginal gyrus</li> <li>↑ R superior parietal</li> <li>↓ L insula</li> <li>↓ L posterior STG</li> </ul>
Findings notes	These are the regions involved in what the authors interpret as a "general shift"
Notes	
Excluded analyses	Individual patient analyses

## Tyler et al. (2010)

### Reference

Authors	Tyler LK, Wright P, Randall B, Marslen-Wilson WD, Stamatakis EA
Title	Reorganization of syntactic processing following left-hemisphere brain damage: does right- hemisphere activity preserve function?
Reference	<i>Brain</i> 2010; 133: 3396-3408
PMID	20870779
DOI	10.1093/brain/awq262

### Participants

Language	UK English
Inclusion criteria	-
Number of individuals with aphasia	<u>14</u>
Number of control participants	10
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 54 years, range 33-76 years)
Is sex reported for patients and controls, and	Yes (males: 11; females: 3)

matched?	
Is handedness reported for patients and controls, and matched?	Yes (right: 14; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 7 years, range 1.4-37.3 years)
To what extent is the nature of aphasia characterized?	Not at all
Language evaluation	Sentence-picture matching, lexical decision, phonological similarity, word repetition, sentence repetition, morphological similarity, semantic categorization, sentence acceptability
Aphasia severity	Not stated
Aphasia type	Not stated
First stroke only?	Not stated
Stroke type	Mixed etiologies
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L
Participants notes	2 of the 14 patients were not stroke, but were post resective surgery

### Imaging

Modality	fMRI
,	Cross-sectional
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (Siemens Trio 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No* (moderate limitation)</u> (there was only one block per condition per run, so condition could be confounded with low frequency drift; also, the length of the sentences is not stated so it is unclear how well the HRF peak aligns with the sparse acquisitions)
Design type	Block
Total images acquired	69
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	sparse sampling
Conditions	

### Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
listening to normal sentences and detecting a target word	Button press	2	Yes	<u>Unknown</u>
listening to grammatical but meaningless sentences and detecting a target word	Button press	2	Yes	<u>Unknown</u>
listening to scrambled sentences and detecting a target word	Button press	2	Yes	<u>Unknown</u>
listening to "musical rain" and detecting a period of white noise	Button press	2	Yes	<u>Unknown</u>
rest	None	2	N/A	N/A

Yes

Conditions notesAuditory presentation; target detection task with early and late targets; 12-15 trials per block<br/>with single sparse acquisition each, but only one block per run, in fixed order; task can<br/>apparently be performed by patients with brain damage, but accuracy is not reported

#### Contrasts

Are the contrasts clearly described?

Contrast 1: listening to grammatical but meaningless sentences and detecting a target word vs listening to scrambled sentences and detecting a target word

Yes

8 8	
Language condition	Listening to grammatical but meaningless sentences and detecting a target word
Control condition	Listening to scrambled sentences and detecting a target word
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive	Yes
demands?	
Is accuracy matched between the language and	Unknown, not reported
control tasks for all relevant groups?	
Is reaction time matched between the language	Appear similar
and control tasks for all relevant groups?	
Behavioral data notes	There appears to be a small RT difference (control condition slower)
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	No
Control activation notes	There are more control participants in another paper (Tyler et al., 2010, Cereb Cortex), but the relevant contrast does not seem to be shown in that paper
Contrast notes	The contrast is intended to identify regions involved in syntactic processing, however it seems possible that there are semantic differences between these conditions also
Analyses	
Are the analyses clearly described?	Yes
Voxelwise analysis 1	
First level contrast	Listening to grammatical but meaningless sentences and detecting a target word vs listening to scrambled sentences and detecting a target word
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Appear similar
Behavioral data notes	The two groups showed similar differences between RTs in the two conditions of the contrast
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No direct comparison
Software	SPM5
Voxelwise p	_
Cluster extent	_
Statistical details	Qualitative comparison on pp. 3402-3; each group is presented at voxelwise p < .005 (CDT), cluster-corrected p < .05 with GRFT
Findings	↑ R IFG pars triangularis

	↑ R IFG pars orbitalis ↓ L posterior MTG
Findings notes	Several other potential differences are apparent in the figure, but only the differences tabulated are interpreted in the text
Ol analysis 1	
First level contrast	Listening to grammatical but meaningless sentences and detecting a target word vs listening to scrambled sentences and detecting a target word
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	RT difference between early and late targets on grammatical but meaningless sentences (a measure of syntactic processing)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
ls accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Analyses focuses on RT differences between early and late targets, not on mean RT per se
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	L IFG pars triangularis and orbitalis
How are the ROI(s) defined?	Activated for the same contrast
Correction for multiple comparisons	One only
Statistical details	-
Findings	↑ L IFG pars triangularis ↑ L IFG pars orbitalis
Findings notes	L IFG showed more activation in patients that had a larger target position effect (indicative or better syntactic processing)
ROI analysis 2	
First level contrast	Listening to grammatical but meaningless sentences and detecting a target word vs listening to scrambled sentences and detecting a target word
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	RT difference between early and late targets on normal sentences
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	L IFG pars triangularis and orbitalis
	Activated for the same contrast
	Activated for the same contrast
How are the ROI(s) defined?	One only
How are the ROI(s) defined? Correction for multiple comparisons Statistical details	
How are the ROI(s) defined? Correction for multiple comparisons	

#### ıy

First level contrast

Listening to grammatical but meaningless sentences and detecting a target word vs listening

	to scrambled sentences and detecting a target word
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	RT difference between early and late targets on scrambled sentences
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	L IFG pars triangularis and orbitalis
How are the ROI(s) defined?	Activated for the same contrast
Correction for multiple comparisons	One only
Statistical details	_
Findings	None
Findings notes	_

First level contrast	Listening to grammatical but meaningless sentences and detecting a target word vs listening to scrambled sentences and detecting a target word
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Damage to L IFG, estimated from T1 signal
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	R IFG pars triangularis and orbitalis
How are the ROI(s) defined?	Activated for the same contrast
Correction for multiple comparisons	One only
Statistical details	-
Findings	None
Findings notes	No correlation (p = .57)
ROI analysis 5	
First level contrast	Listening to grammatical but meaningless sentences and detecting a target word vs listening to scrambled sentences and detecting a target word
Analysis class	Cross sectional correlation with language or other measure

	to scrambled sentences and detecting a target word
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Syntactic processing (presumably the target position effect, though this is not stated)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>

Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	R IFG pars triangularis and orbitalis
How are the ROI(s) defined?	Activated for the same contrast
Correction for multiple comparisons	One only
Statistical details	_
Findings	None
Findings notes	No correlation (p = .41)

### Complex analysis 1

First level contrast	Listening to grammatical but meaningless sentences and detecting a target word vs listening to scrambled sentences and detecting a target word
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Lesion status of each voxel
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Complex
Statistical details	VBM was used to identify any regions where damage was predictive of activation in the L IFG pars triangularis and orbitalis. Tissue integrity was quantified in terms of T1 signal. <u>Clusterwise correction was used, which is not appropriate for VBM.</u>
Findings	Other
Findings notes	Only in the L IFG itself was damage predictive of reduced activation in the L IFG.
Notes	
Excluded analyses	(1) patients, unlike controls, showed a correlation between R IFG and R MTG activity, but the authors do not make much of this, and there is no direct comparison was reported to controls; (2) a nonsignificant correlation between L pMTG activation in patients (lacking at the group level) and tissue integrity in that same region

### van Oers et al. (2010)

Number of control participants

#### Reference

Authors	van Oers CA, Vink M, van Zandvoort MJ, van der Worp HB, de Haan EH, Kappelle LJ, Ramsey NF, Dijkhuizen RM
Title	Contribution of the left and right inferior frontal gyrus in recovery from aphasia: a functional MRI study in stroke patients with preserved hemodynamic responsiveness
Reference	NeuroImage 2010; 49: 885-893
PMID	19733673
DOI	10.1016/j.neuroimage.2009.08.057
Participants	
Language	Dutch
Inclusion criteria	MCA; mRS < 3; able to perform at least 2 out of the 3 tasks
Number of individuals with aphasia	<u>13</u>

13

Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 53 ± 14 years, range 29-74 years)
Is sex reported for patients and controls, and matched?	Yes (males: 4; females: 9)
Is handedness reported for patients and controls, and matched?	No (right: 13; left: 0; not stated for controls)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 1.3-4.7 years)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	AAT, BNT, TT
Aphasia severity	4 moderate, 4 severe, 3 recovered, 2 mild; all had aphasia initially
Aphasia type	5 anomic, 4 Broca's, 3 recovered, 1 Wernicke's
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Range 6.0-167.3 cc
Lesion location	L MCA
Participants notes	-

### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	Behavioral data (TT and a naming measure) were also acquired subacutely (mean 26 $\pm$ 18 days, range 5-56 days)
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (Philips Achieva 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Block
Total images acquired	3036
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	breath holding scan also done to measure hemodynamic responsiveness
Conditions	

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
written word-picture matching	Button press	6	Yes	Yes
semantic decision	Button press	6	Yes	Yes
verb generation	Word (covert)	8	Yes	Yes
visual decision	Button press	12	<u>Unknown</u>	Unknown
rest	None	20	N/A	N/A

Yes

Conditions notes

Patients who could not do tasks were excluded from analyses of those tasks (1 patient from

semantic decision; 3 patients from verb generation); wording is somewhat unclear regarding exclusion of patients who could not perform verb generation, but we assume they were excluded

#### Contrasts

Are the contrasts clearly described?

No (see specific limitation(s) below)

#### Contrast 1: written word-picture matching vs visual decision

Language condition	Written word-picture matching
Control condition	Visual decision
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	Accuracy not reported for control condition
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	Somewhat
Control activation notes	-
Contrast notes	<u>Not clearly stated</u> that language tasks were contrasted only with arrow decision task and not rest for the first two contrasts, but this can be inferred

#### Contrast 2: semantic decision vs visual decision

Language condition	Semantic decision
Control condition	Visual decision
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	Accuracy not reported for control condition
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	Somewhat
Control activation notes	-
Contrast notes	<u>Not clearly stated</u> that language tasks were contrasted only with arrow decision task and not rest for the first two contrasts, but this can be inferred
Contrast 3: verb generation vs rest	

Language condition	Verb generation
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	Yes

Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	Somewhat
Control activation notes	_
Contrast notes	_
Analyses	
Are the analyses clearly described?	No (see specific limitation(s) below)
ROI analysis 1	
First level contrast	Written word-picture matching vs visual decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Accuracy not reported for control condition
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	7
What are the ROI(s)?	(1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal Ll; (6) temporal Ll; (7) whole network Ll
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↓ L IFG ↓ LI (language network) ↓ LI (frontal)
Findings notes	-
ROI analysis 2	
First level contrast	Semantic decision vs visual decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>

Behavioral data notes	Accuracy not reported for control condition
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	7
What are the ROI(s)?	(1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal Ll; (6) temporal Ll; (7) whole network Ll
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↓ L IFG ↓ LI (language network) ↓ LI (frontal)
Findings notes	_
ROI analysis 3	
First level contrast	Verb generation vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	7
What are the ROI(s)?	(1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal Ll; (6) temporal Ll; (7) whole network Ll
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↓ L IFG ↓ LI (language network) ↓ LI (frontal)
Findings notes	_
ROI analysis 4	
First level contrast	Written word-picture matching vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Picture-word matching accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	7

What are the ROI(s)?	(1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal Ll; (6) temporal Ll; (7) whole network Ll
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	_

First level contrast	Semantic decision vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Semantic decision accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	7
What are the ROI(s)?	(1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-
ROI analysis 6	
First level contrast	Written word-picture matching vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Overall language measure
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level	Unknown, not reported

Is reaction time matched across the second level contrast?

Behavioral data notes Type of analysis ROI type

How many ROIs are there? What are the ROI(s)?

How are the ROI(s) defined? Correction for multiple comparisons Statistical details Findings Findings notes Unknown, not reported

-

No correction

\_

None

Regions of interest (ROI) Mixed 7

(1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI WFU pickatlas

First level contrast	Semantic decision vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Overall language measure
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	7
What are the ROI(s)?	(1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal Ll; (6) temporal Ll; (7) whole network Ll
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	Not clear if it was LI for whole language network
Findings	↑ LI (language network)
Findings notes	_

First level contrast	Verb generation vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Overall language measure
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	7
What are the ROI(s)?	(1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal Ll; (6) temporal Ll; (7) whole network Ll
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	_
ROI analysis 9	

Written word-picture matching vs visual decision
Cross-sectional correlation with language or other measure
Aphasia
Lesion volume
Yes

Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	2
What are the ROI(s)?	(1) R anterior language region (IFG); (2) R posterior language region (AG, SMG, STG, MTG)
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-

First level contrast	Semantic decision vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	2
What are the ROI(s)?	(1) R anterior language region (IFG); (2) R posterior language region (AG, SMG, STG, MTG)
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	-

First level contrast	Verb generation vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	2
What are the ROI(s)?	(1) R anterior language region (IFG); (2) R posterior language region (AG, SMG, STG, MTG)
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction

Statistical details	-
Findings	None
Findings notes	-

First level contrast	Written word-picture matching vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Damage to L hemisphere language regions
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	2
What are the ROI(s)?	(1) R anterior language region (IFG); (2) R posterior language region (AG, SMG, STG, MTG)
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-

## ROI analysis 13

First level contrast	Semantic decision vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Damage to L hemisphere language regions
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	2
What are the ROI(s)?	(1) R anterior language region (IFG); (2) R posterior language region (AG, SMG, STG, MTG)
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	_

First level contrast	Verb generation vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Damage to L hemisphere language regions
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes

Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	2
What are the ROI(s)?	(1) R anterior language region (IFG); (2) R posterior language region (AG, SMG, STG, MTG)
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	_

First level contrast	Written word-picture matching vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Previous (current vs subacute) $\Delta$ naming
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	No (current activation will reflect not just prior recovery, but also current language function)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	7
What are the ROI(s)?	(1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal Ll; (6) temporal Ll; (7) whole network Ll
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	_

First level contrast	Semantic decision vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Previous (current vs subacute) $\Delta$ naming
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	No (current activation will reflect not just prior recovery, but also current language function)
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	7
What are the ROI(s)?	(1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal

	Ll; (6) temporal Ll; (7) whole network Ll
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↑ L IFG
Findings notes	_

First level contrast	Verb generation vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Previous (current vs subacute) $\Delta$ naming
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	No (current activation will reflect not just prior recovery, but also current language function)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	7
What are the ROI(s)?	(1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal Ll; (6) temporal Ll; (7) whole network Ll
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↑ L IFG
Findings notes	_

## ROI analysis 18

First level contrast	Written word-picture matching vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Previous (current vs subacute) $\Delta$ TT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>No</u> (current activation will reflect not just prior recovery, but also current language function; TT not optimal measure of overall language function)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	7
What are the ROI(s)?	(1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal Ll; (6) temporal Ll; (7) whole network Ll
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	_

First level contrast	Semantic decision vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Previous (current vs subacute) ∆ TT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>No</u> (current activation will reflect not just prior recovery, but also current language function; TT not optimal measure of overall language function)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	7
What are the ROI(s)?	(1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal Ll; (6) temporal Ll; (7) whole network Ll
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↑ L IFG ↑ R IFG
Findings notes	-
ROI analysis 20	
First level contrast	Verb generation vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Previous (current vs subacute) Δ TT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>No</u> (current activation will reflect not just prior recovery, but also current language function; TT not optimal measure of overall language function)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	7
What are the ROI(s)?	(1) L anterior language region (IFG); (2) L posterior language region (AG, SMG, STG, MTG); (3) R anterior language region (IFG); (4) R posterior language region (AG, SMG, STG, MTG); (5) frontal LI; (6) temporal LI; (7) whole network LI
How are the ROI(s) defined?	WFU pickatlas
Correction for multiple comparisons Statistical details	No correction
Findings	↑ L IFG ↑ R IFG
Findings notes	
Notes	
Excluded analyses	-

Papoutsi et al. (2011)

#### Reference

Authors	Papoutsi M, Stamatakis EA, Griffiths J, Marslen-Wilson WD, Tyler LK
Title	Is left fronto-temporal connectivity essential for syntax? Effective connectivity, tractography and performance in left-hemisphere damaged patients
Reference	NeuroImage 2011; 58: 656-664
PMID	21722742
DOI	10.1016/j.neuroimage.2011.06.036

#### Participants

Language	UK English
Inclusion criteria	-
Number of individuals with aphasia	<u>14</u>
Number of control participants	15
Were any of the participants included in any previous studies?	Yes (reanalysis of same dataset from Tyler et al. (2011))
Is age reported for patients and controls, and matched?	Yes (mean 56 ± 12 years, range 35-77 years)
ls sex reported for patients and controls, and matched?	Yes (males: 11; females: 3)
Is handedness reported for patients and controls, and matched?	Yes (right: 14; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 8 ± 9 years, range 2-40 years)
To what extent is the nature of aphasia characterized?	Not at all
Language evaluation	Sentence-picture matching, grammaticality judgment, lexical decision, phonological discrimination, semantic categorization, sentence repetition, word repetition
Aphasia severity	Not stated
Aphasia type	Not stated
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L MCA
Participants notes	1 patient had post-surgical haematoma rather than stroke (per Tyler et al., 2011)

## Imaging

ModalityfMRIIs the study cross-sectional or longitudinal?Cross-sectionalIf longitudinal, at what time point(s) were imaging data acquired?-If longitudinal, was there any intervention between the time points?-If longitudinal, was there any intervention between the time points?-Is the scanner described?Yes (Siemens Trio 3 Tesla)Is the timing of stimulus presentation and image acquisition clearly described and appropriate?No (length of stimuli not described)Design typeEvent-relatedTotal images acquired1059Are the imaging acquisition parameters, including coverage, adequately described and appropriate?Yes (whole brain)
If longitudinal, at what time point(s) were imaging data acquired?-If longitudinal, was there any intervention between the time points?-Is the scanner described?Yes (Siemens Trio 3 Tesla)Is the timing of stimulus presentation and image acquisition clearly described and appropriate?No (length of stimuli not described)Design typeEvent-relatedTotal images acquired1059Are the imaging acquisition parameters, includingYes (whole brain)
data acquired?If longitudinal, was there any intervention between the time points?—Is the scanner described?Yes (Siemens Trio 3 Tesla)Is the timing of stimulus presentation and image acquisition clearly described and appropriate?No (length of stimuli not described)Design typeEvent-relatedTotal images acquisition parameters, includingYes (whole brain)
the time points?Is the scanner described?Yes (Siemens Trio 3 Tesla)Is the timing of stimulus presentation and image acquisition clearly described and appropriate?No (length of stimuli not described)Design typeEvent-relatedTotal images acquired1059Are the imaging acquisition parameters, includingYes (whole brain)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?No (length of stimuli not described)Design typeEvent-relatedTotal images acquired1059Are the imaging acquisition parameters, includingYes (whole brain)
acquisition clearly described and appropriate?     Event-related       Design type     Event-related       Total images acquired     1059       Are the imaging acquisition parameters, including     Yes (whole brain)
Total images acquired     1059       Are the imaging acquisition parameters, including     Yes (whole brain)
Are the imaging acquisition parameters, including Yes (whole brain)
Is preprocessing and intrasubject coregistration Yes adequately described and appropriate?
Is first level model fitting adequately described and <u>No</u> (lacks explanation of event durations) appropriate?
Is intersubject normalization adequately described Yes

Imaging notes —	and appropriate?		
	Imaging notes	-	

Yes

Yes

#### Conditions

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
listening to unambiguous sentences ("unambiguous")	None	42	<u>N/A</u>	<u>N/A</u>
listening to ambiguous sentences with dominant resolution ("dominant")	None	42	<u>N/A</u>	<u>N/A</u>
listening to ambiguous sentences with subordinate resolution ("subordinate")	None	42	<u>N/A</u>	<u>N/A</u>
listening to filler sentences	None	126	<u>N/A</u>	<u>N/A</u>
listening to "musical rain"	None	42	<u>N/A</u>	N/A
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>
Conditions notes	_			

#### Contrasts

Are the contrasts clearly described?

# Contrast 1: listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to ambiguous sentences with dominant resolution ("dominant")

Language condition	Listening to ambiguous sentences with subordinate resolution ("subordinate")
Control condition	Listening to ambiguous sentences with dominant resolution ("dominant")
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, no behavioral measure</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Yes
Control activation notes	Control data in Tyler et al. (2011); L frontal and temporal
Contrast notes	_
Analyses	
Are the analyses clearly described?	Yes
Voxelwise analysis 1	
First level contrast	Listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to ambiguous sentences with dominant resolution ("dominant")
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Difference in percent of unacceptable judgments between subordinate and dominant sentences (dominance effect)
Is the second level contrast valid in terms of the	Yes

g(x) = g(x) time point(c) and measures involved?	
group(s), time point(s), and measures involved? Is accuracy matched across the second level	N/A, no behavioral measure
contrast?	
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	<u>Clusterwise correction with with GRFT and lenient voxelwise p</u>
Software	SPM8
Voxelwise p	.01
Cluster extent	Based on GRFT
Statistical details	-
Findings	↑ L insula ↑ L posterior STG/STS/MTG ↑ L mid temporal
Findings notes	_
Complex analysis 1	
First level contrast	Listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to ambiguous sentences with dominant resolution ("dominant")
Analysis class Group(s)	Cross-sectional correlation with language or other measure Aphasia
Covariate	Modulation of L IFG connectivity by dominance effect
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	N/A, no behavioral measure
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Complex
Statistical details	A PPI analysis was carried out with the L IFG as the seed region. Correlations were computed between voxelwise modulation of connectivity with this region, and a behavioral measure of syntactic processing, which was the dominance effect: the difference in percent of unacceptable judgments between subordinate and dominant sentences. The resultant SPM was thresholded at voxelwise p < .01 (CDT), then corrected for multiple corrections based on cluster extent and GRFT using SPM8.
Findings	Other
Findings notes	Patients with better syntactic performance had more connectivity from the L IFG seed region to L pMTG and adjacent areas (including the insula); pMTG also significant at voxelwise p < .001 in Figure 2B, corrected for multiple comparisons with GRFT
Complex analysis 2	
First level contrast	Listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to ambiguous sentences with dominant resolution ("dominant")
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Modulation of L pMTG connectivity by dominance effect
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Complex

Statistical details	A similar PPI analysis was carried out with the L pMTG as the seed region. <u>Thresholding was</u> <u>the same as in the previous analysis.</u>
Findings	None
Findings notes	_
Notes	
Excluded analyses	-

## Sebastian & Kiran (2011)

If longitudinal, was there any intervention between

the time points?

Is the scanner described?

### Reference

Authors	Sebastian R, Kiran S.
Title	Task-modulated neural activation patterns in chronic stroke patients with aphasia
Reference	Aphasiology 2011; 25: 927-951
PMID	N/A
DOI	10.1080/02687038.2011.557436

#### Participants

Language	US English
Inclusion criteria	-
Number of individuals with aphasia	<u>8</u>
Number of control participants	8
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (range 40-79 years)
Is sex reported for patients and controls, and matched?	<u>No</u> (males: 5; females: 3; control sex not stated, but reported to be matched)
Is handedness reported for patients and controls, and matched?	Yes (right: 8; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 48.3 months, range 30-78 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	WAB, BNT, portions of PALPA, PPT, CLQT
Aphasia severity	AQ range 74.0-97.8
Aphasia type	6 anomic, 2 recovered
First stroke only?	Not stated
Stroke type	Mixed etiologies
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Range 23-45 cc
Lesion location	L MCA
Participants notes	-
Imaging	
Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_

No (GE 3 Tesla; model not stated)

—

Is the timing of stimulus presentation and image				
acquisition clearly described and appropriate?		may have been syst		ial interval between h timing; the total number
Design type	Event-related			
Total images acquired	not stated			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	· ·		is not stated how incorrection for the stated how incorrection of the state of the	
Is intersubject normalization adequately described and appropriate?	Yes			
Imaging notes	-			
Conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do
picture naming	Word (overt)	60	Yes	Yes
viewing scrambled images and saying "pass"	Word (overt)	60	Unknown	Unknown
semantic decision	Button press	48	Yes	Yes
visual decision	Button press	48	Unknown	Unknown
	Button press	40		
Conditions notes	-			
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: picture naming (correct trials) vs vi	iewing scrambled ima	ages and saying "p	ass"	
Language condition	Picture naming (corre	ect trials)		
	Picture naming (corre Viewing scrambled in		ass"	
Control condition	-		ass"	
Control condition Are the conditions matched for visual demands?	Viewing scrambled in		ass"	
Control condition Are the conditions matched for visual demands? Are the conditions matched for auditory demands?	Viewing scrambled in Yes		ass"	
Language condition Control condition Are the conditions matched for visual demands? Are the conditions matched for auditory demands? Are the conditions matched for motor demands? Are the conditions matched for cognitive/executive demands?	Viewing scrambled in Yes Yes		ass"	
Control condition Are the conditions matched for visual demands? Are the conditions matched for auditory demands? Are the conditions matched for motor demands? Are the conditions matched for cognitive/executive demands? Is accuracy matched between the language and	Viewing scrambled in Yes Yes Yes	nages and saying "pa	ass"	
Control condition Are the conditions matched for visual demands? Are the conditions matched for auditory demands? Are the conditions matched for motor demands? Are the conditions matched for cognitive/executive demands? Is accuracy matched between the language and control tasks for all relevant groups? Is reaction time matched between the language	Viewing scrambled in Yes Yes Yes <u>No</u>	nages and saying "pa <u>ed</u>	ass"	
Control condition Are the conditions matched for visual demands? Are the conditions matched for auditory demands? Are the conditions matched for motor demands? Are the conditions matched for cognitive/executive demands? Is accuracy matched between the language and control tasks for all relevant groups? Is reaction time matched between the language and control tasks for all relevant groups?	Viewing scrambled in Yes Yes Yes <u>No</u> <u>Unknown, not report</u>	nages and saying "pa ed ed		
Control condition Are the conditions matched for visual demands? Are the conditions matched for auditory demands? Are the conditions matched for motor demands? Are the conditions matched for cognitive/executive demands? Is accuracy matched between the language and control tasks for all relevant groups? Is reaction time matched between the language and control tasks for all relevant groups? Behavioral data notes Are control data reported in this paper or another	Viewing scrambled in Yes Yes No <u>Unknown, not report</u>	nages and saying "pa ed ed		
Control condition Are the conditions matched for visual demands? Are the conditions matched for auditory demands? Are the conditions matched for motor demands? Are the conditions matched for cognitive/executive demands? Is accuracy matched between the language and control tasks for all relevant groups? Is reaction time matched between the language and control tasks for all relevant groups? Behavioral data notes Are control data reported in this paper or another that is referenced? Does the contrast selectively activate plausible	Viewing scrambled in Yes Yes Yes <u>No</u> <u>Unknown, not report</u> <u>Accuracy/RT not report</u>	nages and saying "pa ed ed		
Control condition Are the conditions matched for visual demands? Are the conditions matched for auditory demands? Are the conditions matched for motor demands? Are the conditions matched for cognitive/executive demands? Is accuracy matched between the language and control tasks for all relevant groups? Is reaction time matched between the language and control tasks for all relevant groups? Behavioral data notes Are control data reported in this paper or another that is referenced? Does the contrast selectively activate plausible relevant language regions in the control group?	Viewing scrambled in Yes Yes Yes No Unknown, not report Unknown, not report Accuracy/RT not report Somewhat Somewhat	nages and saying "pa ed ed		
Control condition Are the conditions matched for visual demands? Are the conditions matched for auditory demands? Are the conditions matched for motor demands? Are the conditions matched for cognitive/executive	Viewing scrambled in Yes Yes Yes No Unknown, not report Unknown, not report Accuracy/RT not report Somewhat Somewhat	nages and saying "pa ed ed orted for control task		eralization of language

Language condition	Semantic decision (correct trials)
Control condition	Visual decision
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes

	M
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	Accuracy/RT not reported for control task
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Somewhat</u>
Are activations lateralized in the control data?	Yes
Control activation notes	Clearly lateralized frontal activation, but very modest temporal activation
Contrast notes	-
Analyses	
Are the analyses clearly described?	Yes
ROI analysis 1	
First level contrast	Picture naming (correct trials) vs viewing scrambled images and saying "pass"
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	4
What are the ROI(s)?	(1) L IFG (oper/tri); (2) L posterior perisylvian (pSTG, pMTG, AG, SMG); (3) R IFG (oper/tri); (4) R posterior perisylvian (pSTG, pMTG, AG, SMG); (5) language network Ll
How are the ROI(s) defined?	Harvard–Oxford atlas
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↑ R supramarginal gyrus ↑ R angular gyrus ↑ R posterior STG/STS/MTG ↓ LI (language network)
Findings notes	Larger lesions were associated with more R posterior perisylvian activation
ROI analysis 2	
First level contrast	Semantic decision (correct trials) vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>

Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	4
What are the ROI(s)?	(1) L IFG (oper/tri); (2) L posterior perisylvian (pSTG, pMTG, AG, SMG); (3) R IFG (oper/tri); (4) R posterior perisylvian (pSTG, pMTG, AG, SMG); (5) language network Ll
How are the ROI(s) defined?	Harvard–Oxford atlas
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-
Notes	

Excluded analyses

(1) individual patient analyses; (2) comparisons between the two language tasks

# Szaflarski et al. (2011)

### Reference

Authors	Szaflarski JP, Vannest J, Wu SW, DiFrancesco MW, Banks C, Gilbert DL
Title	Excitatory repetitive transcranial magnetic stimulation induces improvements in chronic post- stroke aphasia
Reference	Med Sci Monit 2011; 17: CR132-139
PMID	21358599
DOI	10.12659/msm.881446

## Participants

Language	US English
Inclusion criteria	Moderate aphasia, L MCA
Number of individuals with aphasia	8 (plus 3 excluded: 2 metallic artifact; 1 seizure at time of stroke)
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 54.4 ± 12.7 years)
Is sex reported for patients and controls, and matched?	Yes (males: 4; females: 4)
Is handedness reported for patients and controls, and matched?	Yes (right: 8; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 5.3 ± 3.6 years, > 12 months)
To what extent is the nature of aphasia characterized?	Severity and type
Language evaluation	BNT; phonemic fluency, semantic fluency, complex ideation from BDAE, PPVT, communicative activities log
Aphasia severity	Moderate
Aphasia type	4 Broca's, 3 anomic, 1 anomic/conduction
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Not stated
Lesion location	L MCA
Participants notes	-

#### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, ~2 weeks later
If longitudinal, was there any intervention between the time points?	RTMS to residual activation near Broca's area, 5 sessions/week, 2 weeks
Is the scanner described?	Yes (Varian Unity INOVA 4 T)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	No (timing not clear, because previous studies cited are not all identical in terms of timing)
Design type	Block
Total images acquired	not stated
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	<u>No</u> (lesion impact not addressed)
Imaging notes	-
Conditions	

Are the conditions clearly described?

No (based on Binder et al. (1997), but details not reported)

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
semantic decision	Button press	not stated	<u>Unknown</u>	No
tone decision	Button press	not stated	<u>Unknown</u>	No
Conditions notes	Group only just above ch were at chance	ance, unclear wh	ether significantly better;	clearly some individuals

#### Contrasts

Are the contrasts clearly described?

Yes

#### Contrast 1: semantic decision vs tone decision

Language condition	Semantic decision
Control condition	Tone decision
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Appear similar</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Yes
Control activation notes	Control data in Kim et al. (2011) and Szaflarski et al. (2008); L frontal and temporal, plus other semantic regions
Contrast notes	_

Analyses

-	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (patients improved only on semantic fluency)
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Language and control tasks both matched
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	in-house
Voxelwise p	.05
Cluster extent	None
Statistical details	The figure shows a cutoff of $z > 10$ , which would not correspond to $p < .05$ ; increases and decreases in Figure 3 do not accord with the data from T1 and T2 in Figure 2, raising concerns about the implementation of the analyses; there is no explicit description of the second level analysis
Findings Findings notes	<ul> <li>L IFG</li> <li>L SMA/medial prefrontal</li> <li>L orbitofrontal</li> <li>L inferior parietal lobule</li> <li>L supramarginal gyrus</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L occipital</li> <li>L anterior cingulate</li> <li>L basal ganglia</li> <li>L hippocampus/MTL</li> <li>R dorsal precentral</li> <li>R precuneus</li> <li>R occipital</li> <li>R basal ganglia</li> <li>R hippocampus/MTL</li> <li>R basal ganglia</li> <li>R hippocampus/MTL</li> <li>R basal ganglia</li> <li>R hippocampus/MTL</li> <li>R basal ganglia</li> <li>R basal ganglia</li> <li>R bippocampus/MTL</li> <li>R bippocampus/MTL</li> <li>R basal ganglia</li> <li>R bippocampus/MTL</li> <li>R basal ganglia</li> <li>R bippocampus/MTL</li> <li>R bipp</li></ul>
ROI analysis 1	
First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (patients improved only on semantic fluency)
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>

Behavioral data notes	Language and control tasks both matched
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	3
What are the ROI(s)?	(1) frontal LI; (2) temporal LI; (3) language network LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	T1 LI (temporal) is reported to be negative, which does not accord with the voxelwise analysis in Figure 2; increases and decreases in Figure 3 do not accord with the data from T1 and T2 in Figure 2, raising concerns about the implementation of the analyses
Findings	↑ Ll (language network) ↑ Ll (frontal) ↑ Ll (temporal)
Findings notes	-
Notes	
Excluded analyses	_

# Tyler et al. (2011)

#### Reference

Authors	Tyler LK, Marslen-Wilson WD, Randall B, Wright P, Devereux BJ, Zhuang J, Papoutsi M, Stamatakis EA
Title	Left inferior frontal cortex and syntax: function, structure and behaviour in patients with left hemisphere damage
Reference	<i>Brain</i> 2011; 134: 415-431
PMID	21278407
DOI	10.1093/brain/awq369

### Participants

Language	UK English
Inclusion criteria	
	-
Number of individuals with aphasia	<u>14</u>
Number of control participants	15
Were any of the participants included in any previous studies?	Yes (not stated, but it seems like most of the patients also participated in Tyler et al. (2010))
Is age reported for patients and controls, and matched?	Yes (mean 56 years, range 34-77 years)
ls sex reported for patients and controls, and matched?	Yes (males: 11; females: 3)
Is handedness reported for patients and controls, and matched?	Yes (right: 14; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 7 years, > 1.5 years)
To what extent is the nature of aphasia characterized?	Not at all
Language evaluation	Sentence-picture matching, grammaticality judgment, lexical decision, phonological discrimination, semantic categorization, sentence repetition, word repetition
Aphasia severity	Not stated
Aphasia type	Not stated
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution	Lesion overlay

characterized?	
Lesion extent	Not stated
Lesion location	L MCA
Participants notes	1 patient had post-surgical haematoma rather than stroke

#### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (Siemens Trio 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No</u> (run length not stated; length of stimuli not described)
Design type	Event-related
Total images acquired	not stated but 1059 per Papoutsi et al. (2011)
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	<u>No</u> (lacks explanation of event durations)
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-
Conditions	

#### Conditions

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
listening to unambiguous sentences ("unambiguous")	None	42	<u>N/A</u>	<u>N/A</u>
listening to ambiguous sentences with dominant resolution ("dominant")	None	42	<u>N/A</u>	<u>N/A</u>
listening to ambiguous sentences with subordinate resolution ("subordinate")	None	42	<u>N/A</u>	<u>N/A</u>
listening to filler sentences	None	126	N/A	<u>N/A</u>
listening to "musical rain"	None	42	N/A	N/A
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>
Conditions notes	_			

Yes

Yes

Contrasts

Are the contrasts clearly described?

## Contrast 1: listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")

Language condition	Listening to ambiguous sentences (dominant and subordinate)
Control condition	Listening to unambiguous sentences ("unambiguous")
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and	N/A, no behavioral measure

control tasks for all relevant groups?	
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Somewhat</u>
Are activations lateralized in the control data?	Yes
Control activation notes	L frontal and parietal; R frontal (but L > R); no L temporal
Contrast notes	-

# Contrast 2: listening to ambiguous sentences with dominant resolution ("dominant") vs listening to unambiguous sentences ("unambiguous")

Language condition	Listening to ambiguous sentences with dominant resolution ("dominant")
Control condition	Listening to unambiguous sentences ("unambiguous")
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, no behavioral measure
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	Yes
Control activation notes	L frontal and parietal; no L temporal
Contrast notes	-

# Contrast 3: listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to unambiguous sentences ("unambiguous")

Language condition	Listening to ambiguous sentences with subordinate resolution ("subordinate")
Control condition	Listening to unambiguous sentences ("unambiguous")
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, no behavioral measure
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Yes
Control activation notes	L frontal, temporal and parietal, R frontal (but L > R)
Contrast notes	-

# Contrast 4: listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to ambiguous sentences with dominant resolution ("dominant")

dominant resolution ("dominant")	
Language condition	Listening to ambiguous sentences with subordinate resolution ("subordinate")
Control condition	Listening to ambiguous sentences with dominant resolution ("dominant")
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, no behavioral measure</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Yes
Control activation notes	L frontal and temporal
Contrast notes	_
Analyses	
- Are the analyses clearly described?	Yes
/oxelwise analysis 1	
First level contrast	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Plausible fronto-temporo-parietal language regions
Correction for multiple comparisons	No direct comparison
Software	SPM5
√oxelwise p	-
Cluster extent	-
	Qualitative comparison on p. 423
Statistical details	Qualitative comparison on p. 423 ↓ L IFG
Statistical details Findings	
Statistical details Findings Findings notes	
Statistical details Findings Findings notes <b>Yoxelwise analysis 2</b>	↓ L IFG — Listening to ambiguous sentences with dominant resolution ("dominant") vs listening to
Statistical details Findings Findings notes <b>/oxelwise analysis 2</b> First level contrast	<ul> <li>↓ L IFG</li> <li>—</li> <li>Listening to ambiguous sentences with dominant resolution ("dominant") vs listening to unambiguous sentences ("unambiguous")</li> </ul>
Statistical details Findings Findings notes Foxelwise analysis 2 First level contrast Analysis class	↓ L IFG — Listening to ambiguous sentences with dominant resolution ("dominant") vs listening to
Statistical details Findings Findings notes <b>/oxelwise analysis 2</b> First level contrast Analysis class Group(s) Covariate	<ul> <li>↓ L IFG</li> <li>—</li> <li>Listening to ambiguous sentences with dominant resolution ("dominant") vs listening to unambiguous sentences ("unambiguous")</li> <li>Cross-sectional aphasia vs control</li> </ul>

group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Plausible fronto-temporo-parietal language regions
Correction for multiple comparisons	No direct comparison
Software	SPM5
Voxelwise p	_
Cluster extent	_
Statistical details	Qualitative comparison on p. 423
Findings	↓ L IFG
Findings notes	_
Voxelwise analysis 3	
First level contrast	Listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to unambiguous sentences ("unambiguous")
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Plausible fronto-temporo-parietal language regions
Correction for multiple comparisons	No direct comparison
Software	SPM5
Voxelwise p	-
Cluster extent	-
Statistical details	Qualitative comparison on p. 423
Findings	↓ L IFG
Findings notes	Lack of patient activation in pMTG implied in text, but this activation looks fairly similar in patients and controls (c.f. Figure 3C vs 2C)
Voxelwise analysis 4	
First level contrast	Listening to ambiguous sentences with subordinate resolution ("subordinate") vs listening to ambiguous sentences with dominant resolution ("dominant")
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Plausible fronto-temporo-parietal language regions
Correction for multiple comparisons	<u>No direct comparison</u>

Software	SPM5
Voxelwise p	_
Cluster extent	_
Statistical details	Qualitative comparison on p. 423
Findings	↓ L IFG ↓ L posterior MTG
Findings notes	-
Voxelwise analysis 5	
First level contrast	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Performance on acceptability judgment task (difference in percent of unacceptable judgments between ambiguous and unambiguous sentences)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Plausible fronto-temporo-parietal language regions
Correction for multiple comparisons	<u>Clusterwise correction with with GRFT and lenient voxelwise p</u>
Software	SPM5
Voxelwise p	.01
Cluster extent	Based on GRFT
Statistical details	_
Findings	↑ L IFG pars triangularis ↑ L IFG pars orbitalis ↑ R insula ↑ R mid temporal
Findings notes	Also L pMTG but this did not reach significance
Voxelwise analysis 6	
First level contrast	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Performance on sentence-picture matching task
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Plausible fronto-temporo-parietal language regions
Correction for multiple comparisons	<u>Clusterwise correction based on arbitrary cluster extent</u>
Software	SPM5
Voxelwise p	.01
Cluster extent	30 (units not stated)
Statistical details	_
Findings	↑ L IFG pars orbitalis

	↑ L posterior MTG ↑ R insula ↑ R posterior STG ↑ R mid temporal
Findings notes	_
/oxelwise analysis 7	
First level contrast	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Performance on word monitoring task
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	N/A, no behavioral measure
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Plausible fronto-temporo-parietal language regions
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM5
Voxelwise p	.05
Cluster extent	10 (units not stated)
Statistical details	_
Findings	↑ L IFG pars orbitalis ↑ L posterior MTG ↑ R insula ↑ R mid temporal
Findings notes	— · · · · · · · · · · · · · · · · · · ·
Voxelwise analysis 8	
First level contrast	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Difference in percent of unacceptable judgments between subordinate and dominant sentences (dominance effect)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Plausible fronto-temporo-parietal language regions
Correction for multiple comparisons	Clusterwise correction with with GRFT and lenient voxelwise p
Software	SPM5
Voxelwise p	
	.01
Cluster extent	.01 Based on GRFT
Cluster extent Statistical details	

First level contrast	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Performance on acceptability judgment task (difference in percent of unacceptable judgments between ambiguous and unambiguous sentences)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	3
What are the ROI(s)?	(1) IFG pars opercularis; (2) IFG pars triangularis; (3) IFG pars orbitalis
How are the ROI(s) defined?	AAL
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↑ L IFG pars triangularis ↑ L IFG pars orbitalis
Findings notes	-

### ROI analysis 2

First level contrast	Listening to ambiguous sentences (dominant and subordinate) vs listening to unambiguous sentences ("unambiguous")
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Difference in percentage of unacceptable judgments between subordinate and dominant sentences (dominance effect)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	N/A, no behavioral measure
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	3
What are the ROI(s)?	(1) IFG pars opercularis; (2) IFG pars triangularis; (3) IFG pars orbitalis
How are the ROI(s) defined?	AAL
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-
Notes	

Excluded analyses

It is mentioned in the supplementary material that there was no correlation between activation and lexical (non-syntactic) errors

# Weiduschat et al. (2011)

## Reference

Authors	Weiduschat N, Thiel A, Rubi-Fessen I, Hartmann A, Kessler J, Merl P, Kracht L, Rommel T, Heiss WD
Title	Effects of repetitive transcranial magnetic stimulation in aphasic stroke: a randomized controlled pilot study
Reference	<i>Stroke</i> 2011; 42: 409-415
PMID	21164121
DOI	10.1161/strokeaha.110.597864

## Participants

Language	German
Inclusion criteria	Age 55-85
Number of individuals with aphasia	<u>10</u> (plus 4 excluded: 3 malfunction of TMS device or claustrophobia; 1 recovered nearly completely prior to intervention)
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (range 59-83 years)
ls sex reported for patients and controls, and matched?	Yes (males: 5; females: 5)
Is handedness reported for patients and controls, and matched?	Yes (right: 10; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 18-97 days; patients at different subacute stages of recovery)
To what extent is the nature of aphasia characterized?	<u>Type only</u>
Language evaluation	AAT
Aphasia severity	T1: TT range 0-45 errors; T2: TT range 0-44 errors
Aphasia type	T1: 5 Wernicke's, 2 Broca's, 2 global, 1 amnestic fluent; T2: not stated
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Extent and location
Lesion extent	Range 0.7-88.9 cc
Lesion location	L MCA
Participants notes	-

## Imaging

Modality	PET (rCBF)
Is the study cross-sectional or longitudinal?	Longitudinal—mixed
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/subacute (range 18-97 days post onset); T2: post-treatment, ~2 weeks later
If longitudinal, was there any intervention between the time points?	Individualized SLT, 45 minutes/day, 5 days/week, 2 weeks; 6 patients underwent rTMS to the R IFG pars triangularis; 4 received vertex (sham) rTMS
Is the scanner described?	Yes (CTI-Siemens ECAT EXACT HR)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	PET
Total images acquired	8
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes

Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-

#### Conditions

Are the conditions clearly described?

Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?	
verb generation	Word (covert)	4	<u>Unknown</u>	Unknown	
rest	None	4	<u>N/A</u>	N/A	
Conditions notes	-				
Contrasts					
Are the contrasts clearly described?	Yes				
Contrast 1: verb generation vs rest					
Language condition	Verb generation				
Control condition	Rest				
Are the conditions matched for visual demands?	Yes				
Are the conditions matched for auditory demands?	No				
Are the conditions matched for motor demands?	Yes				
Are the conditions matched for cognitive/executive demands?	No				
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparab</u>	le			
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparab</u>	le			
Behavioral data notes	_				
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>				
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Unknown</u>				
Are activations lateralized in the control data?	Unknown				
Control activation notes	Control data in Herholz e	t al. (1996); insu	fficient to fully validate th	e contrast	
Contrast notes	_				
Analyses					
Are the analyses clearly described?	Yes				
ROI analysis 1					
First level contrast	Verb generation vs rest				
Analysis class	Longitudinal change in a	ohasia			
Group(s)	Aphasia T2 vs T1 (regardless of rTMS)				
Covariate		···,			
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes				
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>				
contrast:					
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>				
Is reaction time matched across the second level	<u>Unknown, not reported</u> —				
Is reaction time matched across the second level contrast?	Unknown, not reported — Regions of interest (ROI)				

How many ROIs are there?	3
What are the ROI(s)?	(1) IFG LI; (2) superior temporal LI; (3) SMA LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	_
ROI analysis 2	
First level contrast	Verb generation vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia treated with rTMS (n = 6) T2 vs T1
Covariate	
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	3
What are the ROI(s)?	(1) IFG LI; (2) superior temporal LI; (3) SMA LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	
Findings	None
Findings notes	_
ROI analysis 3	
First level contrast	Verb generation vs rest
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia with R IFG rTMS (n = 6) T2 vs T1) vs (with sham rTMS (n = 4) T2 vs T1)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level	Unknown, not reported
contrast?	
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	3
What are the ROI(s)?	(1) IFG Ll; (2) superior temporal Ll; (3) SMA Ll
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↑ LI (frontal)
Findings notes	IFG LI was stable in the stimulation group, but shifted to the R in the sham group, yielding a significant difference between groups
ROI analysis 4	
First level contrast	Verb generation vs rest

Analysis class	Longitudinal correlation with language or other measure
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1 (regardless of rTMS)
Covariate	Δ AAT total score
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Region of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	1
What are the ROI(s)?	IFG LI
How are the ROI(s) defined?	
Correction for multiple comparisons	One only
Statistical details	-
Findings	None
Findings notes	-
Notes	

Excluded analyses

(1) difference between groups at T1 (pre-treatment); (2) sham group T2 vs T1 (n = 4)

## Allendorfer et al. (2012)

#### Reference

Authors	Allendorfer JB, Kissela BM, Holland SK, Szaflarski JP
Title	Different patterns of language activation in post-stroke aphasia are detected by overt and covert versions of the verb generation fMRI task
Reference	Med Sci Monit 2012; 18: CR135-147
PMID	22367124
DOI	10.12659/msm.882518

## Participants

Language	US English
Inclusion criteria	MCA; moderate-severe aphasia; mRS ≤ 3
Number of individuals with aphasia	<u>16</u>
Number of control participants	32
Were any of the participants included in any previous studies?	Yes ("part of a larger ongoing study", may overlap with other studies from this group)
Is age reported for patients and controls, and matched?	Yes (mean 54.4 $\pm$ 9.5 years, range 38-78 years)
Is sex reported for patients and controls, and matched?	Yes (males: 9; females: 7)
Is handedness reported for patients and controls, and matched?	Yes (right: 16; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean $3.7 \pm 3.5$ years, range 0.5-11.4 years)
To what extent is the nature of aphasia characterized?	Severity and type
Language evaluation	TT, PPVT, BNT, semantic and phonemic fluency, complex ideation subtest of BDAE
Aphasia severity	Moderate-severe; TT mean 25.5 $\pm$ 11.3; unclear how to reconcile moderate-severe severity with mostly anomic aphasia

Aphasia type First stroke only?	Mostly anomic with some non-fluent Not stated
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Range 2.8-248.9 cc
Lesion location	L MCA
Participants notes	-

#### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	<u>No</u> (Phillips 3 Tesla; model not stated)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Mixed
Total images acquired	435
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	No (no description of HRF model, which is important given sparse sampling design)
Is intersubject normalization adequately described and appropriate?	<u>No</u> (lesion impact not addressed)
Imaging notes	sparse sampling
Conditions	

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?	
verb generation (overt, event-related)	Multiple words (overt)	15	Yes	<u>Unknown</u>	
verb generation (covert, event-related)	Multiple words (covert)	15	<u>Unknown</u>	<u>Unknown</u>	
noun repetition (event-related)	Multiple words (overt)	15	Yes	<u>Unknown</u>	
verb generation (covert, block)	Multiple words (covert)	10	<u>Unknown</u>	<u>Unknown</u>	
finger tapping (block)	Other	10	<u>Unknown</u>	<u>Unknown</u>	
Conditions notes		Given the means and standard deviations presented, it is likely that some patients could not perform some tasks; post-scan recognition tests not considered to quantify performance			

#### Contrasts

Are the contrasts clearly described?

#### Yes

Yes

#### Contrast 1: verb generation (covert, block) vs finger tapping (block)

Language condition	Verb generation (covert, block)
Control condition	Finger tapping (block)
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No

Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Yes
Control activation notes	Strongly lateralized frontal and temporal activation
Contrast notes	-

#### Contrast 2: verb generation (overt, event-related) vs noun repetition (event-related)

Language condition	Verb generation (overt, event-related)
Control condition	Noun repetition (event-related)
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Appear mismatched</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Somewhat</u>
Are activations lateralized in the control data?	Somewhat
Control activation notes	Somewhat L-lateralized frontal, temporal and parietal activations, but also extensive midline activation
Contrast notes	-

## Contrast 3: verb generation (overt, event-related) vs verb generation (covert, event-related)

Language condition	Verb generation (overt, event-related)
Control condition	Verb generation (covert, event-related)
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	N/A
Control activation notes	Bilateral speech motor activations, but also extensive midline activation
Contrast notes	-

#### Analyses

Analyses	
Are the analyses clearly described?	Yes
ROI analysis 1	
First level contrast	Verb generation (covert, block) vs finger tapping (block)
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	2
What are the ROI(s)?	(1) frontal Ll; (2) temporal Ll
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↓ LI (temporal)
Findings notes	-
ROI analysis 2	
First level contrast	Verb generation (overt, event-related) vs noun repetition (event-related)
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Patients less accurate and produced less responses on both conditions, but the difference

Findings notes

Findings

Statistical details

Type of analysis

How many ROIs are there?

How are the ROI(s) defined? Correction for multiple comparisons

What are the ROI(s)?

ROI type

## ROI analysis 3

First level contrast	Verb generation (overt, event-related) vs verb generation (covert, event-related)
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes

between groups was greater for verb generation

Regions of interest (ROI)

(1) frontal LI; (2) temporal LI

Laterality indi(ces)

No correction

↓ LI (frontal)

2

\_

Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Overt performance differed, so covert performance probably did too
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	2
What are the ROI(s)?	(1) frontal LI; (2) temporal LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	
Findings	None
Findings notes	Lack of lateralization in controls makes this analysis difficult to interpret
ROI analysis 4	
First level contrast	Verb generation (overt, event-related) vs noun repetition (event-related)
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Overt verb generation accuracy
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	3
What are the ROI(s)?	(1) L MTG; (2) L SFG/CG; (3) left MFG
How are the ROI(s) defined?	Regions activated by the contrast of overt verb generation vs noun repetition in patients
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↑ L dorsolateral prefrontal cortex ↑ L SMA/medial prefrontal
Findings notes	_
ROI analysis 5	
First level contrast	Verb generation (overt, event-related) vs verb generation (covert, event-related)
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Overt verb generation accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	2
What are the ROI(s)?	2 (1) R insula/IFG; (2) R STG
How are the ROI(s) defined?	Prominent R hemisphere activations for the contrast of overt and covert verb generation in
	romment when sphere activations for the contrast of overt and covert verb generation in

	patients
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	_
Neter	
Notes	
Excluded analyses	Analysis of LI distribution (left/right/bilateral) yielded similar results

# Fridriksson, Hubbard, et al. (2012)

#### Reference

Authors	Fridriksson J, Hubbard HI, Hudspeth SG, Holland AL, Bonilha L, Fromm D, Rorden C
Title	Speech entrainment enables patients with Broca's aphasia to produce fluent speech
Reference	Brain 2012; 135: 3815-3829
PMID	23250889
DOI	10.1093/brain/aws301

## Participants

Language	US English
Inclusion criteria	Broca's aphasia
Number of individuals with aphasia	<u>10</u> (plus 3 excluded: 1 due to a metal implant; 2 for severely non-fluent speech)
Number of control participants	20
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 56.9 ± 9.2 years, range 45-75 years)
Is sex reported for patients and controls, and matched?	No (males: 9; females: 4; control sex not matched)
Is handedness reported for patients and controls, and matched?	Yes (right: 12; left: 1)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 63.8 ± 64.3 months, range 10-261 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	WAB, BNT, AoS from ABA
Aphasia severity	AQ mean 48.5 ± 20.6, range 20.9-73.5
Aphasia type	Broca's
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L MCA
Participants notes	Demographic data includes excluded patients

## Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	-
If longitudinal, was there any intervention between the time points?	-

Is the scanner described?	<u>No</u> (Siemens 3 Tesla; model not stated)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No* (moderate limitation)</u> (it appears that each of the three conditions was presented in a separate run)
Design type	Event-related
Total images acquired	180?
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	No (not described clearly)
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	sparse sampling

### Conditions

Are the conditions clearly described?

No (rest condition implied but not described)

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
listening to/watching audiovisual sentences, while producing the same sentences in unison (speech entrainment)	Sentence (overt)	30 (?)	Yes	<u>Unknown</u>
listening to reversed sentences and viewing a mouth speaking, while producing unrelated sentences	Sentence (overt)	30 (?)	Yes	<u>Unknown</u>
listening to/watching audiovisual sentences and viewing a mouth	None	30 (?)	<u>N/A</u>	<u>N/A</u>
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>

Conditions notes

Contrasts

Are the contrasts clearly described?

No (see specific limitation(s) below)

Contrast 1: listening to/watching audiovisual sentences, while producing the same sentences in unison (speech entrainment) vs listening to reversed sentences and viewing a mouth speaking, while producing unrelated sentences

Language condition	Listening to/watching audiovisual sentences, while producing the same sentences in unison (speech entrainment)
Control condition	Listening to reversed sentences and viewing a mouth speaking, while producing unrelated sentences
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	Behavioral data outside the scanner suggest not matched, but in-scanner behavioral data not reported
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	No

Control activation notes	Control and patient data are combined; this contrast activates bilateral anterior insula and posterior MTG, slightly more extensive on the L
Contrast notes	_

### Contrast 2: listening to/watching audiovisual sentences, while producing the same sentences in unison (speech entrainment) vs rest

Language condition	Listening to/watching audiovisual sentences, while producing the same sentences in unison (speech entrainment)
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	Rest condition implied but not explicitly described

### Contrast 3: listening to reversed sentences and viewing a mouth speaking, while producing unrelated sentences vs rest

Language condition	Listening to reversed sentences and viewing a mouth speaking, while producing unrelated sentences
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	Rest condition implied but not explicitly described

### Contrast 4: listening to/watching audiovisual sentences and viewing a mouth vs rest

Language condition	Listening to/watching audiovisual sentences and viewing a mouth
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No

Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, no behavioral measure</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Unknown</u>
Are activations lateralized in the control data?	Unknown
Control activation notes	_
Contrast notes	Rest condition implied but not explicitly described
Analyses	
Are the analyses clearly described?	No** (major limitation) (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Listening to/watching audiovisual sentences, while producing the same sentences in unison (speech entrainment) vs listening to reversed sentences and viewing a mouth speaking, while producing unrelated sentences
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T1 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Unclear or not stated
Software	FSL (FEAT 5.98)
Voxelwise p	_
Cluster extent	_
Statistical details	Thresholding not stated
Findings	↑ L angular gyrus ↓ L anterior temporal
Findings notes	Based on coordinates in Table 2
Voxelwise analysis 2	
First level contrast	Listening to/watching audiovisual sentences, while producing the same sentences in unison (speech entrainment) vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain

Correction for multiple comparisons	<u>Unclear or not stated</u>
Software	FSL (FEAT 5.98)
Voxelwise p	_
Cluster extent	-
Statistical details	Thresholding not stated
Findings	<ul> <li>↑ L SMA/medial prefrontal</li> <li>↑ L anterior cingulate</li> <li>↑ R precuneus</li> <li>↑ R occipital</li> <li>↑ R hippocampus/MTL</li> <li>↓ L supramarginal gyrus</li> </ul>
Findings notes	Some labels changed based on coordinates
Voxelwise analysis 3	
First level contrast	Listening to reversed sentences and viewing a mouth speaking, while producing unrelated sentences vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Unclear or not stated
Software	FSL (FEAT 5.98)
Voxelwise p	_
Cluster extent	_
Statistical details	Thresholding not stated
Findings	None
Findings notes	_
Voxelwise analysis 4	
First level contrast	Listening to/watching audiovisual sentences and viewing a mouth vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	N/A, no behavioral measure
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Unclear or not stated
Software	FSL (FEAT 5.98)
Voxelwise p	_
Cluster extent	_
Statistical details	Thresholding not stated
Findings	None

Findings notes

## ROI analysis 1

2	
First level contrast	Listening to/watching audiovisual sentences, while producing the same sentences in unison (speech entrainment) vs listening to reversed sentences and viewing a mouth speaking, while producing unrelated sentences
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T1 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	6
What are the ROI(s)?	(1) L anterior insula/IFG pars orbitalis; (2) R anterior insula/IFG pars orbitalis; (3) Broca's area; (4) L MTG; (5) L BA 37; (6) R BA 37
How are the ROI(s) defined?	Regions activated in both groups considered together
Correction for multiple comparisons	No correction
Statistical details	There were no interactions of group by condition; two regions showed main effects of group but this is not pertinent to the contrast
Findings	None
Findings notes	-
Notes	

Excluded analyses

# Fridriksson, Richardson, et al. (2012)

### Reference

Authors	Fridriksson J, Richardson JD, Fillmore P, Cai B
Title	Left hemisphere plasticity and aphasia recovery
Reference	NeuroImage 2012; 60: 854-863
PMID	22227052
DOI	10.1016/j.neuroimage.2011.12.057

# Participants

Language	US English
Inclusion criteria	-
Number of individuals with aphasia	29 (plus 1 excluded: contraindications to MRI)
Number of control participants	14
Were any of the participants included in any previous studies?	Yes (26 of 30 patients were included in Fridriksson (2010))
ls age reported for patients and controls, and matched?	Yes (mean 59.2 years, range 33-81 years)
ls sex reported for patients and controls, and matched?	<u>No</u> (males: 14; females: 16; not stated for controls)
Is handedness reported for patients and controls, and matched?	No

Is time post stroke onset reported and appropriate to the study design?	Yes (mean 51.1 months,	range 6-350 mor	nths)	
To what extent is the nature of aphasia characterized?	Severity and type			
Language evaluation	WAB			
Aphasia severity	AQ mean 57.9 ± 25.8, range 17.2-95.2			
Aphasia type	13 Broca's, 10 anomic, 3	conduction, 2 We	ernicke's, 1 global, 1 trans	cortical motor
First stroke only?	Yes			
Stroke type	Mixed etiologies			
To what extent is the lesion distribution characterized?	Lesion overlay			
Lesion extent	Range 7.7-420.5 cc			
Lesion location	L MCA			
Participants notes	Demographic data inclue	des excluded pati	ient	
Imaging				
Modality	fMRI			
Is the study cross-sectional or longitudinal?	Longitudinal—chronic tr	eatment		
If longitudinal, at what time point(s) were imaging data acquired?		ne point, as well	ment/~4 weeks later; note as another two sessions n	that there were two nidway through treatment
If longitudinal, was there any intervention between the time points?	Anomia treatment using a cueing hierarchy, 3 hours/day, 5 days/week, 2 weeks, with a 1-week gap between the two weeks			
Is the scanner described?	Yes (Siemens Trio 3 Tesla)			
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	No (timing of stimuli within the silent periods is unclear)			
Design type	Event-related			
Total images acquired	120			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	Yes			
Is intersubject normalization adequately described and appropriate?	Yes			
Imaging notes	sparse sampling; 26 patients were also scanned with arterial spin labelling			
Conditions				
conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming	Word (overt)	80	Yes	Unknown
viewing abstract pictures	None	40	<u>N/A</u>	<u>N/A</u>
Conditions notes	_			
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: picture naming vs viewing abstract	pictures			
Language condition	Picture naming			
Control condition	Viewing abstract pictures	5		
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	No			

No

Are the conditions matched for motor demands?

Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	Somewhat
Control activation notes	Control data in Fridriksson et al. (2007); motor activations are prominent; there is some L frontal activation but little temporal activation in either hemisphere
Contrast notes	_
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
ROI analysis 1	
First level contrast	Picture naming vs viewing abstract pictures
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	Δ picture naming accuracy
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	3
What are the ROI(s)?	(1) perilesional L hemisphere language regions; (2) perilesional L hemisphere non-language regions; (3) undamaged non-perilesional L hemisphere language regions
How are the ROI(s) defined?	Based on individual lesions and control activation for picture naming
Correction for multiple comparisons	No correction
Statistical details	-
Findings	Other
Findings notes	Change in perilesional non-language regions positively correlated with improvement in accuracy
ROI analysis 2	
First level contrast	Picture naming vs viewing abstract pictures
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	$\Delta$ (decrease in) semantic errors
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	– Regions of interest (ROI)

ROI type	Other
How many ROIs are there?	3
What are the ROI(s)?	(1) perilesional L hemisphere language regions; (2) perilesional L hemisphere non-language regions; (3) undamaged non-perilesional L hemisphere language regions
How are the ROI(s) defined?	Based on individual lesions and control activation for picture naming
Correction for multiple comparisons	No correction
Statistical details	-
Findings	Other
Findings notes	Change in undamaged non-perilesional language regions negatively correlated with decrease in semantic errors

# ROI analysis 3

First level contrast	Picture naming vs viewing abstract pictures
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	$\Delta$ (decrease in) phonological paraphasias
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	3
What are the ROI(s)?	(1) perilesional L hemisphere language regions; (2) perilesional L hemisphere non-language regions; (3) undamaged non-perilesional L hemisphere language regions
How are the ROI(s) defined?	Based on individual lesions and control activation for picture naming
Correction for multiple comparisons	No correction
Statistical details	_
Findings	Other
Findings notes	Change in perilesional language regions, and change in undamaged non-perilesional language regions, negatively correlated with decrease in phonological paraphasias

# ROI analysis 4

First level contrast	Picture naming vs viewing abstract pictures
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Subsequent $\Delta$ (T2 vs T1) picture naming accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (T1 behavioral measure should be included in model)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	3
What are the ROI(s)?	(1) perilesional L hemisphere language regions; (2) perilesional L hemisphere non-language regions; (3) undamaged non-perilesional L hemisphere language regions
How are the ROI(s) defined?	Based on individual lesions and control activation for picture naming
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None

### Findings notes

#### **ROI** analysis 5

RUI analysis 5	
First level contrast	Picture naming vs viewing abstract pictures
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Subsequent $\Delta$ (T2 vs T1, decrease in) semantic errors
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (T1 behavioral measure should be included in model)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	3
What are the ROI(s)?	(1) perilesional L hemisphere language regions; (2) perilesional L hemisphere non-language regions; (3) undamaged non-perilesional L hemisphere language regions
How are the ROI(s) defined?	Based on individual lesions and control activation for picture naming
Correction for multiple comparisons	No correction
Statistical details	-
Findings	Other
Findings notes	Change in perilesional language regions correlated with decrease in phonological paraphasias
ROI analysis 6	
First level contrast	Picture naming vs viewing abstract pictures
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Subsequent $\Delta$ (T2 vs T1, decrease in) phonological paraphasias
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (T1 behavioral measure should be included in model)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	3
What are the ROI(s)?	(1) perilesional L hemisphere language regions; (2) perilesional L hemisphere non-language regions; (3) undamaged non-perilesional L hemisphere language regions
How are the ROI(s) defined?	Based on individual lesions and control activation for picture naming
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	_

### Notes

Excluded analyses

(1) breakdown of frontal, temporal and parietal components of masks, because stepwise regression <u>not described in sufficient detail</u>; (2) pASL rCBF predictors not task-based; (3) ancillary analyses based on total naming responses instead of accuracy; (4) ancillary analyses after excluding one patient

# Marcotte et al. (2012)

# Reference

Authors	Marcotte K, Adrover-Roig D, Damien B, de Préaumont M, Généreux S, Hubert M, Ansaldo Al
Title	Therapy-induced neuroplasticity in chronic aphasia
Reference	<i>Neuropsychologia</i> 2012; 50: 1776-1786
PMID	22564481
DOI	10.1016/j.neuropsychologia.2012.04.001

# Participants

•	
Language	Canadian French
Inclusion criteria	Moderate-severe aphasia; anomia
Number of individuals with aphasia	<u>9</u>
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean $62 \pm 6.0$ years, range 50-67 years)
Is sex reported for patients and controls, and matched?	Yes (males: 5; females: 4)
Is handedness reported for patients and controls, and matched?	Yes (right: 9; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 110.2 ± 92.5 months, range 50-300 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	Montreal-Toulouse Aphasia Battery, picture naming
Aphasia severity	Moderate-severe
Aphasia type	7 Broca's, 1 Broca's + AoS, 1 Wernicke's + AoS
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Range 14.6-295.8 cc
Lesion location	L MCA
Participants notes	-

# Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, 3-6 weeks later (after 80% performance on trained items, or 6 weeks)
If longitudinal, was there any intervention between the time points?	Semantic feature analysis, 1 hour/day, 3 days/week, 3-6 weeks
Is the scanner described?	Yes (Siemens Trio 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No</u> (total images acquired not stated)
Design type	Event-related
Total images acquired	not stated
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described	<u>No</u> (lesion impact not addressed)

and appropriate?			
Imaging notes	—		

### Conditions

Are the conditions clearly described?

Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming (already known items)	Word (overt)	20	Yes	Yes
picture naming (trained items)	Word (overt)	20	<u>No</u>	No
picture naming (untrained items)	Word (overt)	40	<u>No</u>	No
viewing scrambled images and saying "baba"	Word (overt)	20	Yes	Yes
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>

Conditions notes

#### Contrasts

```
Are the contrasts clearly described?
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No (see specific limitation(s) below)

### Contrast 1: picture naming (T1: known items; T2: trained items; correct trials) vs viewing scrambled images and saying "baba"

Language condition	Picture naming (T1: known items; T2: trained items; correct trials)
Control condition	Viewing scrambled images and saying "baba"
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	Yes, correct trials only
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	Different contrasts at different time points not clearly explained

### Contrast 2: picture naming (known items, correct trials) vs viewing scrambled images and saying "baba"

Language condition	Picture naming (known items, correct trials)
Control condition	Viewing scrambled images and saying "baba"
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	Yes, correct trials only
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	No

Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown	
Are activations lateralized in the control data?	Unknown	
Control activation notes		
Contrast notes	Different contrasts at different time points not clearly explained	
Contrast 3: picture naming (trained items, corr	ect trials) vs viewing scrambled images and saying "baba"	
Language condition	Picture naming (trained items, correct trials)	
Control condition	Viewing scrambled images and saying "baba"	
Are the conditions matched for visual demands?	Yes	
Are the conditions matched for auditory demands?	Yes	
Are the conditions matched for motor demands?	Yes	
Are the conditions matched for cognitive/executive	No	
demands?		
Is accuracy matched between the language and control tasks for all relevant groups?	Yes, correct trials only	
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>	
Behavioral data notes	_	
Are control data reported in this paper or another that is referenced?	No	
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown	
Are activations lateralized in the control data?	Unknown	
Control activation notes	_	
Contrast notes	Different contrasts at different time points not clearly explained	
Analyses		
Are the analyses clearly described?	No (see specific limitation(s) below)	
Voxelwise analysis 1		
First level contrast	Picture naming (T1: known items; T2: trained items; correct trials) vs viewing scrambled images and saying "baba"	
Analysis class	Longitudinal change in aphasia	
Group(s)	Aphasia T2 vs T1	
Covariate	-	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes	
Is accuracy matched across the second level contrast?	Yes, correct trials only	
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>	
Behavioral data notes	_	
Type of analysis	Voxelwise	
Search volume	Whole brain	
Correction for multiple comparisons	No direct comparison	
Software	SPM5	
Voxelwise p	-	
Cluster extent	-	
Statistical details	Qualitative comparison on p. 1780; <u>different contrasts at different time points not clearly</u> <u>explained</u>	
Findings	↑ L supramarginal gyrus ↓ L dorsal precentral ↓ L posterior MTG	
Findings notes	Labels based on figures rather than text	

# Voxelwise analysis 2

VOXEIWISE dilatysis 2	
First level contrast	Picture naming (known items, correct trials) vs viewing scrambled images and saying "baba"
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Subsequent $\Delta$ (T2 vs T1) naming of trained items
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (T1 behavioral measure should be included in model)
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM5
Voxelwise p	.005
Cluster extent	10 voxels (size not stated)
Statistical details	Different contrasts at different time points not clearly explained
Findings	<ul> <li>↑ L dorsolateral prefrontal cortex</li> <li>↑ L SMA/medial prefrontal</li> <li>↑ L somato-motor</li> <li>↑ L anterior cingulate</li> <li>↑ R dorsolateral prefrontal cortex</li> <li>↑ R somato-motor</li> <li>↑ R thalamus</li> </ul>
Findings notes	Labels based on figures and text
Voxelwise analysis 3	
First level contrast	Picture naming (trained items, correct trials) vs viewing scrambled images and saying "baba"
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T2
Covariate	Previous $\Delta$ (T2 vs T1) naming of trained items
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>No</u> (T2 activation not an appropriate measure of treatment-induced recovery because it reflects T2 performance)
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM5
Voxelwise p	.005
Cluster extent	10 voxels (size not stated)
Statistical details	Different contrasts at different time points not clearly explained
Findings	↑ L somato-motor
T IT UITIgs	
Findings notes	Label based on figure
-	

# Schofield et al. (2012)

# Reference

Authors	Schofield TM, Penny WD, Stephan KE, Crinion JT, Thompson AJ, Price CJ, Leff AP
Title	Changes in auditory feedback connections determine the severity of speech processing deficits after stroke
Reference	J Neurosci 2012; 32: 4260-4270
PMID	22442088
DOI	10.1523/jneurosci.4670-11.2012

# Participants

Language	UK English
Inclusion criteria	Comprehension deficit
Number of individuals with aphasia	20 (plus 1 excluded: excessive head motion)
Number of control participants	26
Were any of the participants included in any previous studies?	Yes (patients recruited from database so may have participated in prior studies from this group, but not stated explicitly)
Is age reported for patients and controls, and matched?	Yes (range 35.8-90.3 years)
ls sex reported for patients and controls, and matched?	<u>No</u> (males: 16; females: 4; control sex not stated)
Is handedness reported for patients and controls, and matched?	No
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 3.5 years, range 0.6-8.6 years)
To what extent is the nature of aphasia characterized?	<u>Severity only</u>
Language evaluation	CAT
Aphasia severity	11 patients (plus one excluded) had moderate comprehension impairments, 9 had severe comprehension impairments; this distribution was bimodal
Aphasia type	Not stated
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Range 24.2-403.6 cc
Lesion location	L MCA
Participants notes	Demographic data includes excluded patient

# Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (Siemens Sonata 1.5 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Block
Total images acquired	488
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (mostly whole brain but convexity or cerebellum excluded in some participants)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and	Yes

and appropriate?	appropriate?			
maging notes —	Is intersubject normalization adequately described and appropriate?	Yes		
	Imaging notes	—		

## Conditions

Are the conditions clearly described?

Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
listening to word pairs, speaker gender judgment	Button press	18	Yes	Unknown
listening to reversed word pairs, speaker gender judgment	Button press	18	Yes	<u>Unknown</u>
rest	None	40 (?)	<u>N/A</u>	<u>N/A</u>
Conditions notes	_			

### Contrasts

Are the contrasts clearly	/ described?
ALE LITE COTILIASIS CIERTI	/ UESCHDEU:

### Contrast 1: listening to word pairs or reversed word pairs, speaker gender judgment vs rest

Yes

Language condition	Listening to word pairs or reversed word pairs, speaker gender judgment
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	No
Control activation notes	Control data in Leff et al. (2008); auditory contrast, not intended to be language contrast
Contrast notes	-

### Contrast 2: listening to word pairs, speaker gender judgment vs listening to reversed word pairs, speaker gender judgment

Language condition	Listening to word pairs, speaker gender judgment
Control condition	Listening to reversed word pairs, speaker gender judgment
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	Behavioral data not separated by condition
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible	Somewhat

relevant language regions in the control group?	
Are activations lateralized in the control data?	Yes
Control activation notes	Control data in Leff et al. (2008); L-lateralized activation of posterior STS
Contrast notes	_
Analyses	
Are the analyses clearly described?	No** (major limitation) (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Listening to word pairs or reversed word pairs, speaker gender judgment vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Moderate aphasia (n = 11) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM8
Voxelwise p	.001
Cluster extent	None
Statistical details	-
Findings	↓ L Heschl's gyrus
Findings notes	Structurally, HG was not significantly damaged in this group
Voxelwise analysis 2	
First level contrast	Listening to word pairs or reversed word pairs, speaker gender judgment vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Severe aphasia (n = 9) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	<u>Mixed** (major limitation)</u>
Software	SPM8
Voxelwise p	MGB: SVC; elsewhere: .001
Cluster extent	None
Statistical details	-
Findings	↓ L posterior STG ↓ L Heschl's gyrus ↓ L thalamus
Findings notes	Specifically: PT, HG and MGB; structurally, the PT and HG were significantly damaged, but not the MGB

### Voxelwise analysis 3

First level contrast	Listening to word pairs or reversed word pairs, speaker gender judgment vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Severe (n = 9) vs moderate (n = 11) aphasia
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM8
Voxelwise p	.001
Cluster extent	None
Statistical details	_
Findings	↓ L posterior STG
Findings notes	Specifically, PT; structurally, severe patients had more damage in HG and PT
Notes	
Excluded analyses	Intelligibility contrasts, because <u>findings are unclear: statements of significance in the text do</u> <u>not match Table 5</u> ; DCM analyses (which are the main focus of the paper)

# Wright et al. (2012)

### Reference

Authors	Wright P, Stamatakis EA, Tyler LK
Title	Differentiating hemispheric contributions to syntax and semantics in patients with left- hemisphere lesions
Reference	J Neurosci 2012; 32: 8149-8157
PMID	22699896
DOI	10.1523/jneurosci.0485-12.2012

# Participants

Language	UK English
Inclusion criteria	-
Number of individuals with aphasia	<u>21</u>
Number of control participants	21
Were any of the participants included in any previous studies?	Yes (unclear how many, if any, patients were included in previous studies from this group; design is identical to Tyler et al. (2010))
Is age reported for patients and controls, and matched?	Yes (mean 57.4 ± 12.5 years)
Is sex reported for patients and controls, and matched?	Yes (males: 15; females: 6)
Is handedness reported for patients and controls, and matched?	Yes (right: 21; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 6.5 ± 7.5 years, > 1.4 years)
To what extent is the nature of aphasia characterized?	Not at all
Language evaluation	Sentence-picture matching

Aphasia severity	Not stated
Aphasia type	Not stated
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L MCA
Participants notes	3 of the 21 patients were not stroke, but were post resective surgery

#### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (Siemens Trio 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No* (moderate limitation)</u> (there was only one block per condition per run, so condition could be confounded with low frequency drift; also, the length of the sentences is not stated so it is unclear how well the HRF peak aligns with the sparse acquisitions)
Design type	Block
Total images acquired	69
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	sparse sampling

### Conditions

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
listening to normal sentences and detecting a target word	Button press	2	Yes	Yes
listening to grammatical but meaningless sentences and detecting a target word	Button press	2	Yes	Yes
listening to scrambled sentences and detecting a target word	Button press	2	Yes	Yes
listening to "musical rain" and detecting a period of white noise	Button press	2	Yes	Yes
rest	None	2	<u>N/A</u>	<u>N/A</u>

Conditions notes

Auditory presentation; target detection task with early and late targets; 12-15 trials per block with single sparse acquisition each, but only one block of each condition per run, in fixed order

#### Contrasts

Are the contrasts clearly described?

Contrast 1: listening to normal sentences and detecting a target word vs rest

Yes

Yes

Language condition

Listening to normal sentences and detecting a target word

Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	No
Control activation notes	Bilateral superior temporal, sensorimotor and visual
Contrast notes	-

## Contrast 2: listening to grammatical but meaningless sentences and detecting a target word vs rest

Language condition	Listening to grammatical but meaningless sentences and detecting a target word
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	-
Analyses	
Analyses Are the analyses clearly described?	Yes
-	Yes
Are the analyses clearly described?	Yes Listening to normal sentences and detecting a target word vs rest
Are the analyses clearly described?	
Are the analyses clearly described? Voxelwise analysis 1 First level contrast	Listening to normal sentences and detecting a target word vs rest
Are the analyses clearly described? Voxelwise analysis 1 First level contrast Analysis class	Listening to normal sentences and detecting a target word vs rest Cross-sectional aphasia vs control
Are the analyses clearly described? Voxelwise analysis 1 First level contrast Analysis class Group(s)	Listening to normal sentences and detecting a target word vs rest Cross-sectional aphasia vs control
Are the analyses clearly described? Voxelwise analysis 1 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the	Listening to normal sentences and detecting a target word vs rest Cross-sectional aphasia vs control Aphasia vs control —
Are the analyses clearly described? Voxelwise analysis 1 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level	Listening to normal sentences and detecting a target word vs rest Cross-sectional aphasia vs control Aphasia vs control — Yes
Are the analyses clearly described? Voxelwise analysis 1 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level	Listening to normal sentences and detecting a target word vs rest Cross-sectional aphasia vs control Aphasia vs control — Yes Yes, matched
Are the analyses clearly described? Voxelwise analysis 1 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast?	Listening to normal sentences and detecting a target word vs rest Cross-sectional aphasia vs control Aphasia vs control — Yes Yes, matched

Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM5
Voxelwise p	.01
Cluster extent	-
Statistical details	-
Findings	↓ L posterior STG/STS/MTG ↓ L Heschl's gyrus ↓ L mid temporal
Findings notes	At a more stringent threshold of p < .001, with correction for multiple comparisons based on GRFT and cluster extent, only L HG showed reduced activity in patients
Complex analysis 1	
First level contrast	Listening to normal sentences and detecting a target word vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	See statistical details
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Complex
Statistical details	Joint ICA was performed on structural and functional contrast images for each of the two contrasts using FIT 2.0b. Seven components were derived, of which 2 were further investigated since their loadings correlated with relevant behavioral measures. Functional components were thresholded at p < .001, cluster-corrected for multiple comparisons, minimum cluster extent = 1.27 cc. Component 1 was considered a "semantics component" because it correlated with the semantic behavioral measure and not with either of the two syntactic measures. This component did not have any anatomical aspect to it. Component 2 was considered a "syntax component" because it correlated with the semantic measure. This conceptualization seems somewhat speculative, given that WPE NP and WPE AP are rather indirect measures of syntactic and semantic processing. Component 2 involved damage to left frontal and insular cortex, and underlying dorsal white matter.
Findings	Other
Findings notes	Contrast 1 loaded primarily on the R STG for component 1 (the "semantics component") and on the L ITG for component 2 (the "syntax component").

# Complex analysis 2

First level contrast	Listening to grammatical but meaningless sentences and detecting a target word vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	See statistical details
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Complex
Statistical details	Joint ICA was performed on structural and functional contrast images for each of the two contrasts using FIT 2.0b. Seven components were derived, of which 2 were further

contrasts using FIT 2.0b. Seven components were derived, of which 2 were further investigated since their loadings correlated with relevant behavioral measures. Functional

	components were thresholded at p < .001, cluster-corrected for multiple comparisons, minimum cluster extent = 1.27 cc. Component 1 was considered a "semantics component" because it correlated with the semantic behavioral measure and not with either of the two syntactic measures. This component did not have any anatomical aspect to it. Component 2 was considered a "syntax component" because it correlated with both syntactic behavioral measures and not with the semantic measure. This conceptualization seems somewhat speculative, given that WPE NP and WPE AP are rather indirect measures of syntactic and semantic processing. Component 2 involved damage to left frontal and insular cortex, and underlying dorsal white matter.
Findings	Other
Findings notes	Contrast 2 loaded primarily on the R posterior STG for component 1 (the "semantics component") and on the L posterior STG and L IFG for component 2 (the "syntax component").
Notes	

Excluded analyses

# Szaflarski et al. (2013)

# Reference

Authors	Szaflarski JP, Allendorfer JB, Banks C, Vannest J, Holland SK
Title	Recovered vs. not-recovered from post-stroke aphasia: the contributions from the dominant and non-dominant hemispheres
Reference	Restor Neurol Neurosci 2013; 31: 347-360
PMID	23482065
DOI	10.3233/rnn-120267

# Participants

Language	US English
Inclusion criteria	-
Number of individuals with aphasia	27
Number of control participants	0
Were any of the participants included in any previous studies?	No
ls age reported for patients and controls, and matched?	Yes (recovered: mean 50 $\pm$ 13 years; non-recovered: mean 51 $\pm$ 13 years)
ls sex reported for patients and controls, and matched?	Yes (males: 15; females: 12)
Is handedness reported for patients and controls, and matched?	Yes (right: 27; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (recovered: mean 2.1 $\pm$ 2.1 years; non-recovered: mean 4.9 $\pm$ 3.1 years)
To what extent is the nature of aphasia characterized?	<u>Severity only</u>
Language evaluation	TT, BNT, semantic fluency, phonemic fluency, PPVT, complex ideation subtest of BDAE
Aphasia severity	Recovered: TT mean 43 $\pm$ 1, $\geq$ 41; non-recovered: TT mean 23 $\pm$ 12, < 41
Aphasia type	Not stated
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Recovered: median 9.2 cc, range 2.2-26.5 cc; non-recovered: median 74 cc, range 5.1-206.0 cc
Lesion location	L MCA
Participants notes	-

### Imaging

Inaging				
Modality	fMRI			
Is the study cross-sectional or longitudinal?	Cross-sectional			
If longitudinal, at what time point(s) were imaging data acquired?	-			
If longitudinal, was there any intervention between the time points?	_			
Is the scanner described?	<u>No</u> (Phillips 3 Tesla; mo	del not stated)		
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes			
Design type	Block			
Total images acquired	330			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	Yes			
Is intersubject normalization adequately described and appropriate?	Yes			
Imaging notes	_			
Conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
semantic decision	Button press	10	No	No
tone decision	Button press	12	No	No
Conditions notes	_			
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: semantic decision vs tone decision				
Language condition	Semantic decision			
Control condition	Tone decision			
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	Ves			

Control condition	Tone decision
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Appear mismatched</u>
Is reaction time matched between the language and control tasks for all relevant groups?	Unknown, not reported
Behavioral data notes	Accuracy appears similar in the non-recovered group, but not in the recovered group
Behavioral data notes Are control data reported in this paper or another that is referenced?	Accuracy appears similar in the non-recovered group, but not in the recovered group Yes
Are control data reported in this paper or another	
Are control data reported in this paper or another that is referenced? Does the contrast selectively activate plausible	Yes
Are control data reported in this paper or another that is referenced? Does the contrast selectively activate plausible relevant language regions in the control group?	Yes Yes
Are control data reported in this paper or another that is referenced? Does the contrast selectively activate plausible relevant language regions in the control group? Are activations lateralized in the control data?	Yes Yes Control data in Kim et al. (2011) and Szaflarski et al. (2008); L frontal and temporal, plus other

Analyses

Analyses	
Are the analyses clearly described?	Yes
Voxelwise analysis 1	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia not recovered (n = 18) vs recovered (n = 9)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Interaction of group by condition not reported; non-recovered patients were significantly less accurate only on the semantic decision condition, but they actually showed a smaller difference between conditions than the recovered patients
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on 3dClustSim
Software	AFNI
Voxelwise p	.05
Cluster extent	4.16 cc
Statistical details	<u>Cluster-defining threshold (CDT) p &lt; 0.05 too lenient</u>
Findings	↑ L dorsolateral prefrontal cortex ↑ L superior parietal ↑ L cerebellum ↑ R cerebellum ↓ R posterior STG
Findings notes	_
ROI analysis 1	
<b>ROI analysis 1</b> First level contrast	Semantic decision vs tone decision
First level contrast	
	Semantic decision vs tone decision Cross-sectional correlation with language or other measure Aphasia (recovered and non-recovered)
First level contrast Analysis class	Cross-sectional correlation with language or other measure
First level contrast Analysis class Group(s)	Cross-sectional correlation with language or other measure Aphasia (recovered and non-recovered)
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the	Cross-sectional correlation with language or other measure Aphasia (recovered and non-recovered) BNT
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level	Cross-sectional correlation with language or other measure Aphasia (recovered and non-recovered) BNT Yes
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level	Cross-sectional correlation with language or other measure Aphasia (recovered and non-recovered) BNT Yes <u>Unknown, not reported</u>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast?	Cross-sectional correlation with language or other measure Aphasia (recovered and non-recovered) BNT Yes <u>Unknown, not reported</u>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes	Cross-sectional correlation with language or other measure Aphasia (recovered and non-recovered) BNT Yes <u>Unknown, not reported</u> <u>Unknown, not reported</u> 
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis	<ul> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia (recovered and non-recovered)</li> <li>BNT</li> <li>Yes</li> <li>Unknown, not reported</li> <li>Unknown, not reported</li> <li>Example a section of interest (ROI)</li> </ul>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type	<ul> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia (recovered and non-recovered)</li> <li>BNT</li> <li>Yes</li> <li>Unknown, not reported</li> <li>Unknown, not reported</li> <li>—</li> <li>Regions of interest (ROI)</li> <li>Functional</li> </ul>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there?	<ul> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia (recovered and non-recovered)</li> <li>BNT</li> <li>Yes</li> <li>Unknown, not reported</li> <li>Unknown, not reported</li> <li>—</li> <li>Regions of interest (ROI)</li> <li>Functional</li> <li>4</li> </ul>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)?	<ul> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia (recovered and non-recovered)</li> <li>BNT</li> <li>Yes</li> <li>Unknown, not reported</li> <li>Unknown, not reported</li> <li>Unknown, not reported</li> <li>Regions of interest (ROI)</li> <li>Functional</li> <li>4</li> <li>(1) bilateral cerebellum; (2) R pSTG; (3) L superior parietal lobule; (4) L superior frontal gyrus</li> <li>Regions that were differentially recruited between recovered and non-recovered patients;</li> </ul>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined?	<ul> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia (recovered and non-recovered)</li> <li>BNT</li> <li>Yes</li> <li>Unknown, not reported</li> <li>Unknown, not reported</li> <li>Unknown, not reported</li> <li>Functional</li> <li>4</li> <li>(1) bilateral cerebellum; (2) R pSTG; (3) L superior parietal lobule; (4) L superior frontal gyrus</li> <li>Regions that were differentially recruited between recovered and non-recovered patients; average t scores from individual SPMs</li> </ul>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined?	<ul> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia (recovered and non-recovered)</li> <li>BNT</li> <li>Yes</li> <li>Unknown, not reported</li> <li>Unknown, not reported</li> <li>Unknown, not reported</li> <li>Functional</li> <li>4</li> <li>(1) bilateral cerebellum; (2) R pSTG; (3) L superior parietal lobule; (4) L superior frontal gyrus</li> <li>Regions that were differentially recruited between recovered and non-recovered patients; average t scores from individual SPMs</li> <li>Familywise error (FWE)</li> </ul>

# ROI analysis 2

First level contrast

Semantic decision vs tone decision

Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia (recovered and non-recovered)
Covariate	Semantic fluency
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) bilateral cerebellum; (2) R pSTG; (3) L superior parietal lobule; (4) L superior frontal gyrus
How are the ROI(s) defined?	Regions that were differentially recruited between recovered and non-recovered patients; average t scores from individual SPMs
Correction for multiple comparisons	Familywise error (FWE)
Statistical details	Circular because defined based on recovered status
Findings	↑ L dorsolateral prefrontal cortex
Findings notes	_

## ROI analysis 3

First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia (recovered and non-recovered)
Covariate	Single word comprehension (PPVT)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) bilateral cerebellum; (2) R pSTG; (3) L superior parietal lobule; (4) L superior frontal gyrus
How are the ROI(s) defined?	Regions that were differentially recruited between recovered and non-recovered patients; average t scores from individual SPMs
Correction for multiple comparisons	Familywise error (FWE)
Statistical details	Circular because defined based on recovered status
Findings	↑ L dorsolateral prefrontal cortex
Findings notes	-
ROI analysis 4	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia (recovered and non-recovered)
Covariate	BDAE complex ideation subtest

Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level

contrast?

<u>Unknown, not reported</u>

evel <u>Unknown, not reported</u>

Yes

Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) bilateral cerebellum; (2) R pSTG; (3) L superior parietal lobule; (4) L superior frontal gyrus
How are the ROI(s) defined?	Regions that were differentially recruited between recovered and non-recovered patients; average t scores from individual SPMs
Correction for multiple comparisons	Familywise error (FWE)
Statistical details	Circular because defined based on recovered status
Findings	↑ L dorsolateral prefrontal cortex
Findings notes	-

# ROI analysis 5

First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia (recovered and non-recovered)
Covariate	Phonemic fluency
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) bilateral cerebellum; (2) R pSTG; (3) L superior parietal lobule; (4) L superior frontal gyrus
How are the ROI(s) defined?	Regions that were differentially recruited between recovered and non-recovered patients; average t scores from individual SPMs
Correction for multiple comparisons	Familywise error (FWE)
Statistical details	Circular because defined based on recovered status
Findings	↓ R posterior STG
Findings notes	-

# ROI analysis 6

First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia (recovered and non-recovered)
Covariate	Semantic decision accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) bilateral cerebellum; (2) R pSTG; (3) L superior parietal lobule; (4) L superior frontal gyrus
How are the ROI(s) defined?	Regions that were differentially recruited between recovered and non-recovered patients; average t scores from individual SPMs
Correction for multiple comparisons	Familywise error (FWE)
Statistical details	Circular because defined based on recovered status

Findings	None	
Findings notes	-	
Notes		
Excluded analyses	_	

# Thiel et al. (2013)

### Reference

Authors	Thiel A, Hartmann A, Rubi-Fessen I, Anglade C, Kracht L, Weiduschat N, Kessler J, Rommel T, Heiss WD
Title	Effects of noninvasive brain stimulation on language networks and recovery in early poststroke aphasia
Reference	Stroke 2013; 44: 2240-2246
PMID	23813984
DOI	10.1161/strokeaha.111.000574

#### Participants

data acquired?

Language	German
Inclusion criteria	_
Number of individuals with aphasia	24 (plus 6 excluded: 4 did not tolerate MRI or PET scans; 2 TMS device was defective)
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (rTMS group: mean 69.8 $\pm$ 8.0 years; sham group: mean 71.2 $\pm$ 7.8 years)
Is sex reported for patients and controls, and matched?	No
Is handedness reported for patients and controls, and matched?	Yes (right: 24; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (rTMS group: mean 37.5 $\pm$ 18.5 days; sham group: mean 50.6 $\pm$ 22.6 days)
To what extent is the nature of aphasia characterized?	Severity and type
Language evaluation	AAT
Aphasia severity	T1: rTMS group: AAT sum of scores mean 251.5 $\pm$ 32.4; sham group: mean 251.1 $\pm$ 39.5; T2 not stated
Aphasia type	T1: rTMS group: 7 Wernicke's, 3 amnestic, 2 global, 1 Broca's; sham group: 5 Wernicke's, 3 Broca's, 2 global, 1 amnestic; T2: not stated
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	RTMS group: 233 $\pm$ 197 cc; sham group: 244 $\pm$ 243 cc; lesion extent in images appears much smaller than the stated volumes
Lesion location	L MCA
Participants notes	-
Imaging	
Modality	PET (rCBF)
Is the study cross-sectional or longitudinal?	Longitudinal—mixed
If longitudinal, at what time point(s) were imaging	T1: pre-treatment/subacute (rTMS group: mean 37.5 ± 18.5 days post onset; sham group:

T1: pre-treatment/subacute (rTMS group: mean 37.5 ± 18.5 days post onset; sham group: mean 50.6 ± 22.6 days post onset); T2 post-treatment, ~2.5 weeks later

If longitudinal, was there any intervention between the time points?	RTMS group: inhibitory rTMS over the R IFG pars triangularis + SLT for 45 minutes/day, 5 days/week, 2 weeks; control group: sham TMS + SLT
Is the scanner described?	Yes (CTI-Siemens ECAT EXACT HR)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	PET
Total images acquired	8
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	<u>No</u> (lesion impact not addressed)
Imaging notes	-
Conditions	

#### -----

Are the conditions clearly described?

 Condition
 Response type
 Repetitions
 All groups could do?
 All individuals could do?

 verb generation
 Word (overt)
 4
 Unknown
 Unknown

 rest
 None
 4
 N/A
 N/A

 Conditions notes
 —

 Contrasts

Yes

Are the contrasts clearly described? Yes Contrast 1: verb generation vs rest Language condition Verb generation Control condition Rest Are the conditions matched for visual demands? Yes Are the conditions matched for auditory demands? No Are the conditions matched for motor demands? No Are the conditions matched for cognitive/executive No demands? Is accuracy matched between the language and N/A, tasks not comparable control tasks for all relevant groups? Is reaction time matched between the language N/A, tasks not comparable and control tasks for all relevant groups? Behavioral data notes Are control data reported in this paper or another **Somewhat** that is referenced? Does the contrast selectively activate plausible <u>Unknown</u> relevant language regions in the control group? Are activations lateralized in the control data? <u>Unknown</u> Control activation notes Cites Weiduschat et al. (2011) which in turn cites Herholz et al. (1996) which provides some minimal control data Contrast notes Analyses Are the analyses clearly described? Yes

### Voxelwise analysis 1

First level contrast

Verb generation vs rest

Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia with rTMS (n = 13) T2 vs T1) vs (aphasia with sham (n = 11) T2 vs T1)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No direct comparison
Software	SPM8
Voxelwise p	-
Cluster extent	-
Statistical details	Qualitative comparison on p. 2244
Findings	↑ L IFG ↑ L posterior STG/STS/MTG ↓ R IFG ↓ R posterior STG/STS/MTG
Findings notes	Approximate interpretation of qualitative patterns shown in Figure 3; T1 R lateralization surprising relative to other findings from this group
ROI analysis 1	
First level contrast	Verb generation vs rest
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia with rTMS (n = 13) T2 vs T1) vs (aphasia with sham (n = 11) T2 vs T1)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes

Unknown, not reported

<u>Unknown, not reported</u>

Region of interest (ROI) Laterality indi(ces) 1

Language network LI

One only

Actual LIs are not reported, only change in LI ↑ LI (language network)

Findings Findings notes

Statistical details

contrast?

contrast?

ROI type

Behavioral data notes Type of analysis

What are the ROI(s)?

How many ROIs are there?

How are the ROI(s) defined? Correction for multiple comparisons

Is accuracy matched across the second level

Is reaction time matched across the second level

T1 R lateralization surprising relative to other findings from this group

#### **ROI analysis 2**

First level contrast	Verb generation vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	Δ AAT total score
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level	Unknown, not reported

contrast?	
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	1
What are the ROI(s)?	Language network LI
How are the ROI(s) defined?	
Correction for multiple comparisons	One only
Statistical details	Model did not include treatment group (rTMS vs sham)
Findings	↑ LI (language network)
Findings notes	Patients who improved more showed a greater leftward shift of activation; T1 R lateralization surprising relative to other findings from this group

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### Notes

Excluded analyses

# Abel et al. (2014)

### Reference

Authors	Abel S, Weiller C, Huber W, Willmes K
Title	Neural underpinnings for model-oriented therapy of aphasic word production
Reference	Neuropsychologia 2014; 57: 154-165
PMID	24686092
DOI	10.1016/j.neuropsychologia.2014.03.010

# Participants

Language	German
Inclusion criteria	Anomia; no severe AoS or dysarthria
Number of individuals with aphasia	14 (plus 9 excluded: 4 for ceiling performance; 5 for technical problems)
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (median 48 years, range 35-74 years)
Is sex reported for patients and controls, and matched?	Yes (males: 10; females: 4)
Is handedness reported for patients and controls, and matched?	Yes (right: 14; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (median 41 months, range 11-72 months)
To what extent is the nature of aphasia characterized?	Type only
Language evaluation	AAT
Aphasia severity	Not stated
Aphasia type	8 Broca's, 3 Wernicke's, 1 fluent non-classifiable, 1 global, 1 transcortical sensory
First stroke only?	Yes
Stroke type	Mixed etiologies
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L MCA; 2 also had ACA
Participants notes	-

# Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, ~6 weeks later (labeled T2 and T3 in paper)
If longitudinal, was there any intervention between the time points?	Lexical therapy, alternating between weeks with phonological and semantic treatment, 4 weeks; 60 out of the 132 items were trained
Is the scanner described?	Yes (Philips Achieva 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No* (moderate limitation</u> ) (trials too close together (~8 s) and insufficient jitter (1-3 s) for event-related design)
Design type	Event-related
Total images acquired	560
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	<u>No</u> (lesion impact not addressed)
Imaging notes	_
Conditions	
Are the conditions clearly described?	Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming (semantic trained items)	Word (overt)	30	Yes	<u>Unknown</u>
picture naming (phonological trained items)	Word (overt)	30	Yes	<u>Unknown</u>
picture naming (untrained items)	Word (overt)	30	Yes	Unknown
picture naming (already known items)	Word (overt)	42	Yes	Unknown
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>

Yes

Conditions notes

### Contrasts

Are the contrasts clearly described?

# Contrast 1: picture naming (all conditions) vs rest

Language conditionPicture naming (all conditions)Control conditionRestAre the conditions matched for visual demands?NoAre the conditions matched for auditory demands?NoAre the conditions matched for motor demands?NoAre the conditions matched for cognitive/executive demands?NoIs accuracy matched between the language and control tasks for all relevant groups?N/A, tasks not comparableIs reaction time matched between the language and control tasks for all relevant groups?N/A, tasks not comparableBehavioral data notes—Are control data reported in this paper or another that is referenced?NoDoes the contrast selectively activate plausible relevant language regions in the control group?UnknownAre activations lateralized in the control data?Unknown		
Are the conditions matched for visual demands?NoAre the conditions matched for auditory demands?NoAre the conditions matched for motor demands?NoAre the conditions matched for cognitive/executive demands?NoIs accuracy matched between the language and control tasks for all relevant groups?N/A, tasks not comparableIs reaction time matched between the language and control tasks for all relevant groups?N/A, tasks not comparableBehavioral data notes—Are control data reported in this paper or another that is referenced?NoDoes the contrast selectively activate plausible relevant language regions in the control group?Unknown	Language condition	Picture naming (all conditions)
Are the conditions matched for auditory demands?NoAre the conditions matched for motor demands?NoAre the conditions matched for cognitive/executive demands?NoIs accuracy matched between the language and control tasks for all relevant groups?N/A, tasks not comparableIs reaction time matched between the language and control tasks for all relevant groups?N/A, tasks not comparableBehavioral data notes—Are control data reported in this paper or another that is referenced?NoDoes the contrast selectively activate plausible relevant language regions in the control group?Unknown	Control condition	Rest
Are the conditions matched for motor demands?NoAre the conditions matched for cognitive/executive demands?NoIs accuracy matched between the language and control tasks for all relevant groups?N/A, tasks not comparableIs reaction time matched between the language and control tasks for all relevant groups?N/A, tasks not comparableBehavioral data notes—Are control data reported in this paper or another that is referenced?NoDoes the contrast selectively activate plausible relevant language regions in the control group?Unknown	Are the conditions matched for visual demands?	No
Are the conditions matched for cognitive/executive demands?NoIs accuracy matched between the language and control tasks for all relevant groups?N/A, tasks not comparableIs reaction time matched between the language and control tasks for all relevant groups?N/A, tasks not comparableBehavioral data notes-Are control data reported in this paper or another that is referenced?NoDoes the contrast selectively activate plausible relevant language regions in the control group?Unknown	Are the conditions matched for auditory demands?	No
demands?Is accuracy matched between the language and control tasks for all relevant groups?N/A, tasks not comparableIs reaction time matched between the language and control tasks for all relevant groups?N/A, tasks not comparableBehavioral data notesAre control data reported in this paper or another that is referenced?NoDoes the contrast selectively activate plausible relevant language regions in the control group?Unknown	Are the conditions matched for motor demands?	No
control tasks for all relevant groups?N/A, tasks not comparableIs reaction time matched between the language and control tasks for all relevant groups?N/A, tasks not comparableBehavioral data notesAre control data reported in this paper or another that is referenced?NoDoes the contrast selectively activate plausible relevant language regions in the control group?Unknown	0	No
and control tasks for all relevant groups?Behavioral data notes—Are control data reported in this paper or another that is referenced?NoDoes the contrast selectively activate plausible relevant language regions in the control group?Unknown	,	N/A, tasks not comparable
Are control data reported in this paper or another that is referenced?       No         Does the contrast selectively activate plausible relevant language regions in the control group?       Unknown	0 0	N/A, tasks not comparable
that is referenced? Does the contrast selectively activate plausible Unknown relevant language regions in the control group?	Behavioral data notes	_
relevant language regions in the control group?		No
Are activations lateralized in the control data?	5	Unknown
	Are activations lateralized in the control data?	Unknown

Control activation notes	But see control data reported in a subsequent paper (Abel et al., 2015)
Contrast notes	_

### Contrast 2: picture naming (trained items) vs picture naming (untrained items)

Language condition	Picture naming (trained items)
Control condition	Picture naming (untrained items)
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>No, different</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	Trained items improved more than untrained items
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	-

# Contrast 3: picture naming (semantic trained items) vs picture naming (phonological trained items)

Language condition	Picture naming (semantic trained items)
Control condition	Picture naming (phonological trained items)
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	Yes, matched
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Unknown</u>
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	_
Analyses	
Are the analyses clearly described?	Yes
Voxelwise analysis 1	
First level contrast	Picture naming (all conditions) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Subsequent $\Delta$ (T2 vs T1) picture naming
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (T1 behavioral measure should be included in model)

Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on cluster_threshold_beta
Software	SPM8
Voxelwise p	.01
Cluster extent	11 voxels (size not stated)
Statistical details	_
Findings	↑ L IFG pars opercularis ↓ R basal ganglia
Findings notes	-
Voxelwise analysis 2	
First level contrast	Picture naming (all conditions) vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	Δ picture naming accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_

Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on cluster_threshold_beta
Software	SPM8
Voxelwise p	.01
Cluster extent	11 voxels (size not stated)
Statistical details	_
Findings	<ul> <li>↑ L somato-motor</li> <li>↑ L inferior parietal lobule</li> <li>↑ L supramarginal gyrus</li> <li>↑ L posterior STS</li> <li>↑ L posterior MTG</li> <li>↑ L occipital</li> </ul>

Findings notes

# Voxelwise analysis 3

First level contrast	Picture naming (trained items) vs picture naming (untrained items)
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Trained items improved more than untrained items
Type of analysis	Voxelwise

Search volume	Whole brain			
Correction for multiple comparisons	Clusterwise correction based on cluster threshold_beta			
Software	SPM8			
Voxelwise p	.01			
Cluster extent	11 voxels (size not stated)			
Statistical details	-			
Findings	<ul> <li>L precuneus</li> <li>L posterior STG</li> <li>L Heschl's gyrus</li> <li>L mid temporal</li> <li>L posterior cingulate</li> <li>L thalamus</li> <li>R ventral precentral/inferior frontal junction</li> <li>R somato-motor</li> <li>R Heschl's gyrus</li> <li>R posterior cingulate</li> <li>R thalamus</li> <li>R thalamus</li> <li>R thalamus</li> <li>R thalamus</li> <li>R thalamus</li> </ul>			
Findings notes	-			
Voxelwise analysis 4				
First level contrast	Picture naming (semantic trained items) vs picture naming (phonological trained items)			
Analysis class	Longitudinal change in aphasia			
Group(s)	Aphasia T2 vs T1			
Covariate	-			
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes			
Is accuracy matched across the second level contrast?	Yes, matched			
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>			
Behavioral data notes	No differential effects for semantic vs phonological trained items			
Type of analysis	Voxelwise			
Search volume	Whole brain			
Correction for multiple comparisons	Clusterwise correction based on cluster_threshold_beta			
Software	SPM8			
Voxelwise p	.01			
Cluster extent	11 voxels (size not stated)			
Statistical details	-			
Findings	<ul> <li>R superior parietal</li> <li>L dorsolateral prefrontal cortex</li> <li>L somato-motor</li> <li>L occipital</li> <li>L anterior cingulate</li> <li>L posterior cingulate</li> <li>R precuneus</li> <li>R occipital</li> <li>R anterior cingulate</li> <li>R anterior cingulate</li> <li>R posterior cingulate</li> <li>R posterior cingulate</li> <li>R hippocampus/MTL</li> </ul>			
Findings notes	-			
Voxelwise analysis 5				
First level contrast	Picture naming (all conditions) vs rest			

First level contrast	Picture naming (all conditions) vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with semantic impairment T1 (n = 8) vs with phonological impairment T1 (n = 6)
Covariate	_

to the second level sector of 1915 and 500					
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes				
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>				
Is reaction time matched across the second level contrast?	Unknown, not reported				
Behavioral data notes	_				
Type of analysis	— Voxelwise				
Search volume	Whole brain				
Correction for multiple comparisons	Clusterwise correction based on cluster threshold beta				
Software	SPM8				
Voxelwise p	.01				
Cluster extent	11 voxels (size not stated)				
Statistical details					
Findings	↑ R IFG pars triangularis ↑ R dorsolateral prefrontal cortex				
Findings notes	_				
Voxelwise analysis 6					
First level contrast	Picture naming (all conditions) vs rest				
Analysis class	Longitudinal between two groups with aphasia				
Group(s)	(Aphasia with semantic impairment (n = 8) T2 vs T1) vs (aphasia with phonological impairment (n = 6) T2 vs T1)				
Covariate	_				
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes				
Is accuracy matched across the second level contrast?	<u>No, different</u>				
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>				
Behavioral data notes	Phonological patients showed more improvement on trained items				
Type of analysis	Voxelwise				
Search volume	Whole brain				
Correction for multiple comparisons	Clusterwise correction based on cluster threshold beta				
Software	SPM8				
Voxelwise p	.01				
Cluster extent	11 voxels (size not stated)				
Statistical details	-				
Findings	<ul> <li>↑ L somato-motor</li> <li>↑ L Heschl's gyrus</li> <li>↑ L anterior temporal</li> <li>↑ L occipital</li> <li>↑ L thalamus</li> <li>↑ L basal ganglia</li> <li>↑ R somato-motor</li> <li>↓ L IFG pars opercularis</li> </ul>				
Findings notes	-				
Voxelwise analysis 7					
First level contrast	Picture naming (all conditions) vs rest				
Analysis class	Longitudinal change in aphasia				
Group(s)	Aphasia with semantic impairment (n = 8) T2 vs T1				
Covariate					
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes				
Is accuracy matched across the second level	No, different				

contrast?	
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on cluster_threshold_beta
Software	SPM8
Voxelwise p	.01
Cluster extent	11 voxels (size not stated)
Statistical details	-
Findings	↑ L basal ganglia
Findings notes	_
Voxelwise analysis 8	
First level contrast	Picture naming (all conditions) vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with phonological impairment (n = 6) T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on cluster_threshold_beta
Software	SPM8
Voxelwise p	.01
Cluster extent	11 voxels (size not stated)
Statistical details	-
Findings	None
Findings notes	-
Notes	
Excluded analyses	—

# Benjamin et al. (2014)

### Reference

Authors	Benjamin ML, Towler S, Garcia A, Park H, Sudhyadhom A, Harnish SM, McGregor KM, Zlatar Z, Reilly JJ, Rosenbek JC, Gonzalez LJ, Crosson B
Title	A behavioral manipulation engages right frontal cortex during aphasia therapy
Reference	Neurorehabil Neural Repair 2014; 28: 545-553
PMID	24407914
DOI	10.1177/1545968313517754
Participants	
Languago	LLC English

LanguageUS EnglishInclusion criteria"at least minimal evidence of non-fluent output"; lesion including precentral gyrus or

	underlying white matter			
Number of individuals with aphasia	<u>14</u>			
Number of control participants	0			
Were any of the participants included in any previous studies?	No			
Is age reported for patients and controls, and matched?	Yes (intention group: mean 72.1 $\pm$ 10.5 years; control group: mean 63.0 $\pm$ 9.2 years)			
ls sex reported for patients and controls, and matched?	Yes (males: 8; females: 6)			
Is handedness reported for patients and controls, and matched?	Yes (right: 14; left: 0)			
Is time post stroke onset reported and appropriate to the study design?	Yes (intention group: mean 37.4 $\pm$ 33.5 months, range 12-87 months; control group: 38.1 $\pm$ 37.4 months, range 10-112 months)			
To what extent is the nature of aphasia characterized?	Severity and type			
Language evaluation	WAB, BNT, PPVT			
Aphasia severity	Intention group: AQ mean 65.5 $\pm$ 8.3; control group: AQ mean 71.9 $\pm$ 11.9			
Aphasia type	Intention group: 4 conduction, 2 Broca's, 1 anomic; control group: 4 anomic, 1 Broca's, 1 conduction, 1 transcortical motor			
First stroke only?	No			
Stroke type	Mixed etiologies			
To what extent is the lesion distribution characterized?	Lesion overlay			
Lesion extent	Not stated			
Lesion location	L MCA, extending frontally at least into the precentral gyrus or underlying white matter			
Participants notes	-			
Imaging				
Modality	fMRI			
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment			
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment; T3: 3 months after the end of treatment			
If longitudinal, was there any intervention between the time points?	Word finding therapy for both groups, but the intention group had to produce complex left hand movements, while the control group did not; note that groups were not directly compared in any imaging analyses			
Is the scanner described?	Yes (Philips Achieva 3 Tesla)			
Is the timing of stimulus presentation and image	No (total images acquired not stated)			

#### Is the timing of stimulus presentation and image No (total images acquired not stated) acquisition clearly described and appropriate? Event-related Design type Total images acquired not stated Are the imaging acquisition parameters, including Yes (whole brain) coverage, adequately described and appropriate? Is preprocessing and intrasubject coregistration No (not described) adequately described and appropriate? Is first level model fitting adequately described and No (not described clearly) appropriate? Is intersubject normalization adequately described No (lesion impact not addressed) and appropriate? Imaging notes

### Conditions

Are the conditions clearly described?

Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
word generation	Word (overt)	60	<u>Unknown</u>	<u>Unknown</u>
rest	None	implicit	<u>N/A</u>	<u>N/A</u>

	baseline
Conditions notes	_
Contrasts	
Are the contrasts clearly described?	Yes
Contrast 1: word generation vs rest	
Language condition	Word generation
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	Contrast not described explicitly but there is only one possible contrast
A k	
Analyses	
Are the analyses clearly described?	Yes
ROI analysis 1	
First level contrast	Word generation vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with intention treatment (n = 7) T2 vs T1
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	3
What are the ROI(s)?	(1) lateral frontal LI; (2) medial frontal LI; (3) posterior perisylvian LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↓ LI (frontal)
Findings notes	Laterality shift for lateral frontal LI, not medial frontal LI
ROI analysis 2	
ROI analysis 2	

First level contrast

Word generation vs rest

Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with intention treatment (n = 6) T3 vs T1
Covariate	
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	3
What are the ROI(s)?	(1) lateral frontal Ll; (2) medial frontal Ll; (3) posterior perisylvian Ll
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↓ LI (frontal)
Findings notes	Laterality shift for both lateral and medial frontal LIs
ROI analysis 3	
First level contrast	Word generation vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with control treatment (n = 7) T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	3
What are the ROI(s)?	(1) lateral frontal Ll; (2) medial frontal Ll; (3) posterior perisylvian Ll
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	— 
Findings	None
Findings notes	
ROI analysis 4	
First level contrast	Word generation vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with control treatment (n = 7) T3 vs T1
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
ls accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)

ROI type	Laterality indi(ces)
How many ROIs are there?	3
What are the ROI(s)?	(1) lateral frontal Ll; (2) medial frontal Ll; (3) posterior perisylvian Ll
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	_

## ROI analysis 5

First level contrast	Word generation vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia with intention treatment (n = 7) T2 vs T1
Covariate	$\Delta$ category-member generation probe performance
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	3
What are the ROI(s)?	(1) lateral frontal LI; (2) medial frontal LI; (3) posterior perisylvian LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↓ LI (temporal)
Findings notes	-

## **ROI analysis 6**

First level contrast	Word generation vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia with control treatment (n = 7) T2 vs T1
Covariate	$\Delta$ category-member generation probe performance
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	3
What are the ROI(s)?	(1) lateral frontal Ll; (2) medial frontal Ll; (3) posterior perisylvian Ll
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-
ROI analysis 7	

First level contrast

Word generation vs rest

Group(s)Aphasia with intention treatment (n = 7) T2 vs T1CovariateA picture naming probe performanceIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes-Type of analysisRegions of interest (ROI)ROI typeLaterality indi(ces)How many ROIs are there?3What are the ROI(s)?(1) lateral frontal LI; (2) medial frontal LI; (3) posterior perisylvian LIHow are the ROI(s) defined?-Correction for multiple comparisonsNo correctionStatistical details-FindingsNoneFindings notes-		
Covariate     Á picture naming probe performance       Is decond level contrast valid in tensoures involved     Ves       Is accoud protects and measures involved     Unknown, not reported       Is reaction time matched across the second level     Unknown, not reported       Is reaction time matched across the second level     Inknown, not reported       Behavioral data notes     -       Role protects     Role protects       Role protects     Account and the second level       Behavioral data notes     -       Role protects     Account and the second level       Role protects     Belavioral data notes       Role protects     Protection fornultiple comparisons       Belavioral data notes     -       Role protects     Protection fornultiple comparisons       Role protects     -	Analysis class	Longitudinal correlation with language or other measure
is the second level contrast wild in terms of the group(s), time point(s), and measures involved? is secured year second level contrast? is reaction time matched across the second level contrast? is reaction time matched across the second level contrast? is reaction time matched across the second level contrast? is reaction time matched across the second level contrast? is reaction time matched across the second level contrast? is reaction time matched across the second level contrast? is reaction time matched across the second level contrast? is reaction time matched across the second level contrast? is reaction time matched across the second level contrast? is reaction time matched across the second level contrast (ROI) is reacting to the	Group(s)	
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contrast?	,	<u>Unknown, not reported</u>
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Rol type         Laterality indi(ces)           How many ROIs are there?         3           What are the ROI(s)?         (1) lateral frontal LI; (2) medial frontal LI; (3) posterior perisylvian LI           How are the ROI(s)?         No correction           Correction for multiple comparisons         No correction           Statistical details         —           Findings         Mone           Findings notes         — <b>ROI analysis B</b> —           First level contrast         Word generation vs rest           Analysis class         Longitudinal correlation with language or other measure           Group(s)         Aphasia with control treatment (n = 7) T2 vs T1           Covariate         Socium anning probe performance           Is accuracy matched across the second level         Unknown, not reported           contrast?         Unknown, not reported           Sol analysis         —           Is accuracy matched across the second level         Unknown, not reported           contrast?         Regions of interest (ROI)           Behavioral data notes         —           Type of analysis         Regions of interest (ROI)           ROI type         Laterality indi(Ces)           How many ROIs are there?         3	Behavioral data notes	_
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Correction for multiple comparisonsNo correctionStatistical details-FindingsNone	What are the ROI(s)?	(1) lateral frontal LI; (2) medial frontal LI; (3) posterior perisylvian LI
Statistical details     —       Findings     None	How are the ROI(s) defined?	
Findings None	Correction for multiple comparisons	No correction
	Statistical details	_
Findings notes —	Findings	None
	Findings notes	-

#### Notes

Excluded analyses

SPM analysis in Figure 3, because the authors do not attempt to interpret it

## Brownsett et al. (2014)

#### Reference

Authors	Brownsett SL, Warren JE, Geranmayeh F, Woodhead Z, Leech R, Wise RJ
Title	Cognitive control and its impact on recovery from aphasic stroke
Reference	Brain 2014; 137: 242-254
PMID	24163248

DOI

#### 10.1093/brain/awt289

#### Participants

Participants	
Language	UK English
Inclusion criteria	No involvement of ACA territory
Number of individuals with aphasia	<u>16</u> (plus 3 excluded: 2 withdrew after attempting first scan; 1 had severe dysarthria)
Number of control participants	17
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 60 years, range 37-84 years)
Is sex reported for patients and controls, and matched?	Yes (males: 11; females: 5)
Is handedness reported for patients and controls, and matched?	Yes (right: 16; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 4 years, range 6 months-11 years)
To what extent is the nature of aphasia characterized?	Not at all
Language evaluation	Not stated
Aphasia severity	Not stated
Aphasia type	Not stated, but all had auditory comprehension and repetition deficits, and all could at least attempt to repeat
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L temporal and parietal cortex; 4 extended into the frontal lobe; no lesions involved ACA territory
Participants notes	—
Imaging	
Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	Patients: T1: acclimatization/chronic (but used in some analyses); T2: pre-treatment/chronic (not stated how long after T1); T3: post-treatment/~4 weeks later; controls: T1: pre-training; T2: post-training/~2 weeks later
If longitudinal, was there any intervention between the time points?	Patients: home-based therapy consisting of auditory discrimination and repetition tasks for 3 or 4 weeks between T2 and T3; control: 2 weeks of similar training using noise vocoded speech
Is the scanner described?	Yes (Philips Intera 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	No* (moderate limitation) (timing of sentence presentation not described; sparse event- related design, but ITI of only 8 s and consistent linear order of listening and repetition trials could make it difficult to disentangle hemodynamic responses to listening and repeating trials)
Design type	Event-related
Total images acquired	168 (patients); 280 (controls)
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	No* (moderate limitation) (consistent linear order of listening and repetition trials could make it difficult to disentangle hemodynamic responses to listening and repeating trials)
Is intersubject normalization adequately described and appropriate?	Yes

Imaging notes

sparse sampling; different task structure in controls (two repetition trials per listening trial) raises concerns about comparisons between groups

#### Conditions

Contrast notes

Are the conditions clearly described?

Response type All groups could do? All individuals could do? listening to sentences None aphasia: not N/A N/A stated; control: 40 repeating sentences (sentence from previous Sentence (overt) aphasia: not Yes No trial) stated; control: 40 listening to noise vocoded sentences (control None 40 (control) N/A N/A only) repeating noise vocoded sentences (control only) Sentence (overt) 80 (control) Yes Unknown listening to segmented white noise None aphasia: not N/A N/A stated; control: 40 Conditions notes In two patients, only single words were produced Contrasts Are the contrasts clearly described? Yes Contrast 1: listening to sentences vs listening to segmented white noise Language condition Listening to sentences Control condition Listening to segmented white noise Are the conditions matched for visual demands? Yes Are the conditions matched for auditory demands? Yes Are the conditions matched for motor demands? Yes Are the conditions matched for cognitive/executive Yes demands? Is accuracy matched between the language and N/A, no behavioral measure control tasks for all relevant groups? Is reaction time matched between the language N/A, no timeable task and control tasks for all relevant groups? Behavioral data notes Are control data reported in this paper or another No that is referenced? Does the contrast selectively activate plausible Unknown relevant language regions in the control group? Are activations lateralized in the control data? <u>Unknown</u> Control activation notes

for patients)

No (paradigm was different in patients and controls, and is not described in sufficient detail

#### Contrast 2: listening to sentences (patients) or listening to noise vocoded sentences (controls) vs listening to segmented white noise

Language condition	Listening to sentences (patients) or listening to noise vocoded sentences (controls)
Control condition	Listening to segmented white noise
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, no behavioral measure</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task

Behavioral data notes	-
Are control data reported in this paper or another hat is referenced?	No
Does the contrast selectively activate plausible elevant language regions in the control group?	<u>Unknown</u>
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	_

## Analyses

Are the analyses clearly described?

Yes

First level contrast	
	Listening to sentences vs listening to segmented white noise
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia (T2 and T3) vs control (T1 and T2)
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	Significant difference in accuracy of subsequent repetition
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction with with GRFT and lenient voxelwise p
Software	FSL (FEAT 5.98)
Voxelwise p	~.01 (z > 2.3)
Cluster extent	Based on GRFT
Statistical details	_
Findings	<ul> <li>L insula</li> <li>L anterior cingulate</li> <li>R insula</li> <li>R anterior cingulate</li> <li>L SMA/medial prefrontal</li> <li>L precuneus</li> <li>L posterior cingulate</li> <li>R SMA/medial prefrontal</li> <li>R precuneus</li> <li>R precuneus</li> <li>R posterior cingulate</li> </ul>
Findings notes	Findings are approximate since description is partially in terms of networks; at the earlier time point only, patients also showed reduced activity in left ventral prefrontal cortex and right medial planum temporale
Voxelwise analysis 2	
First level contrast	Listening to sentences (patients) or listening to noise vocoded sentences (controls) vs listening to segmented white noise
Analysis class	Cross-sectional aphasia vs control

	to segmented white hoise
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia (T2 and T3) vs control (T1 and T2)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	N/A, no timeable task

Delessional determination	
Behavioral data notes	No significant difference in accuracy of subsequent repetition
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction with with GRFT and lenient voxelwise p
Software	FSL (FEAT 5.98)
Voxelwise p	~.01 (z > 2.3)
Cluster extent	Based on GRFT
Statistical details	-
Findings	None
Findings notes	_
ROI analysis 1	
First level contrast	Listening to sentences vs listening to segmented white noise
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia mean of T1, T2, T3
Covariate	Picture description score (CAT), mean of T1, T2, T3
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	Referring to accuracy of subsequent repetition; correlation with picture description is not reported
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	Dorsal anterior cingulate cortex/midline superior frontal gyrus
How are the ROI(s) defined?	Contrast of listening to vocoded speech and listening to normal speech in controls
Correction for multiple comparisons	One only
Statistical details	Same result obtained with age and lesion volume included in the model
Findings	L SMA/medial prefrontal     L anterior cingulate     R SMA/medial prefrontal     R anterior cingulate
Findings notes	Increased activation of dACC/SFG was correlated with higher scores on picture description
Notes	
Excluded analyses	Longitudinal analyses, since these were null findings that were not the focus of this paper

## Mattioli et al. (2014)

## Reference

Authors	Mattioli F, Ambrosi C, Mascaro L, Scarpazza C, Pasquali P, Frugoni M, Magoni M, Biagi L, Gasparotti R
Title	Early aphasia rehabilitation is associated with functional reactivation of the left inferior frontal gyrus: a pilot study
Reference	Stroke 2014; 45: 545-552
PMID	24309584
DOI	10.1161/strokeaha.113.003192
Participants	

#### Participants

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Language
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Italian

Inclusion criteria	MCA: comprehension mildly impaired
Number of individuals with aphasia	L MCA; comprehension mildly impaired <u>12</u>
Number of control participants	10
Were any of the participants included in any	No
previous studies?	
Is age reported for patients and controls, and matched?	No (range 37-79 years; control ages not reported, though reported to be matched)
Is sex reported for patients and controls, and matched?	No (males: 7; females: 5; control sex not stated, but reported to be matched)
Is handedness reported for patients and controls, and matched?	Yes (right: 12; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (T1: mean 2.2 ± 1.3 days; T2: mean 16.2 ± 1.3 days; T3: mean 190 ± 25.5 days)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	AAT, TT
Aphasia severity	T1: TT range 2-45; T2: TT range 6-48; T3: TT range 21-48
Aphasia type	T1: 8 Broca's, 3 anomic, 1 Wernicke's; T2: not stated
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Range 4.4-158.3 cc (possibly; units stated do not seem correct)
Lesion location	L MCA; lesions seem very small in Supplementary Figure 1, but are described as more extensive in Supplementary Table 1
Participants notes	Treated and untreated groups differed in severity at baseline, albeit not significantly
Imaging	
Modality	fMRI
	fMRI Longitudinal—mixed
Modality	
Modality Is the study cross-sectional or longitudinal? If longitudinal, at what time point(s) were imaging	Longitudinal—mixed T1: pre-treatment, mean 2.2 ± 1.3 days post onset; T2: post-treatment, mean 16.2 ± 1.3 days
Modality Is the study cross-sectional or longitudinal? If longitudinal, at what time point(s) were imaging data acquired? If longitudinal, was there any intervention between	Longitudinal—mixed T1: pre-treatment, mean 2.2 ± 1.3 days post onset; T2: post-treatment, mean 16.2 ± 1.3 days post onset; T3: mean 190 ± 25.5 days post onset 6 patients were randomized to receive treatment focusing on verbal comprehension and lexical retrieval for 1 hour/day, 5 days/week between T1 and T2; no patient received treatment
Modality Is the study cross-sectional or longitudinal? If longitudinal, at what time point(s) were imaging data acquired? If longitudinal, was there any intervention between the time points?	<ul> <li>Longitudinal—mixed</li> <li>T1: pre-treatment, mean 2.2 ± 1.3 days post onset; T2: post-treatment, mean 16.2 ± 1.3 days post onset; T3: mean 190 ± 25.5 days post onset</li> <li>6 patients were randomized to receive treatment focusing on verbal comprehension and lexical retrieval for 1 hour/day, 5 days/week between T1 and T2; no patient received treatment after T2</li> </ul>
Modality Is the study cross-sectional or longitudinal? If longitudinal, at what time point(s) were imaging data acquired? If longitudinal, was there any intervention between the time points? Is the scanner described? Is the timing of stimulus presentation and image	<ul> <li>Longitudinal—mixed</li> <li>T1: pre-treatment, mean 2.2 ± 1.3 days post onset; T2: post-treatment, mean 16.2 ± 1.3 days post onset; T3: mean 190 ± 25.5 days post onset</li> <li>6 patients were randomized to receive treatment focusing on verbal comprehension and lexical retrieval for 1 hour/day, 5 days/week between T1 and T2; no patient received treatment after T2</li> <li>Yes (Siemens Avanto 1.5 Tesla)</li> </ul>
Modality Is the study cross-sectional or longitudinal? If longitudinal, at what time point(s) were imaging data acquired? If longitudinal, was there any intervention between the time points? Is the scanner described? Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<ul> <li>Longitudinal—mixed</li> <li>T1: pre-treatment, mean 2.2 ± 1.3 days post onset; T2: post-treatment, mean 16.2 ± 1.3 days post onset; T3: mean 190 ± 25.5 days post onset</li> <li>6 patients were randomized to receive treatment focusing on verbal comprehension and lexical retrieval for 1 hour/day, 5 days/week between T1 and T2; no patient received treatment after T2</li> <li>Yes (Siemens Avanto 1.5 Tesla)</li> <li>No (timing of stimuli not clearly described)</li> </ul>
ModalityIs the study cross-sectional or longitudinal?If longitudinal, at what time point(s) were imaging data acquired?If longitudinal, was there any intervention between the time points?Is the scanner described?Is the timing of stimulus presentation and image acquisition clearly described and appropriate?Design type	<ul> <li>Longitudinal—mixed</li> <li>T1: pre-treatment, mean 2.2 ± 1.3 days post onset; T2: post-treatment, mean 16.2 ± 1.3 days post onset; T3: mean 190 ± 25.5 days post onset</li> <li>6 patients were randomized to receive treatment focusing on verbal comprehension and lexical retrieval for 1 hour/day, 5 days/week between T1 and T2; no patient received treatment after T2</li> <li>Yes (Siemens Avanto 1.5 Tesla)</li> <li>No (timing of stimuli not clearly described)</li> <li>Event-related</li> </ul>
ModalityIs the study cross-sectional or longitudinal?If longitudinal, at what time point(s) were imaging data acquired?If longitudinal, was there any intervention between the time points?Is the scanner described?Is the timing of stimulus presentation and image acquisition clearly described and appropriate?Design typeTotal images acquiredAre the imaging acquisition parameters, including	<ul> <li>Longitudinal—mixed</li> <li>T1: pre-treatment, mean 2.2 ± 1.3 days post onset; T2: post-treatment, mean 16.2 ± 1.3 days post onset; T3: mean 190 ± 25.5 days post onset</li> <li>6 patients were randomized to receive treatment focusing on verbal comprehension and lexical retrieval for 1 hour/day, 5 days/week between T1 and T2; no patient received treatment after T2</li> <li>Yes (Siemens Avanto 1.5 Tesla)</li> <li>No (timing of stimuli not clearly described)</li> <li>Event-related</li> <li>504</li> </ul>
ModalityIs the study cross-sectional or longitudinal?If longitudinal, at what time point(s) were imaging data acquired?If longitudinal, was there any intervention between the time points?Is the scanner described?Is the timing of stimulus presentation and image acquisition clearly described and appropriate?Design typeTotal images acquiredAre the imaging acquisition parameters, including coverage, adequately described and appropriate?Is preprocessing and intrasubject coregistration	Longitudinal—mixedT1: pre-treatment, mean 2.2 ± 1.3 days post onset; T2: post-treatment, mean 16.2 ± 1.3 days post onset; T3: mean 190 ± 25.5 days post onset6 patients were randomized to receive treatment focusing on verbal comprehension and lexical retrieval for 1 hour/day, 5 days/week between T1 and T2; no patient received treatment after T2Yes (Siemens Avanto 1.5 Tesla)No (timing of stimuli not clearly described)Event-related504No (unclear; number of slices not stated)
ModalityIs the study cross-sectional or longitudinal?If longitudinal, at what time point(s) were imaging data acquired?If longitudinal, was there any intervention between the time points?Is the scanner described?Is the timing of stimulus presentation and image acquisition clearly described and appropriate?Design typeTotal images acquiredAre the imaging acquisition parameters, including coverage, adequately described and appropriate?Is preprocessing and intrasubject coregistration adequately described and appropriate?Is first level model fitting adequately described and	Longitudinal—mixedT1: pre-treatment, mean 2.2 ± 1.3 days post onset; T2: post-treatment, mean 16.2 ± 1.3 days post onset; T3: mean 190 ± 25.5 days post onset6 patients were randomized to receive treatment focusing on verbal comprehension and lexical retrieval for 1 hour/day, 5 days/week between T1 and T2; no patient received treatment after T2Ves (Siemens Avanto 1.5 Tesla)No (timing of stimuli not clearly described)Event-related504No (unclear; number of slices not stated)Yes
ModalityIs the study cross-sectional or longitudinal?If longitudinal, at what time point(s) were imaging data acquired?If longitudinal, was there any intervention between the time points?Is the scanner described?Is the scanner described?Is the timing of stimulus presentation and image acquisition clearly described and appropriate?Design typeTotal images acquiredAre the imaging acquisition parameters, including coverage, adequately described and appropriate?Is preprocessing and intrasubject coregistration adequately described and appropriate?Is first level model fitting adequately described and appropriate?Is intersubject normalization adequately described	Longitudinal—mixedT1: pre-treatment, mean 2.2 ± 1.3 days post onset; T2: post-treatment, mean 16.2 ± 1.3 days post onset; T3: mean 190 ± 25.5 days post onset6 patients were randomized to receive treatment focusing on verbal comprehension and lexical retrieval for 1 hour/day, 5 days/week between T1 and T2; no patient received treatment after T2Yes (Siemens Avanto 1.5 Tesla)No (timing of stimuli not clearly described)Event-related504No (unclear; number of slices not stated)YesNo (model fitting of noise "bip" not clearly described)
ModalityIs the study cross-sectional or longitudinal?If longitudinal, at what time point(s) were imaging data acquired?If longitudinal, was there any intervention between the time points?Is the scanner described?Is the scanner described?Is the timing of stimulus presentation and image acquisition clearly described and appropriate?Design typeTotal images acquiredAre the imaging acquisition parameters, including coverage, adequately described and appropriate?Is preprocessing and intrasubject coregistration adequately described and appropriate?Is first level model fitting adequately described and appropriate?Is intersubject normalization adequately described and appropriate?	Longitudinal—mixedT1: pre-treatment, mean 2.2 ± 1.3 days post onset; T2: post-treatment, mean 16.2 ± 1.3 days post onset; T3: mean 190 ± 25.5 days post onset6 patients were randomized to receive treatment focusing on verbal comprehension and lexical retrieval for 1 hour/day, 5 days/week between T1 and T2; no patient received treatment after T2Yes (Siemens Avanto 1.5 Tesla)No (timing of stimuli not clearly described)Event-related504No (unclear; number of slices not stated)YesNo (model fitting of noise "bip" not clearly described)

# ConditionResponse typeRepetitionsAll groups could do?All individuals could do?listening to sentences and making a plausibilityButton press56YesUnknownjudgmentS6YesYesYes

listening to reversed speech	None	56	<u>N/A</u>	<u>N/A</u>
Conditions notes	Half of the sentences were	e semantically ar	nomalous	
Contrasts				
Are the contrasts clearly described?	No (see specific limitation	(s) below)		
Contrast 1: listening to sentences and making a	a plausibility judgment v	s listening to re	versed speech	
Language condition	Listening to sentences and	-		
Control condition	Listening to reversed spee		ionity judgitient	
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	Yes			
Are the conditions matched for motor demands?	No			
Are the conditions matched for cognitive/executive demands?	No			
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>	2		
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>	2		
Behavioral data notes	-			
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>			
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Somewhat</u>			
Are activations lateralized in the control data?	Yes			
Control activation notes	10 participants; quite late		-	
Contrast notes	It is mentioned that "noise if this refers to the noise "		•	of the contrast; <u>it is unclear</u>
Analyses				
Are the analyses clearly described?	<u>No* (moderate limitation)</u>	(see specific lim	itation(s) below)	
Voxelwise analysis 1				
First level contrast	Listening to sentences and	d making a plaus	ibility judgment vs listeni	ng to reversed speech
Analysis class	Cross-sectional between t			0
Group(s)	Aphasia treated T2 (n = 6)		•	
Covariate	_			
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>Somewhat</u> (groups were c	lifferent but not	due to treatment)	
Is accuracy matched across the second level contrast?	Yes, matched			
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>			
Behavioral data notes	-			
Type of analysis	Voxelwise			
Search volume	Whole brain			
Correction for multiple comparisons	Clusterwise correction bas	sed on arbitrary	<u>cluster extent</u>	
Software	BrainVoyager QX 1.9			
Voxelwise p	.001			
Cluster extent	0.16 cc			
Statistical details	Methods report cluster ex uncorrected	tent threshold (v	ve assume this was done	), but <mark>figure caption states</mark>
Findings	↑ L IFG pars opercularis ↑ L IFG pars triangularis ↑ L SMA/medial prefronta ↑ L angular gyrus	I		

	↑ R ventral precentral/inferior frontal junction
Findings notes	↑ R supramarginal gyrus Based on coordinates in Table 2
Voxelwise analysis 2	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia treated T3 (n = 6) vs untreated T3 (n = 6)
Covariate	—
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (groups were different but not due to treatment)
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	BrainVoyager QX 1.9
Voxelwise p	.001
Cluster extent	0.16 cc
Statistical details	Methods report cluster extent threshold (we assume this was done), but <u>figure caption states</u> <u>uncorrected</u>
Findings	↑ L IFG pars triangularis ↑ L insula ↑ L supramarginal gyrus
Findings notes	Based on coordinates in Table 2; also increases in R IFG and R supramarginal gyrus but only uncorrected
Voxelwise analysis 3	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia treated (n = 6) T2 vs T1) vs (untreated (n = 6) T2 vs T1)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (no treatment effect)
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No direct comparison
Software	BrainVoyager QX 1.9
Voxelwise p	-
Cluster extent	-
Statistical details	Qualitative comparison on p. 548
Findings	↑ L IFG ↑ R posterior STG ↓ L inferior parietal lobule ↓ R IFG
Findings notes	Treated patients showed increases in L IFG and R STG, while untreated patients showed increases in L IPL and R IFG

#### Voxelwise analysis 4

Voxelwise analysis 4	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia treated (n = 6) T3 vs T2) vs (untreated (n = 6) T3 vs T2)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>Somewhat</u> (no treatment effect)
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No direct comparison
Software	BrainVoyager QX 1.9
Voxelwise p	-
Cluster extent	-
Statistical details	Qualitative comparison on p. 548
Findings	None
Findings notes	The two groups were reported to have comparable increases in L hemisphere language areas
Voxelwise analysis 5	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia treated (n = 6) T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	BrainVoyager QX 1.9
Voxelwise p	.005
Cluster extent	None
Statistical details	-
Findings	↑ L IFG pars opercularis ↑ R posterior STG
Findings notes	-
Voxelwise analysis 6	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia untreated (n = 6) T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level	Voc matched

Yes, matched

Is accuracy matched across the second level

Is reaction time matched across the second level

contrast?

<u>Unknown, not reported</u>

contrast?	
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	BrainVoyager QX 1.9
Voxelwise p	.005
Cluster extent	None
Statistical details	-
Findings	↑ L inferior parietal lobule ↑ R insula
Findings notes	-

## Voxelwise analysis 7

First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia treated (n = 6) T3 vs T2
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	BrainVoyager QX 1.9
Voxelwise p	.005
Cluster extent	None
Statistical details	-
Findings	↑ L IFG ↑ L insula ↑ L inferior parietal lobule ↑ L anterior temporal ↑ R insula
Findings notes	
Voxelwise analysis 8	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia untreated (n = 6) T3 vs T2
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level	<u>Unknown, not reported</u>

First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia untreated (n = 6) T3 vs T2
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	BrainVoyager QX 1.9
Voxelwise p	.005

Cluster extent	None
Statistical details	-
Findings	<ul> <li>↑ L IFG pars opercularis</li> <li>↑ L IFG pars triangularis</li> <li>↑ L IFG pars orbitalis</li> <li>↑ L angular gyrus</li> <li>↑ L superior parietal</li> <li>↑ L posterior STG/STS/MTG</li> <li>↑ R IFG pars opercularis</li> <li>↑ R angular gyrus</li> </ul>
Findings notes	_

## ROI analysis 1

First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia treated (n = 6) T1 $\neq$ T2 $\neq$ T3) vs (untreated (n = 6) T1 $\neq$ T2 $\neq$ T3)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>Somewhat</u> (no treatment effect)
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) L IFG; (2) R IFG; (3) L STG; (4) R STG
How are the ROI(s) defined?	Based on functional data from patients and controls, but details not stated; <u>a different set of</u> ROIs are mentioned in the results so it is not really clear which set were actually used
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↑ L IFG
Findings notes	Interaction of time by treatment: treated group showed greater L IFG activity at T2
ROI analysis 2	
Eirst level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech

First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia treated (n = 6) T2 vs T1
Covariate	Δ written language (AAT)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) L IFG; (2) R IFG; (3) L STG; (4) R STG
How are the ROI(s) defined?	Based on functional data from patients and controls, but details not stated; <u>a different set of</u> <u>ROIs are mentioned in the results so it is not really clear which set were actually used</u>
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None

#### Findings notes

#### **ROI** analysis 3

ROI analysis 3	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia treated (n = 6) T2 vs T1
Covariate	Δ naming (AAT)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) L IFG; (2) R IFG; (3) L STG; (4) R STG
How are the ROI(s) defined?	Based on functional data from patients and controls, but details not stated; <u>a different set of</u> ROIs are mentioned in the results so it is not really clear which set were actually used
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↑ L IFG
Findings notes	_
ROI analysis 4	
First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia untreated (n = 6) T2 vs T1
Covariate	$\Delta$ written language (AAT)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)

## **ROI** analysis 5

Findings notes

Statistical details

ROI type

Findings

How many ROIs are there? What are the ROI(s)?

How are the ROI(s) defined?

Correction for multiple comparisons

First level contrast	Listening to sentences and making a plausibility judgment vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia untreated (n = 6) T2 vs T1
Covariate	Δ naming (AAT)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes

(1) L IFG; (2) R IFG; (3) L STG; (4) R STG

Based on functional data from patients and controls, but details not stated; a different set of

ROIs are mentioned in the results so it is not really clear which set were actually used

Functional

No correction

4

\_

None

Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) L IFG; (2) R IFG; (3) L STG; (4) R STG
How are the ROI(s) defined?	Based on functional data from patients and controls, but details not stated; <u>a different set of</u> ROIs are mentioned in the results so it is not really clear which set were actually used
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↑ R IFG
Findings notes	-
Notes	
Excluded analyses	(1) a visual comparison between all patients at T1, and controls, because there are no specific claims apart from "markedly reduced cortical activation" in patients; (2) pre-treatment comparison between treated and untreated groups

## Mohr et al. (2014)

#### Reference

Authors	Mohr B, Difrancesco S, Harrington K, Evans S, Pulvermüller F
Title	Changes of right-hemispheric activation after constraint-induced, intensive language action therapy in chronic aphasia: fMRI evidence from auditory semantic processing
Reference	Front Hum Neurosci 2014; 8: 919
PMID	25452721
DOI	10.3389/fnhum.2014.00919

## Participants

Language	UK English
Inclusion criteria	MCA; mild-moderate non-fluent aphasia; no severe comprehension deficit
Number of individuals with aphasia	<u>6</u> (plus 6 excluded: 4 for health risks; 2 for technical problems and data loss)
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (range 41-76 years)
Is sex reported for patients and controls, and matched?	Yes (males: 5; females: 1)
Is handedness reported for patients and controls, and matched?	Yes (right: 6; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 17-234 months (including excluded patients))
To what extent is the nature of aphasia characterized?	<u>Severity only</u>
Language evaluation	BDAE, TT
Aphasia severity	Mild-moderate; T1: TT range 15-49 errors (including 2 excluded patients)
Aphasia type	Not stated
First stroke only?	Yes
Stroke type	Mixed etiologies

To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L MCA
Participants notes	Patient numbers in tables 1 and 2 appear not to correspond with patient numbers later in the
	paper

## Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, ~2 weeks later
If longitudinal, was there any intervention between the time points?	CIAT, 3-4 hours/day, 5 days/week, 2 weeks
Is the scanner described?	Yes (Siemens Trio 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Event-related
Total images acquired	76
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	No (lesion impact not addressed)
Imaging notes	sparse sampling
Conditions	

Conditions

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
listening to high ambiguity sentences	None	19	N/A	N/A
listening to low ambiguity sentences	None	19	N/A	N/A
listening to signal-correlated noise	None	19	N/A	N/A
rest	None	19	<u>N/A</u>	<u>N/A</u>

Conditions notes

#### Contrasts

Are the contrasts clearly described?

## Contrast 1: listening to sentences (high and low ambiguity) vs listening to signal-correlated noise

Yes

Yes

Language condition	Listening to sentences (high and low ambiguity)
Control condition	Listening to signal-correlated noise
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, no behavioral measure</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task
Behavioral data notes	-

Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	Some control data in Rodd et al. (2005), but half of the participants were performing a probe judgment task, unlike in the present study
Contrast notes	_
Contrast 2: listening to high ambiguity sentence	es vs listening to low ambiguity sentences
Language condition	Listening to high ambiguity sentences
Control condition	Listening to low ambiguity sentences
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, no behavioral measure</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	Some control data in Rodd et al. (2005), but half of the participants were performing a probe judgment task, unlike in the present study
Contrast notes	_
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Listening to sentences (high and low ambiguity) vs listening to signal-correlated noise
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No direct comparison
Software	SPM8
Voxelwise p	_
Cluster extent	_
Statistical details	Qualitative generalization across individuals on pp. 8-9
Findings	None
Findings notes	_
5	

## ROI analysis 1

First level contrast	Listening to high ambiguity sentences vs listening to low ambiguity sentences
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) L IFG; (2) R IFG; (3) L ITG; (4) R ITG; the temporal ROIs are described as STG but they seem to be in the ITG
How are the ROI(s) defined?	Defined based on control data from Rodd et al. (2005) but <u>the coordinates do not match so it</u> <u>is not clear exactly how they were defined</u>
Correction for multiple comparisons	No correction
Statistical details	ANOVA of timepoint by hemisphere by site, with a significant interaction of timepoint by hemisphere
Findings	↑ R IFG ↑ R posterior inferior temporal gyrus/fusiform gyrus
Findings notes	All signal changes were negative (i.e. less activation for ambiguous sentences), making interpretation challenging
Notes	
Excluded analyses	Noise vs rest (not language); individual patient analyses

## Robson et al. (2014)

## Reference

Authors	Robson H, Zahn R, Keidel JL, Binney RJ, Sage K, Lambon Ralph MA
Title	The anterior temporal lobes support residual comprehension in Wernicke's aphasia
Reference	<i>Brain</i> 2014; 137: 931-943
PMID	24519979
DOI	10.1093/brain/awt373

Participants

Language	UK English
Inclusion criteria	Wernicke's aphasia (impaired spoken single word comprehension, impaired single word repetition, fluent, sentence-like speech with phonological/neologistic errors)
Number of individuals with aphasia	<u>12</u>
Number of control participants	12
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 70.1 ± 8.7 years, range 59-87 years)
Is sex reported for patients and controls, and matched?	Yes (males: 10; females: 2)
Is handedness reported for patients and controls, and matched?	Yes (right: 12; left: 0)

Is time post stroke onset reported and appropriate to the study design?	Yes (range 7-84 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	BDAE, PPT, word-to-picture matching test from Cambridge Semantic Battery, single word reading aloud from PALPA
Aphasia severity	BDAE comprehension range 6-26 (out of 32); BDAE comprehension scores and percentiles do not seem entirely commensurate
Aphasia type	All Wernicke's
First stroke only?	Yes
Stroke type	Mixed etiologies
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L MCA; all involved STG extending into IPL and temporoparietal junction; 8 extending into MTL; 4 extending into inferior frontal
Participants notes	-

## Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	-
If longitudinal, was there any intervention between the time points?	-
Is the scanner described?	Yes (Philips Achieva 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No* (moderate limitation)</u> (each condition was acquired in a separate run, which is suboptimal)
Design type	Block
Total images acquired	417
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	spin echo fMRI to minimize ATL dropout
Conditions	

Are the conditions clearly described?

Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
semantic decision (written word)	Button press	16	Yes	No
semantic decision (picture)	Button press	16	Yes	No
visual decision	Button press	16	Yes	No
rest	None	48	N/A	<u>N/A</u>

Conditions notes

## Contrasts

Are the contrasts clearly described?

No (see specific limitation(s) below)

## Contrast 1: semantic decision (written word and picture) vs visual decision and rest

Language condition

Semantic decision (written word and picture)

Control condition	
Control condition	Visual decision and rest
Are the conditions matched for visual demands?	No Yes
Are the conditions matched for auditory demands?	
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	Not comparable because the control condition includes rest
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	No
Control activation notes	Control data are provided in Table 6 for contrasts of written word semantic decision vs dual baseline, and picture semantic decision vs dual baseline, but not for the main effect of semantic decision; these data suggest that the contrast activates ventral temporal regions bilaterally
Contrast notes	Two contrasts are described: (1) written word judgment versus a dual baseline of visual judgment and rest; (2) picture judgment versus a dual baseline of visual judgment and rest; these two primary contrasts are reported in patients and controls separately, but no between-group contrasts are reported, so these contrasts are excluded from our review; rather, the between-groups analyses in the paper take the form of ANOVAs; the main effect of group in these ANOVAs collapses across the two described contrasts, therefore we have coded the contrast as the average of the two described contrasts; the exact nature of the computation of dual baseline contrasts is not described
Analyses	
Are the analyses clearly described?	<u>No* (moderate limitation)</u> (see specific limitation(s) below)
/oxelwise analysis 1	
First level contrast	Semantic decision (written word and picture) vs visual decision and rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	No, different
Behavioral data notes	Patients also less accurate on control condition, but control condition includes rest so coded based on language condition only
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM8
Voxelwise p	.005
Cluster extent	4 voxels (size not stated)
Statistical details	Dual baseline computation not explained
Findings	↑ L IFG pars orbitalis ↑ L mid temporal ↑ L anterior temporal ↑ L cerebellum

	↑ R mid temporal ↑ R anterior temporal ↑ R posterior inferior temporal gyrus/fusiform gyrus ↑ R cerebellum ↑ R hippocampus/MTL ↓ R posterior cingulate
Findings notes	-
ROI analysis 1	
First level contrast	Semantic decision (written word and picture) vs visual decision and rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>No, different</u>
Behavioral data notes	Patients also less accurate on control condition, but control condition includes rest so coded based on language condition only
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	10
What are the ROI(s)?	(1) L anterior fusiform gyrus; (2) L temporal pole; (3) L anterior STS; (4) L IFG; (5) L ventral occipito-temporal; (6-10) homotopic counterparts
How are the ROI(s) defined?	Spheres around functional peaks from literature
Correction for multiple comparisons	No correction
Statistical details	Dual baseline computation not explained
Findings	↑ L anterior temporal ↑ L posterior inferior temporal gyrus/fusiform gyrus ↑ R posterior inferior temporal gyrus/fusiform gyrus
Findings notes	_
Notes	
Excluded analyses	(1) main effect of condition (written words vs pictures); (2) interactions of condition by group (all of which were non-significant); (3) additional analyses were run including only participants who performed above chance, and only correct responses from all participants, but these

## Szaflarski et al. (2014)

#### Reference

Authors	Szaflarski JP, Allendorfer JB, Byars AW, Vannest J, Dietz A, Hernando KA, Holland SK
Title	Age at stroke determines post-stroke language lateralization
Reference	Restor Neurol Neurosci 2014; 32: 733-742
PMID	25159870
DOI	10.3233/rnn-140402

gave essentially similar results

## Participants

Language	US English
Inclusion criteria	_
Number of individuals with aphasia	32
Number of control participants	32

Were any of the participants included in any previous studies?	Yes (some participants in	cluded in Allendo	orfer et al. (2012))	
Is age reported for patients and controls, and matched?	Yes (mean 51.8 ± 15.1 years)			
ls sex reported for patients and controls, and matched?	Yes (males: 18; females: 14)			
Is handedness reported for patients and controls, and matched?	No			
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 3.2 ± 3.1 years	s, > 6 months)		
To what extent is the nature of aphasia characterized?	Not at all			
Language evaluation	Not stated			
Aphasia severity	"complete or almost com	plete" recovery i	n a "substantial proportic	on" of the patients
Aphasia type	Not stated			
First stroke only?	Not stated			
Stroke type	Not stated			
To what extent is the lesion distribution characterized?	Lesion overlay			
Lesion extent	60.1 ± 57.5 cc			
Lesion location	L MCA			
Participants notes	One participant was < 18 not relevant for this revie were adult or perinatal p	w; 3 participants		a perinatal stroke group, ot stated whether they
Imaging				
Modality	fMRI			
Is the study cross-sectional or longitudinal?	Cross-sectional			
If longitudinal, at what time point(s) were imaging data acquired?	_			
If longitudinal, was there any intervention between the time points?	_			
Is the scanner described?	Yes (Philips Achieva 3 Tes	la, except for 1 p	atient and 1 control on a	Bruker 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes			
Design type	Block			
Total images acquired	165			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	Yes			
Is intersubject normalization adequately described and appropriate?	Yes			
Imaging notes	_			
Conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
verb generation	Multiple words (covert)	5	Yes	Unknown
finger tapping	Other	6	Yes	Yes

Conditions notes

#### Contrasts

Contrasts	
Are the contrasts clearly described?	Yes
Contrast 1: verb generation vs finger tapping	
Language condition	Verb generation
Control condition	Finger tapping
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Somewhat
Control activation notes	Control data in Szaflarski et al. (2008); frontal activation L-lateralized, temporal less so
Contrast notes	_
Analyses	
Are the analyses clearly described?	Yes
Voxelwise analysis 1	
First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No direct comparison
Software	CCHIPS
Voxelwise p	_
Cluster extent	_
Statistical details	Qualitative comparison on pp. 5-6 (page numbers refer to PMC author manuscript)
Findings	↓ L inferior parietal lobule ↓ L superior parietal ↓ L posterior STG/STS/MTG ↓ L occipital ↓ R occipital
Findings notes	_
ROI analysis 1	
First level contrast	Verb generation vs finger tapping

420

Analysis class	Cross-sectional aphasia vs control
5	
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	3
What are the ROI(s)?	(1) frontal LI; (2) temporal LI; (3) language network LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↓ LI (language network) ↓ LI (frontal)
Findings notes	Temporal LI was also marginally significantly reduced (p = .08)
Notes	
Excluded analyses	All analyses involving perinatal stroke group; distribution of language lateralization categories (derived from LI) also differed between patients and controls

## van Hees et al. (2014)

### Reference

Authors	van Hees S, McMahon K, Angwin A, de Zubicaray G, Copland DA
Title	Neural activity associated with semantic versus phonological anomia treatments in aphasia
Reference	Brain Lang 2014; 129: 47-57
PMID	24556337
DOI	10.1016/j.bandl.2013.12.004

## Participants

Language	Australian English
Inclusion criteria	-
Number of individuals with aphasia	8
Number of control participants	14
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 56.4 + 9.2 years; range 41-69 years)
Is sex reported for patients and controls, and matched?	Yes (males: 3; females: 5)
Is handedness reported for patients and controls, and matched?	Yes (right: 8; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 52.3 + 49.8 months; range 17-170 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	WAB, BNT, PPT, CAT, picture naming from International Picture Naming Project Database
Aphasia severity	AQ range 57.3-91.6; 5 mild, 2 moderate, 1 mild-moderate

Aphasia type	6 anomic, 2 conduction
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L hemisphere
Participants notes	-

## Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, 5-6 weeks later; note that "immediate improvement" was measured at the end of SLT, a week or two prior to T2 scan
If longitudinal, was there any intervention between the time points?	SLT with alternating semantic and phonological sessions, 3 days/week, 4 weeks
Is the scanner described?	Yes (Bruker MedSpec 4 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Event-related
Total images acquired	610
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	<u>No</u> (lesion impact not addressed)
Imaging notes	slow event-related design; sparse sampling
Conditions	

#### Conditions

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming (phonological trained items)	Word (overt)	30	Yes	No
picture naming (semantic trained items)	Word (overt)	30	Yes	No
picture naming (known items)	Word (overt)	30	Yes	Yes
viewing scrambled images	None	30	<u>N/A</u>	<u>N/A</u>
Conditions notes	Some patients named •	< 10% correct at T	1	

#### Contrasts

Are the contrasts clearly described?

No (see specific limitation(s) below)

## Contrast 1: picture naming (phonological trained items, correct trials) vs viewing scrambled images

Yes

Language condition	Picture naming (phonological trained items, correct trials)
Control condition	Viewing scrambled images
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>

Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	Control data are described for naming untrained items; the data are reported only briefly in the text; it is notable that no speech motor, visual, or auditory activations are reported, as might be expected in a picture naming task
Contrast notes	Correct and incorrect trials were apparently modeled separately, but <u>this is not clearly stated,</u> nor are the criteria for deciding whether trials were correct; it is generally not clear which <u>contrasts exactly were run</u>

## Contrast 2: picture naming (semantic trained items, correct trials) vs viewing scrambled images

Language condition	Picture naming (semantic trained items, correct trials)
Control condition	Viewing scrambled images
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	Control data are described for naming untrained items; the data are reported only briefly in the text; it is notable that no speech motor, visual, or auditory activations are reported, as might be expected in a picture naming task
Contrast notes	Correct and incorrect trials were apparently modeled separately, but <u>this is not clearly stated,</u> nor are the criteria for deciding whether trials were correct; it is generally not clear which <u>contrasts exactly were run</u>
Analyses	
Are the analyses clearly described?	Yes
Voxelwise analysis 1	
First level contrast	Picture naming (phonological trained items, correct trials) vs viewing scrambled images
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Subsequent $\Delta$ (T2 vs T1) picture naming (phonological treated items)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (T1 behavioral measure should be included in model)
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain

Correction for multiple comparisons	Clusterwise correction based on 3dClustSim
Software	AFNI
Voxelwise p	.005
Cluster extent	0.999 сс
Statistical details	-
Findings	None
Findings notes	-
Voxelwise analysis 2	
First level contrast	Picture naming (semantic trained items, correct trials) vs viewing scrambled images
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Subsequent $\Delta$ (T2 vs T1) picture naming (semantic treated items)
Is the second level contrast valid in terms of the	Somewhat (T1 behavioral measure should be included in model)
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on 3dClustSim
Software	AFNI
Voxelwise p	.005
Cluster extent	0.999 сс
Statistical details	_
Findings	↑ L basal ganglia
Findings notes	_
Voxelwise analysis 3	
First level contrast	Picture naming (phonological trained items, correct trials) vs viewing scrambled images
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T2
Covariate	Previous $\Delta$ (T2 vs T1) picture naming (phonological treated items)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	No (T2 activation not an appropriate measure of treatment-induced recovery because it
Is accuracy matched across the second level	reflects T2 performance) Yes, correct trials only
contrast?	
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on 3dClustSim
Software	AFNI
Voxelwise p	.005
Cluster extent	0.999 сс
Statistical details	-
Findings	↑ L supramarginal gyrus ↑ R precuneus
Findings notes	_
Voxelwise analysis 4	
First level contrast	Picture naming (semantic trained items, correct trials) vs viewing scrambled images

Analysis class     Cross-sectional correlation with language or other measure       Group(s)     Aphasia T2       Covariate     Previous Δ (T2 vs T1) picture naming (semantic treated items)       Is the case and level contract uplid in terms of the     No (T2 optimation pet on parametrize measure of treatment induced	
Covariate Previous Δ (T2 vs T1) picture naming (semantic treated items)	
Is the second level contrast valid in terms of the <u>No</u> (T2 activation not an appropriate measure of treatment-induc	ed recovery because it
group(s), time point(s), and measures involved? reflects T2 performance)	···· · · · · · · · · · · · · · · · · ·
Is accuracy matched across the second level Yes, correct trials only contrast?	
Is reaction time matched across the second level <u>Unknown, not reported</u> contrast?	
Behavioral data notes —	
Type of analysis Voxelwise	
Search volume Whole brain	
Correction for multiple comparisons Clusterwise correction based on 3dClustSim	
Software AFNI	
Voxelwise p .005	
Cluster extent 0.999 cc	
Statistical details —	
Findings None	
Findings notes —	
Voxelwise analysis 5	
First level contrast Picture naming (phonological trained items, correct trials) vs view	ing scrambled images
Analysis class Cross-sectional correlation with language or other measure	
Group(s) Aphasia T1	
Covariate Subsequent outcome (T2) picture naming	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	nout T1 behavior in model)
Is accuracy matched across the second level Yes, correct trials only contrast?	
Is reaction time matched across the second level <u>Unknown, not reported</u> contrast?	
Behavioral data notes —	
Type of analysis Voxelwise	
Search volume Whole brain	
Correction for multiple comparisons Clusterwise correction based on 3dClustSim	
Software AFNI	
Voxelwise p .005	
Cluster extent 0.999 cc	
Statistical details —	
Findings None	
Findings notes —	
Voxelwise analysis 6	
First level contrast Picture naming (semantic trained items, correct trials) vs viewing :	scrambled images
Analysis class Cross-sectional correlation with language or other measure	
Group(s) Aphasia T1	
Covariate Subsequent outcome (T2) picture naming	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	nout T1 behavior in model)
Is accuracy matched across the second level Yes, correct trials only contrast?	
Is reaction time matched across the second level <u>Unknown, not reported</u> contrast?	
Behavioral data notes —	
Type of analysis Voxelwise	

Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on 3dClustSim
Software	AFNI
Voxelwise p	.005
Cluster extent	0.999 сс
Statistical details	_
Findings	None
Findings notes	-

## Voxelwise analysis 7

First level contrast	Picture naming (phonological trained items, correct trials) vs viewing scrambled images
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T2
Covariate	Picture naming T2
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on 3dClustSim
Software	AFNI
Voxelwise p	.005
Cluster extent	0.999 cc
Statistical details	-
Findings	None
Findings notes	_

## Voxelwise analysis 8

First level contrast	Picture naming (semantic trained items, correct trials) vs viewing scrambled images
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T2
Covariate	Picture naming T2
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on 3dClustSim
Software	AFNI
Voxelwise p	.005
Cluster extent	0.999 сс
Statistical details	-
Findings	None
Findings notes	-
Natas	

## Notes

Excluded analyses

Individual patient analyses

## Abel et al. (2015)

## Reference

Authors	Abel S, Weiller C, Huber W, Willmes K, Specht K
Title	Therapy-induced brain reorganization patterns in aphasia
Reference	<i>Brain</i> 2015; 138: 1097-1112
PMID	25688082
DOI	10.1093/brain/awv022

## Participants

Language	German
Inclusion criteria	Anomia; no severe AoS or dysarthria
Number of individuals with aphasia	14 (plus 9 excluded: 4 for ceiling performance; 5 for technical problems)
Number of control participants	14
Were any of the participants included in any previous studies?	Yes (same dataset as Abel et al. (2014))
Is age reported for patients and controls, and matched?	Yes (median 48 years, range 35-74 years)
Is sex reported for patients and controls, and matched?	Yes (males: 10; females: 4)
Is handedness reported for patients and controls, and matched?	Yes (right: 14; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (median 41 months, range 11-72 months)
To what extent is the nature of aphasia characterized?	<u>Type only</u>
Language evaluation	AAT
Aphasia severity	Not stated
Aphasia type	8 Broca's, 3 Wernicke's, 1 fluent non-classifiable, 1 global, 1 transcortical sensory
First stroke only?	Yes
Stroke type	Mixed etiologies
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L MCA; 2 also had ACA
Participants notes	-

## Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, ~6 weeks later (labeled T2 and T3 in paper)
If longitudinal, was there any intervention between the time points?	Lexical therapy, alternating between weeks with phonological and semantic treatment, 4 weeks; 60 out of the 132 items were trained
Is the scanner described?	Yes (Philips Achieva 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No* (moderate limitation)</u> (trials too close together (~8 s) and insufficient jitter (1-3 s) for event-related design)
Design type	Event-related
Total images acquired	560
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes

Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	<u>No</u> (lesion impact not addressed)
Imaging notes	_
Conditions	

#### Conditions

Are the conditions clearly described?

Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming	Word (overt)	132	Yes	Yes
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>
Conditions notes	-			
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: picture naming vs rest				
Language condition	Picture naming			
Control condition	Rest			
Are the conditions matched for visual demands?	No			
Are the conditions matched for auditory demands?	No			
Are the conditions matched for motor demands?	No			
Are the conditions matched for cognitive/executive demands?	No			
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparabl</u>	<u>e</u>		
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparabl</u>	e		
Behavioral data notes	-			
Are control data reported in this paper or another that is referenced?	Yes			
Does the contrast selectively activate plausible relevant language regions in the control group?	No			
Are activations lateralized in the control data?	No			
Control activation notes	Bilateral somato-motor, a impulse analysis only	uditory and to a	lesser extent higher level	visual regions; finite
Contrast notes	-			
Analyses				
Are the analyses clearly described?	Yes			
/oxelwise analysis 1				
First level contrast	Picture naming vs rest			
Analysis class	Longitudinal change in ap	ohasia		
Group(s)	Aphasia T2 vs T1			
Covariate	_			
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes			
Is accuracy matched across the second level contrast?	<u>No, different</u>			
Is reaction time matched across the second level contrast?	<u>No, different</u>			
Behavioral data notes	RT shorter at T2			

Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on cluster threshold beta
Software	SPM8
Voxelwise p	.01
Cluster extent	11 voxels (size not stated)
Statistical details	-
Findings	<ul> <li>L IFG pars triangularis</li> <li>L dorsolateral prefrontal cortex</li> <li>L ventral precentral/inferior frontal junction</li> <li>L dorsal precentral</li> <li>L SMA/medial prefrontal</li> <li>L somato-motor</li> <li>L inferior parietal lobule</li> <li>L precuneus</li> <li>L posterior cingulate</li> <li>L cerebellum</li> <li>R SMA/medial prefrontal</li> <li>R somato-motor</li> <li>R posterior STS</li> <li>R posterior ingulate</li> <li>R posterior ingulate</li> <li>R cerebellum</li> <li>R thalamus</li> </ul>
Findings notes	↓ R hippocampus/MTL 
Voxelwise analysis 2	
First level contrast	Picture naming vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T1 vs control T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	No, different
Behavioral data notes	Controls responded more quickly
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on cluster_threshold_beta
Software	SPM8
Voxelwise p	.01
Cluster extent	11 voxels (size not stated)

- - ↑ R precuneus
- ↓ L somato-motor ↓ L Heschl's gyrus
- $\downarrow$  L anterior cingulate
- $\downarrow$  L posterior cingulate
- ↓ L thalamus
- $\downarrow$  L basal ganglia
- ↓ R insula
- $\downarrow \mathsf{R} \text{ somato-motor}$ ↓ R mid temporal

Findings notes

Statistical details Findings

## Voxelwise analysis 3

voxennise analysis s	
First level contrast	Picture naming vs rest
Analysis class	Longitudinal aphasia vs control
Group(s)	(Aphasia T2 vs T1) vs (control T2 vs T1)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	RT not reported for controls
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on cluster_threshold_beta
Software	SPM8
Voxelwise p	.01
Cluster extent	11 voxels (size not stated)
Statistical details	_
Findings	<ul> <li>L precuneus</li> <li>L anterior cingulate</li> <li>L posterior cingulate</li> <li>L basal ganglia</li> <li>R precuneus</li> <li>R posterior STS</li> <li>R posterior MTG</li> <li>R posterior cingulate</li> <li>R thalamus</li> <li>R hippocampus/MTL</li> </ul>
Findings notes	_
Voxelwise analysis 4	
First level contrast	Picture naming vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T1 vs control T1
Covariate	
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	RT not reported for controls
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No direct comparison
Software	SPM8
Voxelwise p	_
Cluster extent	_
Statistical details	Qualitative comparison between activation in the first 5 TRs after each stimulus on p. 1101
Findings	None
Findings notes	The time course of response is stated to be similar in patients and controls, however the response in patients appears like it could be a couple of seconds slower
Complex analysis 1	
First level contrast	Picture naming vs rest

First level contrast

Picture naming vs rest

Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	RT not reported for controls
Type of analysis	Complex
Statistical details	Joint ICA was performed on structural and functional contrast images using FIT 1.2c. Three of the 7 components differed between groups in their loadings. Components were thresholded at $z > 3.09$ , not corrected for multiple comparisons.
Findings	Other
Findings notes	Three structural-functional components are described in Figure 5 and Table 4. Functional activations are generally small and do not obviously relate to language processing. It is mentioned in the supplementary results that "the lesion maps may dominate estimation of the mixing parameter" (p. 10).
Notes	

Excluded analyses

## Kiran et al. (2015)

## Reference

Authors	Kiran S, Meier EL, Kapse KJ, Glynn PA
Title	Changes in task-based effective connectivity in language networks following rehabilitation in post-stroke patients with aphasia
Reference	Front Hum Neurosci 2015; 9: 316
PMID	26106314
DOI	10.3389/fnhum.2015.00316

## Participants

Language	US English
Inclusion criteria	Impaired naming
Number of individuals with aphasia	<u>8</u>
Number of control participants	8
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 58 years)
Is sex reported for patients and controls, and matched?	Yes (males: 7; females: 1)
Is handedness reported for patients and controls, and matched?	No
Is time post stroke onset reported and appropriate to the study design?	Yes (range 15-157 months)
To what extent is the nature of aphasia characterized?	<u>Severity only</u>
Language evaluation	WAB, BNT, PPT, CLQT
Aphasia severity	AQ range 48.0-97.2
Aphasia type	Not stated
First stroke only?	Yes

Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	24.2-431.6 cc
Lesion location	L MCA except for one patient with R MCA and aphasia
Participants notes	-

## Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, ~10 weeks later
If longitudinal, was there any intervention between the time points?	Semantic feature-based treatment, 10 weeks
Is the scanner described?	Yes (Philips Achieva 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No* (moderate limitation</u> ) (picture and scrambled conditions have different durations; ITI 2-4 s seems too short; total images acquired not stated)
Design type	Event-related
Total images acquired	not stated
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	controls were run on two different sets of parameters, neither of which was the same as the patients
Conditions	

#### Conditions

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming (trained)	Word (overt)	40	Unknown	<u>Unknown</u>
picture naming (untrained)	Word (overt)	40	Unknown	Unknown
viewing scrambled images and saying "skip"	Word (overt)	80	Unknown	Unknown
semantic feature decision	Button press	40	Unknown	Unknown
visual decision	Button press	40	Unknown	Unknown

Conditions notes

#### Contrasts

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Are the contrasts clearly described?
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No (see specific limitation(s) below)

## Contrast 1: picture naming (trained) vs viewing scrambled images and saying "skip"

Yes

Language condition	Picture naming (trained)
Control condition	Viewing scrambled images and saying "skip"
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Is reaction time matched between the language	Unknown, not reported

and control tasks for all relevant groups?	
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	Somewhat
Control activation notes	Overlap of individual participant activation maps; somewhat lateralized frontal and temporal, but also bilateral occipito-temporal
Contrast notes	-

#### Contrast 2: semantic feature decision vs visual decision

contrast 2. semantic reatine decision vs visual decision				
Language condition	Semantic feature decision			
Control condition	Visual decision			
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	Yes			
Are the conditions matched for motor demands?	Yes			
Are the conditions matched for cognitive/executive demands?	No			
Is accuracy matched between the language and control tasks for all relevant groups?	Unknown, not reported			
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>			
Behavioral data notes	-			
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>			
Does the contrast selectively activate plausible relevant language regions in the control group?	No			
Are activations lateralized in the control data?	Somewhat			
Control activation notes	Overlap of individual participant activation maps; somewhat lateralized frontal and temporal, but also bilateral occipito-temporal			
Contrast notes	This contrast inferred but not described			
Analyses				
Are the analyses clearly described?	Yes			
Voxelwise analysis 1				
First level contrast	Picture naming (trained) vs viewing scrambled images and saying "skip"			
Analysis class	Longitudinal change in aphasia			
Group(s)	Aphasia T2 vs T1			
Covariate	_			
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes			
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>			
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>			
Behavioral data notes	_			
Type of analysis	Voxelwise			
Search volume	Whole brain			
Correction for multiple comparisons	No direct comparison			
Software	SPM8			
Voxelwise p	_			
Cluster extent	_			
Statistical details	Analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients			

Findings notes         Regions are approximate since only broad regions are described in Table 6           Voxelwise analysis 2           First level contrast         Semantic feature decision vs visual decision           Analysis class         Longitudinal change in aphasia           Group(s)         Aphasia T2 vs T1           Covariate         -           Is the second level contrast valid in terms of the vs         Vs           group(s), time point(s), and measures involved?         Unknown, not reported           Is reaction time matched across the second level contrast?         Unknown, not reported           Covariat?         -           Behavioral data notes         -           Search of multiple comparisons         Nodirect comparison           Software         SPM8           Voxelwise p         -           Cousing and teals         Cousing and the view region and the view region and teal or was even (sure data notes)           Findings         1 L ventral precentral/inferior frontal junction           Software         SPM8           Voxelwise p         -           Cousing and teal preformat cortex time or the individual patients at p <.001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients	Findings	<ul> <li>L IFG</li> <li>L dorsolateral prefrontal cortex</li> <li>L ventral precentral/inferior frontal junction</li> <li>L dorsal precentral</li> <li>L SMA/medial prefrontal</li> <li>L supramarginal gyrus</li> <li>L angular gyrus</li> <li>L posterior MTG</li> <li>R lFG</li> <li>R dorsolateral prefrontal cortex</li> <li>R SMA/medial prefrontal</li> <li>R supramarginal gyrus</li> <li>R supramarginal gyrus</li> <li>R posterior STG</li> <li>R posterior MTG</li> <li>R posterior inferior temporal gyrus/fusiform gyrus</li> </ul>
First level contrast     Semantic feature decision vs visual decision       Analysis class     Longitudinal change in aphasia       Group(s)     Aphasia T2 vs T1       Covariate     —       Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?     Yes       Is accuracy matched across the second level contrast?     Unknown, not reported       Is reaction time matched across the second level contrast?     Unknown, not reported       Behavioral data notes     —       Type of analysis     Voxelwise       Search volume     Whole brain       Correction for multiple comparisons     No direct comparison       Software     SPM8       Voxelwise p     —       Cluster extent     —       Statistical details     Analyses were carried out in individual patients at p <.001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients       Findings     1 ventral precentral/inferior frontal junction       1 dorsal precentral     1 torsal precentral       1 k of solaterial prefrontal cortex t R Rigor are approximate since only broad regions are described in Table 7       Notes	Findings notes	Regions are approximate since only broad regions are described in Table 6
Analysis class       Longitudinal change in aphasia         Group(s)       Aphasia T2 vs T1         Covariate       -         is the second level contrast valid in terms of the group(s), time point(s), and measures involved?       Yes         Is accuracy matched across the second level contrast?       Unknown, not reported         is reaction time matched across the second level contrast?       Unknown, not reported         Behavioral data notes       -         Type of analysis       Voxelwise         Search volume       Whole brain         Correction for multiple comparisons       No direct comparison         Software       SPM8         Voxelwise p       -         Cluster extent       -         Statistical details       Analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients	Voxelwise analysis 2	
Group(s)     Aphasia T2 vs T1       Covariate     -       Is the second level contrast valid in terms of the group(s), ime point(s), and measures involved?     Yes       Is accuracy matched across the second level contrast?     Unknown, not reported       Is reaction time matched across the second level contrast?     Unknown, not reported       Behavioral data notes     -       Type of analysis     Voxelwise       Search volume     Whole brain       Correction for multiple comparisons     No direct comparison       Software     SPM8       Voxelwise p     -       Cluster extent     -       Statistical details     Analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients       Findings     1 L ventral precentral/inferior frontal junction 1 L dorsal precentral 1 L posterior MTG R Broolaterial prefrontal cortex 1 R posterior MTG       Findings notes     Regions are approximate since only broad regions are described in Table 7       Notes     (1) DCM analyses; (2) activation for untrained categories, since this is reported only for	First level contrast	Semantic feature decision vs visual decision
Covariate       -         Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?       Yes         Is accuracy matched across the second level contrast?       Unknown, not reported         Is reaction time matched across the second level contrast?       Unknown, not reported         Behavioral data notes       -         Correction for multiple comparisons       Voxelwise         Search volume       Whole brain         Correction for multiple comparisons       No direct comparison         Software       SPM8         Voxelwise p       -         Cluster extent       -         Statiscial details       Analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients	Analysis class	Longitudinal change in aphasia
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?         Yes           Is accuracy matched across the second level contrast?         Unknown, not reported           Is reaction time matched across the second level contrast?         Unknown, not reported           Behavioral data notes         -           Type of analysis         Voxelwise           Search volume         Whole brain           Correction for multiple comparisons         No direct comparison           Software         SPM8           Voxelwise p         -           Cluster extent         -           Statistical details         Analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients           Findings         1 L ventral precentral 1 L ootsral precentral           I L ootsral precentral         1 L ootsral precentral           I L posterior STG 1 R dorsolateral prefrontal cortex 1 R posterior STG         R SMA/medial prefrontal 1 R angular gyrus 1 R posterior STG           Findings notes         Regions are approximate since only broad regions are described in Table 7	Group(s)	Aphasia T2 vs T1
group(s), time point(s), and measures involved?         Is accuracy matched across the second level contrast?       Unknown, not reported         Is reaction time matched across the second level contrast?       Unknown, not reported         Behavioral data notes       -         Type of analysis       Voxelwise         Search volume       Whole brain         Correction for multiple comparisons       No direct comparison         Software       SPM8         Voxelwise p       -         Cluster extent       -         Statistical details       Analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients	Covariate	_
contrast?       Unknown, not reported         is reaction time matched across the second level contrast?       Unknown, not reported         Behavioral data notes       -         Type of analysis       Voxelwise         Search volume       Whole brain         Correction for multiple comparisons       No direct comparison         Software       SPM8         Voxelwise p       -         Cluster extent       -         Statistical details       Analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients		Yes
contrast?       Image: Contrast of the second	-	<u>Unknown, not reported</u>
Type of analysis       Voxelwise         Search volume       Whole brain         Correction for multiple comparisons       No direct comparison         Software       SPM8         Voxelwise p       —         Cluster extent       —         Statistical details       Analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients		<u>Unknown, not reported</u>
Search volume       Whole brain         Correction for multiple comparisons       No direct comparison         Software       SPM8         Voxelwise p          Cluster extent          Statistical details       Analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients	Behavioral data notes	_
Correction for multiple comparisons         No direct comparison           Software         SPM8           Voxelwise p         —           Cluster extent         —           Statistical details         Analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients	Type of analysis	Voxelwise
Software       SPM8         Voxelwise p       —         Cluster extent       —         Statistical details       Analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients		Whole brain
Voxelwise p       -         Cluster extent       -         Statistical details       Analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients	Correction for multiple comparisons	No direct comparison
Cluster extent       —         Statistical details       Analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients		SPM8
Statistical details       Analyses were carried out in individual patients at p < .001, uncorrected; regions were considered activated when they were found in 6 or more (out of 8) patients		-
Findings <ul> <li>L ventral precentral/inferior frontal junction</li> <li>L dorsal precentral</li> <li>L posterior MTG</li> <li>R IFG</li> <li>R dorsolateral prefrontal cortex</li> <li>R SMA/medial prefrontal</li> <li>R angular gyrus</li> <li>R posterior STG</li> <li>R posterior MTG</li> </ul> <li>Findings notes</li> <li>Regions are approximate since only broad regions are described in Table 7</li> <li>Excluded analyses</li> <li>(1) DCM analyses; (2) activation for untrained categories, since this is reported only for</li>		
Image: Logical control       Image: Logical control         Image: Logical control       Image: Logical contro         Image: Logical contro	Statistical details	considered activated when they were found in 6 or more (out of 8) patients
Notes         Excluded analyses       (1) DCM analyses; (2) activation for untrained categories, since this is reported only for	Findings	<ul> <li>↑ L dorsal precentral</li> <li>↑ L posterior MTG</li> <li>↑ R IFG</li> <li>↑ R dorsolateral prefrontal cortex</li> <li>↑ R SMA/medial prefrontal</li> <li>↑ R angular gyrus</li> <li>↑ R posterior STG</li> </ul>
Excluded analyses (1) DCM analyses; (2) activation for untrained categories, since this is reported only for	Findings notes	Regions are approximate since only broad regions are described in Table 7
	Notes	
	Excluded analyses	

# Sandberg et al. (2015)

#### Reference

Authors	Sandberg CW, Bohland JW, Kiran S
Title	Changes in functional connectivity related to direct training and generalization effects of a word finding treatment in chronic aphasia
Reference	Brain Lang 2015; 150: 103-116
PMID	26398158
DOI	10.1016/j.bandl.2015.09.002

## Participants

Language	US English
Inclusion criteria	-
Number of individuals with aphasia	<u>10</u>
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 59 years, range 47-75 years)
Is sex reported for patients and controls, and matched?	Yes (males: 7; females: 3)
Is handedness reported for patients and controls, and matched?	Yes (right: 10; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 7-134 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	WAB, BNT, subtests from PALPA, PPT, CLQT
Aphasia severity	AQ range 41.7-99.2
Aphasia type	6 anomic, 2 conduction, 1 Broca's, 1 transcortical motor
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Range 0.3-256.0 cc
Lesion location	L MCA
Participants notes	_

## Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, up to 10 weeks later
If longitudinal, was there any intervention between the time points?	Semantic feature-based treatment, 2 hours/day, 2 days/week, up to 10 weeks (depending on when criterion reached)
Is the scanner described?	Yes (Philips Achieva 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	No* (moderate limitation) (total images acquired not stated; ITI of 1-3 s seems short)
Design type	Event-related
Total images acquired	not stated
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-

#### Conditions

Are the conditions clearly described?	Yes	

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
concreteness judgment (abstract words)	Button press	60	Yes	No
concreteness judgment (concrete words)	Button press	60	Yes	Yes
letter string judgment	Button press	60	Unknown	Unknown
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>

Conditions notes

2 patients below chance on abstract words per supplementary table 2

#### Contrasts

Are the contrasts clearly described?

ibed? <u>No</u> (see specific limitation(s) below)

<u>conditions</u>

Contrast 1: concreteness judgment (abstract words, correct trials) vs rest		
Language condition	Concreteness judgment (abstract words, correct trials)	
Control condition	Rest	
Are the conditions matched for visual demands?	No	
Are the conditions matched for auditory demands?	Yes	
Are the conditions matched for motor demands?	No	
Are the conditions matched for cognitive/executive demands?	No	
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable	
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>	
Behavioral data notes	-	
Are control data reported in this paper or another that is referenced?	No	
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown	
Are activations lateralized in the control data?	Unknown	
Control activation notes	-	
Contrast notes	The concreteness judgment task was compared to the letter string judgment task to define ROIs for connectivity analysis, but the group analysis meeting criteria for this review <u>appears</u> <u>to be based only on comparisons between time points on the concreteness judgment</u>	

#### Contrast 2: concreteness judgment (concrete words, correct trials) vs rest

Language condition	Concreteness judgment (concrete words, correct trials)
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown

Are activations lateralized in the control data?	<u>Unknown</u>
Control activation notes	-
Contrast notes	The concreteness judgment task was compared to the letter string judgment task to define ROIs for connectivity analysis, but the group analysis meeting criteria for this review <u>appears</u> <u>to be based only on comparisons between time points on the concreteness judgment</u> <u>conditions</u>
Analyses	
Are the analyses clearly described?	<u>No** (major limitation)</u> (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Concreteness judgment (abstract words, correct trials) vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with response to treatment (n = 9) T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	Yes, matched
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM8
Voxelwise p	.001
Cluster extent	None
Statistical details	Images show peaks instead of activations
Findings	<ul> <li>L IFG pars opercularis</li> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L inferior parietal lobule</li> <li>L supramarginal gyrus</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L posterior inferior temporal gyrus/fusiform gyrus</li> <li>L posterior cingulate</li> <li>L basal ganglia</li> <li>R orbitofrontal</li> <li>R supramarginal gyrus</li> <li>R anterior temporal</li> <li>K anterior temporal</li> <li>K occipital</li> </ul>
Findings notes	_
Voxelwise analysis 2	
First level contrast	Concreteness judgment (concrete words, correct trials) vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with generalization of treatment effects to concrete words (n = 7) T2 vs T1
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level	Yes, matched

Is reaction time matched across the second level Yes, matched contrast?

Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM8
Voxelwise p	.001
Cluster extent	None
Statistical details	Images show peaks instead of activations
Findings	<ul> <li>↑ L insula</li> <li>↑ L inferior parietal lobule</li> <li>↑ L supramarginal gyrus</li> <li>↑ L precuneus</li> <li>↑ L occipital</li> <li>↑ R dorsolateral prefrontal cortex</li> <li>↑ R ventral precentral/inferior frontal junction</li> <li>↑ R posterior STG</li> <li>↑ R posterior cingulate</li> </ul>
Findings notes	_
Notes	
Excluded analyses	Connectivity analyses due to degree of complexity, which precluded assessment

## Geranmayeh et al. (2016)

#### Reference

Authors	Geranmayeh F, Leech R, Wise RJ
Title	Network dysfunction predicts speech production after left hemisphere stroke
Reference	Neurology 2016; 86: 1296-1305
PMID	26962070
DOI	10.1212/wnl.00000000002537

## Participants

Language	UK English
Inclusion criteria	No severe receptive aphasia
Number of individuals with aphasia	53
Number of control participants	24
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 62 ± 14 years, range 26-83 years)
Is sex reported for patients and controls, and matched?	No (males: 32; females: 21; controls were mostly female, unlike patients)
Is handedness reported for patients and controls, and matched?	Yes (right: 50; left: 3)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 111 ± 27 days, range 84-200 days)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	CAT, QPA
Aphasia severity	"relatively mild stroke"; 17 patients were so mild that they were not aphasic per the CAT
Aphasia type	Not stated
First stroke only?	No
Stroke type	Not stated

To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Mean 25.4 ± 13.5 cc, range 0.3-168.0 cc
Lesion location	L; modest R involvement in 7 cases
Participants notes	Prior strokes were allowed only if no aphasia resulted

#### Imaging

0 0	
Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (Siemens Trio 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Event-related
Total images acquired	213
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	sparse sampling; mini-blocks of 2-4 trials
Conditions	

## Conditions

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
propositional speech production	Sentence (overt)	60	Yes	No
counting	Multiple words (overt)	48	Yes	<u>Unknown</u>
target decision	Button press	48	Yes	Unknown
rest	None	45	N/A	<u>N/A</u>
Conditions notes	—			

#### Contrasts

Are the contrasts clearly described?

Yes

Yes

## Contrast 1: propositional speech production vs rest

Language condition	Propositional speech production
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another	Somewhat

that is referenced?	
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	No
Control activation notes	Control data for univariate analysis in Geranmayeh et al. (2014), but note that the present paper does not describe a univariate analysis; control activations reflect speech rather than language
Contrast notes	_
Contrast 2: propositional speech production vs	s counting
Language condition	Propositional speech production
Control condition	Counting
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>

Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Yes
Control activation notes	Control data for univariate analysis in Geranmayeh et al. (2014), but note that the present paper does not describe a univariate analysis; control activations are L frontal, L pSTS, L SMA, L > R occipito-temporal

Contrast notes

#### Contrast 3: propositional speech production vs target decision

Language condition	Propositional speech production
Control condition	Target decision
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	_
Analyses	

Are the analyses clearly described?

No (see specific limitation(s) below)

## ROI analysis 1

First level contrast	Propositional speech production vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Difference in AICW/trial
Type of analysis	Regions of interest (ROI)
ROI type	Functional
	4
How many ROIs are there?	
What are the ROI(s)?	(1) L fronto-temporo-parietal network; (2) R fronto-temporo-parietal network; (3) cingulo- opercular network; (4) default mode network
How are the ROI(s) defined?	Identified using ICA in controls
Correction for multiple comparisons	No correction
Statistical details	<u>Circular because ROIs defined in one group</u>
Findings	↑ L insula ↑ L anterior cingulate ↑ R insula ↑ R anterior cingulate
Findings notes	-
ROI analysis 2	
First level contrast	Propositional speech production vs counting
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Difference in AICW/trial
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) L fronto-temporo-parietal network; (2) R fronto-temporo-parietal network; (3) cingulo-
How are the POI(s) defined?	opercular network; (4) default mode network
How are the ROI(s) defined?	Identified using ICA in controls
Correction for multiple comparisons	No correction
Statistical details	Circular because ROIs defined in one group
Findings	↑ L insula ↑ L anterior cingulate ↑ R insula ↑ R anterior cingulate ↓ L IFG ↓ L inferior parietal lobule ↓ L posterior inferior temporal gyrus/fusiform gyrus
Findings notes	_
-	

ROI analysis 3

First level contrast	Propositional speech production vs target decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Difference in AlCW/trial
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) L fronto-temporo-parietal network; (2) R fronto-temporo-parietal network; (3) cingulo- opercular network; (4) default mode network
How are the ROI(s) defined?	Identified using ICA in controls
Correction for multiple comparisons	No correction
Statistical details	<u>Circular because ROIs defined in one group</u>
Findings	None
Findings notes	_
Complex analysis 1	
First level contrast	Propositional speech production vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Difference in AICW/trial
Type of analysis	Complex
Statistical details	Activity was compared between pairs of ICA-derived networks. However, <u>circularity was</u> introduced because the networks were defined based on the control <u>group</u> .
Findings	Other
Findings notes	Patients showed greater differential activation than controls between (1) L fronto-temporo- parietal network and the DMN; (2) R fronto-temporo-parietal network and the DMN; (3) cingulo-opercular network and the DMN.
Complex analysis 2	
First level contrast	Propositional speech production vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Appropriate information-carrying words
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Complex
Statistical details	Multiple regression was used to determine whether differential activation between networks

#### Complex

Statistical details

Multiple regression was used to determine whether differential activation between networks

	was predictive of the behavioral measure: appropriate information-carrying words. There is no issue of circularity with this analysis since it involved only individuals with aphasia.
Findings	Other
Findings notes	Differential activation between L fronto-temporo-parietal network and the DMN was positively correlated with AICW. Differential activation between R fronto-temporo-parietal network and the DMN was negatively correlated with AICW.
Complex analysis 3	
First level contrast	Propositional speech production vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Difference in AICW/trial
Type of analysis	Complex
Statistical details	PPI analyses were used to investigate how the speech condition modulated functional connectivity between (1) L fronto-temporo-parietal network and the DMN; (2) R fronto-temporo-parietal network and the DMN. However, <u>circularity was introduced because the networks were defined based on the control group</u> .
Findings	Other
Findings notes	In controls, the L FTP network reduced connectivity with the DMN during speech, while the R FTP network increased connectivity with the DMN during speech. Both of these interactions were significantly decreased in patients. This was also true for contrasts 2 and 3.
Notes	
Excluded analyses	It is mentioned that LFTP and DMN activation did not correlate with speech performance, but insufficient details are provided regarding this analysis

## Griffis et al. (2016)

#### Reference

Authors	Griffis JC, Nenert R, Allendorfer JB, Szaflarski JP
Title	Interhemispheric plasticity following intermittent theta burst stimulation in chronic poststroke aphasia
Reference	<i>Neural Plast</i> 2016; 2016: 4796906
PMID	26881111
DOI	10.1155/2016/4796906

## Participants

•	
Language	US English
Inclusion criteria	Moderate aphasia, L MCA
Number of individuals with aphasia	8 (plus 3 excluded: 2 metallic artifact; 1 seizure at time of stroke)
Number of control participants	0
Were any of the participants included in any previous studies?	Yes (same patients as Szaflarski et al. (2011); different fMRI paradigm acquired in the same sessions)
Is age reported for patients and controls, and matched?	Yes (mean 54.4 ± 12.7 years)
Is sex reported for patients and controls, and matched?	Yes (males: 4; females: 4)

Yes (right: 8; left: 0)
Yes (mean 5.3 ± 3.6 years)
Severity and type
BNT; phonemic fluency, semantic fluency, complex ideation from BDAE, PPVT, communicative activities log
Moderate
4 Broca's, 3 anomic, 1 anomic/conduction
Not stated
Not stated
Individual lesions
Range 1.4-52.5 cc
L MCA

## Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, ~2 weeks later
If longitudinal, was there any intervention between the time points?	RTMS to residual activation near Broca's area, 5 sessions/week, 2 weeks
Is the scanner described?	Yes (Varian Unity INOVA 4 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Block
Total images acquired	140
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	<u>No</u> (lesion impact not addressed)
Imaging notes	-

#### Conditions

Are the conditions clearly described?

Yes

Yes

Response type	Repetitions	All groups could do?	All individuals could do?
Multiple words (covert)	7	Yes	Yes
Other	7	Unknown	Unknown
_			
Yes			
Verb generation			
Finger tapping			
	Other  Yes Verb generation	Multiple words (covert) 7 Other 7  Yes Verb generation	Multiple words (covert)     7     Yes       Other     7     Unknown       —     —       Yes     —       Yes     —       Verb generation     —

Are the conditions matched for visual demands?

Are the conditions matched for suditors demonded	Voc
Are the conditions matched for auditory demands? Are the conditions matched for motor demands?	Yes No
Are the conditions matched for motor demands? Are the conditions matched for cognitive/executive	No
demands?	—
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Somewhat
Control activation notes	Control data in Szaflarski et al. (2008); frontal activation L-lateralized, temporal less so
Contrast notes	-
Analyses	
Are the analyses clearly described?	No (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Verb generation vs finger tapping
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (patients improved only on semantic fluency)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	No correction
Software	SPM12
Voxelwise p	.001
Cluster extent	None
Statistical details	-
Findings	↑ L IFG pars opercularis ↑ R cerebellum ↑ R thalamus ↓ R anterior temporal ↓ R cerebellum
Findings notes	Based on description in text; it is noted that no regions survived FDR correction
ROI analysis 1	
First level contrast	Verb generation vs finger tapping
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (patients improved only on semantic fluency)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level	Unknown, not reported

contrast?         Perivaviar Idata notes       –         Type of analysis       Regions of interest (ROI)         ROI type       Mixed         How mark ROIs are the ROI(s)?       (1) LIFS (2) RIFG; (3) frontal LI         How are the ROI(s)?       (1) LIFS (2) RIFG; (3) frontal LI         How are the ROI(s)?       First principal component of 8 mm spheres defined based on previously reported com peaks         Correction for multiple comparisons       Ealse discovery rate (FDR)         Statistical details       Lesion volume included in model         First principal statistical details       Lesion volume included in model         First principal statistical details       Lesion volume included in model         First level contract       Verb generation vs finger tapping         Analysis class       Longitudinal correlation with language or other measure         Group(s)       Aphasia T2 vs T1         Covariate       A semantic fluency         Is the second level       Unknown. not reported         Covariate       Somewhat (patients improved only on semantic fluency)         Is reaction time matched across the second level       Unknown. not reported         Covariate       A         Regions of interest (ROI)       Regions of interest (ROI)         Ror analysis       Regions of interest (ROI) <th></th>	
Type of analysis         Regions of interest (ROI)           ROI type         Mixed           How many ROIs are the ROI(s)         (1) LIFG: (2) R IFG: (3) frontal L           How are the ROI(s) defined?         First principal component of 8 mm spheres defined based on previously reported compeaks           Correction for multiple comparisons         False discovery rate. (FDR)           Statistical details         Lesion volume included in model           Findings         1. LIFG           a RIFG         1. U (frontai)           Finst level contrast         Verb generation vs finger tapping           Analysis dass         Longitudinal correlation with language or other measure           Group(s)         Aphasia T2 vs T1           Covariate         A semantic fluencry           Is second level contrast valid in terms of the group of interest (ROI)         Unknown, not reported           contrast?         Unknown, not reported           Behavioral data notes         -           Type of analysis are the ROI(s) defined?         If IF (C) (2) R IFG: (2) FIG: (2)	
ROL you       Mixed         How may ROLs are there?       3         How are the ROL(S)       (1) LIFC (2) R IFC; (3) frontal LI         How are the ROL(S)       Fisc principal component of 8 mm spheres defined based on previously reported com peaks         Correction for multiple comparisons       False discovery rate (FDR)         Statistical details       LIFG         Endings       LIFG         Indings notes	
How many ROIs are there?     3       What are the ROI(s)?     (1) LIFG (2) RIFG (3) RIFG (3) Rital LI       How are the ROI(s)?     First principal component of 8 mm spheres defined based on previously reported compeaks       Correction for multiple comparisons     Ealse discovery rate (FDB)       Statistical details     Lesion volume included in model       Findings notes     —       RIFG     1 LIFG       RIFS     Tul (frontal)       First level contrast     Verb generation vs finger tapping       Analysis class     Longitudinal correlation with language or other measure       Group(s)     A phasia T vs Ti       Covariate     A semantic fluency       Is the second level contrast     Somewhat (patients improved only on semantic fluency)       Is cacutary matched across the second level     Unknown, not reported       Covariate     A semantic fluency       Is reaction time matched across the second level     Unknown, not reported       Covariate     A segions of interest (ROI)       Behavioral data notes     —       Type of analysis     Regions of interest (ROI)       ROI uppe     Mixed       How are the ROI(s)     Hird generation vs finger tapping       Low are the ROI(s)     First principal component of 8 mm spheres defined based on previously reported compeaks       Covariate     3       What	
What are ine ROI(s)?(1) LFG; (2) RFG; (3) frontal LiHow are the ROI(s) defined?is principal component of 8 m spheres defined based on previously reported com packsCorrection for multiple comparisonsSaled biscovery rate (FDR)Statistical detailsLesion volume included in modelFindingsLi LFG a li LFG a li LFG a li LFG a li LFG a li LFGFindings notes-Rolleyis Z-Rolleyis CCorrection for multiple comparisonsFirst level contrastNongitudinal correlation with language or ther measureAnalysis CASCongitudinal correlation with language or other measureCovariateSomewhat fluencyStatistical detailsSomewhat fluencySomewhat fluencySomewhat fluencySomewhat fluencySomewhat fluencySomewhat fluency-Somewhat fluencyNoncown, not reportedSomewhat fluency-Somewhat fluenc	
How are the RO(\$) defined?     First principal component of 8 mm spheres defined based on previously reported comparisons       First principal component of 8 mm spheres defined based on previously reported comparisons     False discovery rate (FDR)       Statistical details     Lesion volume included in model       Findings notes     -       Roll analysis 2     Lit (frontal)       First level contrast     Verb generation vs finger tapping       Analysis class     Longitudinal correlation with language or other measure       Group(s)     Aphasia T2 vs T1       Covariate     A semantic fluency       Is rescond level contrast wild in terms of the groupde, time point(s), and measures involved)     Somewhat (patients improved only on semantic fluency)       Is reaction time matched across the second level     Unknown, not reported       Contrast     -       Roll type     Mixed       How mary ROIs are there?     3       What are the ROI(s)?     (1) LI FG; (2) RIFG; (3) frontal LI       How rate the ROI(s)?     (1) LI FG; (2) RIFG; (3) frontal LI       How rate the ROI(s)?     I RIFG       Findings notes     Lesion volume included in model       Correction for multiple comparisons     False discovery rate (FDR)       Statistical details     Lesion volume included in model       Correction for multiple comparisons     False discovery rate (FDR)       Statistical	
peaks         peaks           Correction for multiple comparisons         False discovery rate (FDR)           Statistical details         Lesion volume included in model           Findings         1 L IFG 1 L UFG 1 U (frontal)           Findings notes         -           ROT analysis 2         -           First level contrast         Verb generation vs finger tapping           Analysis class         Longitudinal correlation with language or other measure           Group(s)         Aphasia T2 vs T1           Covariate         A semantic fluency           Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?         Somewhat (patients improved only on semantic fluency)           Is accuracy matched across the second level contrast?         Unknown, not reported           Is accuracy matched across the second level contrast?         Unknown, not reported           Not are the ROI(s)?         Miked           How are the ROI(s)?         I) L IFG (12) R IFG (3) frontal U           How are the ROI(s)?         I, L IFG           Findings notes         Lesiocovery rate (FDR)           Statistical details         Lesio volume included in model           How are the ROI(s)?         I, L IFG (12) R IFG (3) frontal U           How are the ROI(s)?         I, L IFG (2) R IFG (3) frontal U	
Statistical details       Lesion volume included in model         Findings       1 LIFG         Findings notes       -         Rollanalysis 2       -         Rollanalysis 2       -         First level contrast       Veb generation vs finger tapping         Analysis Cass       Longitudinal correlation with language or other measure         Group(s)       Aphasia T2 vs T1         Covariate       A semantic fluency         Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?       Somewhat (patients improved only on semantic fluency)         Is accuracy matched across the second level       Unknown, not reported         contrast?       Unknown, not reported         Statistical details       -         How many ROIs are there?       3         What are the ROI(s)?       Hixed         How many ROIs are there?       3         Vibra conform multiple comparisons       False discovery rate (FDR)         Statistical details       Lesion volume included in model         Findings       I, RIFG         Findings       I, RIFG         Correction for multiple comparisons       False discovery rate (FDR)         Statistical details       Lesion volume included in model         Findings <t< td=""><td>itrol</td></t<>	itrol
Findings       L IFG L RIG L Ifformal)         Findings notes       –         ROI analysis 2       Verb generation vs finger tapping         First level contrast       Longitudinal correlation with language or other measure         Group(s)       Aphasia T2 vs T1         Covariate       A semantic fluency         Is the second level contrast valid in terms of the somewhat (patients improved only on semantic fluency)       Somewhat (patients improved only on semantic fluency)         Is accuracy matched across the second level contrast?       Unknown, not reported         Is reaction line matched across the second level contrast?       Unknown, not reported         Roll type       Mixed         How are the Rol(s)       (1) LIFG (2) R IFG (3) frontal LI         How are the Rol(s) defined?       First principal component of 8 mm spheres defined based on previously reported comparisons         Statistical details       Lesion volume included in model         Findings       J R IFG         Findings       J R IFG         Findings       Lesion volume included in model         Findings       Correctin for Multiple comparisons       Fale	
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First level contrast       Verb generation vs finger tapping         Analysis class       Longitudinal correlation with language or other measure         Group(s)       Aphasia 12 vs T1         Covariate       Semantic fluency         Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?       Somewhat (patients improved only on semantic fluency)         Is cacuracy matched across the second level contrast?       Unknown, not reported         Behavioral data notes          Type of analysis       Regions of interest (ROI)         ROI type       Mixed         How many ROIs are there?       3         What are the ROI(s)?       (1) LIFG; (2) RIFG; (3) frontal LI         How are the ROI(s) defined?       First principal component of 8 mm spheres defined based on previously reported or paeks         Correction for multiple comparisons       Ealse discovery rate (FDR)         Statisci details       Lesion voltime included in model         Findings       I R IFG         Findings       Lesion voltime included in model         Findings       Longitudinal change in aphasia         Group(s)       Aphasia T2 vs T1         Correction for multiple comparisons       Ealse discovery rate (FDR)         Statisci details       Lesion voltime included in model	
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Is reaction time matched across the second level Linknown not reported	
contrast?	
Behavioral data notes —	
Type of analysis Complex	
Statistical details       PPI analyses were used to investigate change over time in modulation by verb generat functional connectivity between L IFG and R IFG.	tion of
Findings Other	
Findings notesThere was a significant decrease in modulation by verb generation of functional conne between L IFG and R IFG (p = 0.03). Prior to TMS, connectivity increased during verb	ectivity

generation compared to finger tapping, while after TMS, connectivity decreased during verb generation compared to finger tapping.

## Complex analysis 2

First level contrast	Verb generation vs finger tapping
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	$\Delta$ semantic fluency in association with modulation of interhemispheric IFG connectivity by verb generation
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (patients improved only on semantic fluency)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Complex
Statistical details	PPI analyses were used to investigate whether change over time in modulation by verb generation of functional connectivity between L IFG and R IFG was associated with changes in semantic fluency scores, which are <u>limited as a measure of language improvement</u> .
Findings	None
Findings notes	-
Complex analysis 3	
First level contrast	Verb generation vs finger tapping
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (patients improved only on semantic fluency)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Complex
Statistical details	PPI analyses were used to investigate change over time in modulation by verb generation of functional connectivity between R IFG and all other brain regions. <u>Voxelwise p &lt; .001, not</u> <u>corrected for multiple comparisons.</u>
Findings	Other
Findings notes	Reduced connectivity was observed in the L IFG pars opercularis, L anterior temporal lobe, L occipital lobe, L basal ganglia, R SMA and pre-SMA, R somato-motor cortex, R posterior MTG, and R cerebellum. It is noted that no regions survived FDR correction.
Notes	
Excluded analyses	(1) correlations between lesion volume and functional measures, not described in sufficient

## Sims et al. (2016)

#### Reference

Authors	Sims JA, Kapse K, Glynn P, Sandberg C, Tripodis Y, Kiran S
Title	The relationships between the amount of spared tissue, percent signal change, and accuracy
	in semantic processing in aphasia

Reference	Neuropsychologia 2016; 84: 113-126
PMID	26775192
DOI	10.1016/j.neuropsychologia.2015.10.019

## Participants

Language	US English
Inclusion criteria	Some spared tissue in L IFG
Number of individuals with aphasia	<u>14</u> (plus 2 excluded: 1 had no spared tissue in the L IFG; 1 had a R hemisphere stroke)
Number of control participants	8
Were any of the participants included in any previous studies?	Yes (although not stated, it is apparent that many of the patients were included in Sandberg et al. (2015))
Is age reported for patients and controls, and matched?	Yes (mean 59.7 years, range 48-75 years)
Is sex reported for patients and controls, and matched?	Yes (males: 10; females: 4)
Is handedness reported for patients and controls, and matched?	Yes (right: 14; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 6 years, range 6 months-13 years)
To what extent is the nature of aphasia characterized?	Severity and type
Language evaluation	WAB, BNT, PPT, CLQT
Aphasia severity	AQ range 48.0-99.2
Aphasia type	4 anomic, 2 Broca's, 2 conduction, 2 transcortical motor, 1 anomic or transcortical motor, 1 Broca's or conduction, 1 "N/A", 1 Wernicke's or conduction
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L MCA
Participants notes	_
Imaging	
Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	-
If longitudinal, was there any intervention between the time points?	-
Is the scanner described?	Yes (Philips Achieva 3 Tesla)
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Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No</u> (total images acquired not stated)
Design type	Event-related
Total images acquired	not stated
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	no smoothing

#### Conditions

Are the conditions clearly described?

#### No (number of visual decision trials not reported)

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
semantic feature decision	Button press	64	Yes	Unknown
visual decision	Button press	not stated	Yes	Unknown
semantic relatedness decision	Button press	50	Yes	Unknown
pseudoword identity decision	Button press	50	Yes	Unknown
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>

#### Conditions notes

#### Contrasts

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Are the contrasts clearly described? Yes
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# Contrast 1: semantic feature decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or pseudoword identity decision

Language condition	Semantic feature decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls)
Control condition	Visual decision or pseudoword identity decision
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>No, different</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	8 patients and 4 controls performed one paradigm, while 6 patients and 4 controls performed another; the data were combined based on the assumption that similar processes were implicated by the two contrasts
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
ROI analysis 1	
First level contrast	Semantic feature decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or pseudoword identity decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Semantic feature decision accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-

Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	16
What are the ROI(s)?	(1) L IFG pars orbitalis; (2) L IFG pars opercularis; (3) L IFG pars triangularis; (4) L SFG; (5) L MFG; (6) L MTG; (7) L AG/SMG; (8) L ACC; (9-16) homotopic counterparts
How are the ROI(s) defined?	AAL
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↑ L IFG pars opercularis ↑ L IFG pars triangularis
Findings notes	_
ROI analysis 2	
First level contrast	Semantic feature decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or pseudoword identity decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	WAB AQ
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	16
What are the ROI(s)?	(1) L IFG pars orbitalis; (2) L IFG pars opercularis; (3) L IFG pars triangularis; (4) L SFG; (5) L MFG; (6) L MTG; (7) L AG/SMG; (8) L ACC; (9-16) homotopic counterparts
How are the ROI(s) defined?	AAL
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	-
ROI analysis 3	
First level contrast	Semantic feature decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or pseudoword identity decision

	4 controls) vs visual decision of pseudoword identity decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	BNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	16
What are the ROI(s)?	(1) L IFG pars orbitalis; (2) L IFG pars opercularis; (3) L IFG pars triangularis; (4) L SFG; (5) L MFG; (6) L MTG; (7) L AG/SMG; (8) L ACC; (9-16) homotopic counterparts
How are the ROI(s) defined?	AAL
Correction for multiple comparisons	No correction

Statistical details	-
Findings	None
Findings notes	-

## ROI analysis 4

First level contrast	Semantic feature decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or pseudoword identity decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	PPT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	16
What are the ROI(s)?	(1) L IFG pars orbitalis; (2) L IFG pars opercularis; (3) L IFG pars triangularis; (4) L SFG; (5) L MFG; (6) L MTG; (7) L AG/SMG; (8) L ACC; (9-16) homotopic counterparts
How are the ROI(s) defined?	AAL
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	—

## ROI analysis 5

First level contrast	Semantic feature decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or pseudoword identity decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No correlation between lesion volume and accuracy, not clear whether control condition accuracy was also tested
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	8
What are the ROI(s)?	As above but only in the R hemisphere
How are the ROI(s) defined?	AAL
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↑ R supramarginal gyrus ↑ R angular gyrus ↑ R posterior MTG
Findings notes	MTG included anterior too; SMG/AG was single ROI
Complex analysis 1	

#### First level contrast

Semantic feature decision (6 patients, 4 controls) or semantic relatedness decision (8 patients,

	4 controls) vs visual decision or pseudoword identity decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Lesion status of 8 ROIs
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Complex
Statistical details	Multivariate mixed-effects linear regression analyses were used to identify relationships between structural damage to 8 regions, and functional activation in 16 regions. Results were corrected for multiple comparisons based on FDR. <u>This analysis was not described in</u> sufficient detail.
Findings	Other
Findings notes	Sparing of the L ACC and L SFG was associated with more functional activation in many regions, however this is difficult to interpret since these regions were largely or completely spared in many patients. Damage to the L IFG pars orbitalis, L MTG and L AG/SMG was associated with activation of the L ACC, L SFG (and other regions) potentially indicative of compensatory processing.
Complex analysis 2	
First level contrast	Semantic feature decision (6 patients, 4 controls) or semantic relatedness decision (8 patients, 4 controls) vs visual decision or pseudoword identity decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Complex
Statistical details	Correlations were computed between functional activation in 16 regions, and <u>qualitatively</u> <u>compared</u> between patients and controls (p. 123). <u>There was no correction for multiple</u> <u>comparisons.</u>
Findings	Other
Findings notes	In controls, all regions were generally correlated with one another. This was largely true in patients too, with the exception of the R IFG pars orbitalis, which was negatively correlated with the L IFG.
Notes	
Excluded analyses	PCA analysis (section 3.4.1)
5	

## Darkow et al. (2017)

#### Reference

Authors	Darkow R, Martin A, Würtz A, Flöel A, Meinzer M
Title	Transcranial direct current stimulation effects on neural processing in post-stroke aphasia
Reference	<i>Hum Brain Mapp</i> 2017; 38: 1518-1531

PMID	27859982
DOI	10.1002/hbm.23469

## Participants

Language	German
Inclusion criteria	L hand motor area spared; mild aphasia
Number of individuals with aphasia	<u>16</u>
Number of control participants	16
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 56.7 ± 10.1 years)
ls sex reported for patients and controls, and matched?	Yes (males: 10; females: 6)
Is handedness reported for patients and controls, and matched?	Yes (right: 16; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 54.3 ± 45.3 months, range 12-169 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	AAT
Aphasia severity	Mild
Aphasia type	Not stated
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Range 9.7-165.1 cc
Lesion location	L MCA not including hand motor area
Participants notes	_

## Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1/T2: chronic; tDCS and sham sessions in randomized order
If longitudinal, was there any intervention between the time points?	-
Is the scanner described?	Yes (Siemens Trio 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Event-related
Total images acquired	100
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	sparse sampling
Conditions	
Are the conditions clearly described?	Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming	Word (overt)	80	Yes	Yes
rest	None	20	<u>N/A</u>	<u>N/A</u>
Conditions notes	-			
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: picture naming vs rest				
Language condition	Picture naming			
Control condition	Rest			
Are the conditions matched for visual demands?	No			
Are the conditions matched for auditory demands?	No			
Are the conditions matched for motor demands?	No			
Are the conditions matched for cognitive/executive	No			
demands?	INO			
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparabl</u>	e		
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparabl</u>	<u>e</u>		
Behavioral data notes	_			
Are control data reported in this paper or another that is referenced?	No			
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Unknown</u>			
Are activations lateralized in the control data?	Unknown			
Control activation notes	_			
Contrast notes	_			
Analyses				
Are the analyses clearly described?	Yes			
Voxelwise analysis 1				
-				
First level contrast	Picture naming vs rest			
Analysis class	Cross-sectional between		•	
Group(s)	Aphasia after tDCS (n = 1) counterbalanced, repeate		er sham stimulation (n = ´	6); same patients, order
Covariate	_			
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>Somewhat</u> (no behaviora	l difference)		
Is accuracy matched across the second level contrast?	Yes, matched			
Is reaction time matched across the second level contrast?	Yes, matched			
Behavioral data notes	_			
Type of analysis	Voxelwise			
Search volume	Whole brain			
Correction for multiple comparisons	Clusterwise correction wi	th with GRFT and	d stringent voxelwise n	
Software	SPM8		of the second se	
Voxelwise p	.001			
Cluster extent	Based on GRFT			
Statistical details	Repeated measures			
Findings	↓ L insula			
	↓ L insula ↓ L anterior cingulate			

	↓ R occipital ↓ R anterior cingulate
Findings notes	-
ROI analysis 1	
First level contrast	Picture naming vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia after sham stimulation (n = 16) vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear similar</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Patients named > 90% correctly in all sessions; control RT not reported
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	3
What are the ROI(s)?	(1) bilateral anterior cingulate; (2) L insula; (3) R lingual gyrus
How are the ROI(s) defined?	Regions that were less active in patients with tDCS vs sham
Correction for multiple comparisons	No correction
Statistical details	Circular because ROIs defined in one group
Findings	↑ L insula ↑ L anterior cingulate ↑ R anterior cingulate

Findings notes

#### ROI analysis 2

First level contrast	Picture naming vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia after tDCS (n = 16) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear similar</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Patients named > 90% correctly in all sessions; control RT not reported
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	3
What are the ROI(s)?	(1) bilateral anterior cingulate; (2) L insula; (3) R lingual gyrus
How are the ROI(s) defined?	Regions that were less active in patients with tDCS vs sham
Correction for multiple comparisons	No correction
Statistical details	Circular because ROIs defined in one group
Findings	None
Findings notes	_

\_

#### Complex analysis 1

First level contrast	Picture naming vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia after tDCS (n = 16) vs aphasia after sham stimulation (n = 16); same patients, order counterbalanced, repeated measures

Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>Somewhat</u> (no behavioral difference)
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	Yes, matched
Behavioral data notes	_
Type of analysis	Complex
Statistical details	ICA was used to derive three task-relevant components: language, motor and visual. <u>Thresholding of the functional maps is not described</u> , but they appear to reflect coherent components of a picture naming network. These components were compared between stimulation conditions in terms of mean activity and power in three frequency bins. It should be noted that the language component is left-lateralized, unlike the model-based picture naming contrast.
Findings	Other
Findings notes	Activity in the language component was greater in the tDCS condition. In the frequency domain, the tDCS condition showed reduced power in the highest frequency bin, and increased power in the lowest frequency bin.
Complex analysis 2	
First level contrast	Picture naming vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia after sham stimulation (n = 16) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Complex
Statistical details	ICA was used to derive three task-relevant components: language, motor and visual. <u>Thresholding of the functional maps is not described</u> , but they appear to reflect coherent components of a picture naming network. These components were compared between stimulation conditions in terms of mean activity and power in three frequency bins. It should be noted that the language component is left-lateralized, unlike the model-based picture naming contrast.
Findings	Other
Findings notes	Mean activity of these components did not differ between patients and controls. However, patients showed increased power in the middle frequency bin of the visual component.
Complex analysis 3	
First level contrast	Picture naming vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia after tDCS (n = 16) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Complex
Statistical details	ICA was used to derive three task-relevant components: language, motor and visual.

	Thresholding of the functional maps is not described, but they appear to reflect coherent components of a picture naming network. These components were compared between stimulation conditions in terms of mean activity and power in three frequency bins. It should be noted that the language component is left-lateralized, unlike the model-based picture naming contrast.
Findings	None
Findings notes	-
Notes	
Excluded analyses	-

# Geranmayeh et al. (2017)

#### Reference

Authors	Geranmayeh F, Chau TW, Wise RJS, Leech R, Hampshire A
Title	Domain-general subregions of the medial prefrontal cortex contribute to recovery of language after stroke
Reference	<i>Brain</i> 2017; 140: 1947-1958
PMID	29177494
DOI	10.1093/brain/awx134

#### Participants

Language	UK English
Inclusion criteria	-
Number of individuals with aphasia	27
Number of control participants	0
Were any of the participants included in any previous studies?	Yes (patients are a subset of those in Geranmayeh et al. (2016))
Is age reported for patients and controls, and matched?	Yes (mean 59.1 ± 10.8 years, range 39-77 years)
Is sex reported for patients and controls, and matched?	Yes (males: 18; females: 9)
Is handedness reported for patients and controls, and matched?	Yes (right: 26; left: 1)
Is time post stroke onset reported and appropriate to the study design?	Yes (T1: 15 ± 7.6 days (range 5-35 days); T2: 108 ± 26 days (range 87-200 days))
To what extent is the nature of aphasia characterized?	Not at all
Language evaluation	CAT, QPA
Aphasia severity	Not stated
Aphasia type	Not stated
First stroke only?	No
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Mean 41.4 ± 44.4 cc, range 3.8-173.9 cc
Lesion location	L; modest R involvement in 3 cases
Participants notes	24 control participants are described, but no imaging data from the controls are analyzed in this paper
Imaging	
Modality	fMRI
la the atual carees eactioned as length direct?	

If longitudinal, at what time point(s) were imaging data acquired?	T1: 15 ± 7.6 days (range 5-35 days); T2: 108 ± 26 days (range 87-200 days)
If longitudinal, was there any intervention between the time points?	Variable modest amounts of SLT (range 0-18 hours) reported in Supplementary Table 1
Is the scanner described?	Yes (Siemens Trio 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Event-related
Total images acquired	213
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	sparse sampling; mini-blocks of 2-4 trials
Conditions	

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
propositional speech production	Sentence (overt)	60	Yes	Yes
counting	Multiple words (overt)	48	Yes	Unknown
target decision	Button press	48	Yes	No
rest	None	45	N/A	<u>N/A</u>
Conditions notes	All participants could do	the target decisi	on task except for one wh	io was at chance

#### Contrasts

Are the contrasts clearly described?

No (see specific limitation(s) below)

Yes

## Contrast 1: propositional speech production vs rest

Language condition	Propositional speech production
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	No
Control activation notes	Control data in Geranmayeh et al. (2014); speech not language; relevant activations are bilateral
Contrast notes	Not entirely clear that the whole brain analysis is indeed propositional speech production vs rest; a contrast of target decision vs mean of propositional speech and counting is also used to define the preSMA/dACC ROI
and control tasks for all relevant groups? Behavioral data notes Are control data reported in this paper or another that is referenced? Does the contrast selectively activate plausible relevant language regions in the control group? Are activations lateralized in the control data? Control activation notes	— Yes           No           No           Control data in Geranmayeh et al. (2014); speech not language; relevant activations are bilateral           Not entirely clear that the whole brain analysis is indeed propositional speech production rest; a contrast of target decision vs mean of propositional speech and counting is also of the s

Analyses

Are the analyses clearly described? Yes

#### Voxelwise analysis 1

First level contrast	Propositional speech production vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia mean of T1, T2
Covariate	Simultaneous $\Delta$ (T2 vs T1) number of appropriate information-carrying words
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>Somewhat</u> (potentially confounded by T1 and T2 language function; language function at T1 was predictive of change in language function)
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	T1 AICW correlated with change in AICW, but not stated whether T2 AICW correlated with change in AICW
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	FSL
Voxelwise p	.05
Cluster extent	1.6 cc
Statistical details	-
Findings	<ul> <li>↑ L SMA/medial prefrontal</li> <li>↑ L anterior cingulate</li> <li>↑ R SMA/medial prefrontal</li> <li>↑ R somato-motor</li> <li>↑ R posterior STS</li> <li>↑ R anterior cingulate</li> </ul>
Findings notes	Findings based on figures and coordinates; the pre-SMA/dACC peak noted to survive FWE correction at p < .001 $$
ROI analysis 1	
First level contrast	Propositional speech production vs rest
·	Propositional speech production vs rest Longitudinal change in aphasia
First level contrast	
First level contrast Analysis class	Longitudinal change in aphasia
First level contrast Analysis class Group(s)	Longitudinal change in aphasia
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the	Longitudinal change in aphasia Aphasia T2 vs T1 —
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level	Longitudinal change in aphasia Aphasia T2 vs T1 — Yes
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level	Longitudinal change in aphasia Aphasia T2 vs T1  Yes No, different
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast?	Longitudinal change in aphasia Aphasia T2 vs T1 — Yes No, different Unknown, not reported
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes	Longitudinal change in aphasia Aphasia T2 vs T1 — Yes No, different Unknown, not reported Number of AICW increased
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis	Longitudinal change in aphasia Aphasia T2 vs T1 — Yes No, different Unknown, not reported Number of AICW increased Region of interest (ROI)
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type	Longitudinal change in aphasia Aphasia T2 vs T1 — Yes No, different Unknown, not reported Number of AICW increased Region of interest (ROI) Functional
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there?	Longitudinal change in aphasia Aphasia T2 vs T1 — Yes No, different Unknown, not reported Number of AICW increased Region of interest (ROI) Functional
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)?	Longitudinal change in aphasia Aphasia T2 vs T1 — Yes No, different Unknown, not reported Unknown, not reported Number of AICW increased Region of interest (ROI) Functional 1 L pre-SMA Peak voxel of the contrast of target decision vs mean of propositional speech and counting in
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined?	Longitudinal change in aphasia Aphasia T2 vs T1 — Yes No, different Unknown, not reported Unknown, not reported Number of AICW increased Region of interest (ROI) Functional 1 L pre-SMA Peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined? Correction for multiple comparisons Statistical details Findings	Longitudinal change in aphasia Aphasia T2 vs T1 — Yes No, different Unknown, not reported Unknown, not reported Number of AICW increased Region of interest (ROI) Functional 1 L pre-SMA Peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia One only
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined? Correction for multiple comparisons Statistical details	Longitudinal change in aphasia Aphasia T2 vs T1 — Yes No, different Unknown, not reported Unknown, not reported Number of AICW increased Region of interest (ROI) Functional 1 L pre-SMA Peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia One only No main effect of session in session by language recovery ANOVA

ROI analysis 2

First level contrast	Propositional speech production vs rest	
Analysis class	Longitudinal correlation with language or other measure	
Group(s)	Aphasia T2 vs T1	
Covariate	$\Delta$ number of appropriate information-carrying words	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>	
Is reaction time matched across the second level contrast?	Unknown, not reported	
Behavioral data notes	_	
Type of analysis	Region of interest (ROI)	
ROI type	Functional	
How many ROIs are there?	1	
What are the ROI(s)?	L pre-SMA	
How are the ROI(s) defined?	Peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia	
Correction for multiple comparisons	One only	
Statistical details	No interaction of session by language recovery in ANOVA	
Findings	None	
Findings notes	_	
ROI analysis 3		
First level contrast	Propositional speech production vs rest	
Analysis class	Cross-sectional correlation with language or other measure	
Group(s)	Aphasia mean of T1, T2	
Covariate	Simultaneous $\Delta$ (T2 vs T1) number of appropriate information-carrying words	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>Somewhat</u> (potentially confounded by T1 and T2 language function; language function at T1 was predictive of change in language function)	
Is accuracy matched across the second level contrast?	Appear mismatched	
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>	
Behavioral data notes	T1 AICW correlated with change in AICW, but not stated whether T2 AICW correlated with change in AICW	
Type of analysis	Region of interest (ROI)	
ROI type	Functional	
How many ROIs are there?	1	
What are the ROI(s)?	L pre-SMA	
How are the ROI(s) defined?	Peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia	
Correction for multiple comparisons	One only	
Statistical details		
Findings	↑ L SMA/medial prefrontal	
Findings notes	Patients with more pre-SMA activity improved more	
ROI analysis 4		
First level contrast	Propositional speech production vs rest	
Analysis class	Cross-sectional correlation with language or other measure	
Group(s)	Aphasia mean of T1, T2	
Covariate	Simultaneous $\Delta$ (T2 vs T1) number of appropriate information-carrying words	
Is the second level contrast valid in terms of the	Somewhat (notentially confounded by T1 and T2 language function: language function at T1	

Is the second level contrast valid in terms of the Somewhat (potentially confounded by T1 and T2 language function; language function at T1 group(s), time point(s), and measures involved? was predictive of change in language function) Is accuracy matched across the second level Appear mismatched

Unknown, not reported

Is reaction time matched across the second level

contrast?

contrast?	
Behavioral data notes	T1 AICW correlated with change in AICW, but not stated whether T2 AICW correlated with change in AICW
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	L pre-SMA
How are the ROI(s) defined?	Peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia
Correction for multiple comparisons	One only
Statistical details	Lesion size covariate
Findings	↑ L SMA/medial prefrontal
Findings notes	Patients with more pre-SMA activity improved more
ROI analysis 5	
First level contrast	Propositional speech production vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia mean of T1, T2
Covariate	Simultaneous $\Delta$ (T2 vs T1) number of appropriate information-carrying words
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes (this analysis is appropriate because T1 behavior is included in model)
Is accuracy matched across the second level	Appear mismatched
contrast?	
contrast? Is reaction time matched across the second level contrast?	Unknown, not reported

change in AICW Type of analysis Region of interest (ROI) ROI type Functional How many ROIs are there? 1 What are the ROI(s)? L pre-SMA How are the ROI(s) defined? Peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia Correction for multiple comparisons One only Statistical details Lesion size, T1 performance, and age covariates Findings ↑ L SMA/medial prefrontal

Patients with more pre-SMA activity improved more

# Findings notes **ROI analysis 6**

First level contrast	Propositional speech production vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia mean of T1, T2
Covariate	Subsequent outcome (T2) number of appropriate information-carrying words
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>No</u> (mathematically equivalent to the previous analysis, because of the inclusion of T1 performance as a covariate)
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	T1 AICW correlated with change in AICW, but not stated whether T2 AICW correlated with change in AICW
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	L pre-SMA
How are the ROI(s) defined?	Peak voxel of the contrast of target decision vs mean of propositional speech and counting in

	people with aphasia
Correction for multiple comparisons	One only
Statistical details	Lesion size, T1 performance, and age covariates
Findings	↑ L SMA/medial prefrontal
Findings notes	_

## ROI analysis 7

First level contrast	Propositional speech production vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Subsequent $\Delta$ (T2 vs T1) number of appropriate information-carrying words
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>Somewhat</u> (potentially confounded by T1 language function; language function at T1 was predictive of change in language function)
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	T1 AICW correlated with change in AICW
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	L pre-SMA
How are the ROI(s) defined?	Peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia
Correction for multiple comparisons	One only
Statistical details	_
Findings	↑ L SMA/medial prefrontal
Findings notes	_

#### **ROI analysis 8**

First level contrast	Propositional speech production vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T2
Covariate	Previous $\Delta$ (T2 vs T1) number of appropriate information-carrying words
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	No (the logic behind correlating activation changes and language outcome is unclear)
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	T1 AICW correlated with change in AICW, but not stated whether T2 AICW correlated with change in AICW
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	L pre-SMA
How are the ROI(s) defined?	Peak voxel of the contrast of target decision vs mean of propositional speech and counting in people with aphasia
Correction for multiple comparisons	One only
Statistical details	-
Findings	↑ L SMA/medial prefrontal
Findings notes	-

#### Notes

Excluded analyses

It is mentioned that activity for other tasks did not correlate with language recovery, but no

## Griffis, Nenert, Allendorfer, & Szaflarski (2017)

#### Reference

Is the scanner described?

Total images acquired

Design type

Is the timing of stimulus presentation and image

Are the imaging acquisition parameters, including

acquisition clearly described and appropriate?

Authors	Griffis JC, Nenert R, Allendorfer JB, Szaflarski JP
Title	Linking left hemispheric tissue preservation to fMRI language task activation in chronic stroke patients
Reference	<i>Cortex</i> 2017; 96: 1-18
PMID	28961522
DOI	10.1016/j.cortex.2017.08.031
Participants	
Language	US English
Inclusion criteria	
Number of individuals with aphasia	43
Number of control participants	43
Were any of the participants included in any previous studies?	Yes (same dataset as Griffis et al. (2017) Hum Brain Mapp)
Is age reported for patients and controls, and matched?	Yes (mean 53 ± 15 years, range 23-90 years)
Is sex reported for patients and controls, and matched?	Yes (males: 25; females: 18)
Is handedness reported for patients and controls, and matched?	Yes (right: 41; left: 2)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 1-14 years)
To what extent is the nature of aphasia characterized?	Not at all
Language evaluation	BNT, semantic fluency, phonemic fluency
Aphasia severity	Not stated
Aphasia type	Not stated
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Mean 105.2 ± 76.3 cc
Lesion location	L
Participants notes	-
Imaging	
Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	-
If longitudinal, was there any intervention between the time points?	—

No (Siemens Allegra 3 Tesla or Philips 3 Tesla; model not stated) Yes Block 165

Yes (whole brain)

coverage, adequately described and appropriate?	
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-

#### Conditions

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
semantic decision	Button press	5	No	No
tone decision	Button press	6	<u>Unknown</u>	<u>Unknown</u>

Yes

Yes

Group performance below chance; several patients at 0 which is difficult to understand in a 2AFC task

#### Contrasts

Conditions notes

Are the contrasts clearly described?

#### Contrast 1: semantic decision vs tone decision

Is reaction time matched across the second level

Semantic decision
Tone decision
Yes
Yes
Yes
Yes
<u>Unknown, not reported</u>
<u>Unknown, not reported</u>
Tone decision accuracy not reported
Yes
Yes
Yes
Temporal activation is mid MTG and AG rather than pSTS
-
Yes
Semantic decision vs tone decision
Cross-sectional correlation with language or other measure
Aphasia
Semantic decision accuracy
Yes
Accuracy is covariate

#### Unknown, not reported

contrast?	
Behavioral data notes	
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	3
What are the ROI(s)?	(1) L AG and bilateral midline components of the canonical semantic network, along with reduced activity in R frontal, temporal and parietal regions; (2) bilateral IFG pars orbitalis; (3) L IFG and DLPFC along with bilateral midline regions
How are the ROI(s) defined?	ROIs are mixing coefficients of functional networks arising from mCCA + jICA that were differently represented in the patient and control groups
Correction for multiple comparisons	Familywise error (FWE)
Statistical details	_
Findings	<ul> <li>L IFG</li> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L posterior cingulate</li> <li>R IFG pars orbitalis</li> <li>R SMA/medial prefrontal</li> <li>R precuneus</li> <li>R posterior cingulate</li> <li>L insula</li> <li>R IFG pars opercularis</li> <li>R IFG pars triangularis</li> <li>R dorsal precentral</li> <li>R supramarginal gyrus</li> <li>R mid temporal</li> </ul>
Findings notes	All 3 networks were significantly correlated; analysis of networks so involvement of each individual region cannot be assured
ROI analysis 2	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Average of semantic and phonemic fluency
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	3
What are the ROI(s)?	(1) L AG and bilateral midline components of the canonical semantic network, along with reduced activity in R frontal, temporal and parietal regions; (2) bilateral IFG pars orbitalis; (3) L IFG and DLPFC along with bilateral midline regions
How are the ROI(s) defined?	ROIs are mixing coefficients of functional networks arising from mCCA + jICA that were differently represented in the patient and control groups
Correction for multiple comparisons	Familywise error (FWE)
Statistical details	-
Findings	↑ L IFG ↑ L dorsolateral prefrontal cortex ↑ L SMA/medial prefrontal

	<ul> <li>L angular gyrus</li> <li>L precuneus</li> <li>L posterior cingulate</li> <li>R SMA/medial prefrontal</li> <li>R precuneus</li> <li>R posterior cingulate</li> <li>L insula</li> <li>R IFG pars opercularis</li> <li>R IFG pars triangularis</li> <li>R insula</li> <li>R dorsal precentral</li> <li>R supramarginal gyrus</li> <li>R posterior STG</li> <li>R mid temporal</li> </ul>
Findings notes	Networks 1 and 3 were significantly correlated; analysis of networks so involvement of each individual region cannot be assured

#### **ROI analysis 3**

First level contrast	Semantic decision vs tone decision		
Analysis class	Cross-sectional correlation with language or other measure		
Group(s)	Aphasia		
Covariate	BNT		
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes		
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>		
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>		
Behavioral data notes	-		
Type of analysis	Regions of interest (ROI)		
ROI type	Other		
How many ROIs are there?	3		
What are the ROI(s)?	(1) L AG and bilateral midline components of the canonical semantic network, along with reduced activity in R frontal, temporal and parietal regions; (2) bilateral IFG pars orbitalis; (3) L IFG and DLPFC along with bilateral midline regions		
How are the ROI(s) defined?	ROIs are mixing coefficients of functional networks arising from mCCA + jICA that were differently represented in the patient and control groups		
Correction for multiple comparisons	Familywise error (FWE)		
Statistical details	-		
Findings	<ul> <li>L IFG</li> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L posterior cingulate</li> <li>R SMA/medial prefrontal</li> <li>R precuneus</li> <li>R posterior cingulate</li> <li>L insula</li> <li>R IFG pars opercularis</li> <li>R lFG pars triangularis</li> <li>R dorsal precentral</li> <li>R supramarginal gyrus</li> <li>R posterior STG</li> <li>R mid temporal</li> </ul>		
Findings notes	Networks 1 and 3 were significantly correlated; analysis of networks so involvement of each individual region cannot be assured		

## Complex analysis 1

1 2	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Semantic decision accuracy not matched, but tone decision accuracy not reported
Type of analysis	Complex
Statistical details	Multimodal canonical correlation analysis (mCCA) and joint ICA were used to identify 3 joint ICs (structural/functional) that were differently represented in the patient and control groups. Although there was <u>no correction for multiple comparisons when the functional maps were</u> <u>thresholded</u> , the maps for the three networks each appeared to relate to coherent parts of the semantic network.
Findings	Other
Findings notes	The first joint IC comprised preservation of tissue in L posterior temporo-parietal region, activity in the L AG and bilateral midline components of the canonical semantic network, and reduced activity in R frontal, temporal and parietal regions. The second joint IC comprised preservation of tissue in the the L basal ganglia/insula region, and activity predominantly in the IFG pars orbitalis bilaterally. The third joint IC comprised preservation of the L IFG and DLPFC along with bilateral midline regions. The first joint IC was considered to provide more robust evidence for structure-function relationships than the other two, because it was the only one where individual structural and functional mixing coefficients remained correlated even when lesion volume was included as a covariate.
Notes	
Excluded analyses	(1) group analyses that were described in a previous paper (Griffis et al., 2017, Hum Brain Mapp); (2) ancillary analysis using different numbers of components per modality; (3) ancillary analysis using lesion masks instead of brain tissue maps; (4) ancillary analysis using multivariate lesion-symptom mapping, because these analyses yielded similar results to the main analysis

# Griffis, Nenert, Allendorfer, Vannest, et al. (2017)

#### Reference

Authors	Griffis JC, Nenert R, Allendorfer JB, Vannest J, Holland S, Dietz A, Szaflarski JP
Title	The canonical semantic network supports residual language function in chronic post-stroke aphasia
Reference	<i>Hum Brain Mapp</i> 2017; 38: 1636-1658
PMID	27981674
DOI	10.1002/hbm.23476
Participants	

Language	US English
Inclusion criteria	_
Number of individuals with aphasia	43
Number of control participants	43
Were any of the participants included in any previous studies?	Yes (data were collected as part of "several separate studies")
Is age reported for patients and controls, and	Yes (mean 53 ± 15 years, range 23-90 years)

matched?	
Is sex reported for patients and controls, and matched?	Yes (males: 25; females: 18)
Is handedness reported for patients and controls, and matched?	Yes (right: 41; left: 2)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 1-14 years)
To what extent is the nature of aphasia characterized?	Not at all
Language evaluation	BNT, semantic fluency, phonemic fluency
Aphasia severity	Not stated
Aphasia type	Not stated
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Mean 105.2 ± 76.3 cc
Lesion location	L
Participants notes	-

## Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	_
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	No (Siemens Allegra 3 Tesla or Philips 3 Tesla; model not stated)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Block
Total images acquired	165
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-

#### Conditions

Are the conditions clearly described?	Yes				
Condition	Response type	Repetitions	All groups could do?	All individuals could do?	
semantic decision	Button press	5	No	No	
tone decision	Button press	6	<u>Unknown</u>	<u>Unknown</u>	
Conditions notes	Group performance b 2AFC task	Group performance below chance; several patients at 0 which is difficult to understand in a 2AFC task			
Contrasts					
Are the contrasts clearly described?	Yes				
Contrast 1: semantic decision vs tone decisi	on				

Language condition	Semantic decision
Control condition	Tone decision
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	Tone decision accuracy not reported
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Yes
Control activation notes	Temporal activation is mid MTG and AG rather than pSTS
Contrast notes	
Analyses	
Are the analyses clearly described?	Yes
Voxelwise analysis 1	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Semantic decision accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on cluster threshold beta
Software	SPM12/in-house
Voxelwise p	.01
Cluster extent	126 voxels (size not stated)
Statistical details	Lesion volume covariate
Findings	<ul> <li>L dorsolateral prefrontal cortex</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L mid temporal</li> <li>L anterior temporal</li> <li>L posterior cingulate</li> <li>L cerebellum</li> <li>L brainstem</li> <li>L hippocampus/MTL</li> <li>R IFG pars orbitalis</li> <li>R angular gyrus</li> <li>R anterior temporal</li> <li>R anterior temporal</li> <li>R anterior temporal</li> <li>R anterior temporal</li> <li>R occipital</li> <li>R brainstem</li> </ul>

	↑ R hippocampus/MTL ↓ L somato-motor
Findings notes	Based on figure and table; larger activations are compelling; smaller activations are not due to lenient correction approach
Voxelwise analysis 2	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Average of semantic and phonemic fluency
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on cluster threshold beta
Software	SPM12/in-house
Voxelwise p	.01
Cluster extent	126 voxels (size not stated)
Statistical details	Lesion volume covariate
Findings	<ul> <li>L IFG</li> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L posterior STS</li> <li>L mid temporal</li> <li>L anterior temporal</li> <li>L brainstem</li> <li>L hippocampus/MTL</li> <li>R SMA/medial prefrontal</li> <li>R occipital</li> <li>R posterior cingulate</li> <li>R hippocampus/MTL</li> <li>R posterior cingulate</li> <li>R posterior cingulate</li> <li>R posterior temporal</li> </ul>
Findings notes	Based on figure and table; larger activations are compelling; smaller activations are not due to lenient correction approach

First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	BNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Voxelwise

First level contrastSemantic decision vs tone decisionAnalysis classCross-sectional correlation with language or other measureGroup(s)AphasiaCovarlateLesion volumeIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedBehavioral data notes-Type of analysisVoselwiseSecuracy multiple comparisonsClusterwise correction based on cluster threshold betaSoftwareSoftwareVoselwise p01Cluster extent126 voxels (size not stated)Statistical details-FindingsR IFIG pars opercularisFindings notesReferentialFindings notesReferentialFindings notesReferentialFindings notesReferentialFindings notesReferentialFindings notesBased on figure and table; larger activations are compelling; smaller activations are not due to lenient correction approach		
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I L SMA/redul prefonalal         I L angular pryros         I L proterior cingulate         I L porterior cingulate         I Dipocampus/MTL         I Rificipars orbitalis         R Rificipars orbitalis <td>Statistical details</td> <td>Lesion volume covariate</td>	Statistical details	Lesion volume covariate
Interfact of approach         Interfact of approach           Voxelwise analysis 4         Semantic decision vs tone decision           Analysis class         Cross-sectional correlation with language or other measure           Group(s)         Aphasia           Covariate         Lesion volume           Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?         Yes           Is accuracy matched across the second level contrast?         Unknown, not reported           Is reaction time matched across the second level contrast?         Unknown, not reported           Is accuracy matched across the second level contrast?         Unknown, not reported           Straction time matched across the second level contrast?         Minknown, not reported           Straction time matched across the second level contrast?         Minknown, not reported           Straction time matched across the second level contrast?         Minknown, not reported           Covariate         -           Type of analysis         Voxelwise           Stratter         Software           Correction for multiple comparisons         Eluster vector           Cluster exten         126 voxels (size not stated)           Statistical details         -           Findings         R life pars opercularis R dorosal preforntal R dorial preforntal R dorial prefo		<ul> <li>L SMA/medial prefrontal</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L posterior cingulate</li> <li>L hippocampus/MTL</li> <li>R IFG pars orbitalis</li> <li>R SMA/medial prefrontal</li> <li>R precuneus</li> <li>R anterior temporal</li> <li>R posterior cingulate</li> <li>R cerebellum</li> </ul>
First level contrast       Semantic decision vs tone decision         Analysis class       Cross-sectional correlation with language or other measure         Group(s)       Aphasia         Covariate       Lesion volume         Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?       Yes         Is accuracy matched across the second level       Unknown, not reported         contrast?       Unknown, not reported         second protection time matched across the second level       Unknown, not reported         contrast?       Voxelwise         Search volume       R hemisphere         Correction for multiple comparisons       Clusterwise correction based on cluster threshold beta         Software       SPM12/in-house         Voxelwise p       0         Cluster extent       126 voxels (size not stated)         Statistical details       -         Findings       1 RIFG pars opercularis         It dorsal precentral       1 R dorsal precentral         It Rorisolateral prefortal       1 Rorbitofrontal         It Reterior temporal       1 Reterior temporal         It Rorbitofrontal       R arbitofrontal         It Rorbitofrontal       R arbitofrontal         It Rorbitofrontal       R corbitogrontal	Findings notes	
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Group(s)         Aphasia           Covariate         Lesion volume           Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?         Ves           Is reaction time matched across the second level contrast?         Unknown, not reported           Is reaction time matched across the second level contrast?         Unknown, not reported           Behavioral data notes         -           Type of analysis         Voxelwise           Search volume         R hemisphere           Correction for multiple comparisons         Clusterwise correction based on cluster threshold beta           Software         SPM12/in-house           Voxelwise p         .01           Cluster extent         126 voxels (size not stated)           Statisci details         -           Findings         R RIFG pars opercularis 1 R Rorsal prefrontal cortex 1 R Rodorsal preferentral 1 R Rotrisol termporal 1 R Rotrisol termporal 1 R Rodorsal preferentral 1 R Rotrisol termporal 1 R Rodorsal preferentral 1 R Rotrisol termporal 1 R Rotrisol	First level contrast	Semantic decision vs tone decision
CovariateLesion volumeto second level contrast valid in terms of the group(s), time point(s), and measures involved?Vmsto accuracy matched across the second level contrast?Unknown, not reportedto reaction time matched across the second level contrast?Unknown, not reportedto reaction time matched across the second level contrast?Unknown, not reportedto reaction time matched across the second level contrast?Unknown, not reportedto reaction time matched across the second level contrast?Unknown, not reportedto reaction time matched across the second level contrast?Unknown, not reportedto reaction time matched across the second level contrast?Unknown, not reportedto reaction time matched across the second level contrast?Unknown, not reportedto reaction time matched across the second level contrast?Unknown, not reportedto reaction time matched across the second level contrast?Envision to terportedto reaction time matched across the second level contrast?RemisphereCorrection for multiple comparisonsClusterwise correction based on cluster threshold betato reaction for multiple comparisonsClusterwise correction based on cluster threshold betato reaction for multiple comparisonsClusterwise correction based on cluster threshold betato reaction for multiple comparisonsTel Sovals (size not stated)to table contrastParison correction table (size not stated)to table contrastParison correction table (size not stated)to table contrastParison correction t	Analysis class	Cross-sectional correlation with language or other measure
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?         Yes           Is accuracy matched across the second level contrast?         Unknown, not reported           Is reaction time matched across the second level contrast?         Unknown, not reported           Behavioral data notes         -           Type of analysis         Voxelwise           Search volume         R hemisphere           Correction for multiple comparisons         Clusterwise correction based on cluster threshold beta           Software         SPM12/in-house           Voxelwise p         .01           Cluster extent         126 voxels (size not stated)           Statistical details         -           Findings         1 R IFG pars opercularis 1 R dorsal preentrual 1 R software           Findings notes         Based on figure and table; larger activations are compelling; smaller activations are not due to lenient correction approach           Findings notes         Seadon figure and table; larger activations are compelling; smaller activations are not due to lenient correction approach           Findings notes         Seadon figure and table; larger activations are compelling; smaller activations are not due to lenient correction approach           Findings notes         Cross-sectional aphasia vs control           First level contrast         Semantic decision vs tone decision	Group(s)	Aphasia
group(s), time point(s), and measures involved?Is accuracy matched across the second level contrast?Inknown, not reportedBehavioral data notes-Pype of analysisVoxelwiseSearch volumeR hemisphereCorrection for multiple comparisonsClusterwise correction based on cluster threshold betaSoftwareSPM12/in-houseVoxelwise p.01Cluster extent126 voxels (size not stated)Statistical details-FindingsR IFG pars opercularis t R dorsolateral prefrontal cortexatFindings.1R IFG pars opercularis t R dorsolateral prefrontal t R acretor threshold stated)Statistical details-Findings.1Findings.1R IFG pars opercularis t R dorsolateral prefrontal t R staterior temporal t R staterior temporal t R staterior temporal t R trebellum t R thamusFindings notesBased on figure and table; larger activations are compelling; smaller activations are not due to lenient correction approachFirst level contrastSematic decision vs tone decisionAnalysis classCross-sectional aphasia vs controlGroup(s)Aphasia vs controlCorrection.1	Covariate	Lesion volume
contrast?Is reaction time matched across the second level contrast?Minknown, not reportedBehavioral data notes–Type of analysisMemisphereCorrection for multiple comparisonsGusterwise correction based on cluster threshold betaSoftwareSPM12/in-houseVoxelwise p.01Cluster extent126 xoxels (size not stated)Statiscial details–FindingsR IRG pars opercularis 1 R dorsal prefontal cortex 1 R dorsal prefontal 2 R anterior temporal 2 R anterior temporal 		Yes
contrast?Behavioral data notes-Type of analysisVoxelwiseSearch volumeR hemisphereCorrection for multiple comparisonsClusterwise correction based on cluster threshold betaSoftwareSPM12/in-houseVoxelwise p.01Cluster extent26 oxorels (size not stated)Statistical details-Findings1 R IFG pars opercularis 1 R lor Solateral prefrontal cortex 1 R dorsolateral prefrontal prefrontal 1 R SMA/medial prefrontal 1 R sMA/medial prefrontal 1 R anterior temporal 1 R thalamusFindings notesBased on figure and table; larger activations are compelling; smaller activations are not due to neinet correction approachFirst level contrastSematic decision vs tone decision Analysis classAnalysis classCross-sectional aphasia vs control Orso-sectional aphasia vs control CovariaeCovariate-		Unknown, not reported
Type of analysisVoxelwiseSearch volumeR hemisphereCorrection for multiple comparisonsClusterwise correction based on cluster threshold betaSoftwareSPM12/in-houseVoxelwise p.01Cluster extent126 voxels (size not stated)Statistical details-Findings↑ R IFG pars opercularis ↑ R dorsolateral prefrontal cortex ↑ R dorsolateral prefrontal ↓ R orbitofrontal ↓ R anterior temporal ↓ R erbellum ↓ R thalamusFindings notesBased on figure and table; larger activations are compelling; smaller activations are not due to lenient correction approachFirst level contrastSemantic decision vs tone decision Analysis classAnalysis classCross-sectional aphasia vs control Group(s)Group(s)Aphasia vs controlCovariate-		<u>Unknown, not reported</u>
Search volumeR hemisphereCorrection for multiple comparisonsClusterwise correction based on cluster threshold betaSoftwareSPM12/in-houseVoxelwise p.01Cluster extent126 voxels (size not stated)Statistical details-Findings1 R IFG pars opercularis 1 R dorsal prefrontal cortex 1 R dorsal prefrontal prefrontal 2 R orbitofrontal 2 R orbitofrontal 2 R erebellum 2 R thalamusFindings notesBased on figure and table; larger activations are compelling; smaller activations are not due to lenient correction approachFirst level contrastSemantic decision vs tone decision 4 Analysis classGroup(s)Aphasia vs controlCovariate-	Behavioral data notes	_
Correction for multiple comparisonsClusterwise correction based on cluster threshold betaSoftwareSPM12/in-houseVoxelwise p.01Cluster extent126 voxels (size not stated)Statistical details-Findingst R IFG pars opercularis t R dorsal precentral t R Orsal precentral t R SMA/medial prefrontal t R orbitofrontal t R thalamusFindings notesBased on figure and table; larger activations are compelling; smaller activations are not due to lenient correction approachFirst level contrastSemantic decision vs tone decisionAnalysis classCross-sectional aphasia vs controlGroup(s)Aphasia vs controlCovariate-	Type of analysis	Voxelwise
SoftwareSPM12/in-houseVoxelwise p.01Cluster extent126 voxels (size not stated)Statistical details—Findings1 R IFG pars opercularis 1 R dorsal precentral 1 R SMA/medial prefrontal cortex 1 R orbitofrontal 1 R scheidellum 1 R erebellum 1 R terebellum 1 R thalamusFindings notesBased on figure and table; larger activations are compelling; smaller activations are not due to lenient correction approachFirst level contrastSemantic decision vs tone decisionAnalysis classCross-sectional aphasia vs controlGroup(s)Aphasia vs controlCovariate—	Search volume	R hemisphere
Voxelwise p.01Cluster extent126 voxels (size not stated)Statistical details—FindingsR IFG pars opercularis R dorsolateral prefrontal cortex R dorsolateral prefrontal R NA/medial prefrontal R SMA/medial prefrontal R orbitofrontal R anterior temporal R thalamusFindings notesBased on figure and table; larger activations are compelling; smaller activations are not due to lenient correction approachFirst level contrastSemantic decision vs tone decisionAnalysis classCross-sectional aphasia vs controlGroup(s)Aphasia vs controlCovariate—	Correction for multiple comparisons	Clusterwise correction based on cluster threshold beta
Cluster extent126 voxels (size not stated)Statistical details–Findings↑ R IFG pars opercularis ↑ R dorsolateral prefrontal cortex ↑ R dorsolateral prefrontal ortex ↑ R dorsolateral prefrontal ortex ↑ R obitofrontal ↓ R orbitofrontal ↓ R orbitofrontal ↓ R anterior temporal ↓ R thalamusFindings notesBased on figure and table; larger activations are compelling; smaller activations are not due to lenient correction approachFirst level contrastSemantic decision vs tone decision CosariateAnalysis classCross-sectional aphasia vs controlGroup(s)Aphasia vs controlCovariate—	Software	SPM12/in-house
Statistical details–Findings1 R IFG pars opercularis 1 R dorsolateral prefrontal cortex 1 R dorsolateral prefrontal cortex 1 R sMA/medial prefrontal 1 R sMA/medial prefrontal 1 R sometrial 1 R anterior temporal 1 R terebellum 1 R terebellum 1 R terebellum 1 R terebellum 1 R terebellum 1 R terebellum 1 R terebellum 2 R ter	Voxelwise p	.01
Findings              R IFG pars opercularis              R dorsolateral prefrontal cortex              R dorsolateral prefrontal cortex              R dorsal precentral              R dorsal precentral              R SMA/medial prefrontal              R orbitofrontal              R orbitofrontal              R cerebellum              R talamus              R ased on figure and table; larger activations are compelling; smaller activations are not due to             lenient correction approach         First level contrast              Semantic decision vs tone decision         Analysis class              Cross-sectional aphasia vs control         Analysis class              Aphasia vs control         Covariate              m         First level contrast              Aphasia vs control	Cluster extent	126 voxels (size not stated)
† R dorsolateral prefrontal cortex † R dorsal precentral † R SMA/medial prefrontal ‡ R SMA/medial prefrontal ‡ R SMA/medial prefrontal ‡ R orbitofrontal ‡ R anterior temporal ‡ R cerebellum ‡ R thalamusFindings notesBased on figure and table; larger activations are compelling; smaller activations are not due to lenient correction approachKol analysis 1Semantic decision vs tone decisionFirst level contrastSemantic decision vs tone decisionAnalysis classCross-sectional aphasia vs controlGroup(s)Aphasia vs controlCovariate—	Statistical details	-
Inient correction approach       ROI analysis 1       First level contrast     Semantic decision vs tone decision       Analysis class     Cross-sectional aphasia vs control       Group(s)     Aphasia vs control       Covariate     —	Findings	↑ R dorsolateral prefrontal cortex ↑ R dorsal precentral ↑ R SMA/medial prefrontal ↓ R orbitofrontal ↓ R anterior temporal ↓ R cerebellum
First level contrastSemantic decision vs tone decisionAnalysis classCross-sectional aphasia vs controlGroup(s)Aphasia vs controlCovariate—	Findings notes	
Analysis classCross-sectional aphasia vs controlGroup(s)Aphasia vs controlCovariate—	ROI analysis 1	
Group(s)Aphasia vs controlCovariate—	First level contrast	Semantic decision vs tone decision
Group(s)Aphasia vs controlCovariate—	Analysis class	Cross-sectional aphasia vs control
Covariate —		
		_
	Is the second level contrast valid in terms of the	Yes

group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Semantic decision accuracy not matched, but tone decision accuracy not reported
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	5
What are the ROI(s)?	(1) overall canonical semantic network (CSN); (2) L CSN; (3) R CSN; (4) mirror L CSN in R; (5) out- of-network CSN in R
How are the ROI(s) defined?	Control data
Correction for multiple comparisons	Familywise error (FWE)
Statistical details	<u>Circular because ROI defined in one group</u>
Findings	<ul> <li>L IFG</li> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L mid temporal</li> <li>L anterior temporal</li> <li>L occipital</li> <li>L cerebellum</li> <li>R IFG</li> <li>R dorsolateral prefrontal cortex</li> <li>R SMA/medial prefrontal</li> <li>R angular gyrus</li> <li>R precuneus</li> <li>R naterior temporal</li> <li>R anterior temporal</li> <li>R occipital</li> <li>R occipital</li> <li>R posterior cingulate</li> <li>R cerebellum</li> <li>R cerebellum</li> </ul>
Findings notes	Results are for whole networks of regions, so individual regions cannot be assured; out-of- network R regions not listed since they were not significant in ROI 5 (only in ROI 4)
ROI analysis 2	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	5
What are the ROI(s)?	(1) overall canonical semantic network (CSN); (2) L CSN; (3) R CSN; (4) mirror L CSN in R; (5) out- of-network CSN in R

How are the ROI(s) defined? Correction for multiple comparisons Statistical details Findings Findings notes of-network CSN in R

Familywise error (FWE)

Control data

\_

None

### ROI analysis 3

ROI allalysis 5	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Semantic decision accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	CSN
How are the ROI(s) defined?	Control data
Correction for multiple comparisons	One only
Statistical details	Lesion volume covariate
Findings Findings notes	<ul> <li>L IFG</li> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L mid temporal</li> <li>L anterior temporal</li> <li>L posterior cingulate</li> <li>L cerebellum</li> <li>R IFG</li> <li>R dorsolateral prefrontal cortex</li> <li>R SMA/medial prefrontal</li> <li>R angular gyrus</li> <li>R precuneus</li> <li>R anterior temporal</li> <li>R opsterior cingulate</li> <li>R anterior temporal</li> <li>R precuneus</li> <li>R anterior temporal</li> <li>R opsterior cingulate</li> <li>R cerebellum</li> <li>Correlation calculated for the whole network of regions, so correlation of individual regions cannot be assured</li> </ul>
ROI analysis 4	
	Compantie decision ve tono decision
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Average of semantic and phonemic fluency
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	CSN
How are the ROI(s) defined?	Control data
now are the rol(b) defined:	

Statistical details       Lesion volume covariate         Findings <sup>1</sup> L IFG <sup>1</sup> L dorsolateral prefrontal cortex <sup>1</sup> L SMA/medial prefrontal <sup>1</sup> L angular gyrus <sup>1</sup> L precuneus <sup>1</sup> L indi temporal <sup>1</sup> L anterior temporal <sup>1</sup> L anterior cingulate <sup>1</sup> L cerebellum <sup>1</sup> R IFG <sup>1</sup> R dorsolateral prefrontal cortex <sup>1</sup> R SMA/medial prefrontal <sup>1</sup> R angular gyrus <sup>1</sup> R precuneus <sup>1</sup> R angular gyrus <sup>1</sup> R recuneus <sup>1</sup> C cerebellum <sup>1</sup> R recuneus <sup>1</sup> R angular gyrus <sup>1</sup> R recuneus <sup>1</sup> R cerebellum <sup>1</sup> R recuneus <sup>1</sup> R orsolateral prefrontal <sup>1</sup> R cerebellum <sup>1</sup> R recuneus <sup>1</sup> R anterior temporal <sup>1</sup> R anterior temporal <sup>1</sup> R anterior temporal <sup>1</sup> R orsolateral prefrontal <sup>1</sup> R orsolateral prefrontal <sup>1</sup> R anterior temporal <sup>1</sup> R orsolateral prefrontal <sup>1</sup> R orsolateral prefrontal <sup>1</sup> R angular gyrus <sup>1</sup> R precuneus <sup>1</sup> R anterior temporal <sup>1</sup> R orsolateral <sup>1</sup> R orsolateral <sup>1</sup> R orsolateral <sup>1</sup> R anterior temporal <sup>1</sup> R ortenor cingulate <sup>1</sup> R cerebellum <sup>1</sup> R cerebellum <sup>1</sup> R cerebellum <sup>1</sup> R ortenor calculated for the whole network of regions, so correlation of individual regions         cannot be assured	Correction for multiple comparisons	One only
<ul> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L mid temporal</li> <li>L anterior temporal</li> <li>L cerebellum</li> <li>R IFG</li> <li>R dorsolateral prefrontal cortex</li> <li>R SMA/medial prefrontal</li> <li>R angular gyrus</li> <li>R angular gyrus</li> <li>R precuneus</li> <li>R anterior temporal</li> <li>R posterior cingulate</li> <li>R cerebellum</li> <li>R precuneus</li> <li>R opsterior cingulate</li> <li>R posterior cingulate</li> <li>R precuneus</li> <li>R anterior temporal</li> <li>R precuneus</li> <li>R opsterior cingulate</li> <li>R cerebellum</li> </ul>	Statistical details	Lesion volume covariate
	Findings	<ul> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L mid temporal</li> <li>L anterior temporal</li> <li>L posterior cingulate</li> <li>L cerebellum</li> <li>R IFG</li> <li>R dorsolateral prefrontal cortex</li> <li>R SMA/medial prefrontal</li> <li>R angular gyrus</li> <li>R precuneus</li> <li>R anterior temporal</li> <li>R anterior temporal</li> </ul>
	Findings notes	

### ROI analysis 5

First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	BNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	CSN
How are the ROI(s) defined?	Control data
Correction for multiple comparisons	One only
Statistical details	Lesion volume covariate
Findings	<ul> <li>L IFG</li> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L angular gyrus</li> <li>L precuneus</li> <li>L mid temporal</li> <li>L anterior temporal</li> <li>L posterior cingulate</li> <li>L cerebellum</li> <li>R IFG</li> <li>R dorsolateral prefrontal cortex</li> <li>R SMA/medial prefrontal</li> <li>R angular gyrus</li> <li>R precuneus</li> <li>R anterior temporal</li> <li>R anterior temporal</li> <li>R anterior temporal</li> <li>R cerebellum</li> </ul>
Findings notes	Correlation calculated for the whole network of regions, so correlation of individual regions

#### cannot be assured

Complex analysis 1	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Semantic decision accuracy not matched, but tone decision accuracy not reported
Type of analysis	Complex
Statistical details	Correlations between activation magnitudes in the L and R canonical semantic network (CSN) were compared between groups. However, <u>this analysis is circular because the CSN ROIs were defined based on controls only</u> .
Findings	None
Findings notes	_
Complex analysis 2	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Semantic decision accuracy not matched, but tone decision accuracy not reported
Type of analysis	Complex
Statistical details	Correlations between activation magnitudes in the L CSN and R mirrored CSN were compared between groups. However, <u>this analysis is circular because the CSN ROIs were defined based on controls only</u> .
Findings	Other
Findings notes	Correlations between activations in the L CSN and the mirrored L CSN in the R hemisphere were stronger in patients than controls.
Complex analysis 3	
First level contrast	Semantic decision vs tone decision

First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Semantic decision accuracy not matched, but tone decision accuracy not reported
Type of analysis	Complex
Statistical details	Correlations between activation magnitudes in the L CSN and R out-of-network homotopic regions were compared between groups. However, this analysis is circular because the CSN

	POIc ware defined based on controls only
Findings	<u>ROIs were defined based on controls only</u> . Other
Findings	Correlations between activations in the L CSN and R out-of-network homotopic regions were
Thruings holes	stronger in patients than controls.
Complex analysis 4	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Semantic decision accuracy not matched, but tone decision accuracy not reported
Type of analysis	Complex
Statistical details	The difference in activation between the L CSN and R CSN was compared between patients and controls. However, <u>this analysis is circular because the CSN ROIs were defined based on controls only</u> .
Findings	None
Findings notes	-
Complex analysis 5	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
ls reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Semantic decision accuracy not matched, but tone decision accuracy not reported
Type of analysis	Complex
Statistical details	The difference in activation between the L CSN and mirror L CSN in the R was compared between patients and controls. However, <u>this analysis is circular because the CSN ROIs were</u> <u>defined based on controls only</u> .
Findings	Other
Findings notes	The difference was smaller in patients.
Complex analysis 6	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Semantic decision accuracy not matched, but tone decision accuracy not reported
Type of analysis	Complex

Statistical details	The difference in activation between the R CSN and out-of-network homotopic regions in the R was compared between patients and controls. However, <u>this analysis is circular because the CSN ROIs were defined based on controls only</u> .
Findings	Other
Findings notes	The difference was smaller in patients.
Complex analysis 7	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Interactions of semantic fluency and naming measures by lesion size
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Complex
Statistical details	For the 4 R hemisphere regions that were more activated in patients with larger lesions (SPM analysis 4), analyses were carried out to determine whether the semantic fluency or naming measures were differentially impacted by activation depending on whether lesions were larger or smaller.
Findings	Other
Findings notes	For 1 of the 4 regions (R SMA), there were significant interactions such that in patients with larger lesions, more activation was associated with higher semantic fluency scores and higher BNT scores, while in patients with smaller lesions, more activation was associated with lower fluency and BNT scores. There was a similar relationship with semantic fluency in the R IFG pars opercularis but only at p(FDR) = 0.07.
Notes	
Excluded analyses	Ancillary whole brain analyses without lesion volume covariate (Supporting Figure 3); Figure 3b and 3c, which are derivatives of included analyses

# Harvey et al. (2017)

### Reference

Authors	Harvey DY, Podell J, Turkeltaub PE, Faseyitan O, Coslett HB, Hamilton RH
Title	Functional reorganization of right prefrontal cortex underlies sustained naming improvements in chronic aphasia via repetitive transcranial magnetic stimulation
Reference	Cogn Behav Neurol 2017; 30: 133-144
PMID	29256908
DOI	10.1097/wnn.000000000000141

## Participants

Language	US English
Inclusion criteria	Mild-moderate non-fluent aphasia; relatively intact comprehension; able to produce meaningful words and phrases
Number of individuals with aphasia	<u>6</u>
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (range 47-75 years)

Is sex reported for patients and controls, and matched?	Yes (males: 5; females: 1)			
Is handedness reported for patients and controls, and matched?	Yes (right: 6; left: 0)			
Is time post stroke onset reported and appropriate to the study design?	Yes (range 6-102 months)			
To what extent is the nature of aphasia characterized?	Comprehensive battery			
Language evaluation	BDAE, BNT			
Aphasia severity	Mild-moderate			
Aphasia type	All non-fluent			
First stroke only?	Yes			
Stroke type	Ischemic only			
To what extent is the lesion distribution	Individual lesions			
characterized?				
Lesion extent	Range 36.6-252.1 cc			
Lesion location	L MCA			
Participants notes	_			
Imaging				
Modality	fMRI			
Is the study cross-sectional or longitudinal?	Longitudinal—chronic tre	atment		
If longitudinal, at what time point(s) were imaging	T1: pre-treatment/chroni		ient. 2 months after treat	ment: T3: 6 months after
data acquired?	treatment (the 2-month t significant behavioral effe	ime point was no		
If longitudinal, was there any intervention between the time points?	Inhibitory rTMS to R IFG,	10 days		
Is the scanner described?	Yes (Siemens Trio 3 Tesla	)		
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes			
Design type	Block			
Total images acquired	200			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	Yes			
Is intersubject normalization adequately described and appropriate?	<u>No</u> (lesion impact not add	dressed)		
Imaging notes	-			
Conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming	Word (overt)	20	Yes	Yes
viewing patterns	None	20	N/A	<u>N/A</u>
Conditions notes	Assume all individuals co	uld do based on	inclusion criterion and BN	NT scores
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: picture naming vs viewing patterns				
Language condition	Picture naming			

Control condition	Viewing patterns
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	_
Contrast notes	_
Analyses	
Are the analyses clearly described?	Yes
Are the analyses clearly described:	
Voxelwise analysis 1	
First level contrast	Picture naming vs viewing patterns
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T3 vs T1
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	No direct comparison
Software	SPM8
Voxelwise p	
Cluster extent	
Statistical details	— Qualitative comparison on pp. 138-9
Findings	<ul> <li>L SMA/medial prefrontal</li> <li>L posterior inferior temporal gyrus/fusiform gyrus</li> <li>L occipital</li> <li>L anterior cingulate</li> <li>R IFG pars opercularis</li> <li>R ventral precentral/inferior frontal junction</li> <li>L dorsolateral prefrontal cortex</li> </ul>
	↓ R IFG pars triangularis ↓ R posterior inferior temporal gyrus/fusiform gyrus ↓ R occipital ↓ R hippocampus/MTL
Findings notes	Based on Figure 5 and Table 4
Notes	

#### Notes

Excluded analyses

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# Nardo et al. (2017)

### Reference

Authors	Nardo D, Holland R, Leff AP, Price CJ, Crinion JT
Title	Less is more: neural mechanisms underlying anomia treatment in chronic aphasic patients
Reference	Brain 2017; 140: 3039-3054
PMID	29053773
DOI	10.1093/brain/awx234

### Participants

Language	UK English
Inclusion criteria	Anomia; good single word comprehension; relatively spared word and nonword repetition; no AoS; spared or partially spared L IFG
Number of individuals with aphasia	<u>18</u>
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 50 ± 12 years, range 21-67 years)
Is sex reported for patients and controls, and matched?	Yes (males: 12; females: 6)
Is handedness reported for patients and controls, and matched?	Yes (right: 18; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 61 $\pm$ 58 months, range 5-264 months)
To what extent is the nature of aphasia characterized?	Not at all
Language evaluation	BNT, one CAT subtest, two PALPA subtests
Aphasia severity	Not stated
Aphasia type	Not stated
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L MCA
Participants notes	-

### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, ~6 weeks later
If longitudinal, was there any intervention between the time points?	Anomia treatment (computer-based practice), 2+ hours/day, 6 weeks
Is the scanner described?	Yes (Siemens Trio 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Event-related
Total images acquired	696
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration	Yes

adequately described and appropriate?	
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-

#### Conditions

Are the conditions clearly described?

Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming (untrained items, word cue)	Word (overt)	54	Yes	<u>Unknown</u>
picture naming (untrained items, initial phonemes cue)	Word (overt)	54	Yes	<u>Unknown</u>
picture naming (untrained items, final phonemes cue)	Word (overt)	54	Yes	<u>Unknown</u>
picture naming (untrained items, no cue)	Word (overt)	54	Yes	Unknown
picture naming (trained items, word cue)	Word (overt)	53	Yes	Unknown
picture naming (trained items, initial phonemes cue)	Word (overt)	53	Yes	<u>Unknown</u>
picture naming (trained items, final phonemes cue)	Word (overt)	53	Yes	<u>Unknown</u>
picture naming (trained items, no cue)	Word (overt)	53	Yes	Unknown
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>

Conditions notes

Spectrally rotated noise vocoded auditory stimulus in no-cue conditions; one patient had a BNT of 1/60 so it is unclear whether that patient could do the task

#### Contrasts

Are the contrasts clearly described?

No (see specific limitation(s) below)

#### Contrast 1: picture naming (all conditions, correct trials) vs rest

Language condition	Picture naming (all conditions, correct trials)
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	It is difficult to determine exactly what contrasts were employed

#### Contrast 2: picture naming (untrained items, no cue, correct trials) vs picture naming (trained items, no cue, correct trials)

Language condition	Picture naming (untrained items, no cue, correct trials)
Control condition	Picture naming (trained items, no cue, correct trials)

Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	Yes, correct trials only
Is reaction time matched between the language and control tasks for all relevant groups?	<u>No, different</u>
Behavioral data notes	Untrained items significantly slower at T2
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Unknown</u>
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	It is difficult to determine exactly what contrasts were employed
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Picture naming (all conditions, correct trials) vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>No, different</u>
Behavioral data notes	RT faster at T2
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise FWE correction
Software	SPM12
Voxelwise p	FWE p < .05
Cluster extent	-
Statistical details	-
Findings	None
Findings notes	_
ROI analysis 1	
First level contrast	Picture naming (untrained items, no cue, correct trials) vs picture naming (trained items, no cue, correct trials)
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T2
Covariate	"a change in un-cued naming RT" (exact measure unclear)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (unclear whether behavioral measure is longitudinal)
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Pohavioral data potos	

Behavioral data notes

Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) R anterior insula; (2) R IFG; (3) dorsal anterior cingulate; (4) L premotor cortex
How are the ROI(s) defined?	Peaks (only with SVC) for the main effect of untrained (4 conditions) vs trained (4 conditions) in T2 aphasia
Correction for multiple comparisons	No correction
Statistical details	Unclear what the behavioral measure was exactly
Findings	↑ R IFG pars opercularis ↑ R insula
Findings notes	_
Netec	

#### Notes

Excluded analyses

Most analyses were between conditions in people with aphasia, so did not meet criteria for this review

## Nenert et al. (2017)

### Reference

Authors	Nenert R, Allendorfer JB, Martin AM, Banks C, Ball A, Vannest J, Dietz AR, Szaflarski JP
Title	Neuroimaging correlates of post-stroke aphasia rehabilitation in a pilot randomized trial of constraint-induced aphasia therapy
Reference	Med Sci Monit 2017; 23: 3489-3507
PMID	28719572
DOI	10.12659/msm.902301

### Participants

Language	US English
Inclusion criteria	At least mild aphasia per TT
Number of individuals with aphasia	<u>19</u>
Number of control participants	38
Were any of the participants included in any previous studies?	Yes (patients are a subset of the 24 participants in Szaflarski et al. (2015), a clinical trial on CIAT)
Is age reported for patients and controls, and matched?	Yes (CIAT group: mean 58.0 $\pm$ 10.6 years; untreated group: mean 50.3 $\pm$ 13.3 years)
Is sex reported for patients and controls, and matched?	Yes (males: 11; females: 8)
Is handedness reported for patients and controls, and matched?	No (right: 17; left: 0; other: 2; 2 patients "atypical": unclear whether L or mixed)
Is time post stroke onset reported and appropriate to the study design?	Yes (CIAT group: mean 60.2 $\pm$ 48.9 months; untreated group: mean 41.9 $\pm$ 30.0 months; all > 1 year)
To what extent is the nature of aphasia characterized?	Severity only
Language evaluation	TT, PPVT, BNT, semantic fluency, phonemic fluency, communicative activities log
Aphasia severity	6 mild (2 control, 4 CIAT); 5 moderate (3 control, 2 CIAT); 8 severe (3 control, 5 CIAT)
Aphasia type	Not stated
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L MCA
Participants notes	-

### Imaging

Imaging				
Modality	fMRI			
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment			
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, ~3 weeks later; T3: 3 months after the end of treatment			
If longitudinal, was there any intervention between the time points?	CIAT, 4 hours/day, 5 days	/week, 2 weeks		
Is the scanner described?	<u>No</u> (Philips 3 Tesla or Sier	nens 3 Tesla; mo	odels not stated)	
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes			
Design type	Block			
Total images acquired	600			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	Yes			
Is intersubject normalization adequately described and appropriate?	<u>No</u> (lesion impact not add	lressed)		
Imaging notes	-			
Conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
semantic decision	Button press	10	<u>Unknown</u>	<u>Unknown</u>
tone decision	Button press	10	<u>Unknown</u>	<u>Unknown</u>
verb generation	Multiple words (covert)	10	<u>Unknown</u>	<u>Unknown</u>
finger tapping	Other	10	<u>Unknown</u>	<u>Unknown</u>
Conditions notes	Behavioral data are provi denominator is unclear; a cannot confirm verb gene	i post-scan reco	gnition test for verb gene	ecision tasks, but the ration is reported, but this
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: semantic decision vs tone decision				
Language condition	Semantic decision			
Control condition	Tone decision			
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	Yes			
Are the conditions matched for motor demands?	Yes			
Are the conditions matched for cognitive/executive demands?	Yes			
Is accuracy matched between the language and control tasks for all relevant groups?	Appear mismatched			
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>			
Behavioral data notes	Appear mismatched at le	ast in healthy co	ntrols in Table 3	
Are control data reported in this paper or another that is referenced?	Yes			
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes			
	Ves			

Yes

Are activations lateralized in the control data?

Control activation notes	Lateralized frontal, temporal, and parietal
Contrast notes	
Contrast 2: verb generation vs finger tapping	
Language condition	Verb generation
Control condition	Finger tapping
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Somewhat
Control activation notes	Control data in Szaflarski et al. (2008); frontal activation L-lateralized, temporal less so
Contrast notes	-
Analyses	
Are the analyses clearly described?	Yes
Voxelwise analysis 1	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia CIAT T2 (n = 11) vs untreated T2 (n = 8)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>Somewhat</u> (no treatment effect)
Is accuracy matched across the second level contrast?	<u>Appear similar</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	—
Findings	↑ L somato-motor ↑ L superior parietal ↑ L brainstem ↑ R ventral precentral/inferior frontal junction ↑ R somato-motor ↑ R superior parietal
Findings notes	Based on coordinates in Table 4
Voxelwise analysis 2	
	Semantic decision vs tone decision

First level contrast

Semantic decision vs tone decision

Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia CIAT T3 (n = 11) vs untreated T3 (n = 8)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (no treatment effect)
Is accuracy matched across the second level contrast?	<u>Unknown, no test</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	_
Findings	↑ L superior parietal
	↑ L anterior temporal  ↑ L hippocampus/MTL  ↑ R orbitofrontal
	↓ L dorsolateral prefrontal cortex ↓ L posterior inferior temporal gyrus/fusiform gyrus
	↓ R IFG pars orbitalis ↓ R ventral precentral/inferior frontal junction ↓ R posterior STS
Findings notes	Based on coordinates in Table 4
Voxelwise analysis 3	
First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia CIAT T2 (n = 11) vs untreated T2 (n = 8)
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (no treatment effect)
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons Software	Clusterwise correction based on arbitrary cluster extent SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	_
Findings	↓ L precuneus ↓ R dorsolateral prefrontal cortex ↓ R posterior STS ↓ R anterior temporal ↓ R posterior inferior temporal gyrus/fusiform gyrus
	T R posterior interior temporal gyrus/fusion gyrus
Findings notes	Based on coordinates in Table 4
Findings notes Voxelwise analysis 4	

Analysis along	
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia CIAT T3 (n = 11) vs untreated T3 (n = 8)
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (no treatment effect)
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	_
Findings	↑ L SMA/medial prefrontal ↑ R basal ganglia ↓ L anterior temporal ↓ R posterior STS ↓ R Heschl's gyrus ↓ R posterior inferior temporal gyrus/fusiform gyrus
Findings notes	_
Voxelwise analysis 5	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia CIAT T1 (n = 11) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	<u>Clusterwise correction based on arbitrary cluster extent</u>
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	_
Findings	<ul> <li>L orbitofrontal</li> <li>L hippocampus/MTL</li> <li>R IFG pars opercularis</li> <li>R SMA/medial prefrontal</li> <li>R supramarginal gyrus</li> <li>R posterior STG/STS/MTG</li> <li>R anterior temporal</li> <li>R anterior cingulate</li> <li>R dorsolateral prefrontal cortex</li> </ul>
Findings notes	-
Voxelwise analysis 6	

First level contrast

Semantic decision vs tone decision

Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia CIAT T2 (n = 11) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	-
Findings	<ul> <li>L anterior cingulate</li> <li>R IFG pars opercularis</li> <li>R insula</li> <li>R ventral precentral/inferior frontal junction</li> <li>R supramarginal gyrus</li> <li>R Heschl's gyrus</li> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>K cerebellum</li> <li>R dorsolateral prefrontal cortex</li> </ul>
Findings notes	_
Voxelwise analysis 7	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia CIAT T3 (n = 11) vs control
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	-
Findings	↑ L orbitofrontal ↑ L anterior cingulate ↑ L hippocampus/MTL ↑ R superior patiental

- R superior parietal
   ↓ L cerebellum
   ↓ R dorsolateral prefrontal cortex
   ↓ R anterior temporal
   ↓ R cerebellum

VOXEIWISE dildiysis o	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia untreated T1 (n = 8) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	_
Findings	<ul> <li>L dorsolateral prefrontal cortex</li> <li>R dorsolateral prefrontal cortex</li> <li>R SMA/medial prefrontal</li> <li>R somato-motor</li> <li>L IFG pars orbitalis</li> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L angular gyrus</li> <li>L anterior temporal</li> <li>R anterior temporal</li> <li>R anterior temporal</li> <li>R posterior inferior temporal gyrus/fusiform gyrus</li> </ul>
Findings notes	-
Voxelwise analysis 9	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia untreated T2 (n = 8) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons Software	<u>Clusterwise correction based on arbitrary cluster extent</u> SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	_
Findings	↑ L posterior inferior temporal gyrus/fusiform gyrus ↑ R dorsolateral prefrontal cortex ↑ R orbitofrontal

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	<ul> <li>R mid temporal</li> <li>L IFG pars orbitalis</li> <li>L SMA/medial prefrontal</li> <li>L orbitofrontal</li> <li>L orbitofrontal</li> <li>L intraparietal sulcus</li> <li>L superior parietal</li> <li>L anterior cingulate</li> <li>L brainstem</li> <li>R IFG pars orbitalis</li> <li>R dorsolateral prefrontal cortex</li> <li>R inferior parietal lobule</li> <li>R supramarginal gyrus</li> <li>R anterior temporal gyrus/fusiform gyrus</li> <li>R hippocampus/MTL</li> </ul>
Findings notes	-
Voxelwise analysis 10	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia untreated T3 (n = 8) vs control
Covariate	
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Patients less accurate than controls on both tasks, but not significantly for the semantic decision task, and more so on the tone decision task
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	_
Findings	<ul> <li>L dorsolateral prefrontal cortex</li> <li>R dorsolateral prefrontal cortex</li> <li>R SMA/medial prefrontal</li> <li>R orbitofrontal</li> <li>R superior parietal</li> <li>R cerebellum</li> <li>L orbitofrontal</li> <li>L mid temporal</li> <li>L anterior temporal</li> <li>L cerebellum</li> <li>L cerebellum</li> <li>L anterior temporal</li> <li>A cerebellum</li> <li>R angular gyrus</li> <li>R anterior temporal</li> </ul>
Findings notes	_
Voxelwise analysis 11	
First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control

First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia CIAT T1 (n = 11) vs control
Covariate	_

Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	_
Findings	↑ L dorsal precentral ↑ L superior parietal ↑ R cerebellum ↓ L dorsolateral prefrontal cortex ↓ L SMA/medial prefrontal ↓ R posterior inferior temporal gyrus/fusiform gyrus
Findings notes	_
Voxelwise analysis 12	
First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia CIAT T2 (n = 11) vs control
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level	Unknown, not reported

Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia CIAT T2 (n = 11) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	-
Findings	<ul> <li>↑ L dorsal precentral</li> <li>↑ L anterior cingulate</li> <li>↓ L IFG pars orbitalis</li> <li>↓ L dorsolateral prefrontal cortex</li> <li>↓ L SMA/medial prefrontal</li> <li>↓ L superior parietal</li> <li>↓ L posterior inferior temporal gyrus/fusiform gyrus</li> <li>↓ L occipital</li> <li>↓ R IFG pars orbitalis</li> </ul>
Findings notes	_
Voxelwise analysis 13	
First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia CIAT T3 (n = 11) vs control
Covariate	-

Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	-
Findings	<ul> <li>L somato-motor</li> <li>L anterior cingulate</li> <li>L posterior cingulate</li> <li>L IFG pars orbitalis</li> <li>L dorsolateral prefrontal cortex</li> <li>L superior parietal</li> <li>L posterior inferior temporal gyrus/fusiform gyrus</li> <li>R dorsolateral prefrontal cortex</li> <li>R mid temporal</li> </ul>
Findings notes	_
Voxelwise analysis 14	
First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia untreated T1 (n = 8) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons Software	<u>Clusterwise correction based on arbitrary cluster extent</u> SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	-
Findings	<ul> <li>L superior parietal</li> <li>L occipital</li> <li>L cerebellum</li> <li>R dorsolateral prefrontal cortex</li> <li>R cerebellum</li> <li>L IFG pars orbitalis</li> <li>L SMA/medial prefrontal</li> <li>L posterior inferior temporal gyrus/fusiform gyrus</li> <li>L cerebellum</li> <li>R superior parietal</li> </ul>
Findings notes	

Findings notes

## Voxelwise analysis 15

First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia untreated T2 (n = 8) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	-
Findings	<ul> <li>L dorsolateral prefrontal cortex</li> <li>R SMA/medial prefrontal</li> <li>R angular gyrus</li> <li>R posterior STG</li> <li>R posterior cingulate</li> <li>R cerebellum</li> <li>L dorsolateral prefrontal cortex</li> <li>L SMA/medial prefrontal</li> <li>L superior parietal</li> <li>L anterior temporal</li> <li>L posterior inferior temporal gyrus/fusiform gyrus</li> <li>L occipital</li> <li>R superior parietal</li> <li>R superior parietal</li> <li>R superior parietal</li> <li>R cerebellum</li> </ul>
Findings notes	

First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia untreated T3 (n = 8) vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	-
Findings	↑ L superior parietal ↑ L anterior temporal ↑ L occipital

	<ul> <li>R insula</li> <li>R ventral precentral/inferior frontal junction</li> <li>R orbitofrontal</li> <li>R occipital</li> <li>R cerebellum</li> <li>L IFG pars orbitalis</li> <li>L SMA/medial prefrontal</li> <li>L superior parietal</li> <li>L occipital</li> <li>R insula</li> <li>R dorsolateral prefrontal cortex</li> <li>R cerebellum</li> <li>R basal ganglia</li> </ul>
Findings notes	—
Voxelwise analysis 17	
First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	ΔBNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	-
Findings	↑ R insula ↑ R anterior cingulate ↑ R cerebellum ↑ R brainstem ↑ R basal ganglia
Findings notes	-
Voxelwise analysis 18	
First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T3 vs T2
Covariate	ΔBNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (no treatment effect)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>

↑ R insula

Unknown, not reported

-

Is reaction time matched across the second level

contrast?

Software

Behavioral data notes

Type of analysis

Search volume

Voxelwise Voxels spared in all patients

Correction for multiple comparisons Clusterwise correction based on arbitrary cluster extent

SPM12

N / 1 / 1	
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	-
Findings	↑ R somato-motor ↑ R posterior MTG ↑ R thalamus
Findings notes	_
Voxelwise analysis 19	
First level contrast	Verb generation vs finger tapping
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	ΔΒΝΤ
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	_
Findings	↑ R orbitofrontal ↑ R mid temporal
Findings notes	
Voxelwise analysis 20	
First level contrast	Verb generation vs finger tapping
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T3 vs T2
Covariate	ΔΒΝΤ
Is the second level contrast valid in terms of the	Somewhat (no treatment effect)
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM12
Voxelwise p	.01
Cluster extent	50 voxels (size not stated)
Statistical details	_
Findings	↑ L dorsolateral prefrontal cortex
	↑ R dorsolateral prefrontal cortex ↑ R orbitofrontal

First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia ANOVA including T1, T2, T3
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear similar</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	5
What are the ROI(s)?	(1) frontal Ll; (2) temporo-parietal Ll; (3) cerebellar Ll; (4) fronto-parietal Ll; (5) Broca's Ll
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	_
ROI analysis 2	
First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia CIAT (n = 11) T1 ≠ T2 ≠ T3) vs (untreated (n = 8) T1 ≠ T2 ≠ T3)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (no treatment effect)
Is accuracy matched across the second level contrast?	Appear similar

Unknown, not reported

— —

Regions of interest (ROI) Laterality indi(ces)

5

(1) frontal LI; (2) temporo-parietal LI; (3) cerebellar LI; (4) fronto-parietal LI; (5) Broca's LI

No correction		
_		
None		

Findings notes **ROI analysis 3** 

Statistical details Findings

contrast?

ROI type

Behavioral data notes Type of analysis

What are the ROI(s)? How are the ROI(s) defined? Correction for multiple comparisons

How many ROIs are there?

Is reaction time matched across the second level

First level contrast	Verb generation vs finger tapping
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia ANOVA including T1, T2, T3
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_

Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	5
What are the ROI(s)?	(1) frontal Ll; (2) temporo-parietal Ll; (3) cerebellar Ll; (4) fronto-parietal Ll; (5) Broca's Ll
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-

#### ROI analysis 4

First level contrast	Verb generation vs finger tapping
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia CIAT (n = 11) T1 ≠ T2 ≠ T3) vs (untreated (n = 8) T1 ≠ T2 ≠ T3)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (no treatment effect)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	5
What are the ROI(s)?	(1) frontal LI; (2) temporo-parietal LI; (3) cerebellar LI; (4) fronto-parietal LI; (5) Broca's LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	_
N - 6	

### Notes

Excluded analyses

(1) pretreatment comparisons between CIAT and untreated groups; (2) Figure 4 caption states that LI values for control group are different to the aphasia groups, but there is no statistical test in support of this

## Qiu et al. (2017)

#### Reference

Authors	Qiu WH, Wu HX, Yang QL, Kang Z, Chen ZC, Li K, Qiu GR, Xie CQ, Wan GF, Chen SQ
Title	Evidence of cortical reorganization of language networks after stroke with subacute Broca's aphasia: a blood oxygenation level dependent-functional magnetic resonance imaging study
Reference	Neural Regen Res 2017; 128: 109-117
PMID	28250756
DOI	10.4103/1673-5374.198996
Deuti-in-eut-	

#### Participants

Language	Mandarin
Inclusion criteria	Broca's aphasia
Number of individuals with aphasia	<u>10</u>
Number of control participants	10

Were any of the participants included in any previous studies?	No			
Is age reported for patients and controls, and matched?	Yes (mean 55.9 ± 13.4 years, range 40-70 years)			
Is sex reported for patients and controls, and matched?	Yes (males: 7; females: 3)			
Is handedness reported for patients and controls, and matched?	Yes (right: 10; left: 0)			
Is time post stroke onset reported and appropriate to the study design?	Yes (range 1-3 months)			
To what extent is the nature of aphasia characterized?	Severity and type	Severity and type		
Language evaluation	WAB			
Aphasia severity	Moderate-severe			
Aphasia type	All Broca's			
First stroke only?	Yes			
Stroke type	Mixed etiologies			
To what extent is the lesion distribution characterized?	Not at all			
Lesion extent	Not stated			
Lesion location	L			
Participants notes	_			
Imaging				
Modality	fMRI			
Is the study cross-sectional or longitudinal?	Cross-sectional			
If longitudinal, at what time point(s) were imaging data acquired?				
If longitudinal, was there any intervention between the time points?	_			
Is the scanner described?	Yes (GE Signa 1.5 Tesla)			
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No* (moderate limitation)</u> (only three pictures were named per 30-second block)			
Design type	Block			
Total images acquired	186			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	No (not described)			
Is first level model fitting adequately described and appropriate?	<u>No</u> (no description of mo	<u>No</u> (no description of model fitting)		
Is intersubject normalization adequately described and appropriate?	<u>No</u> (not described)	No (not described)		
Imaging notes	_			
Conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming	Word (overt)	9	Unknown	Unknown
rest	None	9	N/A	N/A
Conditions notes	_			
Contrasts				
Are the contrasts clearly described?	Yes			

### Contrast 1: picture naming vs rest

Language condition	Picture naming
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	Somewhat
Control activation notes	Somewhat L-lateralized frontal and anterior temporal language activations, but the majority of activation is in unexpected regions
Contrast notes	_
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Picture naming vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on arbitrary cluster extent
Software	SPM8
Voxelwise p	.05
Cluster extent	10 voxels (size not stated)
Statistical details	In the footnote to Table 2, there is a reference to FWE correction with Monte Carlo simulation, but <u>this is not described in the text</u> , <u>and the values in the table appear to be inconsistent with</u> <u>that</u>
Findings	<ul> <li>↑ L intraparietal sulcus</li> <li>↑ L posterior inferior temporal gyrus/fusiform gyrus</li> <li>↑ L occipital</li> <li>↑ L thalamus</li> <li>↑ R inferior parietal lobule</li> <li>↑ R intraparietal sulcus</li> <li>↑ R precuneus</li> <li>↑ R anterior temporal</li> <li>↓ L IFG</li> <li>↓ L orbitofrontal</li> </ul>

	↓ L somato-motor ↓ R ventral precentral/inferior frontal junction
Findings notes	Findings are based on coordinates, which in many cases do not match the labels assigned in the paper
Notes	
Excluded analyses	Comparisons between activation volumes in the left and right hemispheres in the two groups, because <u>not described in sufficient detail</u>

# Skipper-Kallal et al. (2017a)

#### Reference

Authors	Skipper-Kallal LM, Lacey EH, Xing S, Turkeltaub PE
Title	Functional activation independently contributes to naming ability and relates to lesion site in post-stroke aphasia
Reference	<i>Hum Brain Mapp</i> 2017a; 38: 2051-2066
PMID	28083891
DOI	10.1002/hbm.23504

### Participants

Language	US English
Inclusion criteria	Able to name 20% of pictures correctly in the scanner
Number of individuals with aphasia	32 (plus 14 excluded: < 20% accuracy in scanner)
Number of control participants	25
Were any of the participants included in any previous studies?	Yes (29 of the participants overlap with the other Skipper-Kallal et al. (2017) paper)
Is age reported for patients and controls, and matched?	Yes (mean 58.8 ± 8.6 years, range 45.7-78.2 years)
ls sex reported for patients and controls, and matched?	Yes (males: 19; females: 12; stated to be not matched, but difference not significant)
Is handedness reported for patients and controls, and matched?	Yes (right: 26; left: 3; other: 2)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 40.9 ± 36.1 months, 4.9-151.0 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	WAB, PNT
Aphasia severity	AQ mean 77.7 ± 21.0, range 22.8-99.2
Aphasia type	21 anomic, 7 Broca's, 3 conduction, 1 transcortical sensory
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Mean 27.5 ± 22.9 cc
Lesion location	L MCA
Participants notes	_

### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	-
If longitudinal, was there any intervention between	-

the time points?	
Is the scanner described?	Yes (Siemens Trio 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No* (moderate limitation</u> ) (total images acquired not stated; separation of adjacent events (covert and overt naming) will be limited because of the small amount of jitter in their timing (only 1500 ms))
Design type	Event-related
Total images acquired	~450 but not stated
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	<u>No* (moderate limitation</u> ) (entire phases where picture was displayed modeled as covert and overt naming; difficult to separate phases due to timing)
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-
Conditions	

Are the conditions clearly described?

Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming (silently name)	Word (covert)	32	Yes	Yes
picture naming (produce the name)	Word (overt)	32	Yes	Yes
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>

Conditions notes

Covert and overt naming were modeled as two phases of each trial (there was a cue to produce the name after 7500-9000 ms); 5 participants who were more impaired were given easier pictures to name; patients who named less than 20% of items correctly were excluded

#### Contrasts

Are the contrasts clearly described?	No (see specific limitation(s) below)
--------------------------------------	---------------------------------------

### Contrast 1: picture naming (silently name, correct trials) vs rest

Language condition	Picture naming (silently name, correct trials)
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	No
Control activation notes	Bilateral frontal and occipito-temporal, but not posterior temporal
Contrast notes	-

#### Contrast 2: picture naming (produce the name, correct trials) vs rest

Language condition

Picture naming (produce the name, correct trials)

Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	No
Control activation notes	Bilateral frontal and occipito-temporal, but not posterior temporal; speech motor activation not readily apparent
Contrast notes	-

### Contrast 3: picture naming (both phases, correct trials) vs picture naming (both phases, incorrect trials)

Language condition	Picture naming (both phases, correct trials)
Control condition	Picture naming (both phases, incorrect trials)
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	<u>Unknown</u>
Are the conditions matched for motor demands?	Unknown
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	No, by design
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	N/A
Does the contrast selectively activate plausible relevant language regions in the control group?	N/A
Are activations lateralized in the control data?	N/A
Control activation notes	Control data N/A because controls do not typically make errors
Contrast notes	<u>It is unclear whether there were no-response trials and whether they were modeled as incorrect</u>
Analyses	
Are the analyses clearly described?	Yes
Voxelwise analysis 1	
First level contrast	Picture naming (silently name, correct trials) vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>

Behavioral data notes	Covert phase but accuracy derived from overt phase
Type of analysis	Voxelwise
Search volume	Whole brain gray matter
Correction for multiple comparisons	Clusterwise correction with with GRFT and lenient voxelwise p
Software	FSL 5.0.6
Voxelwise p	~.01 (z > 2.3)
Cluster extent	Based on GRFT
Statistical details	Threshold of z > 3.1 mentioned in results, but presume 2.3 based on methods and figure
Findings	↑ R precuneus ↓ L occipital
Findings notes	-

Voxelwise analysis 2	
First level contrast	Picture naming (produce the name, correct trials) vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain gray matter
Correction for multiple comparisons	<u>Clusterwise correction with with GRFT and lenient voxelwise p</u>
Software	FSL 5.0.6
Voxelwise p	~.01 (z > 2.3)
Cluster extent	Based on GRFT
Statistical details	Threshold of z > 3.1 mentioned in results, but presume 2.3 based on methods and figure
Findings	<ul> <li>L SMA/medial prefrontal</li> <li>L orbitofrontal</li> <li>L precuneus</li> <li>R insula</li> <li>R ventral precentral/inferior frontal junction</li> <li>R SMA/medial prefrontal</li> <li>R orbitofrontal</li> <li>R orbitofrontal</li> <li>R somato-motor</li> <li>R supramarginal gyrus</li> <li>R posterior STS</li> <li>L IFG</li> <li>L insula</li> <li>L ventral precentral/inferior frontal junction</li> <li>L intraparietal sulcus</li> <li>L anterior temporal</li> <li>L hippocampus/MTL</li> <li>R intraparietal sulcus</li> </ul>
Findings notes	Labels based largely on text with some adjustments based on figures; overall pattern of decreased L activity and increased R activity is quite convincing
Voxelwise analysis 3	
First level contrast	Picture naming (silently name, correct trials) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	PNT
Is the second level contrast valid in terms of the	Yes

group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Covert phase but accuracy derived from overt phase
Type of analysis	Voxelwise
Search volume	Whole brain gray matter
Correction for multiple comparisons	Clusterwise correction with with GRFT and lenient voxelwise p
Software	FSL 5.0.6
Voxelwise p	~.01 (z > 2.3)
Cluster extent	Based on GRFT
Statistical details	Dased OII GRET
Findings	↑ L anterior temporal ↓ L SMA/medial prefrontal ↓ L supramarginal gyrus ↓ R SMA/medial prefrontal ↓ R somato-motor
Findings notes	L anterior temporal correlation remained significant after accounting for lesion load and other factors
Voxelwise analysis 4	
First level contrast	Picture naming (produce the name, correct trials) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	PNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain gray matter
Correction for multiple comparisons	Clusterwise correction with with GRFT and lenient voxelwise p
Software	FSL 5.0.6
Voxelwise p	~.01 (z > 2.3)
Cluster extent	Based on GRFT
Statistical details	_
Findings	<ul> <li>↑ L posterior STG</li> <li>↑ R somato-motor</li> <li>↑ R posterior STS</li> <li>↑ R occipital</li> <li>↓ L IFG pars orbitalis</li> <li>↓ L dorsolateral prefrontal cortex</li> <li>↓ L angular gyrus</li> </ul>
Findings notes	L IFG pars orbitalis, R pSTS, and R somato-motor correlations remained remained significant after accounting for lesion load and other factors; note that the pars orbitalis region is described as frontal pole in the paper but the coordinates and image support pars orbitalis
Voxelwise analysis 5	
First level contrast	Picture naming (both phases, correct trials) vs picture naming (both phases, incorrect trials)
Analysis class	Cross-sectional performance-defined conditions
Group(s)	Aphasia with naming < 80% (n = 24)
Covariate	-

Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	No, by design
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain gray matter
Correction for multiple comparisons	<u>Clusterwise correction with with GRFT and lenient voxelwise p</u>
Software	FSL 5.0.6
Voxelwise p	~.01 (z > 2.3)
Cluster extent	Based on GRFT
Statistical details	-
Findings	None
Findings notes	_
ROI analysis 1	
First level contrast	Picture naming (produce the name, correct trials) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	PNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	11
What are the ROI(s)?	(1) right IPS; (2) left IPS; (3) left PTr; (4) left dPOp; (5) right superior motor cortex; (6) right ventral motor cortex; (7) right supramarginal sulcus; (8) left medial SMA; (9) right marginal sulcus; (10) left dorsal motor cortex; (11) right STS
How are the ROI(s) defined?	Regions that were activated for control > aphasia (ROIs 1-4) or aphasia > control (ROIs 5-11)
Correction for multiple comparisons	Familywise error (FWE)
Statistical details	_
Findings	↑ R ventral precentral/inferior frontal junction ↑ R posterior STS ↓ L IFG pars opercularis
Findings notes	The L IFG pars opercularis and the R posterior STS also contributed to predicting PNT scores even when lesion load on critical areas for picture naming, and several other variables, were included in multiple regression models
ROI analysis 2	
First level contrast	Picture naming (silently name, correct trials) vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported

Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	L anterior temporal
How are the ROI(s) defined?	Activity for covert naming correlated with naming ability in patients, after controlling for lesion and demographic factors
Correction for multiple comparisons	One only
Statistical details	-
Findings	None
Findings notes	-

First level contrast	Picture naming (produce the name, correct trials) vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	3
What are the ROI(s)?	(1) L frontal pole; (2) R postcentral gyrus; (3) R STS
How are the ROI(s) defined?	Activity for overt naming correlated with naming ability in patients, after controlling for lesion and demographic factors
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↑ R somato-motor ↑ R posterior STS
Findings notes	_
Complex analysis 1	
First level contrast	Picture naming (produce the name, correct trials) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia

Alialysis class	cross-sectional correlation with language of other measure
Group(s)	Aphasia
Covariate	Lesion patterns identified with SVR-LSM
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Complex
Statistical details	SVR-LSM was used to identify regions of damage associated with activation of R pSTS ROI (defined based on SPM analysis 2). <u>The results were thresholded at voxelwise p &lt; .01 (CDT),</u> <u>cluster extent &gt; 500 voxels.</u>
Findings	Other
Findings notes	Damage to the L IFG pars opercularis was associated with more activity in the R pSTS. Damage to the L pSTS was associated with less activity in the R pSTS.

# Complex analysis 2

First level contrast	Picture naming (produce the name, correct trials) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia without IFG POp damage (n = 26)
Covariate	Lesion patterns identified with SVR-LSM
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Complex
Statistical details	SVR-LSM was used to identify regions of damage associated with activation of L IFG pars opercularis ROI (defined based on SPM analysis 2). <u>The results were thresholded at voxelwise p &lt; .01 (CDT), cluster extent &gt; 500 voxels.</u>
Findings	Other
Findings notes	Damage to the L pSTG, L pSTS, and white matter underlying the L precuneus was associated with more activity in the L IFG pars opercularis. There were no regions associated with less activity.
Notes	
Excluded analyses	Negative correlation between functional activation in the L IFG pars opercularis and R pSTS

# Skipper-Kallal et al. (2017b)

# Reference

Authors	Skipper-Kallal LM, Lacey EH, Xing S, Turkeltaub PE
Title	Right hemisphere remapping of naming functions depends on lesion size and location in poststroke aphasia
Reference	<i>Neural Plast</i> 2017b; 2017: 8740353
PMID	28168061
DOI	10.1155/2017/8740353

# Participants

Language	US English
Inclusion criteria	10% accuracy on scanner task
Number of individuals with aphasia	39 (plus 10 excluded: < 10% accuracy in scanner)
Number of control participants	37
Were any of the participants included in any previous studies?	Yes (29 of the participants overlap with the other Skipper-Kallal et al. (2017) paper)
Is age reported for patients and controls, and matched?	Yes (mean 59.8 ± 10.0 years)
Is sex reported for patients and controls, and matched?	Yes (males: 26; females: 13)
Is handedness reported for patients and controls, and matched?	Yes (right: 33; left: 4; other: 2; missing for 2 participants)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 52.9 ± 51.4 months, range 6.3-255.7 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	WAB, PNT
Aphasia severity	Not stated

Aphasia type	23 anomic, 11 Broca's, 3	conduction, 1 tra	anscortical sensory, 1 Wer	nicke's
First stroke only?	Not stated			
Stroke type	Not stated			
To what extent is the lesion distribution characterized?	Lesion overlay			
Lesion extent	Not stated			
Lesion location	L MCA			
Participants notes	—			
Imaging				
Modality	fMRI			
Is the study cross-sectional or longitudinal?	Cross-sectional			
If longitudinal, at what time point(s) were imaging data acquired?	—			
If longitudinal, was there any intervention between the time points?	_			
Is the scanner described?	Yes (Siemens Trio 3 Tesl	a)		
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?			cquired not stated; separa because of the small amo	
Design type	Event-related			
Total images acquired	~450 but not stated			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	<u>No* (moderate limitatio</u>	<u>n)</u> (not stated but	t see Skipper-Kallal et al. (2	:017b))
Is intersubject normalization adequately described and appropriate?	Yes			
Imaging notes	at each voxel, individual	s with lesions to t	hat voxel were excluded f	rom analysis
Conditions				
Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming (prepare to name)	Word (covert)	32	Yes	Yes
picture naming (produce the name)	Word (overt)	32	Yes	Yes
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>
Conditions notes	Covert and overt naming were modeled as two phases of each trial (there was a cue to produce the name after 7500-9000 ms); 14 participants who were more impaired were given easier pictures to name; patients who named less than 10% of items correctly were excluded			
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: picture naming (prepare to name, correct trials) vs rest				
Language condition	Picture naming (prepare	to name, correct	t trials)	
Control condition	Rest			
Are the conditions matched for visual demands?	No			

Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	No
Control activation notes	Bilateral frontal and occipito-temporal, but not posterior temporal
Contrast notes	_

# Contrast 2: picture naming (produce the name, correct trials) vs rest

Language condition	
	Picture naming (produce the name, correct trials)
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	No
Control activation notes	Bilateral frontal and occipito-temporal, but not posterior temporal; speech motor activation not readily apparent
Contrast notes	_
Analyses	
Are the analyses clearly described?	Yes
Voxelwise analysis 1	
<b>Voxelwise analysis 1</b> First level contrast	Picture naming (prepare to name, correct trials) vs rest
	Picture naming (prepare to name, correct trials) vs rest Cross-sectional aphasia vs control
First level contrast	
First level contrast Analysis class	Cross-sectional aphasia vs control
First level contrast Analysis class Group(s)	Cross-sectional aphasia vs control
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the	Cross-sectional aphasia vs control Aphasia vs control —
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level	Cross-sectional aphasia vs control Aphasia vs control — Yes
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level	Cross-sectional aphasia vs control Aphasia vs control  Yes Yes, correct trials only
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast?	Cross-sectional aphasia vs control Aphasia vs control — Yes Yes, correct trials only Unknown, not reported
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes	Cross-sectional aphasia vs control Aphasia vs control — Yes Yes, correct trials only Unknown, not reported Covert phase but accuracy derived from overt phase
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis	Cross-sectional aphasia vs control Aphasia vs control — Yes Yes, correct trials only Unknown, not reported Covert phase but accuracy derived from overt phase Voxelwise
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis Search volume	Cross-sectional aphasia vs control Aphasia vs control  Yes Yes, correct trials only Unknown, not reported Covert phase but accuracy derived from overt phase Voxelwise Whole brain
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis Search volume Correction for multiple comparisons	Cross-sectional aphasia vs control         Aphasia vs control            Yes         Yes, correct trials only         Unknown, not reported         Covert phase but accuracy derived from overt phase         Voxelwise         Whole brain         Clusterwise correction with with GRFT and lenient voxelwise p

Statistical details	
Findings	<ul> <li>L cerebellum</li> <li>L thalamus</li> <li>L basal ganglia</li> <li>R IFG pars opercularis</li> <li>R insula</li> <li>R cerebellum</li> <li>R basal ganglia</li> <li>L dorsolateral prefrontal cortex</li> <li>L orbitofrontal</li> <li>L intraparietal sulcus</li> <li>L anterior cingulate</li> <li>R dorsolateral prefrontal cortex</li> </ul>
Findings notes	Based on Table 2
Voxelwise analysis 2	
First level contrast	Picture naming (produce the name, correct trials) vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	<u>Clusterwise correction with with GRFT and lenient voxelwise p</u>
Software	FSL 5.0.6
Voxelwise p	.01
Cluster extent	Based on GRFT
Statistical details	-
Findings	<ul> <li>L somato-motor</li> <li>L intraparietal sulcus</li> <li>L anterior cingulate</li> <li>R insula</li> <li>R dorsal precentral</li> <li>R somato-motor</li> <li>R supramarginal gyrus</li> <li>R posterior MTG</li> <li>R Heschl's gyrus</li> <li>L ventral precentral/inferior frontal junction</li> <li>L somato-motor</li> <li>L posterior STG/STS/MTG</li> <li>L mid temporal</li> <li>L cerebellum</li> <li>L thalamus</li> <li>L hippocampus/MTL</li> </ul>
Findings notes	Based on Table 3
Voxelwise analysis 3	
First level contrast	Picture naming (prepare to name, correct trials) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Lesion volume

Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Covert phase but accuracy derived from overt phase
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction with with GRFT and lenient voxelwise p
Software	FSL 5.0.6
Voxelwise p	.01
Cluster extent	Based on GRFT
Statistical details	_
Findings	<ul> <li>L ventral precentral/inferior frontal junction</li> <li>L intraparietal sulcus</li> <li>L superior parietal</li> <li>L occipital</li> <li>L basal ganglia</li> <li>R IFG</li> <li>R insula</li> <li>R ventral precentral/inferior frontal junction</li> <li>R SMA/medial prefrontal</li> <li>R somato-motor</li> <li>R intraparietal sulcus</li> <li>R occipital</li> <li>R cerebellum</li> <li>R brainstem</li> <li>R basal ganglia</li> </ul>
Findings notes	Based on Table 4, except for R frontal activations which are missing from the table, and were added based on the figure
Voxelwise analysis 4	
First level contrast	Picture naming (produce the name, correct trials) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	<u>Clusterwise correction with with GRFT and lenient voxelwise p</u>
Software	FSL 5.0.6
Voxelwise p	.01
Cluster extent	Based on GRFT
Statistical details	-
Findings	<ul> <li>↑ L somato-motor</li> <li>↑ L precuneus</li> <li>↑ L occipital</li> <li>↑ L cerebellum</li> <li>↑ R IFG pars triangularis</li> <li>↑ R insula</li> <li>↑ R ventral precentral/inferior frontal junction</li> </ul>

	<ul> <li>↑ R SMA/medial prefrontal</li> <li>↑ R posterior STG/STS/MTG</li> <li>↑ R mid temporal</li> <li>↑ R occipital</li> <li>↑ R cerebellum</li> <li>↑ R basal ganglia</li> <li>↑ R hippocampus/MTL</li> </ul>
Findings notes	Based on Table 4, except for bilateral occipital activations which are missing from the table, and were added based on the figure
Voxelwise analysis 5	
First level contrast	Picture naming (prepare to name, correct trials) vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with IPS damage (n not stated) vs without IPS damage (n not stated)
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Covert phase but accuracy derived from overt phase
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction with with GRFT and lenient voxelwise p
Software	FSL 5.0.6
Voxelwise p	.01
Cluster extent	Based on GRFT
Statistical details	Lesion volume covariate
Findings	None
Findings notes	_
Voxelwise analysis 6	
First level contrast	Picture naming (prepare to name, correct trials) vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with insula damage ( $n = 18$ ) vs without insula damage ( $n = 21$ )
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Covert phase but accuracy derived from overt phase
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	<u>Clusterwise correction with with GRFT and lenient voxelwise p</u>
Software	FSL 5.0.6
Voxelwise p	.01
Cluster extent	Based on GRFT
Statistical details	Lesion volume covariate
Findings	↓ R IFG pars triangularis ↓ R dorsolateral prefrontal cortex
Findings notes	_

First level contrast	Picture naming (prepare to name, correct trials) vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with IFG POp damage (n = 16) vs without IFG POp damage (n = 23)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Covert phase but accuracy derived from overt phase
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	<u>Clusterwise correction with with GRFT and lenient voxelwise p</u>
Software	FSL 5.0.6
Voxelwise p	.01
Cluster extent	Based on GRFT
Statistical details	Lesion volume covariate
Findings	↓ R IFG pars triangularis ↓ R dorsolateral prefrontal cortex
Findings notes	
Voxelwise analysis 8	
First level contrast	Picture naming (produce the name, correct trials) vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with motor cortex damage (n = 24) vs without motor cortex damage (n = 15)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	<u>Clusterwise correction with with GRFT and lenient voxelwise p</u>
Software	FSL 5.0.6
Voxelwise p	.01
Cluster extent	Based on GRFT
Statistical details	Lesion volume covariate
Findings	None
Findings notes	_
Voxelwise analysis 9	
First level contrast	Picture naming (produce the name, correct trials) vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with STS damage (n not stated) vs without STS damage (n not stated)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level	Unknown, not reported

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contrast?

Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction with with GRFT and lenient voxelwise p
Software	FSL 5.0.6
Voxelwise p	.01
Cluster extent	Based on GRFT
Statistical details	Lesion volume covariate
Findings	None
Findings notes	-

First level contrast	Picture naming (prepare to name, correct trials) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia with IFG POp damage (n = 16)
Covariate	PNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Covert phase but accuracy derived from overt phase
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	R DLPFC
How are the ROI(s) defined?	Peak location for decreased activation for patients with left insula and left POp lesions compared to patients without said damage
Correction for multiple comparisons	One only
Statistical details	Lesion volume covariate
Findings	None
Findings notes	-
ROI analysis 2	

-	
First level contrast	Picture naming (prepare to name, correct trials) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia without IFG POp damage (n = 23)
Covariate	PNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Covert phase but accuracy derived from overt phase
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	R DLPFC
How are the ROI(s) defined?	Peak location for decreased activation for patients with left insula and left POp lesions compared to patients without said damage
Correction for multiple comparisons	One only
Statistical details	Lesion volume covariate
Findings	None

### Findings notes

#### **ROI** analysis 3

ROI analysis 3	
First level contrast	Picture naming (prepare to name, correct trials) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia with insula damage (n = 18)
Covariate	PNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Covert phase but accuracy derived from overt phase
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	R DLPFC
How are the ROI(s) defined?	Peak location for decreased activation for patients with left insula and left POp lesions compared to patients without said damage
Correction for multiple comparisons	One only
Statistical details	Lesion volume covariate
Findings	None
Findings notes	-
ROI analysis 4	
First level contrast	Picture naming (prepare to name, correct trials) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia without insula damage (n = 21)
Covariate	PNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level	Vac. correct trials apply

Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Covert phase but accuracy derived from overt phase
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	R DLPFC
How are the ROI(s) defined?	Peak location for decreased activation for patients with left insula and left POp lesions compared to patients without said damage
Correction for multiple comparisons	One only
Statistical details	Lesion volume covariate
Findings	None
Findings notes	-

First level contrast	Picture naming (prepare to name, correct trials) vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with IPS damage (n not stated) vs without IPS damage (n not stated)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes

Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Covert phase but accuracy derived from overt phase
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	5
What are the ROI(s)?	(1) L IPS; (2) L insula; (3) L IFG pars opercularis; (4) R IPS; (5) R insula
How are the ROI(s) defined?	5 mm spheres around control peaks
Correction for multiple comparisons	No correction
Statistical details	Lesion volume covariate
Findings	None
Findings notes	-

First level contrast	Picture naming (prepare to name, correct trials) vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with insula damage (n = 18) vs without insula damage (n = 21)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Covert phase but accuracy derived from overt phase
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	5
What are the ROI(s)?	(1) L IPS; (2) L insula; (3) L IFG pars opercularis; (4) R IPS; (5) R insula
How are the ROI(s) defined?	5 mm spheres around control peaks
Correction for multiple comparisons	No correction
Statistical details	Lesion volume covariate
Findings	None
Findings notes	-

First level contrast	Picture naming (prepare to name, correct trials) vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with IFG POp damage (n = 16) vs without IFG POp damage (n = 23)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Covert phase but accuracy derived from overt phase
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	5
What are the ROI(s)?	(1) L IPS; (2) L insula; (3) L IFG pars opercularis; (4) R IPS; (5) R insula
How are the ROI(s) defined?	5 mm spheres around control peaks
Correction for multiple comparisons	No correction

Statistical details	Lesion volume covariate
Findings	None
Findings notes	-

First level contrast	Picture naming (produce the name, correct trials) vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with motor cortex damage (n = 24) vs without motor cortex damage (n = 15)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) L motor; (2) L pSTS; (3) R motor; (4) R pSTS
How are the ROI(s) defined?	5 mm spheres around control peaks
Correction for multiple comparisons	No correction
Statistical details	Lesion volume covariate
Findings	↑ R somato-motor
Findings notes	-

# ROI analysis 9

First level contrast	Picture naming (produce the name, correct trials) vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with STS damage (n not stated) vs without STS damage (n not stated)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) L motor; (2) L pSTS; (3) R motor; (4) R pSTS
How are the ROI(s) defined?	5 mm spheres around control peaks
Correction for multiple comparisons	No correction
Statistical details	Lesion volume covariate
Findings	↓ R somato-motor
Findings notes	-

First level contrast	Picture naming (produce the name, correct trials) vs rest
Analysis class d	Cross-sectional correlation with language or other measure
Group(s)	Aphasia without motor cortex damage (n = 15)
Covariate	PNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes

Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	R motor
How are the ROI(s) defined?	5 mm sphere around control peak
Correction for multiple comparisons	One only
Statistical details	Lesion volume covariate
Findings	None
Findings notes	-
ROI analysis 11	
First level contrast	Picture naming (produce the name, correct trials) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia with motor cortex damage (n = 24)
Covariate	PNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level	Unknown not reported

Covariate	PNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, correct trials only
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	R motor
How are the ROI(s) defined?	5 mm sphere around control peak
Correction for multiple comparisons	One only
Statistical details	Lesion volume covariate
Findings	↑ R somato-motor
Findings notes	-

#### Notes

Excluded analyses

# Dietz et al. (2018)

### Reference

Authors	Dietz A, Vannest J, Maloney T, Altaye M, Holland S, Szaflarski JP
Title	The feasibility of improving discourse in people with aphasia through AAC: clinical and functional MRI correlates
Reference	Aphasiology 2018; 32: 693-719
PMID	N/A
DOI	10.1080/02687038.2018.1447641
Participants	
Participants	

#### Participants

Language
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US English

Inclusion criteria	_
Number of individuals with aphasia	<u>12</u> (plus 2 excluded: 1 for illness; 1 for MRI contraindication or personal conflict (inconsistent information provided))
Number of control participants	0
Were any of the participants included in any previous studies?	Yes (same data as Dietz et al. (2016), which is a methodological paper)
Is age reported for patients and controls, and matched?	Yes (AAC group: range 39-63 years; usual care group: range 47-71 years)
Is sex reported for patients and controls, and matched?	Yes (males: 5; females: 7)
Is handedness reported for patients and controls, and matched?	Yes (right: 11; left: 1)
Is time post stroke onset reported and appropriate to the study design?	Yes (AAC group: range 16-170 months; usual care group: range 38-105 months)
To what extent is the nature of aphasia characterized?	Severity and type
Language evaluation	WAB, Reading Comprehension Battery for Aphasia
Aphasia severity	AAC group: AQ range 37.6-82.4; usual care group: AQ range 36.7-89.2
Aphasia type	AAC group: 2 Broca's, 1 anomic, 1 conduction, 1 global, 1 Wernicke's; usual care group: 2 anomic, 2 Broca's, 1 conduction, 1 Wernicke's
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	AAC group: range 7849-30570 voxels; usual care group: 1583-30110 voxels (voxel size not stated)
Lesion location	L MCA
Participants notes	-
Imaging	

#### fMRI Modality Is the study cross-sectional or longitudinal? Longitudinal—chronic treatment If longitudinal, at what time point(s) were imaging T1: pre-treatment/chronic; T2: post-treatment, ~4 weeks later data acquired? AAC group: treatment aimed at teaching participants how to utilize AAC to facilitate discourse; If longitudinal, was there any intervention between the time points? usual care group: traditional SLT, not focused on discourse or AAC specifically Yes (Philips Achieva 3 Tesla) Is the scanner described? Is the timing of stimulus presentation and image Yes acquisition clearly described and appropriate? Design type Event-related Total images acquired 135 Are the imaging acquisition parameters, including Yes (whole brain) coverage, adequately described and appropriate? Is preprocessing and intrasubject coregistration Yes adequately described and appropriate? Is first level model fitting adequately described and No (no description of HRF model, which is important given sparse sampling design) appropriate? Is intersubject normalization adequately described No (lesion impact not addressed) and appropriate? Imaging notes additional methodological details in Dietz et al. (2016) Conditions Are the conditions clearly described? Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
verb generation (covert)	Multiple words (covert)	15	<u>Unknown</u>	<u>Unknown</u>

verb generation (overt)	Multiple words (overt)	15	Yes	<u>Unknown</u>
noun repetition	Multiple words (overt)	15	Yes	<u>Unknown</u>
Conditions notes	Evidence for task perform	nance from Dietz	z et al. (2016)	
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: verb generation (overt) vs noun rep	petition			
Language condition	Verb generation (overt)			
Control condition	Noun repetition			
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	Yes			
Are the conditions matched for motor demands?	Yes			
Are the conditions matched for cognitive/executive	No			
demands?	_			
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>			
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>			
Behavioral data notes	-			
Are control data reported in this paper or another that is referenced?	Yes			
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Somewhat</u>			
Are activations lateralized in the control data?	Somewhat			
Control activation notes	Control data in Allendorfe activations, but also exter			ntal, temporal and parietal
Contrast notes	_			
Analyses				
Are the analyses clearly described?	No* (moderate limitation	) (see specific lin	nitation(s) below)	
ROI analysis 1				
First level contrast	Verb generation (overt) vert	s noun repetition	า	
Analysis class	Cross-sectional between	two groups with	aphasia	
Group(s)	Aphasia with AAC treatme	ent (n = 6) T2 vs	usual care T2 (n = 6)	
Covariate	—			
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>Somewhat</u> (marginal trea	tment effect)		
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>			
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>			
Behavioral data notes	_			
Type of analysis	Region of interest (ROI)			
ROI type	Laterality indi(ces)			
How many ROIs are there?	1			
What are the ROI(s)?	Frontal LI			
How are the ROI(s) defined?				
Correction for multiple comparisons	One only			
Statistical details	Temporal LI calculated bu	<u>ut not reported</u>		
Findings	None			
Findings notes	_			

First level contrast	Verb generation (overt) vs noun repetition
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia (both groups) T2 vs T1
Covariate	Δ WAB AQ
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (gain in AQ not tested for significance)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Region of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	1
What are the ROI(s)?	Frontal LI
How are the ROI(s) defined?	
Correction for multiple comparisons	One only
Statistical details	Temporal LI calculated but not reported
Findings	↑ LI (frontal)
Findings notes	-
Notes	

Excluded analyses	(1) pre-treatment comparison between treated and untreated groups; (2) several other
	analyses based on LI in different ROIs, because there were no inferential statistics

# Hallam et al. (2018)

### Reference

Authors	Hallam GP, Thompson HE, Hymers M, Millman RE, Rodd JM, Lambon Ralph MA, Smallwood J, Jefferies E
Title	Task-based and resting-state fMRI reveal compensatory network changes following damage to left inferior frontal gyrus
Reference	Cortex 2018; 99: 150-165
PMID	29223933
DOI	10.1016/j.cortex.2017.10.004

### Participants

Language	UK English
Inclusion criteria	Semantic aphasia; left frontal damage (+ other regions, typically)
Number of individuals with aphasia	<u>14</u>
Number of control participants	16
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 61 ± 11 years, range 38-80 years)
ls sex reported for patients and controls, and matched?	Yes (males: 5; females: 9)
Is handedness reported for patients and controls, and matched?	No
Is time post stroke onset reported and appropriate to the study design?	Yes (range 11-264 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery

Language evaluation	Cambridge semantic battery, three additional semantic tasks, connected speech words per minute, repetition from PALPA
Aphasia severity	Not stated
Aphasia type	6 anomic, 2 Broca's, 2 global, 2 transcortical sensory, 1 mixed transcortical, 1 not stated
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L IFG plus other MCA regions; vATL and pMTG spared
Participants notes	_

### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	-
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (GE Signa HDx 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Event-related
Total images acquired	348
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	interleaved silent steady state imaging
Conditions	

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
listening to high ambiguity sentences	None	24	N/A	N/A
listening to low ambiguity sentences	None	24	N/A	N/A
listening to spectrally rotated speech	None	24	N/A	N/A
pressing a button to a visual cue	Button press	9	Unknown	Unknown
rest	None	12	N/A	N/A
Conditions notes	All but one patient has sentence compreher	0 0	comprehension, which w	as argued to support

### Contrasts

Are the contrasts clearly described?

Yes

Yes

# Contrast 1: listening to high or low ambiguity sentences vs listening to spectrally rotated speech

Language condition	Listening to high or low ambiguity sentences
Control condition	Listening to spectrally rotated speech
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes

Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, no behavioral measure
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Unknown</u>
Are activations lateralized in the control data?	Unknown
Control activation notes	Hard to evaluate contrast because a "semantic mask" is used but is not described in detail
Contrast notes	_

# Contrast 2: listening to high ambiguity sentences vs listening to low ambiguity sentences

Language condition	Listening to high ambiguity sentences
Control condition	Listening to low ambiguity sentences
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, no behavioral measure
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	-
Analyses	
Are the analyses clearly described?	Yes
ROI analysis 1	
First level contrast	Listening to high or low ambiguity sentences vs listening to spectrally rotated speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	2
What are the ROI(s)?	(1) L vATL; (2) L pMTG

Analysis class	Cross-sectional aphasia vs control
First level contrast	Listening to high ambiguity sentences vs listening to low ambiguity sentences
Complex analysis 2	
Findings notes	There was a functional activation by group interaction in the L aSTG. For controls, there was a positive association between L pMTG activity and functional connectivity to aSTG, while for the patients, there was a negative association.
Findings	Other
Statistical details	A whole brain analysis was carried out to identify regions where the groups differed in the extent to which the strength of functional connectivity at rest from L pMTG was associated with the difference in signal between the high ambiguity and low ambiguity conditions in the same ROI. <u>Thresholding is not described and cluster extent is not reported.</u>
Type of analysis	Complex
Behavioral data notes	
contrast?	N/A, no timeable task
Is accuracy matched across the second level contrast? Is reaction time matched across the second level	N/A, no behavioral measure
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Covariate	 Voc
Group(s)	Aphasia (subset with resting state data, n = 10) vs control (subset with resting state data, n = 10)
Analysis class	Cross-sectional aphasia vs control
First level contrast	Listening to high ambiguity sentences vs listening to low ambiguity sentences
Complex analysis 1	
Findings notes	_
Findings	None
Statistical details	No interaction of group by condition
Correction for multiple comparisons	No correction
How are the ROI(s) defined?	Functional coordinates in literature
What are the ROI(s)?	(1) L vATL; (2) L pMTG
How many ROIs are there?	2
ROI type	Functional
Type of analysis	Regions of interest (ROI)
Behavioral data notes	
Is reaction time matched across the second level contrast?	N/A, no timeable task
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	— Yes
Group(s) Covariate	Aphasia vs control
Analysis class	Cross-sectional aphasia vs control
First level contrast	Listening to high ambiguity sentences vs listening to low ambiguity sentences
ROI analysis 2	
Findings notes	_
Findings	↑ L posterior MTG ↑ L anterior temporal
Statistical details	ANOVA revealed main effect of group (patient vs control), confirmed in follow-up tests for each ROI
Correction for multiple comparisons	No correction

Group(s)	Aphasia (subset with resting state data, n = 10) vs control (subset with resting state data, n = 10)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
ls accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Complex
Statistical details	A whole brain analysis was carried out to identify regions where the groups differed in the extent to which the strength of functional connectivity at rest from L pMTG was associated with the difference in signal between the high ambiguity and low ambiguity conditions in the same ROI. <u>Thresholding is not described.</u>
Findings	None
Findings notes	No interaction is reported; both groups showed a correlation between L vATL activity and functional connectivity to a ventral IFG region
Notes	
Excluded analyses	Analyses involving resting state data, except for those that also involved task-based data

# Nenert et al. (2018)

### Reference

Authors	Nenert R, Allendorfer JB, Martin AM, Banks C, Vannest J, Holland SK, Hart KW, Lindsell CJ, Szaflarski JP
Title	Longitudinal fMRI study of language recovery after a left hemispheric ischemic stroke
Reference	Restor Neurol Neurosci 2018; 36: 359-385
PMID	29782329
DOI	10.3233/rnn-170767

# Participants

Language	US English
Inclusion criteria	Aphasia at acute screening (not necessarily at first study time point)
Number of individuals with aphasia	17 (plus 1 excluded: significant signal artifacts)
Number of control participants	85
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 46 ± 16 years)
Is sex reported for patients and controls, and matched?	Yes (males: 9; females: 8)
Is handedness reported for patients and controls, and matched?	<u>No</u> (right: 17; left: 0; all patients stated to be right handed, but "ambidextrous patients" mentioned on p. 364)
Is time post stroke onset reported and appropriate to the study design?	Yes (T1: ~2 weeks; T2: ~6 weeks; T3: ~12 weeks; T4: ~26 weeks; T5: ~52 weeks)
To what extent is the nature of aphasia characterized?	Not at all
Language evaluation	PPVT, BNT, phonemic fluency, semantic fluency, complex ideation subtest of BDAE
Aphasia severity	Not stated for study timepoints, but on admission, aphasia severity was assessed with the TT: 2 no aphasia per cutoff but clinical impression of aphasia, 5 mild, 6 moderate, 4 severe
Aphasia type	Not stated
First stroke only?	No

Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	L MCA; mostly posterior per Supplementary Figure 2
Participants notes	Presence and severity of aphasia assessed on hospital admission, not at first study time point, so it is not clear that all participants actually had aphasia at first study time point
Imaging	
Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—recovery
If longitudinal, at what time point(s) were imaging data acquired?	T1: ~2 weeks; T2: ~6 weeks; T3: ~12 weeks; T4: ~26 weeks; T5: ~52 weeks
If longitudinal, was there any intervention between the time points?	Not stated
Is the scanner described?	No (Philips 3 Tesla or Siemens 3 Tesla; models not stated)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Block
Total images acquired	600
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	No (lesion impact not addressed)
Imaging notes	scanner identity appropriately included as covariate
Conditions	

### Conditions

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
semantic decision	Button press	5	No	No
tone decision	Button press	5	Yes	Unknown
verb generation	Multiple words (covert)	5	Unknown	Unknown
finger tapping	Other	5	Unknown	Unknown

Assume semantic decision is out of 25, so chance is 12.5 and 95% CI below chance at T2; postscan recognition test for verb generation not considered to quantify task performance

Yes

Yes

# Contrasts

Conditions notes

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Are the contrasts clearly described?
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### Contrast 1: semantic decision vs tone decision

Language condition	Semantic decision
Control condition	Tone decision
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Appear mismatched</u>
Is reaction time matched between the language	Unknown, not reported

and control tasks for all relevant groups?	
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Yes
Control activation notes	L lateral and medial frontal and AG, strongly lateralized
Contrast notes	_

# Contrast 2: verb generation vs finger tapping

Language condition	Verb generation
Control condition	Finger tapping
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Yes
Control activation notes	L lateral and medial frontal and mid temporal, strongly lateralized
Contrast notes	_

# Analyses

Are the analyses clearly described?	<u>No** (major limitation)</u> (see specific limitation(s) below)
Voxelwise analysis 1	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T1 vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	-
Statistical details	-
Findings	↑ L Heschl's gyrus
Findings notes	-

voxelwise analysis 2	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T2 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	
Statistical details	_
Findings	None
Findings notes	
Through the states	
Voxelwise analysis 3	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T3 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	_
Statistical details	_
Findings	None
Findings notes	_
Voxelwise analysis 4	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T4 vs control
Covariate	
Is the second level contrast valid in terms of the	 Voc
group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>

Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	-
Statistical details	-
Findings	None
Findings notes	-

First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T5 vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	_
Statistical details	_
Findings	None
Findings notes	_

First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T1 vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	-
Statistical details	-
Findings	None
Findings notes	-

VOXEIWISE allarysis 7	
First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T2 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	_
Statistical details	_
Findings	None
Findings notes	_
Voxelwise analysis 8	
First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T3 vs control
Covariate	
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	_
Statistical details	_
Findings	None
Findings notes	_
Voxelwise analysis 9	
First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T4 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level	Unknown, not reported
contrast?	

Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	-
Statistical details	-
Findings	None
Findings notes	-

First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T5 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	-
Statistical details	-
Findings	None
Findings notes	-

First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Semantic decision accuracy
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	-
Statistical details	-
Findings	↑ L anterior temporal
Findings notes	Unclear why this type of analysis was run only for semantic task, and only at T1

Voxelwise analysis 12	
First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T4 vs aphasia T1
Covariate	ΔBNT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	_
Statistical details	_
Findings	None
Findings notes	_
Voxelwise analysis 13	
First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T4 vs aphasia T1
Covariate	$\Delta$ semantic fluency
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	_
Statistical details	_
Findings	None
Findings notes	_
Voxelwise analysis 14	
First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T4 vs aphasia T1
Covariate	

Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T4 vs aphasia T1
Covariate	ΔPPVT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>

Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	-
Statistical details	-
Findings	None
Findings notes	-

First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T4 vs aphasia T1
Covariate	Δ phonemic fluency
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	-
Statistical details	-
Findings	None
Findings notes	-

First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T4 vs aphasia T1
Covariate	$\Delta$ BDAE complex ideation subtest
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	-
Statistical details	-
Findings	None
Findings notes	-

Voxelwise analysis 17	
First level contrast	Verb generation vs finger tapping
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T4 vs aphasia T1
Covariate	ΔΒΝΤ
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	_
Statistical details	-
Findings	None
Findings notes	_
Voxelwise analysis 18	
First level contrast	Verb generation vs finger tapping
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T4 vs aphasia T1
Covariate	$\Delta$ semantic fluency
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	_
Statistical details	_
Findings	↑ L dorsolateral prefrontal cortex ↑ L SMA/medial prefrontal ↑ R somato-motor ↑ R anterior temporal
Findings notes	-
Voxelwise analysis 19	
First level contrast	Verb generation vs finger tapping
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T4 vs aphasia T1

Covariate

Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level

<u>Unknown, not reported</u>

 $\Delta PPVT$ 

Yes

contrast?	
Is reaction time matched across the second level	Unknown, not reported
contrast?	
Behavioral data notes	— 
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	-
Statistical details	-
Findings	None
Findings notes	-
Voxelwise analysis 20	
First level contrast	Verb generation vs finger tapping
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T4 vs aphasia T1
Covariate	Δ phonemic fluency
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	-
Statistical details	-
Findings	↑ L cerebellum
Findings notes	-
Voxelwise analysis 21	
First level contrast	Verb generation vs finger tapping
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T4 vs aphasia T1
Covariate	Δ BDAE complex ideation subtest
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Voxelwise correction based on permutation testing
Software	SPM12/SnPM13
Voxelwise p	FWE p < .05
Cluster extent	_
Statistical details	_

First level contrastSemantic decision vs tone decisionAnalysis classLongitudinal change in aphasiaGroup(s)Aphasia (comparisons between all pairs of time points)Covariate-Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Appear similarIs reaction time matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?-Type of analysisRegions of interest (ROI)ROI typeLaterality indices)How many ROIs are there?4What are the ROI(s?)(1) frontal Ll; (2) temporo-parietal Ll; (3) language network Ll; (4) cerebellar LIHow are the ROI(s) defined?-Correction for multiple comparisonsNocerrectionStatistical details-Findings notes-		
Procession         Semantic decision vs tone decision           Analysis Class         Conjuctional change in aphasia           Courgito         Aphasia (comparisons between all pairs of time points)           Courgito         Semantic decision vs tone decision           Courgito         Aphasia (comparisons between all pairs of time points)           Courgito         Semantic decision set time points)           Courgito         Semantic decision set time points)           Semantic decision set time points)         Semantic decision set time points)           Semantic decision set time points)         Semantic decision set time points)           Semantic decision set time points)         Semantic decision set time points)           Semantic decision set time points)         Semantic decision set time points)           Semantic decision set time points         Semantic decision set time points)           Semantic decision set time points         Semantic decision set time points)           Semantic decision set time points         Semantic decision set time points           Semantic decision set time points         Semantic decision set time points)           Semantic decision set time points         Semantic decision set time points           Semantic decision set time points         Semantic decision set time points           Semantic decision set time points         Semantic decision set time p	Findings	None
First level contrast     Semantic decision vs tone decision       Analysis class     Ongitudinal change in aphasia       Group(s)     Aphasia (comparisons between all pairs of time points)       Covariate	Findings notes	_
Analysis classLongitudinal change in aphasiaGroupis—Covariate—Is the scontal level contrast valid in terms of the group(s) time point(s) and measures involvesAppear similarStreatcontal matched across the second level contrast?Appear similarContrast?—Behavioral data notes the second level contrast?—Behavioral data notes—Contrast?—Behavioral data notes—Contrast?—Contrast?—Contrast?—Printley Contrast?—Printley Contrast?—	ROI analysis 1	
Group(s)Aphasia (comparisons between all pairs of time points)Covariate-Covariate-Site sectoral level contrast valid in terms of the group(s), time point(s), and measures involved?Appear similarIs carcurary matched across the second level contrast?Appear similarIs reaction time matched across the second level contrast?Unknown, not reported contrast?Behavioral data notes-Penderoval data notes-Type of analysisRegions of interest (RO)ROI typeLaterality indi(ces)How many ROIs are there?4How are the RO(s)?(1) frontal Li (2) temporo-parietal Li (3) language network Li (4) cerebellar LIHow are the RO(s) defined?-Correction for multiple comparisonsNe correctionStatistical details-Findings notes-Findings notes-Findings notes-Corrata-Corrata-Corrata-Corrata-Statistical details-Findings notes-If indings notes-Statistical details-Corrata-Corrata-Corrata-Corrata-Corrata-Statistical details-Corrata-Corrata-Corrata-Corrata-Statistical detains mesures involved?-Statistical detains escond level- <tr< td=""><td>First level contrast</td><td>Semantic decision vs tone decision</td></tr<>	First level contrast	Semantic decision vs tone decision
Covints-Scheepon level contrast valid numesures involvedYesIs account level contrast valid numesures involvedAper similarIs account level contrast he second levelAper similarIs account level contrast he second levelInknow, not reportedBehaviorat data notes-Type of analysisRegions of interest (ROI)ROI yopAccount of the second level contrast he second level	Analysis class	Longitudinal change in aphasia
is the second level contrast valid in terms of the grout(s), time point(s), and measures involved?         Yes           S accural matched across the second level contrast?         Appear similar           contrast?         Juknown, not reported           Behavioral data notes         -           Behavioral data notes         -           Dype of analysis         Regions of intrest (ROI)           ROI type         Laterality indi(ces)           How may ROIs are there?         4           What are the ROI(s)?         (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI           How are the ROI(s)?         Orrection for multiple comparisons           Statistical details         -           Correction for multiple comparisons         None           Findings         None           Findings notes         Longitudinal change in aphasia           Group(s)         Aphasia (comparisons between all pairs of time points)           Covariate         -           Statustical detains and measures involved?         Yes           Stacurary matched across the second level         Inknown,	Group(s)	Aphasia (comparisons between all pairs of time points)
group(s), time point(s), and measures involved?Is accuragy matched across the second level contrast?Speer similarIs reaction time matched across the second level contrast?Inknown, not reportedBehavioral data notes–Type of analysisRegions of interest (ROI)ROI typeLaterality indi(ces)How many ROIs are there?4What are the ROI(s)(I) frontal Ll' (2) temporo-parietal Ll' (3) language network Ll' (4) cerebellar LlHow are the ROI(s) defined?NoorectionCorrection for multiple comparisonsNoorectionStatistical details–FindingsNoorectionFindingsVerspeerstownRoley accurationAnaloguage network Ll' (4) cerebellar LlAnalysis dass–Statistical details–Protection for multiple comparisonsNoorectionStatistical details–Statistical details–Analysis dassLongitudinal change in aphasiaGroup(s)Aphasia (comparisons between all pairs of time points)Covariact–Statistical duration time softheSecond level contrast valid in terms of themStatistical data notes–Statistical data notes–Proteorial data notes–Statistical data notes– <t< td=""><td>Covariate</td><td>_</td></t<>	Covariate	_
contrast <sup>2</sup> Unknown, not reported           Is reaction time matched across the second level         Unknown, not reported           Behavioral data notes         –           Behavioral data notes         –           Type of analysis         Regions of interest (ROI)           ROI type         Letarality indi(ces)           How many ROIs are there?         4           What are the ROI(s)?         Ion fontal Lit (2) temporo-parietal Lit (3) language network Lit (4) cerebellar LI           How are the ROI(s)?         Ion fontal Lit (2) temporo-parietal Lit (3) language network Lit (4) cerebellar LI           How are the ROI(s)?         –           Correction for multiple comparisons         No correctional           Findings         No correctional           Findings notes         –           Personal Contrast         –           Roupsis dass         Gongutudinal change in aphasia           Group(s)         Aphasia (comparisons between all pairs of time points)           Covariat         –           Socouraty matched across the second level         Ninkown, not reported           Contrast V         Yes           Socouraty matched across the second level         Ninkown, not reported           Contrast V         Socouraty           Socouraty matched across the se		Yes
contrast?	-	<u>Appear similar</u>
Type of analysis         Regions of interest (ROI)           ROI type         Laterality indi(ces)           How many ROIs are there?         4           What are the ROI(s)?         (1) frontal Lit (2) temporo-parietal Lit (3) language network Lit (4) cerebellar LI           How are the ROI(s) defined?         -           Correction for multiple comparisons         No correction           Statistical details         -           Findings         None           Findings notes         - <b>ROI analysis 2</b> -           First level contrast         Verb generation vs finger tapping           Analysis class         Longitudinal change in aphasia           Group(s)         Aphasia (comparisons between all pairs of time points)           Covariate         -           Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?         Verb generation time pointed           Is accuracy matched across the second level         Uhknown, not reported           contrast?         -           Behavioral data notes         -           ROI type         Laterality indi(Ces)           How many ROIs are there?         4           How mary ROIs det here?         4           How mary ROIs are there?         10 frontal Lit (2) te		<u>Unknown, not reported</u>
R0 typeLaterality indi(ces)How any R0 is are there?4What are the R0 (s)?(f) fontal L( 2) temporo-parietal L( 3) language network L( 4) cerebellar LHow are the R0 (s)?No correction for multiple comparisonsStatical details–Forder dor multiple comparisonsNo correction for multiple comparisonsFindingsNo enFindings notes–Correction for multiple comparisons–First lev contrastVergeneration single tappingAnalysis classLongitudinal change in aphasiaGroup(s)Aphasic (comparisons between all pairs of time points)Covariae–Staccural public built in terms of the sourcy static built in terms of the sourcy static built in terms of the sourcy static built in terms of the 	Behavioral data notes	-
How many ROIs are there?     4       What are the ROI(s)?     (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI       How are the ROI(s)?     No correction       Correction for multiple comparisons     No correction       Statistical details     -       Findings     None       Rollings notes     -       RO analysis C     Verb generation vs finger tapping       Analysis class     Longitudinal change in aphasia       Group(s)     Aphasia (comparisons between all pairs of time points)       Covariate     -       second level contrast valid in terms of the group(s), time point(s), and measures involved;     Yes       Statistical data notes     -       Statistical data notes     -       Type of analysis     Regions of interest (ROI)       RO type     Langitudin(cs)       Rol type     Langitudin(cs)       Rol type     Langitudics)       Statistical details     -       Statistical details     -       Statistical valid in terms of the point(s), and measures involved;     Yes       Statistical data notes     -       Statistical data notes     -       Statistical data notes     -       Rol type     Langitudic(s)       Rol type     Langitudic(s)       Rol type     Langitud	Type of analysis	Regions of interest (ROI)
What are kn ROI(s)?(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LIHow are the ROI(s) defined?Correction for multiple comparisonsMocorrectionStatistical details–FindingsNoneFindings notes–ROTablyis DCorrection for multiple comparisonsFirst level contrastVerb generation vs finger tappingAnalysis classLongitudinal change in aphasiaGroup(s)Aphasia (comparisons between all pairs of time points)Covariae–Is the second level contrast valid in terms of the group(s), time point(s), and measures involve(erb)Verb generation vs finger tappingIs the second level contrast valid in terms of the group(s), time point(s), and measures involve(erb)Verb generation vs finger tappingIs the second level contrast valid in terms of the group(s), and measures involve(erb)Verb generation vs finger tappingIs the second level contrast valid in terms of the 	ROI type	Laterality indi(ces)
How are the ROI(s) defined?No correctionCorrection for multiple comparisonsNo correctionStatistical details–IndingsNoneFindings notes–ROI analysis 2Statistical detailsFirst level contrastVerb generation vs finger tappingAnalysis ClassLongitudinal change in aphasiaGroup(s)Aphasia (comparisons between all pairs of time points)Covariae–Is the second level contrast valid in terms of theVerb generation vs finger tappingIs accuracy matched across the second levelUnknown, not reportedIs reaction time matched across the second levelUnknown, not reportedcontrast?–Behavioral data notes–Type of analysisRegions of interest (ROI)Rol tappe there?4How are the RO(s)?(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LIHow are the RO(s)?No correctionCorrection for multiple comparisonsNo correctionStatistical details–Correction for multiple comparisonsNo correctionStatistical details–Correction for multiple comparisonsNo correctionStatistical details–FindingsNo correctionStatistical details–Correction for multiple comparisonsNo correctionStatistical details–FindingsNone	How many ROIs are there?	4
Correction for multiple comparisonsNo correctionStatistical details–Findings notes–Roll analysis CarVerb generation vs finger tappingAnalysis dassLong tudinal change in aphasiaGroup(s)Aphasia (comparisons between all pairs of time points)Statistical details–Is the second level contrast valid in terms of the group(s), time point(s), and measures involve?YesIs reaction time matched across the second level–Is reaction time matched across the second level–Strated tata notes–Strated tata notes–Type of analysisEusenst (ROI)Rolty are there?4Mata ret Rol(s)?(1) forntal Li (2) temporo-parietal Li (3) language network Li (4) cerebellar LIHow are the Rol(s) defined?–Correction for multiple comparisonsNoneStatistical details–Correction for multiple comparisonsNoneStatistical details–FindingsNoneStatistical to the second levelNoneStatistical to the second level?NoneStatistical to the second level?–Statistical to the second level?NoneStatistical to the second level?None <t< td=""><td>What are the ROI(s)?</td><td>(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI</td></t<>	What are the ROI(s)?	(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI
Statistical details-FindingsNoneFindings notes-ROI analysis 2-Statistical detailsVerb generation vs finger tappingAnalysis classLongitudinal change in aphasiaGroup(s)Aphasia (comparisons between all pairs of time points)Covariate-Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs cacuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedType of analysis-Rol tappeLaterality indi(ces) Generation (s)How many ROIs are there?4How are the RO(Is)?(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LIHow are the RO(Is)?NocrectionStatistical details-FindingsNone	How are the ROI(s) defined?	
FindingsNoneFindings notes– <b>RO analysis 2</b> - <b>RO analysis 2</b> Verb generation vs finger tappingAnalysis classLongitudinal change in aphasiaGroup(s)Aphasia (comparisons between all pairs of time points)Covariate–Is the second level contrast valid in terms of the group(s), time point(s), and measures involveed?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Minsown, not reportedBehavioral data notes–Type of analysisRegions of interest (ROI)RO typeLaterality indi(ces)How many ROIs are there?4What are the RO(s)?(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LIHow are the RO(s) defined?SocrrettonCorrection for multiple comparisonsNoneFindingsNone	Correction for multiple comparisons	No correction
Findings notes       –         ROI analysis 2       First level contrast       Verb generation vs finger tapping         Analysis class       Longitudinal change in aphasia       Congruptions between all pairs of time points)         Group(s)       Aphasia (comparisons between all pairs of time points)       Pointage (Comparisons between all pairs of time points)         Covariate       –       –         Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?       Yes         Is cacuracy matched across the second level contrast?       Unknown, not reported         Is reaction time matched across the second level contrast?       Unknown, not reported         Is reaction time matched across the second level contrast?       Vers on terported         Secouracy matched across the second level contrast valid in terms of the group company	Statistical details	-
RD analysis S2First level contrastVerb generation vs finger tappingAnalysis classLongitudinal change in aphasiaGroup(s)Aphasia (comparisons between all pairs of time points)Covariat–Store Score Method Score MethodYesIs descore Alevel contrast valid in terms of the group(s), time point(s), and measures involved?VerbIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedSteadout at notes–Type of analysisRegions of interest (ROI)Rolt ypeLetrality indicesHow many RDIs are there?4What en ter ROI(s)Hoi (2) (2) temporto-parietal LI; (2) language network I; (4) cerebelleral LIHow are the ROI(s)NocrrettoinGorrettoin for multipe comparisonsMcorrettoinStatistical details–FordingMcorrettoinStatistical details–FindingsNore	Findings	None
First level         Verb generation vs finger tapping           Analysis class         Longitudinal change in aphasia           Group(s)         Aphasia (comparisons between all pairs of time points)           Covariate         -           Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?         Yes           Is cacuracy matched across the second level         Unknown, not reported           Contrast?         Junknown, not reported           Is reaction time matched across the second level         Unknown, not reported           Contrast?         Regions of interest (ROI)           Rol topp         Regions of interest (ROI)           Rol topp         Laterality indi(ces)           How many ROIs are there?         4           Vhat are the ROI(s)         Mocorrection           How are the ROI(s) defined?         Secoretion           Correction for multiple comparisons         Mocorrection           Statistical details         -           Findings         None	Findings notes	-
Analysis classLongitudinal change in aphasiaGroup(s)Aphasia (comparisons between all pairs of time points)CovariateIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes-Type of analysisRegions of interest (ROI)ROI typeLaterality indi(ces)How many ROIs are there?4What are the ROI(s)?(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LIHow are the ROI(s) defined?-Correction for multiple comparisonsNo correctionStatistical details-FindingsNone	ROI analysis 2	
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Covariate-Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes-Type of analysisRegions of interest (ROI)ROI typeLaterality indi(ces)How many ROIs are there?4What are the ROI(s)?(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LIHow are the ROI(s) defined?NocorrectionCorrection for multiple comparisonsNo correctionStatistical details-FindingsNone	Analysis class	Longitudinal change in aphasia
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notesType of analysisRegions of interest (ROI)ROI typeLaterality indices)How many ROIs are there?4What are the ROI(s)?(1) frontal Ll; (2) temporo-parietal Ll; (3) language network Ll; (4) cerebellar LIHow are the ROI(s) defined?NoeCorrection for multiple comparisonsNoe	Group(s)	Aphasia (comparisons between all pairs of time points)
group(s), time point(s), and measures involved?Is accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes-Type of analysisRegions of interest (ROI)ROI typeLaterality indices)How many ROIs are there?4What are the ROI(s)?(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LIHow are the ROI(s) defined?No correctionStatistical details-FindingsNone	Covariate	_
contrast?Is reaction time matched across the second level contrast?Unknown, not reported Second Second Se		Yes
contrast?Behavioral data notes—Type of analysisRegions of interest (ROI)ROI typeLaterality indi(ces)How many ROIs are there?4What are the ROI(s)?(1) frontal Ll; (2) temporo-parietal Ll; (3) language network Ll; (4) cerebellar LIHow are the ROI(s) defined?-Correction for multiple comparisonsNo correctionStatistical details—FindingsNone		<u>Unknown, not reported</u>
Type of analysisRegions of interest (ROI)ROI typeLaterality indi(ces)How many ROIs are there?4What are the ROI(s)?(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LIHow are the ROI(s) defined?Vocrection for multiple comparisonsStatistical details–FindingsNone		<u>Unknown, not reported</u>
ROI typeLaterality indi(ces)How many ROIs are there?4What are the ROI(s)?(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LIHow are the ROI(s) defined?No correction for multiple comparisonsCorrection for multiple comparisonsNo correctionStatistical details–FindingsNone	Behavioral data notes	-
How many ROIs are there?4What are the ROI(s)?(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LIHow are the ROI(s) defined?Correction for multiple comparisonsNo correctionStatistical details–FindingsNone	51 5	
What are the ROI(s)?     (1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI       How are the ROI(s) defined?	ROI type	Laterality indi(ces)
How are the ROI(s) defined?     No correction       Correction for multiple comparisons     No correction       Statistical details     -       Findings     None		
Correction for multiple comparisons     No correction       Statistical details     -       Findings     None	What are the ROI(s)?	(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI
Statistical details     —       Findings     None		
Findings None	Correction for multiple comparisons	No correction
-	Statistical details	-
Findings notes —	-	None
	Findings notes	_

First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T1 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level	Appear mismatched

contrast?	
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	4
What are the ROI(s)?	(1) frontal Ll; (2) temporo-parietal Ll; (3) language network Ll; (4) cerebellar Ll
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	_
POL analyzia 4	

First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T2 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	4
What are the ROI(s)?	(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	_

First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T3 vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	4
What are the ROI(s)?	(1) frontal Ll; (2) temporo-parietal Ll; (3) language network Ll; (4) cerebellar Ll
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-

Findings	None
Findings notes	-
ROI analysis 6	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T4 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	4
What are the ROI(s)?	(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-
ROI analysis 7	
First level contrast	Semantic decision vs tone decision
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T5 vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	Patients less accurate than controls on both tasks, but more so on the tone decision task
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	4
What are the ROI(s)?	(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-
ROI analysis 8	
First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T1 vs control
Covariata	

Covariate Is the second level contrast valid in terms of the Yes group(s), time point(s), and measures involved? Is accuracy matched across the second level

<u>Unknown, not reported</u>

\_

contrast?	
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	4
What are the ROI(s)?	(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-
ROI analysis 9	
First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T2 vs control
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	4
What are the ROI(s)?	(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	—
Findings	↓ LI (language network) ↓ LI (frontal)
Findings notes	-
ROI analysis 10	
First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T3 vs control
Covariate	_
Is the second level contrast valid in terms of the	Yes

# Yes

group(s), time point(s), and measures involved? Is accuracy matched across the second level

Is reaction time matched across the second level

contrast?

#### Unknown, not reported

### Unknown, not reported

contrast?	<u>onknown, notreported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	4
What are the ROI(s)?	(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction

Statistical details	_	
Findings	↓ LI (language network) ↓ LI (frontal)	

Findings notes

# ROI analysis 11

First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T4 vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	4
What are the ROI(s)?	(1) frontal LI; (2) temporo-parietal LI; (3) language network LI; (4) cerebellar LI
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-

First level contrast	Verb generation vs finger tapping
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia T5 vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	4
What are the ROI(s)?	(1) frontal Ll; (2) temporo-parietal Ll; (3) language network Ll; (4) cerebellar Ll
How are the ROI(s) defined?	
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	_
Complex analysis 1	
First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal change in aphasia

FIISLIEVELCUTILIASL	Semantic decision vs tone decision
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia (comparisons between all pairs of time points)
Covariate	_
Is the second level contrast valid in terms of the	Yes

group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Appear similar</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Complex
Statistical details	PPI analyses were carried out to investigate potential changes over time in how connectivity from L and R IFG was modulated by the semantic decision task. The resultant SPM was thresholded at FWE p < .05 using permutation testing implemented in SnPM 13.
Findings	None
Findings notes	_
Complex analysis 2	
First level contrast	Verb generation vs finger tapping
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia (comparisons between all pairs of time points)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Complex
Statistical details	PPI analyses were carried out to investigate potential changes over time in how connectivity from L and R IFG was modulated by the verb generation task. The resultant SPM was thresholded at FWE p < .05 using permutation testing implemented in SnPM 13.
Findings	None
Findings notes	_
Notes	
Excluded analyses	Longitudinal analyses in people with aphasia, because of <u>contradictory and unclear reporting</u> <u>of findings</u>

# Pillay et al. (2018)

### Reference

Authors	Pillay SB, Gross WL, Graves WW, Humphries C, Book DS, Binder JR
Title	The neural basis of successful word reading in aphasia
Reference	J Cogn Neurosci 2018; 30: 514-525
PMID	29211656
DOI	10.1162/jocn_a_01214

## Participants

Language	US English
Inclusion criteria	Residual phonologic retrieval deficit; intact semantic processing
Number of individuals with aphasia	<u>21</u>
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and	Yes (mean 56.4 ± 12.5 years, range 30-80 years)

matched?	
Is sex reported for patients and controls, and matched?	Yes (males: 11; females: 10)
Is handedness reported for patients and controls, and matched?	Yes (right: 21; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 1134 ± 1491 days, range 180-6732 days)
To what extent is the nature of aphasia characterized?	Not at all
Language evaluation	Pseudoword rhyme matching, semantic picture matching (similar to PPT-P), picture naming
Aphasia severity	Not stated
Aphasia type	Not stated
First stroke only?	Not stated
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Mean 73.4 ± 58.6 cc, range 6.7-227.0 cc
Lesion location	17 L MCA, 2 combined L MCA/ACA, combined 2 L MCA/PCA
Participants notes	-

## Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Cross-sectional
If longitudinal, at what time point(s) were imaging data acquired?	-
If longitudinal, was there any intervention between the time points?	_
Is the scanner described?	Yes (GE Excite 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	No (precise timing of stimuli not stated; total images acquired not stated)
Design type	Event-related
Total images acquired	not stated
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-

#### Conditions

	Are the conditions c	learly described?
--	----------------------	-------------------

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
reading nouns aloud	Word (overt)	72	Yes	No
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>
Conditions notes	Some participants had <	10% accuracy, bu	it this is appropriately add	lressed in the analysis
Contrasts				
Are the contrasts clearly described?	Yes			

#### Contrast 1: reading nouns aloud (correct trials) vs reading nouns aloud (incorrect trials)

Yes

Language condition	Reading nouns aloud (correct trials)
Control condition	Reading nouns aloud (incorrect trials)
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	No, by design
Is reaction time matched between the language and control tasks for all relevant groups?	Yes, matched
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	N/A
Does the contrast selectively activate plausible relevant language regions in the control group?	N/A
Are activations lateralized in the control data?	N/A
Control activation notes	Control data N/A because controls do not typically make errors
Contrast notes	_
Analyses	
Are the analyses clearly described?	Yes
Voxelwise analysis 1	
First level contrast	Reading nouns aloud (correct trials) vs reading nouns aloud (incorrect trials)
Analysis class	Cross-sectional performance-defined conditions
Group(s)	Aphasia
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	No, by design
Is reaction time matched across the second level contrast?	Yes, matched
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on 3dClustSim
Software	AFNI
Voxelwise p	.01
Cluster extent	1.609 cc
Statistical details	Regarding correction for multiple comparisons, addition of monoexponential function reduces but does not eliminate inflation of p values (Cox et al., 2017)
Findings	<ul> <li>↑ L angular gyrus</li> <li>↓ L ventral precentral/inferior frontal junction</li> <li>↓ L SMA/medial prefrontal</li> <li>↓ R insula</li> <li>↓ R ventral precentral/inferior frontal junction</li> <li>↓ R SMA/medial prefrontal</li> </ul>
Findings notes	Positive region (L AG) was part of the semantic network, while many negative regions were positively modulated by reaction time in the aphasia group
Notes	
Excluded analyses	(1) ancillary analysis in which similar findings were obtained when phonological impairment was included as a covariate; (2) ancillary analysis in which similar findings were obtained when lesioned patients were excluded at each voxel; (3) analysis of modulation by reaction time (while informative, this analysis does not meet our inclusion criteria)

(while informative, this analysis does not meet our inclusion criteria)

# Szaflarski et al. (2018)

### Reference

Authors	Szaflarski JP, Griffis J, Vannest J, Allendorfer JB, Nenert R, Amara AW, Sung V, Walker HC, Martin AN, Mark VW, Zhou X
Title	A feasibility study of combined intermittent theta burst stimulation and modified constraint- induced aphasia therapy in chronic post-stroke aphasia
Reference	Restor Neurol Neurosci 2018; 36: 503-518
PMID	29889086
DOI	10.3233/rnn-180812

## Participants

Language	US English
Inclusion criteria	-
Number of individuals with aphasia	<u>12</u> (plus 1 excluded: scanned at only 2 out of 3 time points)
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (range 26-66 years)
Is sex reported for patients and controls, and matched?	Yes (males: 9; females: 3)
Is handedness reported for patients and controls, and matched?	Yes (right: 11; left: 1)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 1-12 years)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	WAB, BNT, semantic fluency, phonemic fluency
Aphasia severity	AQ range 10.4-94.6
Aphasia type	8 anomic, 2 Broca's, 1 conduction, 1 global
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Not stated
Lesion location	L MCA
Participants notes	-

## Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic (1-2 weeks prior to treatment); T2: post-treatment (within 1 week after end of 2-week treatment); T3: 13-20 weeks after end of treatment
If longitudinal, was there any intervention between the time points?	Modified CIAT + intermittent theta burst stimulation to residual left hemispheric language activation, 45 minutes/session, 5 days/week, 2 weeks
Is the scanner described?	Yes (Siemens Allegra 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Block
Total images acquired	330
Are the imaging acquisition parameters, including	Yes (whole brain)

coverage, adequately described and appropriate?	
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	_

#### Conditions

Are the conditions clearly described?

Are the conditions clearly described?	Yes			
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
semantic decision	Button press	5	<u>Unknown</u>	<u>Unknown</u>
tone decision	Button press	6	<u>Unknown</u>	<u>Unknown</u>
Conditions notes	_			
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: semantic decision vs tone decision				
Language condition	Semantic decision			
Control condition	Tone decision			
Are the conditions matched for visual demands?	Yes			
Are the conditions matched for auditory demands?	Yes			
Are the conditions matched for motor demands?	Yes			
Are the conditions matched for cognitive/executive demands?	Yes			
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>			
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>			
Behavioral data notes	_			
Are control data reported in this paper or another that is referenced?	Yes			
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes			
Are activations lateralized in the control data?	Yes			
Control activation notes	L frontal and temporal, p	lus other seman	tic regions	
Contrast notes	_			
Analyses				
Are the analyses clearly described?	Yes			
Voxelwise analysis 1				

First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>

Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on cluster_threshold_beta
Software	SPM12
Voxelwise p	.05
Cluster extent	0.928 cc
Statistical details	-
	<ul> <li>L supramarginal gyrus</li> <li>L intraparietal sulcus</li> <li>L precuneus</li> <li>L posterior STG</li> <li>L Heschl's gyrus</li> <li>L mid temporal</li> <li>L anterior temporal</li> <li>R supramarginal gyrus</li> <li>R superior parietal</li> <li>R precuneus</li> <li>R mid temporal</li> <li>R anterior cingulate</li> <li>L IFG pars opercularis</li> <li>L dorsolateral prefrontal cortex</li> <li>L ventral precentral/inferior frontal junction</li> <li>L SMA/medial prefrontal</li> <li>L somato-motor</li> <li>L superior parietal</li> <li>L superior parietal</li> </ul>
Findings notes	

## Voxelwise analysis 2

First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T3 vs T2
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on cluster_threshold_beta
Software	SPM12
Voxelwise p	.05
Cluster extent	0.928 cc
Statistical details	-
Findings	<ul> <li>↑ L dorsolateral prefrontal cortex</li> <li>↑ L angular gyrus</li> <li>↑ L precuneus</li> <li>↑ L posterior STS</li> <li>↓ L SMA/medial prefrontal</li> <li>↓ L anterior temporal</li> <li>↓ L anterior cingulate</li> <li>↓ R IFG</li> <li>↓ R dorsolateral prefrontal cortex</li> </ul>

	<ul> <li>↓ R ventral precentral/inferior frontal junction</li> <li>↓ R SMA/medial prefrontal</li> <li>↓ R somato-motor</li> <li>↓ R precuneus</li> <li>↓ R posterior STG/STS/MTG</li> <li>↓ R anterior temporal</li> </ul>
Findings notes	-
Voxelwise analysis 3	
First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T3 vs T1
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on cluster_threshold_beta
Software	SPM12
Voxelwise p	.05
Cluster extent	0.928 сс
Statistical details	_
Findings	<ul> <li>↑ L supramarginal gyrus</li> <li>↑ L angular gyrus</li> <li>↑ L precuneus</li> <li>↑ L posterior STG</li> <li>↑ L mid temporal</li> <li>↑ L anterior temporal</li> <li>↑ L posterior cingulate</li> <li>↓ L somato-motor</li> <li>↓ R dorsolateral prefrontal cortex</li> </ul>
Findings notes	-
Voxelwise analysis 4	
First level contrast	Semantic decision vs tone decision
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T3 vs aphasia T2
Covariate	Δ WAB AQ
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	Whole brain
Correction for multiple comparisons	Clusterwise correction based on cluster_threshold_beta
Software	SPM12
Voxelwise p	.05
Cluster extent	0.928 сс
Statistical details	Inclusive mask of voxels that differed between T2 and T3

FindingsI inferior parietal lobuleFindings notes-Voxelwise analysis 5First level contrastSemantic decision vs tone decisionAnalysis classLongitudinal correlation with language or other measureGroup(s)Aphasia T3 vs aphasia T1CovariateA BNTIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes
First level contrast       Semantic decision vs tone decision         Analysis class       Longitudinal correlation with language or other measure         Group(s)       Aphasia T3 vs aphasia T1         Covariate       Δ BNT         Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?       Yes         Is accuracy matched across the second level contrast valid in terms of the group(s), time point(s), and measures involved?       Unknown, not reported         Is reaction time matched across the second level contrast?       Unknown, not reported         Behavioral data notes       —
First level contrastSemantic decision vs tone decisionAnalysis classLongitudinal correlation with language or other measureGroup(s)Aphasia T3 vs aphasia T1CovariateΔ BNTIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second levelUnknown, not reportedBehavioral data notes—
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Group(s)Aphasia T3 vs aphasia T1CovariateΔ BNTIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes-
Covariate $\Delta$ BNTIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes—
group(s), time point(s), and measures involved?       Unknown, not reported         Is accuracy matched across the second level contrast?       Unknown, not reported         Is reaction time matched across the second level contrast?       Unknown, not reported         Behavioral data notes       —
contrast?     Is reaction time matched across the second level     Unknown, not reported       contrast?     Behavioral data notes     —
contrast? Behavioral data notes —
Type of analysis Voxelwise
Search volume Whole brain
Correction for multiple comparisons Clusterwise correction based on cluster_threshold_beta
Software SPM12
Voxelwise p .05
Cluster extent 0.928 cc
Statistical details Inclusive mask of voxels that differed between T1 and T3
Findings J R IFG
Findings notes —
Notes

Excluded analyses

# van de Sandt-Koenderman et al. (2018)

#### Reference

Authors	van de Sandt-Koenderman, MWME; Orellana, CPM; van der Meulen, I; Smits, M; Ribbers, GM
Title	Language lateralisation after Melodic Intonation Therapy: an fMRI study in subacute and chronic aphasia
Reference	Aphasiology 2018; 32: 765-783
PMID	N/A
DOI	10.1080/02687038.2016.1240353
Participants	
Language	Dutch
Inclusion criteria	Severe non-fluent aphasia (< 50 words/minute); articulation deficits; repetition severely affected; moderate-good auditory comprehension
Number of individuals with aphasia	<u>9</u>
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (subacute: mean 51.2 years, range 25-61 years; chronic: mean 54.0 years, range 21-66 years)
Is sex reported for patients and controls, and matched?	Yes (males: 5; females: 4)
Is handedness reported for patients and controls, and matched?	Yes (right: 8; left: 0; other: 1)
Is time post stroke onset reported and appropriate	Yes (subacute: range 0.5-3 months; chronic: range 17-40 months)

to the study design?	
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	AAT, ANELT
Aphasia severity	T1: subacute: ASRS median 1, range 0-2; ANELT range 10-29; chronic: ASRS median 1.5, range 1-2; ANELT range 20-29; T2: subacute: ASRS range 1-3; ANELT range 10-43; chronic: ASRS range 1-2; ANELT range 22-31
Aphasia type	T1: all severe non-fluent; T2: not stated
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Extent and location
Lesion extent	Subacute: range 32.4-141.2 cc (no lesion extent was reported for one subacute participant because there was no tissue loss yet); chronic: range 27.4-87.9 cc
Lesion location	8 L MCA, 1 L SMA and R insular-temporoparietal
Participants notes	-
Imaging	
Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—mixed
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre treatment/subacute or chronic; T2: post-treatment, ~6 weeks later
If longitudinal, was there any intervention between the time points?	MIT, 5+ hours/week
Is the scanner described?	<u>No</u> (GE 3 Tesla; model not stated)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Block
Total images acquired	132
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	No (lesion impact not addressed)
Imaging notes	_
Conditions	
Are the conditions clearly described?	Yes
Condition	Response type Repetitions All groups could do? All individuals could do?
listening to narrative speech	None 6 <u>N/A</u> <u>N/A</u>
listening to reversed speech	None 6 <u>N/A</u> <u>N/A</u>

Conditions notes

#### Contrasts

Are the contrasts clearly described?

Yes

\_

# Contrast 1: listening to narrative speech vs listening to reversed speech

Language condition	Listening to narrative speech
Control condition	Listening to reversed speech
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes

Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	Yes
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, no behavioral measure</u>
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, no timeable task
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	-
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
ROI analysis 1	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	1
What are the ROI(s)?	Language network LI
How are the ROI(s) defined?	Activations that were "not clearly related to known language areas" were excluded, but <u>the</u> basis for this determination is not clear
Correction for multiple comparisons	One only
Statistical details	_
Findings	None
Findings notes	-
ROI analysis 2	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Laterality indi(ces)

How many ROIs are there?	1
What are the ROI(s)?	Language network LI
How are the ROI(s) defined?	Activations that were "not clearly related to known language areas" were excluded, but <u>the</u> <u>basis for this determination is not clear</u>
Correction for multiple comparisons	One only
Statistical details	-
Findings	None
Findings notes	_
ROI analysis 3	
First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	Δ AAT repetition score
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	N/A, no behavioral measure
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	1
What are the ROI(s)?	Language network LI
How are the ROI(s) defined?	Activations that were "not clearly related to known language areas" were excluded, but <u>the</u> <u>basis for this determination is not clear</u>
Correction for multiple comparisons	One only
Statistical details	-
Findings	None
Findings notes	-
ROI analysis 4	
First level contrast	Listening to narrative speech vs listening to reversed speech

First level contrast	Listening to narrative speech vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	Δ ANELT
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Laterality indi(ces)
How many ROIs are there?	1
What are the ROI(s)?	Language network LI
How are the ROI(s) defined?	Activations that were "not clearly related to known language areas" were excluded, but <u>the</u> <u>basis for this determination is not clear</u>
Correction for multiple comparisons	One only
Statistical details	-
Findings	None
Findings notes	-

#### Notes

# van Oers et al. (2018)

#### Reference

Authors	van Oers CAMM, van der Worp HB, Kappelle LJ, Raemaekers MAH, Otte WM, Dijkhuizen RM
Title	Etiology of language network changes during recovery of aphasia after stroke
Reference	<i>Sci Rep</i> 2018; 8: 856
PMID	29339771
DOI	10.1038/s41598-018-19302-4

## Participants

Language	Dutch
Inclusion criteria	MRS $\leq$ 3; ability to perform tasks
Number of individuals with aphasia	<u>12</u>
Number of control participants	8
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 67.9 ± 11.4 years, range 46-86 years)
ls sex reported for patients and controls, and matched?	Yes (males: 10; females: 2)
Is handedness reported for patients and controls, and matched?	Yes (right: 12; left: 0)
Is time post stroke onset reported and appropriate to the study design?	<u>No* (moderate limitation)</u> (T1: within 2 weeks; T2: ~3 months; T3: ~6 months; T4: ~12 months; specific timing of first time point not stated)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	AAT, BNT
Aphasia severity	T1: 8 moderate, 2 severe, 2 not stated; T2: 4 moderate, 3 recovered, 2 not stated, 1 mild, 1 severe
Aphasia type	T1: 6 Broca's, 3 anomic, 2 Wernicke's, 1 global; T2: 4 anomic, 3 recovered, 2 Broca's, 1 unclassified, 1 Wernicke's
First stroke only?	Yes
Stroke type	Ischemic only
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Range 9-208 cc
Lesion location	L MCA
Participants notes	_

#### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—recovery
If longitudinal, at what time point(s) were imaging data acquired?	T1: within 2 weeks; T2: ~3 months; T3: ~6 months; T4: ~12 months; specific timing of first time point not stated
If longitudinal, was there any intervention between the time points?	Not stated
Is the scanner described?	Yes (Philips Achieva 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No* (moderate limitation)</u> (stimulus presentation was self-paced, but the ITI is not reported, nor are the number of trials presented per condition; it is likely that the language and control blocks contained different numbers of trials)
Design type	Block

Total images acquired	1656
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	not all participants scanned at each time point; the number scanned at each time point is not stated

#### Conditions

Are the conditions clearly described?

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
written word-picture matching	Button press	6	<u>Unknown</u>	<u>Unknown</u>
semantic decision	Button press	6	<u>Unknown</u>	<u>Unknown</u>
visual decision	Button press	12	<u>Unknown</u>	<u>Unknown</u>
rest	None	12	N/A	<u>N/A</u>
Conditions notes	_			

Yes

Yes

#### Contrasts

Are the contrasts clearly described?

## Contrast 1: written word-picture matching vs visual decision

Language condition	Written word-picture matching
Control condition	Visual decision
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	<u>Somewhat</u>
Control activation notes	Primarily bilateral visual activations; frontal activation is L-lateralized
Contrast notes	-

#### Contrast 2: semantic decision vs visual decision

Language condition	Semantic decision
Control condition	Visual decision
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and	Unknown, not reported

arr action time matched between the language and carred table and leave any group?         Lakewan. not reported           Are control data notes         -           Are control data reported in this paper or another table is referenced by table reported in the curred stars?         Yes           Does the control data report in the curred stars?         Yes           Control data report in the curred stars?         Yes           Control data report in the curred stars?         Yes           Are the analysis Charly described?         Net fundation is interacted in the curred stars?           Are the analysis Charly described?         Net fundation (See specific limitation) (See specine) (See specine) (See specific limitation) (See specific limita	control tasks for all relevant groups?	
and control tasks for all relevant groups?     —       Are control data reported in this paper or another tasks referenced?     Somewhat       Does the contrast selectively activate plausible relevant language regions in the control group?     Somewhat       Are another contrast selectively activate plausible relevant language regions in the control group?     Yee       Are anothers control group?     Yee       Control not notes     —       Control notes     —       Are analyses clearly describer?     Yee       Are the many set clearly describer?     Notes word-picture matching vs visual decision       Contrast notes     —       Contrast notes     Cross-sectional correlation with language or other measure foruph?       Analysis dass     Cross-sectional correlation with language measure (average of AAT measures)       Contrast notes     Subsequent outcome (T4) overall language measure (average of AAT measures)       Contrast notes     —       Contrast notes     =       Contrast notes     =       Contrast notes     =       C	0	Unknown, not reported
sphe control duta reported in this paper or another that is referenced?         Somewhat           Description of the control group?         Yes           Control activation notes         L fromal, L posterior IG, L superior parietal           Control activation notes         -           Are activatoria barling and exclusion         No* (moderate limitation) (see specific limitation(s) below)           Control activation notes         No* (moderate limitation) (see specific limitation(s) below)           Control activation notes         No* (moderate limitation) (see specific limitation(s) below)           Control activation notes         No* (moderate limitation) (see specific limitation(s) below)           Rol analysis 1         Vitten word-picture matching vs vsual decision           For long/sig         Aphasia (subset who returned for follow-up) T1 (n = 10)           Courista         Subsequent outcome (f4) overall language measure (average of AT measures)           Reported across the second level         Unknown, not reported           Control analysis         Seconderate limitations (f1) betterin limitations (f2) Langular groups (f1) Reported groups)           Reported at notes         -           Reported at notes         -           Second level contrast         Unknown, not reported           Control at notes         -           Reported at notes         -		
that is reterement?         Image: control group: a program is the control group program is th	Behavioral data notes	-
relevant language regions in the control group? Are activations threaled in the control data? Ke the analyses clearly described? Not funderate limitation) (see specific limitation(s) below) Ke the analyses clearly described? Ke the analyses clearly described? Not funderate limitation (see specific limitation(s) below) Ke the analyses clearly described? Ke the analyses clearly described across the second level Cortrared? Ke the anoles of the corts the second level Cortrared? Ke the anoles of the corts the second level Cortrared? Ke the anoles of the anoles of the corts the second level Cortrared? Ke the anoles of the cort of of t		Somewhat
Contrast notes         L frontal, L posterior ITG, L superior parietal           Contrast notes         -           Analyses         -           Analyses         Not_(moderate limitation) (see specific limitation(s) below)           Ker the analyses clearly describes?         Not_(moderate limitation) (see specific limitation(s) below)           Roll analysis 1         -           First leed contrast         Written word-picture matching vs visual decision           Analysis class         Cross sectional correlation with language or other measure           Grouph)         Aphasia (subset who returned for follow-up) T1 (n = 10)           Covinata         Subsequent outcome (T4) overall language measure (average of AAT measures)           Ves         Subsequent outcome (T4) overall language measure (average of AAT measures)           Is actrucary matched across the second level         Unknown, not reported           Contrast         Unknown, not reported           Contrast of the matched across the second level         Unknown, not reported           Contrast of the matched across the second level         Unknown, not reported           Contrast of the matched across the second level         Unknown, not reported           Contrast of the matched across the second level         Unknown, not reported           Contrast of the matched across the second level         Unknown, not reported </td <td></td> <td><u>Somewhat</u></td>		<u>Somewhat</u>
Contrast notes     –       Analyses     Net the analyses clearly described?     Net "(moderate limitation) (see specific limitation(s) below)       ROI analysis 1     First level contrast     Written word-picture matching vs visual decision       Analysis class     Cross-sectional correlation with language or other measure       Group(s)     Aphasia (subset who returned for follow up) T1 (n = 10)       Courtast     Subsequent outcome (T4) overall language measure (average of AAT measures)       Is second level contrast valid in terms of the group(s) the point(s) and measures involved?     Yes       States acond level contrast valid in terms of the group(s) the point(s) and measure (average of AAT measures)     Yes       Is accuracy matched across the second level     Unknown, not reported       Contrast?     Punctional       Behavioral data notes     –       Type of analysis     Regions of interest (ROI)       Kolt ype     Functional       How are the ROI(s)?     Control activations and their homotopic counterparts in the R hemisphere; activation measured activated at p = 0.001, uncorrected       Correction for multiple comparisons     Ealer acount of valid activations and their homotopic counterparts in the R hemisphere; activation measured activated at p = 0.001, uncorrected       Correction for multiple comparisons     Fade also covery rate (FBB)       Statistical deteins     –       Findings     1 L posterior inferior temporal gyrus/fuiform gyrus<	Are activations lateralized in the control data?	Yes
Analyses       No* (moderate limitation) (see specific limitations) below)         Are the analyses clearly described?       No* (moderate limitation) (see specific limitations) below)         Roleards       Cross sectional correlation with language or other measure         Analysis class       Cross sectional correlation with language or other measure         Corouts(s)       Aphasis (elsubse liwo returned for follow-up) (to = 10)         Covariate       Subsequent outcome (T4) overall language measure (average of AAT measures)         Is the scrond level contrast valid in terms of the yes       Unknown, not reported         st cacuracy matched across the second level       Unknown, not reported         ocrotatad       Punctional         Behavioral data notes       -         Type of analysis       Regions of interest (ROI)         ROI type       Functional         How are the ROI(s) defined?       10 bilateral dorsal anterior cingulate; (2) Langular gyrus; (3) LIPG pars opercularis and triangularis; (12) R MFG         Is vascute for the multiple comparisons       Eale discovery rate (FDR)         Statistical defaile       -         Findings       1 Lossterior inferior temporal gyrus/fusfform gyrus         Findings       1 Lossterior inferior temporal gyrus/fusfform gyrus         Findings       1 Lossterior inferior temporal gyrus/fusfform gyrus         Findings	Control activation notes	L frontal, L posterior ITG, L superior parietal
Are the analyses clearly described?         Not (moderate limitation) (see specific limitation))           ROI analysis 1           First level contrast         Writen word-picture matching vs visual decision           Analysis class         Cross-sectional correlation with language or other measure           Group(s)         Aphasis (eluste whord-picture matching vs visual decision           Covariate         Subsequent outcome (T4) overall language measure (average of AAT measures)           Is the second level contrast valid in terms of the yres         Yes           group(s), time point(s), and measures involved?         Unknown, not reported           Is accuracy matched across the second level         Unknown, not reported           contrast?         Regions of interest (ROI)           Roll type         Functional           How many ROIs are there?         12           What are the ROI(s)?         Control alteral dorsal anterior cingulate; (2) Langular gyrus; (3) LIFG pars opercularis and triangularis; (12) R MFG           How are the ROI(s) defined?         Control activations and their homotopic counterparts in the R hemisphere; activation measured accoust the measured accoust the measured accoust for voxels accourt of voxels activated at p < 0.001, uncorrected	Contrast notes	_
ROI analysis 1         First level contrast       Written word-picture matching vs visual decision         Analysis class       Cross-sectional correlation with language or other measure         Group(s)       Aphasia (clusse who returned for followup) 11 (n = 10)         Covariate       Subsequent outcome (T4) overall language measure (average of AAT measures)         Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?       Ver         Is accuracy matched across the second level contrast?       Unknown, not reported         Is reaction time matched across the second level contrast?       Unknown, not reported         Behavioral data notes       -         Type of analysis       Regions of interest (R0I)         ROI type       Functional         How are the ROI(s)?       This lateral dorsal anterior cingulate; (2) Langular gyrus; (3) LIFG pars opercularis and triangularis; (4) L thalamus; (1) LMFG (6) L posterior TG; (11) RIFG pars opercularis and triangularis; (12) R MFG         Now are the ROI(s) defined?       Cortrol activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected	Analyses	
First level contrast     Written word-picture matching vs visual decision       Analysis class     Cross-sectional correlation with language or other measure       Group(s)     Aphasia (subset who returned for follow-up) T1 (n = 10)       Covariate     Subsequent outcome (T4) overall language measure (average of AAT measures)       Is the second level contrast valid in terms of the group(s), time points), and measures involved?     Ves       Is reaction time matched across the second level contrast?     Unknown, not reported       Contrast?     Pandot across the second level contrast?     Unknown, not reported       Contrast?     Pandot across the second level contrast?     Unknown, not reported       Contrast?     Pandot across the second level contrast?     Unknown, not reported       Contrast?     Pandot across the second level contrast?     Unknown, not reported       Contrast?     Pandot across the second level contrast?     Unknown, not reported       Contrast?     Pandot across the second level contrast?     Pandot across the second level contrast?       Ves     Pandot across the second level contrast     Pandot across the second level contrast?       Ves     Pandot across the second level contrast?     Pandot across the second level contrast?       Ves     Pandot across the second level contrast?     Pandot across the second level contrast?       Ves     Pandot across the second level contrast?     Pandot acrosthe second level contra	Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
Analysis classCross-sectional correlation with language or other measureGroup(s)Aphasia (subset who returned for follow-up) 11 (n = 10)CovariateSubsequent outcome (T4) overall language measure (average of AAT measures)Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedBehavioral data notes-Type of analysisRegions of interest (ROI)ROI typeFunctionalHow many ROIs are there?12What are the ROI(s)?(1) bilateral dorsal anterior cingulate; (2) Langular gyrus; (3) LIFG pars opercularis and triangularis; (1) R thalmus; (5) LMFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (1) R thalmus; (10) R posterior ITG; (17) R angular gyrus; (8) R IFG pars triangularis; (10) R bilateral dorsal anterior cingulate; 2 - 0.001, uncorrectedHow are the ROI(s) defined?Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected	ROI analysis 1	
Group(s)         Aphasia (subset who returned for follow-up) T1 (n = 10)           Covariate         Subsequent outcome (T4) overall language measure (average of AAT measures)           is the second level contrast valid in terms of the group(s), time point(s), and measures involved?         Unknown, not reported           is accuracy matched across the second level contrast?         Unknown, not reported           is reaction time matched across the second level contrast?         Unknown, not reported           Behavioral data notes            Type of analysis         Regions of interest (ROI)           How many ROIs are there?         12           What are the ROI(s)?         (1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalaus; (5) L MFG (6) L posterior ITG; (7) R angular gyrus; (8) R FG pars triangularis; (4) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) TA may and their homotopic counterparts in the R hemisphere; activation measured as count of vaxels activated at p < 0.001, uncorrected		
Covariate         Subsequent outcome (T4) overall language measure (average of AAT measures)           Is the second level contrast valid in terms of the group(s), time point(s), and measures involved contrast?         Unknown, not reported           Is reaction time matched across the second level contrast?         Unknown, not reported           Behavioral data notes         —           Type of analysis         Regions of interest (ROI)           ROI type         Functional           How many ROIs are there?         12           What are the ROI(s)?         (1) bilateral dorsal anterior cingulate; (2) Langular gyrus; (3) LIFG pars opercularis and triangularis; (0) R thalamus; (10) R posterior ITG; (11) R IEG pars opercularis and triangularis; (0) R thalamus; (10) R posterior ITG; (11) R IEG pars opercularis and triangularis; (0) R thalamus; (10) R posterior ITG; (11) R IEG pars opercularis and triangularis; (2) R MEG           Correction for multiple comparisons         False discovery rate (FDR)           Statistical details         —           Findings         1 L posterior ITG; (11) R IEG pars opercularis and triangularis triangularis (2) R Homore terporal gyrus/fusiform gyrus           Findings         Cross-sectional correlation with language or other measure discovery rate (FDR)           Findings         Cross-sectional correlation with language or other measure discovery and chea across the second level group(s) time model           Findings         Cross-sectional correlation with language or other measure discoverast watc	Analysis class	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?     Yes       Is accuracy matched across the second level contrast?     Unknown, not reported       Is reaction time matched across the second level contrast?     Unknown, not reported       Behavioral data notes     -       Type of analysis     Regions of interest (ROI)       ROI type     Functional       How many ROIs are there?     12       What are the ROI(s)?     (1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (4) L thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (4) L MHEG       How are the ROI(s)?     Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected	Group(s)	
group(s), time point(s), and measures involved?         Unknown, not reported           Is accuracy matched across the second level contrast?         Unknown, not reported           Is reaction time matched across the second level contrast?         Unknown, not reported           Behavioral data notes         —           Type of analysis         Regions of interest (ROI)           ROI type         Functional           How many ROIs are there?         12           What are the ROI(s)?         (1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (12) R MFG (5) Destrior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (12) R MFG (5)           How are the ROI(s) defined?         Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected		Subsequent outcome (T4) overall language measure (average of AAT measures)
contrast?Is reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes-Type of analysisRegions of interest (ROI)How many ROIs are there?12What are the ROI(s)?(1) bilateral dorsal anterior cingulate; (2) Langular gyrus; (3) LIFG pars opercularis and triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFGHow are the ROI(s) defined?Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected		Yes
contrast?meanBehavioral data notes—Type of analysisRegions of interest (ROI)ROI typeFunctionalHow many ROIs are there?12What are the ROI(s)?(1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (9) R thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFGHow are the ROI(s) defined?Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected	-	Unknown, not reported
Type of analysisRegions of interest (ROI)ROI typeFunctionalHow many ROIs are there?12What are the ROI(s)?(1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFGHow are the ROI(s) defined?Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected		<u>Unknown, not reported</u>
ROI type         Functional           How many ROIs are there?         12           What are the ROI(s)?         (1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFG           How are the ROI(s) defined?         Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected	Behavioral data notes	_
How many ROIs are there?12What are the ROI(s)?(1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (12) R MFGHow are the ROI(s) defined?Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected	Type of analysis	Regions of interest (ROI)
What are the ROI(s)?(1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFGHow are the ROI(s) defined?Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected	ROI type	Functional
triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFGHow are the ROI(s) defined?Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected	How many ROIs are there?	12
Image: Contraction for multiple comparisonsFalse discovery rate (FDR)Statistical details—Findings↑ L posterior inferior temporal gyrus/fusiform gyrusFindings notesActivation predicted later outcome even when initial language performance was included in the modelROI analysis 2First level contrastWritten word-picture matching vs visual decisionAnalysis classCross-sectional correlation with language or other measureGroup(s)Aphasia (all time points)CovariateOverall language measure (average of AAT measures) all time pointsIs accuracy matched across the second level contrast?Unknown, not reportedIs raction time matched across the second level contrast?Unknown, not reportedBehavioral data notes—Type of analysisRegions of interest (ROI)	What are the ROI(s)?	triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis;
Statistical details-Findings↑ L posterior inferior temporal gyrus/fusiform gyrusFindings notesActivation predicted later outcome even when initial language performance was included in the modelROI analysis 2First level contrastWritten word-picture matching vs visual decisionAnalysis classCross-sectional correlation with language or other measureGroup(s)Aphasia (all time points)CovariateOverall language measure (average of AAT measures) all time pointsIs the second level contrast the second levelUnknown, not reportedIs reaction time matched across the second levelUnknown, not reportedIs reaction time matched across the second levelUnknown, not reportedBehavioral data notes-Type of analysisRegions of interest (ROI)	How are the ROI(s) defined?	
Findings1 L posterior inferior temporal gyrus/fusiform gyrusFindings notesActivation predicted later outcome even when initial language performance was included in the model <b>ROI analysis 2</b> First level contrastFirst level contrastWritten word-picture matching vs visual decisionAnalysis classCross-sectional correlation with language or other measureGroup(s)Aphasia (all time points)CovariateOverall language measure (average of AAT measures) all time pointsIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?VesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes—Type of analysisRegions of interest (ROI)	Correction for multiple comparisons	False discovery rate (FDR)
Findings notesActivation predicted later outcome even when initial language performance was included in the modelROI analysis 2First level contrastWritten word-picture matching vs visual decisionAnalysis classCross-sectional correlation with language or other measureGroup(s)Aphasia (all time points)CovariateOverall language measure (average of AAT measures) all time pointsIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes—Type of analysisRegions of interest (ROI)	Statistical details	_
the modelthe modelROI analysis 2First level contrastWritten word-picture matching vs visual decisionAnalysis classCross-sectional correlation with language or other measureGroup(s)Aphasia (all time points)CovariateOverall language measure (average of AAT measures) all time pointsIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes—Type of analysisRegions of interest (ROI)	Findings	↑ L posterior inferior temporal gyrus/fusiform gyrus
First level contrastWritten word-picture matching vs visual decisionAnalysis classCross-sectional correlation with language or other measureGroup(s)Aphasia (all time points)CovariateOverall language measure (average of AAT measures) all time pointsIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes—Type of analysisRegions of interest (ROI)	Findings notes	
Analysis classCross-sectional correlation with language or other measureGroup(s)Aphasia (all time points)CovariateOverall language measure (average of AAT measures) all time pointsIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes-Type of analysisRegions of interest (ROI)	ROI analysis 2	
Group(s)Aphasia (all time points)CovariateOverall language measure (average of AAT measures) all time pointsIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes—Type of analysisRegions of interest (ROI)	First level contrast	Written word-picture matching vs visual decision
Group(s)Aphasia (all time points)CovariateOverall language measure (average of AAT measures) all time pointsIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes—Type of analysisRegions of interest (ROI)	Analysis class	Cross-sectional correlation with language or other measure
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes—Type of analysisRegions of interest (ROI)		
group(s), time point(s), and measures involved?         Is accuracy matched across the second level contrast?       Unknown, not reported         Is reaction time matched across the second level contrast?       Unknown, not reported         Behavioral data notes       –         Type of analysis       Regions of interest (ROI)		Overall language measure (average of AAT measures) all time points
Is accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes–Type of analysisRegions of interest (ROI)		Yes
contrast?       Behavioral data notes       Type of analysis       Regions of interest (ROI)	Is accuracy matched across the second level	Unknown, not reported
Type of analysis Regions of interest (ROI)		<u>Unknown, not reported</u>
	Behavioral data notes	_
ROI type Functional	Type of analysis	Regions of interest (ROI)
	ROI type	Functional

How many ROIs are there?	12
What are the ROI(s)?	(1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFG
How are the ROI(s) defined?	Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at $p < 0.001$ , uncorrected
Correction for multiple comparisons	False discovery rate (FDR)
Statistical details	Mixed model; <u>minimal detail provided</u>
Findings	↑ L posterior inferior temporal gyrus/fusiform gyrus
Findings notes	_
ROI analysis 3	
First level contrast	Written word-picture matching vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia (all time points)
Covariate	Average of AAT comprehension score and BNT, all time points

Unknown, not reported

Yes

Unknown, not reported

↓ R IFG pars triangularis

contrast?	
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	12
What are the ROI(s)?	(1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFG
How are the ROI(s) defined?	Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < $0.001$ , uncorrected
Correction for multiple comparisons	False discovery rate (FDR)
Statistical details	Mixed model; minimal detail provided
Findings	↓ R IFG pars opercularis

Findings notes

contrast?

contrast?

Is the second level contrast valid in terms of the

group(s), time point(s), and measures involved? Is accuracy matched across the second level

Is reaction time matched across the second level

#### **ROI** analysis 4

First level contrast	Written word-picture matching vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia (all time points)
Covariate	Picture-word matching accuracy, all time points
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	12
What are the ROI(s)?	(1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars

	triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFG
How are the ROI(s) defined?	Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected
Correction for multiple comparisons	False discovery rate (FDR)
Statistical details	Mixed model; minimal detail provided
Findings	↑ R posterior inferior temporal gyrus/fusiform gyrus
Findings notes	_

Type of analysis

,	
First level contrast	Written word-picture matching vs visual decision
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia: linear effect of time
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	12
What are the ROI(s)?	(1) bilateral dorsal anterior cingulate; (2) L angular gyrus; (3) L IFG pars opercularis and triangularis; (4) L thalamus; (5) L MFG; (6) L posterior ITG; (7) R angular gyrus; (8) R IFG pars triangularis; (9) R thalamus; (10) R posterior ITG; (11) R IFG pars opercularis and triangularis; (12) R MFG
How are the ROI(s) defined?	Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected
Correction for multiple comparisons	False discovery rate (FDR)
Statistical details	Mixed model; minimal detail provided
Findings	<ul> <li>L dorsolateral prefrontal cortex</li> <li>L angular gyrus</li> <li>L posterior inferior temporal gyrus/fusiform gyrus</li> <li>L anterior cingulate</li> <li>R dorsolateral prefrontal cortex</li> <li>R angular gyrus</li> <li>R anterior cingulate</li> <li>R anterior cingulate</li> <li>R thalamus</li> <li>L IFG pars opercularis</li> <li>L IFG pars triangularis</li> </ul>
Findings notes	Similar numbers of findings are reported for controls
ROI analysis 6	
First level contrast	Semantic decision vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia (subset who returned for follow-up) T1 (n = 10)
Covariate	Subsequent outcome (T4) overall language measure (average of AAT measures)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>Somewhat</u> (not appropriate to correlate T1 imaging with T4 behavior without T1 behavior in model)
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
<b>T C L L</b>	

Regions of interest (ROI)

How many ROIs are there?6What are the ROI(s)?(1) L angular gyrus; (2) L IFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITGHow are the ROI(s) defined?Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrectedCorrection for multiple comparisonsFalse discovery rate (FDR)Statistical details–FindingsNoneFindings notes–ROI analysis 7Semantic decision vs visual decisionFirst level contrastSemantic decision vs visual decisionCovariatOverall language measure (average of AAT measures) all time pointsCovariatOverall language measure (average of AAT measures) all time pointsIs the second level contrast he second level group(s), time point(s), and measures involved?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes–		Four other all
What are k RO(s)?(1) L angular gyrus; (2) L IFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITGHow are the RO(s) defined?Corrotol activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected	ROI type	Functional
IndexByrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITGHow are the ROI(s) defined?Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected		-
includemeasured as count of voxels activated at p < 0.001, uncorrectedCorrection for multiple comparisonsFalse discovery rate (FDR)Statistical details–EndingsNoneFindings notes–Correction for multiple comparisons–Conservery activation–Conservery activation–Conservery activation–Conservery activationSemantic decision vs visual decisionAnalysis classCorservertial correlation with language or other measureGroup(s)Aphasia (all time points)CovariateOverall language measure (average of AAT measures) all time pointsIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?Verall language measure (average of AAT measures) all time pointsIs reaction time matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedStratistical data notes–Stratistical data notesRegions of interest (ROI)ROI typeFunctionalHow many ROIs are there?6What are the ROI(s) defined?Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected	What are the ROI(s)?	
Statistical details-FindingsNoneFindings notes-Coll analysis 7First level contrastSemantic decision vs visual decisionAnalysis classCross-sectional correlation with language or other measureGroup(s)Aphasia (all time points)CovariateOverall language measure (average of AAT measures) all time pointsIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedBehavioral data notes-Rol typeFunctionalRol typeFunctionalRol typeSegins of interest (ROI)Rol typeFunctionalHow many ROIs are there?6What are the ROI(s)? defined?Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected	How are the ROI(s) defined?	
FindingsNoneFindings notes- <b>CO analysis 7</b> First level contrastSemantic decision vs visual decisionAnalysis classCross-sectional correlation with language or other measureGroup(s)Aphasia (all time points)CovariateOverall language measure (average of AAT measures) all time pointsIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?VersoIs accuracy matched across the second level contrast?Unknown, not reportedSection time matched across the second level contrast?Unknown, not reportedBehavioral data notes-Type of analysisRegions of interest (ROI)ROI typeFunctionalHow any ROIs are there?6What are the ROI(s)?(1) Langular gyrus; (2) LIFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R poste	Correction for multiple comparisons	False discovery rate (FDR)
Findings notes       —         ROI analysis 7         First level contrast       Semantic decision vs visual decision         Analysis class       Cross-sectional correlation with language or other measure         Group(s)       Aphasia (all time points)         Covariate       Overall language measure (average of AAT measures) all time points         Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?       Yes         Is accuracy matched across the second level contrast?       Unknown, not reported         Is reaction time matched across the second level contrast?       Unknown, not reported         Behavioral data notes       —         Type of analysis       Regions of interest (ROI)         ROI type       Functional         How many ROIs are there?       6         What are the ROI(s)?       (1) Langular gyrus; (2) L IFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG         How are the ROI(s) defined?       Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected	Statistical details	-
ROI analysis 7         First level contrast       Semantic decision vs visual decision         Analysis class       Cross-sectional correlation with language or other measure         Group(s)       Aphasia (all time points)         Covariate       Overall language measure (average of AAT measures) all time points         Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?       Yes         Is accuracy matched across the second level       Unknown, not reported contrast?         Is reaction time matched across the second level       Unknown, not reported contrast?         Behavioral data notes       —         Type of analysis       Regions of interest (ROI)         ROI type       Functional         How many ROIs are there?       6         What are the ROI(s)?       (1) L angular gyrus; (2) L IFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R poste	Findings	None
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CovariateOverall language measure (average of AAT measures) all time pointsIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?YesIs accuracy matched across the second level contrast?Unknown, not reportedIs reaction time matched across the second level contrast?Unknown, not reportedBehavioral data notes-Type of analysisRegions of interest (ROI)ROI typeFunctionalHow many ROIs are there?6What are the ROI(s)?Control activations and their homotopic counterparts in the R hemisphere; activation 	Analysis class	Cross-sectional correlation with language or other measure
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contrast?Behavioral data notes—Type of analysisRegions of interest (ROI)ROI typeFunctionalHow many ROIs are there?6What are the ROI(s)?(1) L angular gyrus; (2) L IFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITGHow are the ROI(s) defined?Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected		<u>Unknown, not reported</u>
Type of analysisRegions of interest (ROI)ROI typeFunctionalHow many ROIs are there?6What are the ROI(s)?(1) L angular gyrus; (2) L IFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITGHow are the ROI(s) defined?Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected		Unknown, not reported
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measured as count of voxels activated at p < 0.001, uncorrectedCorrection for multiple comparisonsFalse discovery rate (FDR)Statistical detailsMixed model; minimal detail providedFindingsNone	What are the ROI(s)?	
Statistical details     Mixed model; minimal detail provided       Findings     None	How are the ROI(s) defined?	
Findings None	Correction for multiple comparisons	False discovery rate (FDR)
Findings None	Statistical details	Mixed model; minimal detail provided
Findings notes —	Findings	
	Findings notes	_

First level contrast	Semantic decision vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia (all time points)
Covariate	Average of AAT comprehension score and BNT, all time points
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	6
What are the ROI(s)?	(1) L angular gyrus; (2) L IFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG
How are the ROI(s) defined?	Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected
Correction for multiple comparisons	False discovery rate (FDR)
Statistical details	Mixed model; minimal detail provided

Findings	None
Findings notes	-
ROI analysis 9	
First level contrast	Semantic decision vs visual decision
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia (all time points)
Covariate	Semantic decision accuracy, all time points
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Accuracy is covariate
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	6
What are the ROI(s)?	(1) L angular gyrus; (2) L IFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG
How are the ROI(s) defined?	Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at $p < 0.001$ , uncorrected
Correction for multiple comparisons	False discovery rate (FDR)
Statistical details	Mixed model; minimal detail provided
Findings	None
Findings notes	-
ROI analysis 10	
First level contrast	Semantic decision vs visual decision
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia: linear effect of time
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes

Unknown, not reported

Is accuracy matched across the second level

Is reaction time matched across the second level

contrast?

Unknown, not reported

contrast?	
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	6
What are the ROI(s)?	(1) L angular gyrus; (2) L IFG pars opercularis and triangularis; (3) L posterior ITG; (4) R angular gyrus; (5) R IFG pars opercularis and triangularis; (6) R posterior ITG
How are the ROI(s) defined?	Control activations and their homotopic counterparts in the R hemisphere; activation measured as count of voxels activated at p < 0.001, uncorrected
Correction for multiple comparisons	False discovery rate (FDR)
Statistical details	Mixed model; minimal detail provided
Findings	↑ L posterior inferior temporal gyrus/fusiform gyrus ↑ R angular gyrus ↓ L IFG pars opercularis ↓ L IFG pars triangularis
Findings notes	Similar numbers of findings are reported for controls
Notes	
Excluded analyses	(1) activation maps in patients at each time point (Fig. 2); (2) analyses assessing whether

outcome can be better predicted by including fMRI data; (3) analyses examining relationships between activations related to breath holding and language tasks (there was little if any evidence that vascular reactivity was abnormal in patients); (4) correlations with ROI activity level instead of counts of activated voxels, which yielded similar but non-significant findings

# Barbieri et al. (2019)

#### Reference

Authors	Barbieri E, Mack J, Chiappetta B, Europa E, Thompson CK
Title	Recovery of offline and online sentence processing in aphasia: Language and domain-general network neuroplasticity
Reference	Cortex 2019; 120: 394-418
PMID	31419597
DOI	10.1016/j.cortex.2019.06.015

#### Participants

•	
Language	US English
Inclusion criteria	-
Number of individuals with aphasia	18 (plus 1 excluded: developed a hematoma between baseline and post-testing)
Number of control participants	23
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	No (range 22-73 years; controls were younger)
ls sex reported for patients and controls, and matched?	Yes (males: 11; females: 7)
Is handedness reported for patients and controls, and matched?	No (right: 15; left: 3; not stated for controls)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 13-107 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	WAB, Northwestern Assessment of Verbs and Sentences (NAVS), Northwestern Naming Battery (NNB), analysis of spontaneous speech (Cinderella story) using Northwestern Narrative Language Analysis (NNLA) protocol
Aphasia severity	AQ range 52.8-91.7
Aphasia type	Not stated, except that "language deficits were consistent with nonfluent aphasia and agrammatism"
First stroke only?	Yes
Stroke type	Mixed etiologies
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Not stated
Lesion location	Mostly L MCA but some lesions include PCA or ACA territory
Participants notes	One patient had two strokes within one day, but we would consider that essentially a single stroke

#### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, ~12 weeks later
If longitudinal, was there any intervention between the time points?	13 patients were treated and 5 were not; treatment of underlying forms; 90 minutes/session, 2 sessions/week until 80% accuracy met on weekly probe task, then 1 session/week, 12 weeks

	except for one patient who demonstrated rapid improvement and completed treatment in 6 weeks
Is the scanner described?	Yes (Siemens Trio 3 Tesla or Siemens Prisma 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No* (moderate limitation</u> ) (stimulus timing described does not match stated duration of data acquisition; timing of language and control trials not matched)
Design type	Block
Total images acquired	~482
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	2 runs before treatment and 2 runs after treatment; each pair of runs took place on two separate days (1-7 days apart)
Conditions	

Are the conditions clearly described?

Yes

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
auditory sentence-picture verification	Button press	32	Unknown	Unknown
listening to reversed speech and viewing scrambled pictures	Button press	8	<u>Unknown</u>	<u>Unknown</u>
Conditions notes	Based on the behavi at chance on the lan		utside the scanner, it is lik	ely that many patients were
Contrasts				

#### Are the contrasts clearly described?

No (see specific limitation(s) below)

## Contrast 1: auditory sentence-picture verification vs listening to reversed speech and viewing scrambled pictures

Language condition	Auditory sentence-picture verification
Control condition	Listening to reversed speech and viewing scrambled pictures
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>Unknown, not reported</u>
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Somewhat
Are activations lateralized in the control data?	Somewhat
Control activation notes	L-lateralized inferior frontal and posterior temporal, but also bilateral posterior inferior temporal and lateral occipital activations
Contrast notes	Contrast described as "passive > control" but seems to involve active and passive sentences
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)

#### Voxelwise analysis 1

,		
First level contrast	Auditory sentence-picture verification vs listening to reversed speech and viewing scrambled pictures	
Analysis class	Longitudinal change in aphasia	
Group(s)	Aphasia treated (n = 13) T2 vs T1	
Covariate	-	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes	
Is accuracy matched across the second level contrast?	Unknown, not reported	
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>	
Behavioral data notes	Out-of-scanner performance on passive sentences improved	
Type of analysis	Voxelwise	
Search volume		
Correction for multiple comparisons	Clusterwise correction based on 3dClustSim	
Software	SPM8	
Voxelwise p	.001	
Cluster extent	37 voxels (size not stated)	
Statistical details	_	
Findings	<ul> <li>↑ L precuneus</li> <li>↑ R ventral precentral/inferior frontal junction</li> <li>↑ R somato-motor</li> <li>↑ R supramarginal gyrus</li> <li>↑ R intraparietal sulcus</li> <li>↑ R superior parietal</li> <li>↑ R precuneus</li> </ul>	
Findings notes	Based on Table 7 and Figure 8	
Voxelwise analysis 2		
First level contrast	Auditory sentence-picture verification vs listening to reversed speech and viewing scrambled pictures	
Analysis class	Longitudinal change in aphasia	
Group(s)	Aphasia natural history (n = 5) T2 vs T1	
Covariate	-	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>	
Is reaction time matched across the second level contrast?	Unknown, not reported	
Behavioral data notes	_	
Type of analysis	Voxelwise	
Search volume		
Correction for multiple comparisons	Clusterwise correction based on 3dClustSim	
Software	SPM8	
Voxelwise p	.001	
Cluster extent	37 voxels (size not stated)	
Statistical details	-	
Findings	None	
Findings notes	_	
ROI analysis 1		
First level contrast	Auditory sentence-picture verification vs listening to reversed speech and viewing scrambled pictures	
Analysis class	Longitudinal between two groups with aphasia	

Group(s)	(Aphasia treated (n=13) T2 vs T1) vs (aphasia natural history (n=5) T2 vs T1)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	4
What are the ROI(s)?	(1) L hemisphere sentence processing network (IFGpt, pMTG, pSTG, AG); (2) R hemisphere homotopic regions; (3) L dorsal attention network (MFG, PrCG, SPL, sLOC); (4) R dorsal attention network (same regions)
How are the ROI(s) defined?	Sentence processing network based on Walenski et al. (2019); dorsal attention network based on Corbetta et al. (2008) and Vincent et al. (2008); ROIs were defined based on Harvard-Oxford atlas <u>which would align imperfectly with these functional networks</u> ; dependent variable was number of active voxels (p < .001, uncorrected) divided by number of intact voxels
Correction for multiple comparisons	No correction
Statistical details	Derivation of dependent measures from ROIs difficulty to follow, but it seems that ROIs with less than 5 voxels upregulated were excluded and deactivations were not considered, meaning that estimates of change may be biased
Findings	<ul> <li>L dorsolateral prefrontal cortex</li> <li>L ventral precentral/inferior frontal junction</li> <li>L dorsal precentral</li> <li>L angular gyrus</li> <li>L intraparietal sulcus</li> <li>L superior parietal</li> <li>R dorsolateral prefrontal cortex</li> <li>R ventral precentral/inferior frontal junction</li> <li>R dorsal precentral</li> <li>R angular gyrus</li> <li>R intraparietal sulcus</li> <li>R superior parietal</li> </ul>
Findings notes	Bilateral dorsal attention network; findings were for networks as a whole; regions coded correspond to atlas ROIs
ROI analysis 2	
First level contrast	Auditory sentence-picture verification vs listening to reversed speech and viewing scrambled pictures
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	$\Delta$ offline comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	4
What are the ROI(s)?	(1) L hemisphere sentence processing network (IFGpt, pMTG, pSTG, AG); (2) R hemisphere homotopic regions; (3) L dorsal attention network (MFG, PrCG, SPL, sLOC); (4) R dorsal attention network (same regions)
How are the ROI(s) defined?	Sentence processing network based on Walenski et al. (2019); dorsal attention network based

	on Corbetta et al. (2008) and Vincent et al. (2008); ROIs were defined based on Harvard-Oxford atlas <u>which would align imperfectly with these functional networks</u> ; dependent variable was number of active voxels (p < .001, uncorrected) divided by number of intact voxels
Correction for multiple comparisons	No correction
Statistical details	Derivation of dependent measures from ROIs difficulty to follow, but it seems that <u>ROIs with</u> less than 5 voxels upregulated were excluded and deactivations were not considered <u>,</u> meaning that estimates of change may be biased
Findings	<ul> <li>↑ R IFG pars triangularis</li> <li>↑ R dorsolateral prefrontal cortex</li> <li>↑ R ventral precentral/inferior frontal junction</li> <li>↑ R dorsal precentral</li> <li>↑ R angular gyrus</li> <li>↑ R intraparietal sulcus</li> <li>↑ R superior parietal</li> <li>↑ R posterior STG/STS/MTG</li> </ul>
Findings notes	R homotopic sentence processing network and R dorsal attention network; findings were for networks as a whole; regions coded correspond to atlas ROIs
ROI analysis 3	
First level contrast	Auditory sentence-picture verification vs listening to reversed speech and viewing scrambled pictures
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia participants with eye tracking data (n = 16) T2 vs T1
Covariate	$\Delta$ decrease in eye tracking online thematic prediction score
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	4
What are the ROI(s)?	(1) L hemisphere sentence processing network (IFGpt, pMTG, pSTG, AG); (2) R hemisphere homotopic regions; (3) L dorsal attention network (MFG, PrCG, SPL, sLOC); (4) R dorsal attention network (same regions)
How are the ROI(s) defined?	Sentence processing network based on Walenski et al. (2019); dorsal attention network based on Corbetta et al. (2008) and Vincent et al. (2008); ROIs were defined based on Harvard-Oxford atlas <u>which would align imperfectly with these functional networks</u> ; dependent variable was number of active voxels (p < .001, uncorrected) divided by number of intact voxels
Correction for multiple comparisons	No correction
Statistical details	<u>Derivation of dependent measures from ROIs difficulty to follow</u> , but it seems that <u>ROIs with</u> less than 5 voxels upregulated were excluded and deactivations were not considered, meaning that estimates of change may be biased
Findings	↑ R IFG pars triangularis ↑ R angular gyrus ↑ R posterior STG/STS/MTG
Findings notes	R homotopic sentence processing network; findings were for networks as a whole; regions coded correspond to atlas ROIs
ROI analysis 4	
First level contrast	Auditory sentence-picture verification vs listening to reversed speech and viewing scrambled pictures
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia participants with eye tracking data (n = 16) T2 vs T1
Covariate	$\Delta$ eye tracking online thematic integragration score
Is the second lovel contrast valid in terms of the	Voc

Is the second level contrast valid in terms of the

Yes

group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	4
What are the ROI(s)?	(1) L hemisphere sentence processing network (IFGpt, pMTG, pSTG, AG); (2) R hemisphere homotopic regions; (3) L dorsal attention network (MFG, PrCG, SPL, sLOC); (4) R dorsal attention network (same regions)
How are the ROI(s) defined?	Sentence processing network based on Walenski et al. (2019); dorsal attention network based on Corbetta et al. (2008) and Vincent et al. (2008); ROIs were defined based on Harvard-Oxford atlas <u>which would align imperfectly with these functional networks</u> ; dependent variable was number of active voxels (p < .001, uncorrected) divided by number of intact voxels
Correction for multiple comparisons	No correction
Statistical details	Derivation of dependent measures from ROIs difficulty to follow, but it seems that <u>ROIs with</u> less than 5 voxels upregulated were excluded and deactivations were not considered, meaning that estimates of change may be biased
Findings	<ul> <li>↑ R dorsolateral prefrontal cortex</li> <li>↑ R ventral precentral/inferior frontal junction</li> <li>↑ R dorsal precentral</li> <li>↑ R angular gyrus</li> <li>↑ R intraparietal sulcus</li> <li>↑ R superior parietal</li> </ul>
Findings notes	R dorsal attention network; findings were for networks as a whole; regions coded correspond to atlas ROIs
Notes	
Excluded analyses	Analysis of relationship between lesion volume with ROIs and functional changes in ROIs, because L and R hemisphere networks seem to be combined

# Johnson et al. (2019)

### **Reference** Authors

Authors	Johnson JP, Meier EL, Pan Y, Kiran S
Title	Treatment-related changes in neural activation vary according to treatment response and extent of spared tissue in patients with chronic aphasia
Reference	Cortex 2019; 121: 147-168
PMID	31627014
DOI	10.1016/j.cortex.2019.08.016
Participants	
Language	US English
Inclusion criteria	Anomia
Number of individuals with aphasia	30 (plus 5 excluded: 2 withdrew from non-treatment arm; 3 fMRI acquisition errors; 1 did not complete treatment and post-treatment scanning (but of these latter 4, one must have at least

completed the non-treatment arm))

17

No

#### Number of control participants Were any of the participants included in any previous studies? Is age reported for patients and controls, and matched?

Yes (treated group: mean 62.8  $\pm$  10.2 years, range 42-80 years; untreated group: mean 59.0  $\pm$  11.8 years, range 39-79 years)

Is sex reported for patients and controls, and matched?	Yes (males: 21; females: 9)
Is handedness reported for patients and controls, and matched?	Yes (right: 27; left: 3)
Is time post stroke onset reported and appropriate to the study design?	Yes (treated group: mean 58.3 ± 51.8 months, range 12-170 months; untreated group: mean 85.2 ± 141.9 months, range 10-467 months)
To what extent is the nature of aphasia characterized?	<u>Severity only</u>
Language evaluation	WAB, BNT, PPT
Aphasia severity	Treated group: AQ mean 60.1 $\pm$ 24.0, range 11.7-95.2; untreated group: AQ mean 65.8 $\pm$ 24.6, range 26.9-91.5
Aphasia type	Not stated
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Treated group: 136.6 ± 81.1 cc, range 11.7-317.1 cc; untreated group: 112.7 ± 94.6 cc, range 1.6-317.1 cc
Lesion location	Mostly MCA with a few extending into PCA
Participants notes	There were 26 patients in the treated group and 10 in the untreated group, but 6 patients overlapped between the two groups (they joined the treated group after completing the untreated phase)

## Imaging

fMRI
Longitudinal—chronic treatment
T1: pre-treatment/chronic; T2: post-treatment, ~12 weeks later
Semantic naming treatment, 2 sessions/week
Yes (Siemens Trio 3 Tesla, except for 2 patients on a Siemens Prisma 3 Tesla)
<u>No* (moderate limitation)</u> (total images not stated; short ITI and minimal jitter)
Event-related
not stated
Yes (whole brain)
Yes
<u>No* (moderate limitation)</u> (unclear whether there was sufficient resting data to allow the key contrast to be computed)
Yes
-
Yes

Are the	conditions	clearly	describe

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
picture naming (trained items)	Word (overt)	36	Unknown	<u>Unknown</u>
picture naming (untrained items, from control category)	Word (overt)	36	<u>Unknown</u>	<u>Unknown</u>
picture naming (untrained items, from experimental categories)	Word (overt)	36	<u>Unknown</u>	<u>Unknown</u>
viewing scrambled images and saying "skip"	Word (overt)	36	Unknown	<u>Unknown</u>
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>

Conditions notes	The untrained group were not actually trained on "trained items"; no accuracy data for untrained group (except for lack of change between T1 and T2)
Contrasts	
Are the contrasts clearly described?	Yes
Contrast 1: picture naming (trained items) vs re	est
Language condition	Picture naming (trained items)
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>
Does the contrast selectively activate plausible relevant language regions in the control group?	No
Are activations lateralized in the control data?	No
Control activation notes	Most ROIs deactivated in controls
Contrast notes	-
Analyses	
Are the analyses clearly described?	Yes
ROI analysis 1	
First level contrast	Picture naming (trained items) vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia treated T1 (n = 26) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>No, different</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Anatomical
How many ROIs are there?	16
What are the ROI(s)?	(1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9-16) homotopic counterparts
How are the ROI(s) defined?	AAL but lesioned voxels were excluded from ROIs on an individual basis
Correction for multiple comparisons Statistical details	No correction —
Findings	↑ L IFG pars triangularis ↑ R IFG pars triangularis ↓ L angular gyrus
Findings notes	Significant interaction of ROI by group
ROI analysis 2	

First level contrast	Picture naming (trained items) vs rest	
Analysis class	Cross-sectional aphasia vs control	
Group(s)	Aphasia treated T2 (n = 26) vs control	
Covariate	-	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes	
Is accuracy matched across the second level contrast?	<u>No, different</u>	
Is reaction time matched across the second level contrast?	Unknown, not reported	
Behavioral data notes	_	
Type of analysis	Regions of interest (ROI)	
ROI type	Anatomical	
How many ROIs are there?	16	
What are the ROI(s)?	(1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9-16) homotopic counterparts	
How are the ROI(s) defined?	AAL but lesioned voxels were excluded from ROIs on an individual basis	
Correction for multiple comparisons	No correction	
Statistical details	_	
Findings	↑ L IFG pars triangularis ↑ R IFG pars opercularis ↑ R IFG pars triangularis	
Findings notes	Significant interaction of ROI by group; patients also showed more activity than controls across the average of all ROIs	
ROI analysis 3		
First level contrast	Picture naming (trained items) vs rest	
Analysis class	Longitudinal change in aphasia	
Group(s)	Aphasia untreated (n = 10) T2 vs T1	
Group(s)		
Covariate		
	- Yes	
Covariate Is the second level contrast valid in terms of the		
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level	Yes	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level	Yes, matched	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast?	Yes, matched	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes	Yes Yes, matched Unknown, not reported	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis	—         Yes         Yes, matched         Unknown, not reported         —         Regions of interest (ROI)	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type	Yes         Yes, matched         Unknown, not reported            Regions of interest (ROI)         Anatomical	
CovariateIs the second level contrast valid in terms of the group(s), time point(s), and measures involved?Is accuracy matched across the second level contrast?Is reaction time matched across the second level contrast?Behavioral data notesType of analysisROI typeHow many ROIs are there?	Yes, matched         Unknown, not reported            Regions of interest (ROI)         Anatomical         16         (1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9-16)	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)?	<ul> <li></li> <li>Yes</li> <li>Yes, matched</li> <li>Unknown, not reported</li> <li></li> <li>Regions of interest (ROI)</li> <li>Anatomical</li> <li>16</li> <li>(1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9-16) homotopic counterparts</li> </ul>	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined?	<ul> <li></li> <li>Yes</li> <li>Yes, matched</li> <li>Unknown, not reported</li> <li></li> <li>Regions of interest (ROI)</li> <li>Anatomical</li> <li>16</li> <li>(1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9-16) homotopic counterparts</li> <li>AAL but lesioned voxels were excluded from ROIs on an individual basis</li> </ul>	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined? Correction for multiple comparisons	<ul> <li></li> <li>Yes</li> <li>Yes, matched</li> <li>Unknown, not reported</li> <li></li> <li>Regions of interest (ROI)</li> <li>Anatomical</li> <li>16</li> <li>(1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9-16) homotopic counterparts</li> <li>AAL but lesioned voxels were excluded from ROIs on an individual basis</li> </ul>	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined? Correction for multiple comparisons Statistical details	Yes         Yes, matched         Unknown, not reported            Regions of interest (ROI)         Anatomical         16         (1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9-16) homotopic counterparts         AAL but lesioned voxels were excluded from ROIs on an individual basis         No correction	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined? Correction for multiple comparisons Statistical details Findings	Yes         Ves, matched         Unknown, not reported            Regions of interest (ROI)         Anatomical         16         (1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9-16) homotopic counterparts         AAL but lesioned voxels were excluded from ROIs on an individual basis         No correction            None	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined? Correction for multiple comparisons Statistical details Findings Findings notes	Yes         Ves, matched         Unknown, not reported            Regions of interest (ROI)         Anatomical         16         (1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9-16) homotopic counterparts         AAL but lesioned voxels were excluded from ROIs on an individual basis         No correction            None	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined? Correction for multiple comparisons Statistical details Findings Findings notes Complex analysis 1	Yes Yes, matched Unknown, not reported Unknown, not reported  Regions of interest (ROI) Anatomical 16 (1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9-16) homotopic counterparts AAL but lesioned voxels were excluded from ROIs on an individual basis No correction  None No main effect of time or interaction of time by ROI	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined? Correction for multiple comparisons Statistical details Findings Findings notes Complex analysis 1 First level contrast	-         Yes         Yes, matched         Unknown, not reported         -         Regions of interest (ROI)         Anatomical         16         (1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9-16) homotopic counterparts         AAL but lesioned voxels were excluded from ROIs on an individual basis         No correction         -         None         No main effect of time or interaction of time by ROI         Picture naming (trained items) vs rest	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined? Correction for multiple comparisons Statistical details Findings Findings notes Complex analysis 1 First level contrast Analysis class	-         Yes         Yes, matched         Unknown, not reported         -         Regions of interest (ROI)         Anatomical         16         (1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9-16) homotopic counterparts         AAL but lesioned voxels were excluded from ROIs on an individual basis         No correction         -         None         No main effect of time or interaction of time by ROI         Picture naming (trained items) vs rest         Longitudinal change in aphasia	
Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there? What are the ROI(s)? How are the ROI(s) defined? Correction for multiple comparisons Statistical details Findings Findings notes Findings notes First level contrast Analysis class Group(s)	-         Yes         Yes, matched         Unknown, not reported         -         Regions of interest (ROI)         Anatomical         16         (1) L IFGorb; (2) L IFGtri; (3) L IFGop; (4) L MFG; (5) L PrCG; (6) L MTG; (7) L SMG; (8) L AG; (9-16) homotopic counterparts         AAL but lesioned voxels were excluded from ROIs on an individual basis         No correction         -         None         No main effect of time or interaction of time by ROI         Picture naming (trained items) vs rest         Longitudinal change in aphasia	

contrast?	
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Complex
Statistical details	A linear model was constructed to examine the relationship between proportion of spared tissue in each L hemisphere ROI and changes in activation over time. <u>The model is not</u> <u>described in sufficient detail.</u>
Findings	Other
Findings notes	There was a significant 3-way interaction of time by ROI by spared tissue, such that in some regions (AG, MFG, IFG orb, SMG), less spared tissue was associated with greater increases in activation, while in others (PrCG, IFG op, IFG tri), less spared tissue was associated with greater decreases in activation.
Notes	
Excluded analyses	(1) the treated group showed an increase in activation over time averaged across all ROIs, and a near-significant interaction of time by hemisphere such that greater increases were observed in the right hemisphere; (2) "responders" showed an increase in activation over time averaged across all ROIs, while "nonresponders" did not (excluded because not anatomically specific, but also note that the definition of responders vs nonresponders was somewhat arbitrary)

# Kristinsson et al. (2019)

#### Reference

Authors	Kristinsson S, Yourganov G, Xiao F, Bonilha L, Stark BC, Rorden C, Basilakos A, Fridriksson J
Title	Brain-derived neurotrophic factor genotype-specific differences in cortical activation in chronic aphasia
Reference	J Speech Lang Hear Res 2019; 62: 3923-3936
PMID	31756156
DOI	10.1044/2019_jslhr-l-rsnp-19-0021

## Participants

US English
< 80% on PNT; able to name at least 5 out of 40 items during fMRI; WAB-R spontaneous speech $\ge$ 2; WAB-R auditory comprehension $\ge$ 2
87
0
Yes (65 were previously included in Fridriksson et al. (2018), a tDCS study)
Yes (typical BDNF genotype group mean 59.6 $\pm$ 11.2 years, range 29-77 years; atypical BDNF genotype group mean 57.7 $\pm$ 10.9 years, range 30-76 years)
Yes (males: 58; females: 29)
Yes (right: 87; left: 0)
Yes (typical BDNF genotype group: mean 44.0 ± 38.7 months; atypical BDNF genotype group: mean 34.5 ± 36.9 months; all participants > 6 months)
Severity and type
WAB, PNT, PPT
Typical BDNF genotype group: AQ mean 64.2 $\pm$ 20.3; atypical BDNF genotype group: AQ mean 54.3 $\pm$ 21.0
Typical BDNF genotype group: 25 Broca's, 12 anomic, 11 conduction, 2 transcortical motor

	aphasia, 2 Wernicke's, 1 global; atypical BDNF genotype group: 16 Broca's, 6 anomic, 6 conduction, 3 global, 3 Wernicke's
First stroke only?	No
Stroke type	Mixed etiologies
To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Typical BDNF genotype group: 121.4 $\pm$ 73.2 cc; atypical BDNF genotype group: 142.2 $\pm$ 88.4 cc
Lesion location	L MCA
Participants notes	-

## Imaging

picture naming	Word (overt)	40	Yes	Unknown
Condition	Response type	Repetitions	All groups could do?	All individuals could do?
,				
Are the conditions clearly described?	Yes			
Conditions				
Imaging notes	sparse sampling			
Is intersubject normalization adequately described and appropriate?	Yes			
Is first level model fitting adequately described and appropriate?	Yes			
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes			
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)			
Total images acquired	60			
Design type	Event-related			
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes			
Is the scanner described?	Yes (Siemens Trio 3 Tesla	or Siemens Prisn	na 3 Tesla)	
If longitudinal, was there any intervention between the time points?	_			
If longitudinal, at what time point(s) were imaging data acquired?	_			
Is the study cross-sectional or longitudinal?	Cross-sectional			
Modality	fMRI			

viewing abstract pictures	None	20	N/A
Conditions notes	—		
Contrasts			

Yes

# Contrast 1: picture naming vs viewing abstract pictures

Are the contrasts clearly described?

Language condition	Picture naming
Control condition	Viewing abstract pictures
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>

N/A

Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	-
Contrast notes	-

#### Analyses

Are the analyses clearly described?	<u>No* (moderate limitation)</u> (see specific limitation(s) below)	
Voxelwise analysis 1		
First level contrast	Picture naming vs viewing abstract pictures	

First level contrast	Picture naming vs viewing abstract pictures
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with typical genotype (n = 53) vs atypical genotype (n = 34)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Voxelwise
Search volume	
Correction for multiple comparisons	Voxelwise FWE correction
Software	SPM12
Voxelwise p	_
Cluster extent	_
Statistical details	_
Findings	None
Findings notes	_

#### Notes

Excluded analyses

Comparisons between numbers of voxels activated, because not regionally specific and <u>not</u> <u>described in sufficient detail</u>

# Purcell et al. (2019)

#### Reference

Authors	Purcell JJ, Wiley RW, Rapp B
Title	Re-learning to be different: Increased neural differentiation supports post-stroke language recovery
Reference	NeuroImage 2019; 202: 116145
PMID	31479754
DOI	10.1016/j.neuroimage.2019.116145

## Participants

Language	US English
Inclusion criteria	Chronic dysgraphia (acquired impairment in spelling)
Number of individuals with aphasia	21 (plus 4 excluded: 3 health reasons; 1 data acquisition error)
Number of control participants	0

Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (range 40-80 years)
Is sex reported for patients and controls, and matched?	Yes (males: 13; females: 8)
Is handedness reported for patients and controls, and matched?	Yes (right: 16; left: 3; other: 2)
Is time post stroke onset reported and appropriate to the study design?	Yes (range 14-209 months)
To what extent is the nature of aphasia characterized?	Comprehensive battery
Language evaluation	Spelling (PALPA 40 and 54, and other word lists), oral reading (PALPA 35), reading comprehension (PALPA 51), spoken word-picture matching and picture naming tests from Northwestern Naming Battery, PPT-P; note no generic aphasia battery, but fairly complete coverage of language domains
Aphasia severity	Spelling of untrained items range 51%-94%
Aphasia type	4 orthographic working memory deficit, 8 orthographic long-term memory deficit, 9 both types of deficit
First stroke only?	Yes
Stroke type	Not stated
To what extent is the lesion distribution	Lesion overlay
characterized?	·
Lesion extent	Range 7.7-215.0 cc
Lesion location	L MCA with L ventral occipitotemporal cortex mostly intact
Participants notes	-
Imaging	
Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—chronic treatment
If longitudinal, at what time point(s) were imaging data acquired?	T1: pre-treatment/chronic; T2: post-treatment, 6-24 weeks later
If longitudinal, was there any intervention between the time points?	Spelling treatment, 60-80 minutes/day, 2 days/week, range 6-24 weeks
Is the scanner described?	
	<u>No</u> (not stated)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	No (not stated) Yes
acquisition clearly described and appropriate?	
acquisition clearly described and appropriate? Design type	Yes Event-related
acquisition clearly described and appropriate? Design type Total images acquired Are the imaging acquisition parameters, including	Yes
acquisition clearly described and appropriate? Design type Total images acquired Are the imaging acquisition parameters, including coverage, adequately described and appropriate? Is preprocessing and intrasubject coregistration	Yes Event-related 1232 (four runs distributed over two days)
acquisition clearly described and appropriate? Design type Total images acquired Are the imaging acquisition parameters, including coverage, adequately described and appropriate? Is preprocessing and intrasubject coregistration adequately described and appropriate? Is first level model fitting adequately described and	Yes Event-related 1232 (four runs distributed over two days) Yes (cerebellum excluded) Yes No* (moderate limitation) (not feasible to separate closely spaced instruction, word, and
acquisition clearly described and appropriate?Design typeTotal images acquiredAre the imaging acquisition parameters, including coverage, adequately described and appropriate?Is preprocessing and intrasubject coregistration adequately described and appropriate?Is first level model fitting adequately described and appropriate?Is intersubject normalization adequately described	Yes Event-related 1232 (four runs distributed over two days) Yes (cerebellum excluded) Yes
acquisition clearly described and appropriate? Design type Total images acquired Are the imaging acquisition parameters, including coverage, adequately described and appropriate? Is preprocessing and intrasubject coregistration adequately described and appropriate? Is first level model fitting adequately described and appropriate?	Yes Event-related 1232 (four runs distributed over two days) Yes (cerebellum excluded) Yes No* (moderate limitation) (not feasible to separate closely spaced instruction, word, and letter/response, especially when responses will be compared to rest)
acquisition clearly described and appropriate?Design typeTotal images acquiredAre the imaging acquisition parameters, including coverage, adequately described and appropriate?Is preprocessing and intrasubject coregistration adequately described and appropriate?Is first level model fitting adequately described and appropriate?Is intersubject normalization adequately described and appropriate?	Yes Event-related 1232 (four runs distributed over two days) Yes (cerebellum excluded) Yes No* (moderate limitation) (not feasible to separate closely spaced instruction, word, and letter/response, especially when responses will be compared to rest)
acquisition clearly described and appropriate?Design typeTotal images acquiredAre the imaging acquisition parameters, including coverage, adequately described and appropriate?Is preprocessing and intrasubject coregistration adequately described and appropriate?Is first level model fitting adequately described and appropriate?Is intersubject normalization adequately described and appropriate?Is intersubject normalization adequately described and appropriate?Imaging notes	Yes Event-related 1232 (four runs distributed over two days) Yes (cerebellum excluded) Yes No* (moderate limitation) (not feasible to separate closely spaced instruction, word, and letter/response, especially when responses will be compared to rest)

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
spelling probe (training items)	Button press	60	Yes	<u>Unknown</u>
spelling probe (known items)	Button press	60	Yes	<u>Unknown</u>
case verification	Button press	60	Yes	<u>Unknown</u>

rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>
Conditions notes	Condition 3 not used in a	ny contrasts		
Contrasts				
Are the contrasts clearly described?	Yes			
Contrast 1: spelling probe (training items) vs re	est			
Language condition	Spelling probe (training it	ems)		
Control condition	Rest			
Are the conditions matched for visual demands?	No			
Are the conditions matched for auditory demands?	No			
Are the conditions matched for motor demands?	No			
Are the conditions matched for cognitive/executive demands?	No			
Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparabl</u>	l <u>e</u>		
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparabl</u>	l <u>e</u>		
Behavioral data notes	_			
Are control data reported in this paper or another that is referenced?	No			
Does the contrast selectively activate plausible relevant language regions in the control group?	<u>Unknown</u>			
Are activations lateralized in the control data?	<u>Unknown</u>			
Control activation notes		•	who report lateralized active not report results relative	vations for the contrast of e to fixation baseline
Contract notac				

Contrast notes

# Contrast 2: spelling probe (known items) vs rest

Language condition	Spelling probe (known items)
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	No
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	Unknown
Control activation notes	Task comes from Rapp and Lipka (2011), who report lateralized activations for the contrast of spelling probes to case verification, but do not report results relative to fixation baseline
Contrast notes	-
Analyses	
Are the analyses clearly described?	No* (moderate limitation) (see specific limitation(s) below)
Voxelwise analysis 1	

First level contrast	Spelling probe (training items) vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with both timepoints (n = 20) T2 vs T1
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Appear mismatched</u>
Is reaction time matched across the second level contrast?	<u>Appear mismatched</u>
Behavioral data notes	See section S2, but main effects include known items also
Type of analysis	Voxelwise
Search volume	Appears to be restricted to voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction based on 3dClustSim
Software	BrainVoyager QX 2.4 or SPM12
Voxelwise p	.01
Cluster extent	49 voxels (size not stated)
Statistical details	-
Findings	↑ L posterior cingulate ↑ R angular gyrus ↑ R posterior cingulate
Findings notes	-

•	
First level contrast	Spelling probe (training items) vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia with both timepoints (n = 20) T2 vs T1
Covariate	$\Delta$ spelling accuracy on training items
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	3
What are the ROI(s)?	(1) R AG; (2) L PCC; (3) R PCC
How are the ROI(s) defined?	Regions activated in SPM analysis 1
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	-
ROI analysis 2	
First level contrast	Spelling probe (training items) vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia with both timepoints (n = 20) T2 vs T1
Covariate	$\Delta$ spelling accuracy on untrained items
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>

Is reaction time matched across the second level contrast?

Unknown, not reported

Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	3
What are the ROI(s)?	(1) R AG; (2) L PCC; (3) R PCC
How are the ROI(s) defined?	Regions activated in SPM analysis 1
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-

First level contrast	Spelling probe (training items) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Subsequent $\Delta$ spelling accuracy on training items (T2 vs T1)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (T1 behavioral measure should be included in model)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	L ventral occipitotemporal cortex
How are the ROI(s) defined?	The region that showed an increase in Local-Hreg from T1 to T2
Correction for multiple comparisons	One only
Statistical details	-
Findings	None
Findings notes	-

## ROI analysis 4

,	
First level contrast	Spelling probe (training items) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia with both timepoints T1 (n = 20)
Covariate	Subsequent $\Delta$ spelling accuracy on untrained items (T2 vs T1)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (T1 behavioral measure should be included in model)
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	L ventral occipitotemporal cortex
How are the ROI(s) defined?	The region that showed an increase in Local-Hreg from T1 to T2
Correction for multiple comparisons	One only
Statistical details	-
Findings	None
Findings notes	-

,	
First level contrast	Spelling probe (training items) vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia with both timepoints (n = 20) T2 vs T1
Covariate	$\Delta$ spelling accuracy on training items
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Region of interest (ROI)
ROI type	Functional
How many ROIs are there?	1
What are the ROI(s)?	L ventral occipitotemporal cortex
How are the ROI(s) defined?	The region that showed an increase in Local-Hreg from T1 to T2
Correction for multiple comparisons	One only
Statistical details	-
Findings	None
Findings notes	_
ROI analysis 6	
First level contrast	Spelling probe (training items) vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia with both timepoints (n = 20) T2 vs T1
Covariate	$\Delta$ spelling accuracy on untrained items
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	_
Type of analysis	Region of interest (ROI)

ROI type

Findings

Functional 1 L ventral occipitotemporal cortex The region that showed an increase in Local-Hreg from T1 to T2 Correction for multiple comparisons One only \_ None

#### Complex analysis 1

Statistical details

Findings notes

How many ROIs are there?

How are the ROI(s) defined?

What are the ROI(s)?

First level contrast	Spelling probe (training items) vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with both timepoints (n = 20) T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Appear mismatched
Is reaction time matched across the second level contrast?	Appear mismatched

Behavioral data notes	See section S2, where Figures S1 and S2 appear to show differences; the main effects of time were not significant for accuracy or RT, but those analyses included known items also, which had smaller effects
Type of analysis	Complex
Statistical details	Local Heterogeneity Regression Analysis (Local-Hreg) was used to identify brain regions where the heterogeneity of timecourses between neighboring voxels, specifically for the trained condition, increased from T1 to T2. A voxelwise threshold of p < 0.05 was applied, followed by cluster correction based on permutation testing. The analysis appears to have been restricted to brain regions not damaged in any patients.
Findings	Other
Findings notes	Only in L ventral occipitotemporal cortex, there was a significant increase in Local-Hreg from T1 to T2 (p = 0.028, corrected).
Complex analysis 2	
First level contrast	Spelling probe (known items) vs rest
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia with both timepoints (n = 20) T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	Yes, matched
Behavioral data notes	See section S2, main effects were not significant and effects appear smaller for known than trained
Type of analysis	Complex
Statistical details	Local Heterogeneity Regression Analysis (Local-Hreg) was used to identify brain regions where the heterogeneity of timecourses between neighboring voxels, specifically for the known condition, increased from T1 to T2. A voxelwise threshold of $p < 0.05$ was applied, followed by cluster correction based on permutation testing. The analysis appears to have been restricted to brain regions not damaged in any patients.
Findings	None
Findings notes	_
Complex analysis 3	
First level contrast	Spelling probe (training items) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	T1 spelling accuracy on training items
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>Somewhat</u> (training items were selected for individual patients, so training item accuracy is not an appropriate measure of spelling ability)
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Complex
Statistical details	A linear mixed effects model was used to investigate the relationship between Local-Hreg at T1 in the L ventral occipitotemporal region previously identified and T1 spelling accuracy of training items. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but <u>this is not described in detail</u> .
Findings	Other
Findings notes	There was a significant positive relationship between T1 Local-Hreg and T1 spelling accuracy

on training items.

# Complex analysis 4

complex analysis 4	
First level contrast	Spelling probe (training items) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Subsequent Δ spelling accuracy on training items (T2 vs T1)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (T1 behavioral measure should be included in model)
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Complex
Statistical details	A linear mixed effects model was used to investigate the relationship between Local-Hreg at T1 in the L ventral occipitotemporal region previously identified and subsequent improvement in spelling accuracy of training items from T1 to T2. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but this is not described in detail.
Findings	Other
Findings notes	There was a significant positive relationship between T1 Local-Hreg and subsequent improvement in spelling accuracy on training items from T1 to T2.
Complex analysis 5	
First level contrast	Spelling probe (training items) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia with both timepoints T1 (n = 20)
Covariate	Subsequent $\Delta$ spelling accuracy on untrained items (T2 vs T1)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (T1 behavioral measure should be included in model)
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	-
Type of analysis	Complex
Statistical details	A linear mixed effects model was used to investigate the relationship between Local-Hreg at T1 in the L ventral occipitotemporal region previously identified and subsequent improvement in spelling accuracy of untrained items from T1 to T2. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but this is not described in detail.
Findings	Other
Findings notes	There was a significant positive relationship between T1 Local-Hreg and subsequent improvement in spelling accuracy on untrained items from T1 to T2.
Complex analysis 6	
First level contrast	Spelling probe (training items) vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia with both timepoints (n = 20) T2 vs T1
Covariate	$\Delta$ spelling accuracy on training items
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_

<b>T</b>	
Type of analysis	Complex
Statistical details	A linear mixed effects model was used to investigate the relationship between change in Local-Hreg in the L ventral occipitotemporal region previously identified and change in spelling accuracy of training items. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but <u>this is not described in detail</u> .
Findings	Other
Findings notes	There was a significant negative relationship between change in Local-Hreg and change in spelling accuracy on training items.
Complex analysis 7	
First level contrast	Spelling probe (training items) vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia with both timepoints (n = 20) T2 vs T1
Covariate	Δ spelling accuracy on untrained items
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Complex
Statistical details	A linear mixed effects model was used to investigate the relationship between change in Local-Hreg in the L ventral occipitotemporal region previously identified and change in spelling accuracy of untrained items. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but <u>this is not described in detail</u> .
Findings	Other
Findings notes	There was a significant negative relationship between change in Local-Hreg and change in spelling accuracy on untrained items.
Complex analysis 8	
First level contrast	Spelling probe (training items) vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia with both timepoints T2 (n = 20)
Covariate	T2 spelling accuracy on training items
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
ls accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	-
Type of analysis	Complex
Statistical details	A linear mixed effects model was used to investigate the relationship between Local-Hreg at T2 in the L ventral occipitotemporal region previously identified and T2 spelling accuracy of training items. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but <u>this is not described in detail</u> .
Findings	None
Findings notes	_
Complex analysis 9	
First level contrast	Spalling probe (training items) vs rest
Analysis class	Spelling probe (training items) vs rest Longitudinal correlation with language or other measure
Group(s)	Aphasia with both timepoints (n = 20) T2 vs T1
Group(s)	

Covariate	Previous T1 Local-Hreg in L ventral occipitotemporal ROI
Is the second level contrast valid in terms of the	No (the ROI was defined based on change in Local-Hreg, so spurious findings could arise in
group(s), time point(s), and measures involved?	the absence of a real effect)
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Complex
Statistical details	A linear mixed effects model was used to investigate the relationship between change in Local-Hreg in the L ventral occipitotemporal region previously identified and T1 Local-Hreg. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but <u>this is not described in detail</u> .
Findings	Other
Findings notes	There was a significant negative relationship between change in Local-Hreg and T1 Local-Hreg.
Complex analysis 10	
First level contrast	Spelling probe (training items) vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia with both timepoints (n = 20) T2 vs T1
Covariate	$\Delta$ spelling accuracy on training items
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Complex
Statistical details	A linear mixed effects model was used to investigate the relationship between change in Local-Hreg in the R AG, L PCC, and R PCC and change in spelling accuracy of training items. A complex model was used in which every voxel for every patient was considered an observation, with random effects of voxel and patient, but <u>this is not described in detail</u> .
Findings	None
Findings notes	_
Complex analysis 11	
First level contrast	Spelling probe (training items) vs rest
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia with both timepoints (n = 20) T2 vs T1
Covariate	$\Delta$ spelling accuracy on untrained items
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	_
Type of analysis	Complex
Statistical details	A linear mixed effects model was used to investigate the relationship between change in Local-Hreg in the R AG, L PCC, and R PCC and change in spelling accuracy of untrained items. A complex model was used in which every voxel for every patient was considered an
	observation, with random effects of voxel and patient, but this is not described in detail.
Findings	observation, with random effects of voxel and patient, but <u>this is not described in detail</u> . None

### Notes

(1) confirmatory voxelwise analyses in section S4.1 and S4.2; (2) additional analyses accounting for spelling deficit type and auditory comprehension deficits described in 3.3.3; (3) relationship between overall BOLD and local heterogeneity described in 3.4.3, because not related to aphasia recovery

# Sreedharan, Chandran, et al. (2019)

### Reference

Authors	Sreedharan S, Chandran A, Yanamala VR, Sylaja PN, Kesavadas C, Sitaram R
Title	Self-regulation of language areas using real-time functional MRI in stroke patients with expressive aphasia
Reference	Brain Imaging Behav 2019; None:
PMID	31089955
DOI	10.1007/s11682-019-00106-7

### Participants

Language	Malayalam
Inclusion criteria	Broca's aphasia or anomic aphasia; comprehension relatively preserved; "motivated for speech therapy"
Number of individuals with aphasia	8 (plus 3 excluded: 2 for claustrophobia; 1 for transportation issues)
Number of control participants	4
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	No (range 18-68 years; controls were younger)
Is sex reported for patients and controls, and matched?	Yes (males: 7; females: 1)
Is handedness reported for patients and controls, and matched?	Yes (right: 8; left: 0)
Is time post stroke onset reported and appropriate to the study design?	No (6-22 weeks; patients at different subacute stages of recovery)
To what extent is the nature of aphasia characterized?	<u>Severity only</u>
Language evaluation	WAB translated into Malayalam
Aphasia severity	AQ range approximately 50-80
Aphasia type	Broca's or anomic
First stroke only?	Not stated
Stroke type	Not stated
To what extent is the lesion distribution characterized?	Individual lesions
Lesion extent	Not stated
Lesion location	7 L MCA, 1 bilateral MCA
Participants notes	-

### Imaging

### Modality Is the study cross-sectional or longitudinal? If longitudinal, at what time point(s) were imaging data acquired?

If longitudinal, was there any intervention between the time points? Is the scanner described?

### fMRI

Longitudinal-mixed

Neurofeedback group: T1: pre-treatment/subacute; T2: 1-5 weeks later; T3: 2-6 weeks after T1; T4: 3-11 weeks after T1; T5: 4-12 weeks after T1; T6: 5-12 weeks after T1; no training group: T1: subacute; T2: 2-12 weeks later; controls: T1: start of study; T2: 1-4 weeks later; T3: 3-5 weeks after T1; T4: 4-8 weeks after T1; T5: 7-37 weeks after T1; T6: 12-43 weeks after T1
4 patients received 4 additional sessions involving neurofeedback training, while 4 patients received treatment as usual
Yes (Siemens Avanto 1.5 Tesla)

Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	No* (moderate limitation) (picture naming events consistently located between blocks)
Design type	Mixed
Total images acquired	probably 964
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	No* (moderate limitation) (event timing will make conditions difficult to disentangle)
Is intersubject normalization adequately described and appropriate?	No (lesion impact not addressed)
Imaging notes	-

### Conditions

Are the conditions clearly described?

All groups could do? All individuals could do Response type Other 24 neurofeedback (try to activate language areas) <u>Unknown</u> <u>Unknown</u> rest None 24 N/A N/A picture naming Other first and last No No timepoints: 48; other timepoints: 0 Multiple words (covert) word generation 5 Unknown Unknown Conditions notes Suggested strategies to activate language areas included "making a speech, having a conversation, reciting a poem or any other form of language activity performed covertly"; picture naming task involved covert word response and button press; picture naming task not used in any contrast; word generation task used only to generate ROIs

Yes

Yes

### Contrasts

Are	the contrasts	clearly	/ described?
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### Contrast 1: neurofeedback (try to activate language areas) vs rest

Language condition	Neurofeedback (try to activate language areas)
Control condition	Rest
Are the conditions matched for visual demands?	No
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	Yes
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	-
Are control data reported in this paper or another that is referenced?	<u>Somewhat</u>
Does the contrast selectively activate plausible relevant language regions in the control group?	Unknown
Are activations lateralized in the control data?	No
Control activation notes	Task activated L IFG and L STG in controls (Fig. 8c), but no data on other regions, and language activations were not lateralized (Fig. 9d)
Contrast notes	-

### Analyses

Are the analyses clearly described?

No\* (moderate limitation) (see specific limitation(s) below)

,	
First level contrast	Neurofeedback (try to activate language areas) vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia mean of T1, T2, T3, T4, T5, T6 (neurofeedback patients) or T1, T2 (no training patients) vs control mean
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	_
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	4
What are the ROI(s)?	(1) L Broca's area (IFG pars opercularis and triangularis); (2) L Wernicke's area (pSTG); (3-4) homotopic counterparts
How are the ROI(s) defined?	Individual activations within AAL ROIs on a separate word generation localizer
Correction for multiple comparisons	No direct comparison
Statistical details	-
Findings	↓ L IFG pars opercularis ↓ L IFG pars triangularis ↓ L posterior STG ↓ R IFG pars opercularis ↓ R IFG pars triangularis ↓ R posterior STG
Findings notes	-
ROI analysis 2	
First level contrast	Neurofeedback (try to activate language areas) vs rest

First level contrast	Neurofeedback (try to activate language areas) vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia with neurofeedback training (n = 4) mean of T4, T5, T6 vs no training (n = 4) T2
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Somewhat (no treatment effect; second half measures rather than measures of change)
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	15
What are the ROI(s)?	(1) L Broca's area (IFG pars opercularis and triangularis); (2) L Wernicke's area (pSTG); (3-4) homotopic counterparts; (5) L MFG; (6) L PrCG; (7) L Rolandic operculum; (8) L insula; (9) L IFG pars orbitalis; (10) L MFG orbital; (11) L SMG; (12) L MTG; (13) L PoCG; (14) L AG; (15) L HG
How are the ROI(s) defined?	(1-4) individual activations within AAL ROIs on a separate word generation localizer; (5-15) AAL
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↑ L ventral precentral/inferior frontal junction ↑ L somato-motor
Findings notes	_

# Complex analysis 1

First level contrast	Neurofeedback (try to activate language areas) vs rest
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia mean of T1, T2, T3, T4, T5, T6 (neurofeedback patients) or T1, T2 (no training patients) vs control mean
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>N/A, no behavioral measure</u>
Is reaction time matched across the second level contrast?	N/A, no timeable task
Behavioral data notes	-
Type of analysis	Complex
Statistical details	Signal change in L IFG and L pSTG ROIs was computed, along with functional connectivity between these ROIs. Neurofeedback values were calculated based on signal change as well as correlation between the ROIs. Group differences in neurofeedback values were compared, but <u>not quantified statistically</u> .
Findings	Other
Findings notes	Patients received lower neurofeedback values than controls, due to lower signal changes and lower functional connectivity.
Notes	
Excluded analyses	(1) individual participant analyses in Fig. 10; (2) comparisons between groups at each time point (Fig. 11), which yielded similar results to comparisons averaged across time points; (3) <u>vague statements about temporal trends in Figs. 12, 13, and 14</u>

# Hartwigsen et al. (2020)

### Reference

Authors	Hartwigsen G, Stockert A, Charpentier L, Wawrzyniak M, Klingbeil J, Wrede K, Obrig H, Saur
Title	Short-term modulation of the lesioned language network
Reference	<i>eLife</i> 2020; 9: e54277
PMID	32181741
DOI	10.7554/elife.54277

# Participants

Language	German
Inclusion criteria	Lesion involving left temporo-parietal cortex and sparing left frontal cortex; relatively well- recovered
Number of individuals with aphasia	<u>12</u> (plus 2 excluded: 1 lost to follow-up; 1 did not show any sound-related neural activation in auditory cortex after sham cTBS)
Number of control participants	0
Were any of the participants included in any previous studies?	No
Is age reported for patients and controls, and matched?	Yes (mean 58.8 years, range 43-72 years)
Is sex reported for patients and controls, and matched?	Yes (males: 8; females: 4)
Is handedness reported for patients and controls, and matched?	Yes (right: 12; left: 0)
Is time post stroke onset reported and appropriate to the study design?	Yes (mean 37.9 ± 34.8 months, range 6-122 months)
To what extent is the nature of aphasia	Not at all

characterized?	A A T				
Language evaluation		AAT			
Aphasia severity	7 mild residual aphasia, 5 recovered				
Aphasia type	Not stated				
First stroke only?		Yes			
Stroke type	Ischemic only				
To what extent is the lesion distribution characterized?	Lesion overlay				
Lesion extent	Range 11.9-176.3 cc				
Lesion location	Left temporo-parietal co	ortex; maximal ov	erlap in SMG		
Participants notes	_				
Imaging					
Modality	fMRI				
Is the study cross-sectional or longitudinal?	Longitudinal—chronic ti	reatment			
If longitudinal, at what time point(s) were imaging data acquired?	T1/T2/T3: chronic; session IFG, or sham; sessions a		TBS over left anterior IFG, rt in randomized order	cTBS over left posterior	
If longitudinal, was there any intervention between the time points?	CTBS				
Is the scanner described?	Yes (Siemens Verio 3 Te	sla)			
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	<u>No* (moderate limitation)</u> (stimulus timing not described in detail; stated duration of data acquisition substantially outside possible range of duration of stimuli)				
Design type	Block		0		
Total images acquired	740				
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	Yes (whole brain)				
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes				
Is first level model fitting adequately described and appropriate?	Yes				
Is intersubject normalization adequately described and appropriate?	<u>No</u> (lesion impact not ac	ldressed)			
Imaging notes	_				
Conditions					
Are the conditions clearly described?	Yes				
Condition	Response type	Repetitions	All groups could do?	All individuals could do?	
syllable count decision	Button press	10	Yes	Yes	
semantic decision	Button press	10	Yes	Yes	
rest	None	20	<u>N/A</u>	<u>N/A</u>	
Conditions notes	Extent of recovery supp	orts the assertior	that all individuals could	do the tasks	
Contrasts					
Are the contrasts clearly described?	Yes				
Contrast 1: syllable count decision vs rest					
Language condition	Syllable count decision				
Control condition	Rest				
Are the conditions matched for visual demands?	Yes				
Are the conditions matched for auditory demands?	No				
Are the conditions matched for motor demands?	No				
Are the conditions matched for cognitive/executive demands?	No				

Is accuracy matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Is reaction time matched between the language and control tasks for all relevant groups?	<u>N/A, tasks not comparable</u>
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Somewhat
Control activation notes	Control data in Hartwigsen et al. (2017); L-lateralized IFG but bilateral SMG
Contrast notes	-
Contrast 2: semantic decision vs rest	
Language condition	Semantic decision
Control condition	Rest
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	No
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	_
Are control data reported in this paper or another that is referenced?	Yes
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Yes
Control activation notes	Control data in Hartwigsen et al. (2017); L-lateralized IFG and AG most prominent
Contrast notes	_
Analyses	
Are the analyses clearly described?	Yes
Voxelwise analysis 1	
First level contrast	Syllable count decision vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia after cTBS to posterior IFG vs sham; same patients, repeated measures
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	<u>No, different</u>
Behavioral data notes	Significantly slower response times when cTBS was applied over pIFG relative to when sham cTBS was applied
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction with with GRFT and stringent voxelwise p
Software	SPM12
Voxelwise p	.001
Cluster extent	Based on GRFT

Statistical details	
Findings	↓ L IFG pars opercularis ↓ L SMA/medial prefrontal ↓ R SMA/medial prefrontal
	↓ R basal ganglia
Findings notes	Based on Figure 4A and Table 3
Voxelwise analysis 2	
First level contrast	Syllable count decision vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia after cTBS to posterior IFG vs after cTBS to anterior IFG; same patients, repeated measures
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	<u>No, different</u>
Behavioral data notes	Significantly slower response times when cTBS was applied over pIFG relative to when cTBS was applied over aIFG
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction with with GRFT and stringent voxelwise p
Software	SPM12
Voxelwise p	.001
Cluster extent	Based on GRFT
Statistical details	-
Findings	↓ L IFG pars opercularis
Findings notes	Based on Table 3
Voxelwise analysis 3	
First level contrast	Semantic decision vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia after cTBS to anterior IFG vs sham; same patients, repeated measures
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	<u>Somewhat</u> (no behavioral difference)
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	Yes, matched
Behavioral data notes	Difference in reaction time did not survive correction
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction with with GRFT and stringent voxelwise p
Software	SPM12
Voxelwise p	.001
Cluster extent	Based on GRFT
Statistical details	—
Findings	↓ L insula ↓ L dorsolateral prefrontal cortex ↓ R insula ↓ R dorsolateral prefrontal cortex ↓ R SMA/medial prefrontal
Findings notes	Based on Figure 4B and Table 3

# Voxelwise analysis 4

First level contrast	Semantic decision vs rest
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia after cTBS to anterior IFG vs after cTBS to posterior IFG ; same patients, repeated measures
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Yes, matched
Is reaction time matched across the second level contrast?	No, different
Behavioral data notes	Significantly slower response times when cTBS was applied over alFG relative to when cTBS was applied over plFG
Type of analysis	Voxelwise
Search volume	Voxels spared in all patients
Correction for multiple comparisons	Clusterwise correction with with GRFT and stringent voxelwise p
Software	SPM12
Voxelwise p	.001
Cluster extent	Based on GRFT
Statistical details	
Findings	↓ L insula ↓ R insula ↓ R dorsolateral prefrontal cortex
Findings notes	Based on Table 3
Complex analysis 1	
First level contrast	Syllable count decision vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia after cTBS to posterior IFG vs sham; same patients, repeated measures
Covariate	$\Delta$ RT for syllable decision (cTBS to posterior IFG timepoint vs sham timepoint)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>RT is covariate</u>
Behavioral data notes	-
Type of analysis	Complex
Statistical details	Whole brain correlations were computed between the difference in functional activity after cTBS to posterior IFG versus sham stimulation, and the difference in reaction times on the syllable counting task under these two conditions. The resulting SPM was thresholded at voxelwise p < .001 (CDT) followed by correction for multiple comparisons based on cluster extent and GRFT using SPM12.
Findings	Other
Findings notes	Upregulation of the R supramarginal gyrus after cTBS was significantly associated with slowing of RT after cTBS. This finding remained significant after including lesion volume as covariate.
Complex analysis 2	
First level contrast	Semantic decision vs rest
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia after cTBS to anterior IFG vs sham; same patients, repeated measures
Covariate	$\Delta$ RT for semantic decision (cTBS to posterior IFG timepoint vs sham timepoint)
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level	Unknown, not reported

contrast?	
Is reaction time matched across the second level contrast?	<u>RT is covariate</u>
Behavioral data notes	-
Type of analysis	Complex
Statistical details	Whole brain correlations were computed between the difference in functional activity after cTBS to anterior IFG versus sham stimulation, and the difference in reaction times on the semantic decision task under these two conditions. The resulting SPM was thresholded at voxelwise $p < .001$ (CDT) followed by correction for multiple comparisons based on cluster extent and GRFT using SPM12.
Findings	None
Findings notes	-
Notes	

Excluded analyses

# Stockert et al. (2020)

### Reference

Authors	Stockert A, Wawrzyniak M, Klingbeil J, Wrede K, Kümmerer D, Hartwigsen G, Kaller CP, Weiller C, Saur D
Title	Dynamics of language reorganization after left temporo-parietal and frontal stroke
Reference	Brain 2020; 143: 844-861
PMID	32068789
DOI	10.1093/brain/awaa023

# Participants

Language	German
Inclusion criteria	Lesion localized to frontal or temporal cortex
Number of individuals with aphasia	34 (plus 50 excluded: 19 lesions spanned frontal and temporal, or were subcortical, or had persisting large vessel occlusions; 31 not all three timepoints were acquired)
Number of control participants	17
Were any of the participants included in any previous studies?	Yes (8 patients were included in Saur et al. (2006); there may also be overlap with Saur et al. (2010), a study that did not meet our inclusion criteria)
Is age reported for patients and controls, and matched?	Yes (frontal group: mean 52.3 ± 18.9 years, range 15-78 years; temporo-parietal group: mean 54.4 ± 12.7 years, range 31-76 years)
Is sex reported for patients and controls, and matched?	Yes (males: 25; females: 9)
Is handedness reported for patients and controls, and matched?	No (right: 31; left: 2; other: 1; not stated for controls)
Is time post stroke onset reported and appropriate to the study design?	Yes (frontal group: T1 acute: mean $3.2 \pm 2.0$ days, range 1-7 days; T2 subacute: mean $11.9 \pm 2.2$ days, range 8-17 days; T3 chronic: mean $272.6 \pm 88.5$ days, range 181-435 days; temporoparietal group: T1 acute: mean $1.6 \pm 0.8$ days, range 1-4 days; T2 subacute: mean $10.1 \pm 1.7$ days, range 8-13 days; T3 chronic: mean $262.5 \pm 75.0$ days, range 184-394 days)
To what extent is the nature of aphasia characterized?	Severity only
Language evaluation	AAT including TT, comprehension composite (LRScomp) and production composite (LRSprod) were derived
Aphasia severity	Frontal group: T1 acute: LRScomp mean 0.48 $\pm$ 0.26; T2 subacute: LRScomp mean 0.64 $\pm$ 0.21; T3 chronic: LRScomp mean 0.91 $\pm$ 0.07; temporo-parietal group: T1 acute: LRScomp mean 0.63 $\pm$ 0.32; T2 subacute: LRScomp mean 0.79 $\pm$ 0.20; T3 chronic: LRScomp mean 0.91 $\pm$ 0.13
Aphasia type	Not stated
First stroke only?	Yes
Stroke type	Ischemic only

To what extent is the lesion distribution characterized?	Lesion overlay
Lesion extent	Frontal group: mean 69.3 ± 34.0 cc, range 12.3-76.6 cc; temporo-parietal group: mean 54.8 ± 41.1 cc, range 6.2-108.5 cc
Lesion location	L MCA, frontal (n = 17) or temporo-parietal (n = 17)
Participants notes	1630 patients screened for inclusion; frontal patients scanned later than temporal patients at T1 and T2

#### Imaging

Modality	fMRI
Is the study cross-sectional or longitudinal?	Longitudinal—recovery
If longitudinal, at what time point(s) were imaging data acquired?	T1 acute: 1-7 days; T2 subacute: 8-21 days; T3 chronic: > 6 months
If longitudinal, was there any intervention between the time points?	Not stated
Is the scanner described?	Yes (Siemens Trio 3 Tesla or Siemens Verio 3 Tesla)
Is the timing of stimulus presentation and image acquisition clearly described and appropriate?	Yes
Design type	Event-related
Total images acquired	660 (20 patients; paradigm 1) or 260 (14 patients; paradigm 2)
Are the imaging acquisition parameters, including coverage, adequately described and appropriate?	<u>No</u> (whole brain; TE = 96 ms questionable)
Is preprocessing and intrasubject coregistration adequately described and appropriate?	Yes
Is first level model fitting adequately described and appropriate?	Yes
Is intersubject normalization adequately described and appropriate?	Yes
Imaging notes	-

### Conditions

Are the conditions clearly described?

<u>No</u> (description implies that paradigm 2 did not include a semantically anomalous condition, but previous papers indicate that it did)

Condition	Response type	Repetitions	All groups could do?	All individuals could do?
listening to normal sentences and making a plausibility judgment (paradigm 1)	None	46	<u>Unknown</u>	<u>Unknown</u>
listening to semantically anomalous sentences and making a plausibility judgment (paradigm 1)	Button press	46	<u>Unknown</u>	<u>Unknown</u>
listening to reversed speech	Button press	paradigm 1: 92; paradigm 2: 30	Yes	<u>Unknown</u>
listening to normal sentences (paradigm 2)	Button press	15	Yes	Unknown
listening to semantically anomalous sentences (paradigm 2)	Button press	15	Yes	<u>Unknown</u>
listening to pseudoword speech (paradigm 2)	Button press	30	Yes	<u>Unknown</u>
rest	None	implicit baseline	<u>N/A</u>	<u>N/A</u>

Conditions notes

Conditions 2, 5, and 6 were not used, and condition 7 was effectively contrasted out; reported behavioral data collapses across conditions and paradigms and so does not establish performance on any specific condition, but the data suggest that at least the conditions where no language-related decisions were required could have been performed by all groups

#### Contrasts

Are the contrasts clearly described?

No (see specific limitation(s) below)

# Contrast 1: listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech

2) vs listening to reversed speech	
Language condition	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2)
Control condition	Listening to reversed speech
Are the conditions matched for visual demands?	Yes
Are the conditions matched for auditory demands?	Yes
Are the conditions matched for motor demands?	No
Are the conditions matched for cognitive/executive demands?	No
Is accuracy matched between the language and control tasks for all relevant groups?	Unknown, not reported
Is reaction time matched between the language and control tasks for all relevant groups?	N/A, tasks not comparable
Behavioral data notes	In paradigm 1, responses were required in the language condition but not the control condition, making the tasks not comparable for RT
Are control data reported in this paper or another that is referenced?	Somewhat
Does the contrast selectively activate plausible relevant language regions in the control group?	Yes
Are activations lateralized in the control data?	Yes
Control activation notes	Not stated which of the two paradigms controls were run on, but clearly L-lateralized frontal and temporal activation; bilateral MD network activation also noted
Contrast notes	20 patients performed paradigm 1 and 14 patients performed paradigm 2; data were combined despite some differences; <u>unclear whether all reversed speech was included, or</u> <u>only reversed speech derived from plausible sentences</u>
Analyses	
Are the analyses clearly described?	Yes
ROI analysis 1	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
ls accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	13
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL
How are the ROI(s) defined?	Spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints
Correction for multiple comparisons	No correction
Statistical details	Post-hoc tests comparing 2 out of the 3 time points were corrected using the Bonferroni-Holm procedure, but there is no indication that that multiple comparisons across ROIs were accounted for
Findings	↑ L IFG pars orbitalis

	↑ L insula ↑ L dorsolateral prefrontal cortex ↑ L SMA/medial prefrontal ↑ R insula
Findings notes	Based on Figure 3; several additional regions are mentioned in text and/or Table 1
ROI analysis 2	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T3 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	13
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL
How are the ROI(s) defined?	Spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints
Correction for multiple comparisons	No correction
Statistical details	Post-hoc tests comparing 2 out of the 3 time points were corrected using the Bonferroni-Holm procedure, but there is no indication that that multiple comparisons across ROIs were accounted for
Findings	↑ L IFG pars orbitalis ↑ L dorsolateral prefrontal cortex ↑ L posterior STG/STS/MTG ↑ L anterior temporal
Findings notes	Based on Figure 3; several additional regions are mentioned in text and/or Table 1
ROI analysis 3	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T3 vs T2
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	13
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL
How are the ROI(s) defined?	Spheres around peaks of whole brain analysis of all patients collapsing across groups and

	timepoints
Correction for multiple comparisons	No correction
Statistical details	Post-hoc tests comparing 2 out of the 3 time points were corrected using the Bonferroni-Holm procedure, but there is no indication that that multiple comparisons across ROIs were accounted for
Findings	None
Findings notes	Based on Figure 3; several additional regions are mentioned in text and/or Table 1
ROI analysis 4	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia frontal mean of T1, T2, T3 (n = 17) vs temporo-parietal mean of T1, T2, T3 (n = 17)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	13
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL
How are the ROI(s) defined?	Spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↑ L posterior STG/STS/MTG ↑ R IFG pars orbitalis ↑ R anterior temporal ↓ L IFG pars opercularis ↓ L IFG pars triangularis ↓ L dorsolateral prefrontal cortex
Findings notes	Based on Table 1
ROI analysis 5	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia frontal (n = 17) T2 vs T1) vs (temporo-parietal (n = 17) T2 vs T1)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	13
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L

	SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL
How are the ROI(s) defined?	Spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints
Correction for multiple comparisons	No correction
Statistical details	Interactions were significant in model with all 3 time points; <u>post-hoc sub-interactions not</u> <u>reported but the patterns appear clear</u>
Findings	↓ L IFG pars opercularis ↓ L IFG pars triangularis ↓ R IFG pars triangularis ↓ R dorsolateral prefrontal cortex
Findings notes	_
ROI analysis 6	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia frontal (n = 17) T3 vs T1) vs (temporo-parietal (n = 17) T3 vs T1)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	13
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL
How are the ROI(s) defined?	Spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints
Correction for multiple comparisons	No correction
Statistical details	Interactions were significant in model with all 3 time points; <u>post-hoc sub-interactions not</u> <u>reported and patterns are not clear</u>
Findings	↓ L IFG pars opercularis ↓ L IFG pars triangularis ↓ R IFG pars triangularis ↓ R dorsolateral prefrontal cortex
Findings notes	— · · · · · · · · · · · · · · · · · · ·
ROI analysis 7	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia frontal (n = 17) T3 vs T2) vs (temporo-parietal (n = 17) T3 vs T2)
Covariate	_
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)

ROI type	Functional
How many ROIs are there?	13
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL
How are the ROI(s) defined?	Spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints
Correction for multiple comparisons	No correction
Statistical details	Post-hoc sub-interactions not reported but there do not appear to be any T2/T3 effects
Findings	None
Findings notes	-

First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T2 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	2
What are the ROI(s)?	(1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals
How are the ROI(s) defined?	(1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	Test of group by time interaction not reported
Findings	Other
Findings notes	There was a significant increase in activation in perilesional ROIs

First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to
	normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T3 vs T1
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	2
What are the ROI(s)?	(1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals
How are the ROI(s) defined?	(1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or

	temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	Test of group by time interaction not reported
Findings	Other
Findings notes	There was a significant increase in activation in perilesional ROIs
ROI analysis 10	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal change in aphasia
Group(s)	Aphasia T3 vs T2
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	2
What are the ROI(s)?	(1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals
How are the ROI(s) defined?	(1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	Test of group by time interaction not reported
Findings	None
Findings notes	—
ROI analysis 11	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to

First level contrast	normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia frontal mean of T1, T2, T3 (n = 17) vs temporo-parietal mean of T1, T2, T3 (n = 17)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	2
What are the ROI(s)?	(1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals
How are the ROI(s) defined?	(1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	Test of group by time interaction not reported; this comparison is somewhat questionable

	riven the differing extent to which fronted and temperal regions are activated in controls
Findings	given the differing extent to which frontal and temporal regions are activated in controls
Findings	Other
Findings notes	Frontal patients showed relatively greater activation in regions homotopic to their lesions
ROI analysis 12	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia frontal T1 (n = 17) vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	13
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL
How are the ROI(s) defined?	Spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; <u>circular because patients but not controls used to define ROIs</u>
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↓ L IFG pars triangularis ↓ L insula ↓ L dorsolateral prefrontal cortex
Findings notes	_
ROI analysis 13	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia temporo-parietal T1 (n = 17) vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	13
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL
How are the ROI(s) defined?	Spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; <u>circular because patients but not controls used to define ROIs</u>
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↓ L IFG pars triangularis

	↓ L insula ↓ L dorsolateral prefrontal cortex ↓ L SMA/medial prefrontal ↓ L posterior STG/STS/MTG ↓ R IFG pars triangularis
Findings notes	_
ROI analysis 14	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia frontal T1 (n = 17) vs temporo-parietal T1 (n = 17)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	13
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL
How are the ROI(s) defined?	Spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↑ L anterior temporal ↑ R IFG pars triangularis ↑ R anterior temporal
Findings notes	-
ROI analysis 15	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia frontal T2 (n = 17) vs control
Covariate	—
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	13
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL
How are the ROI(s) defined?	Spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; <u>circular because patients but not controls used to define ROIs</u>
Correction for multiple comparisons	No correction

Statistical details	-
Findings	↓ L IFG pars triangularis
Findings notes	_

ROI analysis 16	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia temporo-parietal T2 (n = 17) vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	13
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL
How are the ROI(s) defined?	Spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; <u>circular because patients but not controls used to define ROIs</u>
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	_
ROI analysis 17	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia frontal T2 (n = 17) vs temporo-parietal T2 (n = 17)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions

Type of analysis ROI type How many ROIs are there? What are the ROI(s)?

How are the ROI(s) defined?

Correction for multiple comparisons Statistical details Findings

↓ L IFG pars opercularis

Regions of interest (ROI)

Functional

timepoints

No correction

13

\_

↓ L IFG pars triangularis

 $\downarrow$  L dorsolateral prefrontal cortex

(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL

Spheres around peaks of whole brain analysis of all patients collapsing across groups and

Findings notes

### **ROI analysis 18**

KOI allalysis to	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia frontal T3 (n = 17) vs control
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	13
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL
How are the ROI(s) defined?	Spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; <u>circular because patients but not controls used to define ROIs</u>
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↓ L IFG pars triangularis ↓ L insula
Findings notes	-
ROI analysis 19	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia temporo-parietal T3 (n = 17) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported

Behavioral data notes

Type of analysis ROI type How many ROIs are there? What are the ROI(s)?

How are the ROI(s) defined?

Correction for multiple comparisons Statistical details Findings Findings notes

### **ROI analysis 20**

data pooled across conditions

Regions of interest (ROI)

Functional

No correction

None

13

No differences in proportion of expected button presses by group or time, but behavioral

(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL

timepoints; circular because patients but not controls used to define ROIs

Spheres around peaks of whole brain analysis of all patients collapsing across groups and

First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia frontal T3 (n = 17) vs temporo-parietal T3 (n = 17)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Functional
How many ROIs are there?	13
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL
How are the ROI(s) defined?	Spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints
Correction for multiple comparisons	No correction
Statistical details	-
Findings	↓ L IFG pars opercularis ↓ L IFG pars triangularis ↓ L IFG pars orbitalis ↓ L dorsolateral prefrontal cortex
Findings notes	
ROI analysis 21	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia frontal T1 (n = 17) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	2
What are the ROI(s)?	(1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals
How are the ROI(s) defined?	(1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	Other
Findings notes	Frontal patients showed reduced activation in perilesional tissue
ROI analysis 22	

First level contrast

Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to

	normal contoneos (paradigm 2) vs listoning to reversed speech
An abusta abasa	normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia frontal T2 (n = 17) vs control
Covariate	
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	2
What are the ROI(s)?	(1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals
How are the ROI(s) defined?	(1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	Other
Findings notes	Frontal patients showed reduced activation in perilesional tissue
ROI analysis 23	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia frontal T3 (n = 17) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	2
What are the ROI(s)?	(1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals
How are the ROI(s) defined?	(1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	Other
Findings notes	Frontal patients showed reduced activation in perilesional tissue
ROI analysis 24	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia temporo-parietal T1 (n = 17) vs control
Covariate	_

Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	Lipknown patroported
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	2
What are the ROI(s)?	(1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals
How are the ROI(s) defined?	(1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	Other
Findings notes	Temporal patients showed reduced activation in perilesional tissue and in regions homotopic to their lesions
OI analysis 25	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia temporo-parietal T2 (n = 17) vs control
Covariate	_
is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	2
What are the ROI(s)?	(1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals
How are the ROI(s) defined?	(1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-
OI analysis 26	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional aphasia vs control
Group(s)	Aphasia temporo-parietal T3 (n = 17) vs control
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level	<u>Unknown, not reported</u>

contract)	
contrast?	Lakaowa pot reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Other
How many ROIs are there?	2
What are the ROI(s)?	(1) perilesional tissue; (2) regions homotopic to lesions; each unique to individuals
How are the ROI(s) defined?	(1) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (2) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	—
ROI analysis 27	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	—
Findings	↑ L IFG pars opercularis ↑ L IFG pars triangularis ↑ L IFG pars orbitalis other
Findings notes	L IFG pars opercularis and orbitalis did not remain significant when lesion volume was included as a covariate; there was a significant correlation between perilesional activation and LRScomp; this did not remain significant when lesion volume was included as a covariate
ROI analysis 28	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T2
Covariate	Comprehension composite

Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↑ L IFG pars triangularis other
Findings notes	There was a significant correlation between perilesional activation and LRScomp
ROI analysis 29	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T3
Covariate	Comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↑ L IFG pars triangularis
Findings notes	Did not remain significant when lesion volume was included as a covariate
Ol analysis 30	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure

Group(s)	Aphasia T2 vs T1
Covariate	Δ comprehension composite
Is the second level contrast valid in terms of the	Yes
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level contrast?	Unknown, not reported
ls reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↑ L insula ↑ R dorsolateral prefrontal cortex
Findings notes	R dorsolateral prefrontal cortex did not remain significant when lesion volume was included as a covariate
ROI analysis 31	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T3 vs T1
Covariate	$\Delta$ comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	_
POL analysis 22	

First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T3 vs T2
Covariate	$\Delta$ comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	_
ROI analysis 33	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia frontal T1 (n = 17)
Covariate	Comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-

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First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia frontal T2 (n = 17)
Covariate	Comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-
ROI analysis 35	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia frontal T3 (n = 17)
Covariate	Comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	
Findings	None

Findings notes

### **ROI analysis 36**

ROI dildiysis 50	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia frontal (n = 17) T2 vs T1
Covariate	Δ comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	_
ROI analysis 37	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia frontal (n = 17) T3 vs T1
Covariate	Δ comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical datails	

Statistical details

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Findings	None
Findings notes	-
ROI analysis 38	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia frontal (n = 17) T3 vs T2
Covariate	$\Delta$ comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-
ROI analysis 39	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia temporo-parietal T1 (n = 17)
Covariate	Comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Behavioral data notes Type of analysis	No differences in proportion of expected button presses by group or time, but behavioral
	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions Regions of interest (ROI)
Type of analysis ROI type	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions Regions of interest (ROI) Mixed
Type of analysis ROI type How many ROIs are there?	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions Regions of interest (ROI) Mixed 15 (1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional

Statistical details	-
Findings	↑ R anterior temporal
Findings notes	-
ROI analysis 40	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia temporo-parietal T2 (n = 17)
Covariate	Comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	
-	↑ L IFG pars opercularis ↑ L posterior STG/STS/MTG
Findings notes	
Findings notes	↑ L posterior STG/STS/MTG —
Findings notes	
Findings notes ROI analysis 41	<ul> <li>↑ L posterior STG/STS/MTG</li> <li>—</li> <li>Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech</li> <li>Cross-sectional correlation with language or other measure</li> </ul>
Findings notes  ROI analysis 41  First level contrast  Analysis class Group(s)	<ul> <li>↑ L posterior STG/STS/MTG</li> <li>—</li> <li>Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech</li> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia temporo-parietal T3 (n = 17)</li> </ul>
Findings notes ROI analysis 41 First level contrast Analysis class	<ul> <li>↑ L posterior STG/STS/MTG</li> <li>—</li> <li>Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech</li> <li>Cross-sectional correlation with language or other measure</li> </ul>
Findings notes  ROI analysis 41  First level contrast  Analysis class Group(s)	<ul> <li>↑ L posterior STG/STS/MTG</li> <li>—</li> <li>Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech</li> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia temporo-parietal T3 (n = 17)</li> </ul>
Findings notes  ROI analysis 41  First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the	<ul> <li>↑ L posterior STG/STS/MTG</li> <li>Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech</li> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia temporo-parietal T3 (n = 17)</li> <li>Comprehension composite</li> </ul>
Findings notes  FOI analysis 41  First level contrast  Analysis class  Group(s)  Covariate  Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?  Is accuracy matched across the second level	<ul> <li>              L posterior STG/STS/MTG       </li> <li>             Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to             normal sentences (paradigm 2) vs listening to reversed speech             Cross-sectional correlation with language or other measure             Aphasia temporo-parietal T3 (n = 17)             Comprehension composite             Yes             </li> </ul>
Findings notes Findings notes ROI analysis 41 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level	<ul> <li> <sup>†</sup> L posterior STG/STS/MTG         <ul> <li></li></ul></li></ul>
Findings notes Findings notes ROI analysis 41 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast?	<ul> <li>↑ L posterior STG/STS/MTG</li> <li>Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech</li> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia temporo-parietal T3 (n = 17)</li> <li>Comprehension composite</li> <li>Yes</li> <li>Unknown, not reported</li> <li>Unknown, not reported</li> <li>No differences in proportion of expected button presses by group or time, but behavioral</li> </ul>
Findings notes FOI analysis 41 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes	<ul> <li>↑ L posterior STG/STS/MTG</li> <li>Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech</li> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia temporo-parietal T3 (n = 17)</li> <li>Comprehension composite</li> <li>Yes</li> <li>Unknown, not reported</li> <li>Unknown, not reported</li> <li>No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions</li> </ul>
Findings notes First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis	<ul> <li></li></ul>
Findings notes For analysis 41 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type	<ul> <li>↑ L posterior STG/STS/MTG</li> <li></li> <li>Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech</li> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia temporo-parietal T3 (n = 17)</li> <li>Comprehension composite</li> <li>Yes</li> <li>Unknown, not reported</li> <li>Unknown, not reported</li> <li>No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions</li> <li>Regions of interest (ROI)</li> <li>Mixed</li> </ul>
Findings notes Findings notes ROI analysis 41 First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes Type of analysis ROI type How many ROIs are there?	<ul> <li>† L posterior STG/STS/MTG</li> <li>—</li> <li>Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech</li> <li>Cross-sectional correlation with language or other measure</li> <li>Aphasia temporo-parietal T3 (n = 17)</li> <li>Comprehension composite</li> <li>Yes</li> <li>Unknown, not reported</li> <li>Unknown, not reported</li> <li>No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions</li> <li>Regions of interest (ROI)</li> <li>Mixed</li> <li>15</li> <li>(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional</li> </ul>

	in frontal or temporal regions activated by the language contract in controls (45) have starting
	in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	_
ROI analysis 42	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia temporo-parietal (n = 17) T2 vs T1
Covariate	Δ comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	_
Findings	↑ L insula
Findings notes	
ROI analysis 43	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia temporo-parietal (n = 17) T3 vs T1
Covariate	$\Delta$ comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions

How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-

First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia temporo-parietal (n = 17) T3 vs T2
Covariate	Δ comprehension composite
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	_
ROI analysis 45	

First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional

	tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons Statistical details	No correction
Findings	↓ L IFG pars triangularis
Findings notes	Lesion volume negatively correlated with activation
ROI analysis 46	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T2
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	_
ROI analysis 47	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T3
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral

	SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesiona tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-
Ol analysis 48	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T2 vs T1
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesion tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	-
Ol analysis 49	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T3 vs T1
Covariate	Lesion volume
Is the second level contrast valid in terms of the	Yes

614

No differences in proportion of expected button presses by group or time, but behavioral

Unknown, not reported

Unknown, not reported

Regions of interest (ROI)

Mixed

15

data pooled across conditions

group(s), time point(s), and measures involved? Is accuracy matched across the second level

Is reaction time matched across the second level

contrast?

contrast?

ROI type

Behavioral data notes

How many ROIs are there?

Type of analysis

What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	_
Findings	None
Findings notes	_
ROI analysis 50	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal correlation with language or other measure
Group(s)	Aphasia T3 vs T2
Covariate	Lesion volume
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Regions of interest (ROI)
ROI type	Mixed
How many ROIs are there?	15
What are the ROI(s)?	(1) L IFG orb; (2) L IFG tri; (3) L IFG op; (4) L DLPFC; (5) L insula; (6) L ATL; (7) L PTL; (8) L SMA/dACC; (9) R L IFG orb; (10) R IFG tri; (11) R insula; (12) R DLPFC; (13) R ATL; (14) perilesional tissue; (15) regions homotopic to lesions
How are the ROI(s) defined?	(1-13) spheres around peaks of whole brain analysis of all patients collapsing across groups and timepoints; (14) perilesional ROIs were voxels 3-15 mm from the lesion that were located in frontal or temporal regions activated by the language contrast in controls; (15) homotopic ROIs were flipped lesions
Correction for multiple comparisons	No correction
Statistical details	-
Findings	None
Findings notes	_
Complex analysis 1	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia frontal T1 (n = 17) vs temporo-parietal T1 (n = 17)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Complex
Statistical details	Correlations between activity in 15 ROIs and LRScomp were compared between patients with

	frontal and temporal lesions, using interaction terms as well as the Fisher r-to-z transformation. <u>There was no correction for multiple comparisons across the 15 ROIs.</u>
Findings	Other
Findings notes	Correlations were higher in the temporal group in the R ATL.
omplex analysis 2	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia frontal T2 (n = 17) vs temporo-parietal T2 (n = 17)
Covariate	_
s the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Complex
Statistical details	Correlations between activity in 15 ROIs and LRScomp were compared between patients with frontal and temporal lesions, using interaction terms as well as the Fisher r-to-z transformation. There was no correction for multiple comparisons across the 15 ROIs.
Findings	Other
Findings notes	Correlations were higher in the temporal group in L posterior temporal cortex and L IFG op.
omplex analysis 3	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia frontal T3 (n = 17) vs temporo-parietal T3 (n = 17)
Covariate	_
s the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Complex
Statistical details	Correlations between activity in 15 ROIs and LRScomp were compared between patients with frontal and temporal lesions, using interaction terms. <u>There was no correction for multiple</u> <u>comparisons across the 15 ROIs.</u>
Findings	Other
Findings notes	Correlations were different between groups in the R ATL, but the correlation is not reported as significant in the temporo-parietal group alone.
omplex analysis 4	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia frontal (n = 17) T2 vs T1) vs (aphasia temporo-parietal (n = 17) T2 vs T1)
Covariate	_
ls the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
is accuracy matched across the second level	<u>Unknown, not reported</u>

contrast?	
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Complex
Statistical details	Correlations between changes in activity in 15 ROIs and changes in LRScomp were compared between patients with frontal and temporal lesions, using interaction terms as well as the Fisher r-to-z transformation. <u>There was no correction for multiple comparisons across the 15 ROIs.</u>
Findings	Other
Findings notes	In the L insula, the temporo-parietal group showed a stronger correlation than the frontal group between changes in activation and changes in LRScomp.
Complex analysis 5	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia frontal (n = 17) T3 vs T1) vs (temporo-parietal (n = 17) T3 vs T1)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Complex
Statistical details	Correlations between changes in activity in 15 ROIs and changes in LRScomp were compared between patients with frontal and temporal lesions, using interaction terms as well as the Fisher r-to-z transformation. <u>There was no correction for multiple comparisons across the 15 ROIs.</u>
Findings	Other
Findings notes	In the L insula, the temporo-parietal group showed a stronger correlation than the frontal group between changes in activation and changes in LRScomp.
Complex analysis 6	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia frontal (n = 17) T3 vs T2) vs (temporo-parietal (n = 17) T3 vs T2)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Complex
Statistical details	Correlations between changes in activity in 15 ROIs and changes in LRScomp were compared between patients with frontal and temporal lesions, using interaction terms as well as the Fisher r-to-z transformation. <u>There was no correction for multiple comparisons across the 15 ROIs.</u>
Findings	None
- 0,	

Findings notes

### Complex analysis 7

1 3	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia frontal T1 (n = 17) vs temporo-parietal T1 (n = 17)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Complex
Statistical details	Correlations between activity in 15 ROIs and lesion extent were compared between patients with frontal and temporal lesions. <u>There was no correction for multiple comparisons across</u> <u>the 15 ROIs.</u>
Findings	None
Findings notes	-
Complex analysis 8	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech

First level contrast	normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia frontal T2 (n = 17) vs temporo-parietal T2 (n = 17)
Covariate	-
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Complex
Statistical details	Correlations between activity in 15 ROIs and lesion extent were compared between patients with frontal and temporal lesions. <u>There was no correction for multiple comparisons across</u> the 15 ROIs.
Findings	None
Findings notes	_
Complex analysis 9	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional between two groups with aphasia
Group(s)	Aphasia frontal T3 (n = 17) vs temporo-parietal T3 (n = 17)

Covariate	
Is the second level contrast valid in terms of the	د
group(s), time point(s), and measures involved?	
Is accuracy matched across the second level	
contrast?	

Is reaction time matched across the second level contrast?

Behavioral data notes

No differences in proportion of expected button presses by group or time, but behavioral

Yes

Unknown, not reported

Unknown, not reported

	data pooled across conditions
Type of analysis	Complex
Statistical details	Correlations between activity in 15 ROIs and lesion extent were compared between patients with frontal and temporal lesions. <u>There was no correction for multiple comparisons across</u>
	<u>the 15 ROIs.</u>
Findings	None
Findings notes	_
Complex analysis 10	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia frontal (n = 17) T2 vs T1) vs (temporo-parietal (n = 17) T2 vs T1)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	Unknown, not reported
Is reaction time matched across the second level contrast?	Unknown, not reported
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Complex
Statistical details	Correlations between changes in activity in 15 ROIs and lesion extent were compared between patients with frontal and temporal lesions. <u>There was no correction for multiple comparisons</u> <u>across the 15 ROIs.</u>
Findings	None
Findings notes	-
Complex analysis 11	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia frontal (n = 17) T3 vs T1) vs (temporo-parietal (n = 17) T3 vs T1)
Covariate	_
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Complex
Statistical details	Correlations between changes in activity in 15 ROIs and lesion extent were compared between patients with frontal and temporal lesions. <u>There was no correction for multiple comparisons</u> <u>across the 15 ROIs.</u>
Findings	None
Findings notes	-
Complex analysis 12	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Longitudinal between two groups with aphasia
Group(s)	(Aphasia frontal (n = 17) T3 vs T2) vs (temporo-parietal (n = 17) T3 vs T2)
Covariate	_

Is the second level contrast valid in terms of the	
group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Complex
Statistical details	Correlations between changes in activity in 15 ROIs and lesion extent were compared between patients with frontal and temporal lesions. <u>There was no correction for multiple comparisons</u> across the 15 ROIs.
Findings	None
Findings notes	_
Complex analysis 13	
First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
Analysis class	Cross-sectional correlation with language or other measure
Group(s)	Aphasia T1
Covariate	Interaction of comprehension composite by lesion size
Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	Yes
Is accuracy matched across the second level contrast?	<u>Unknown, not reported</u>
Is reaction time matched across the second level contrast?	<u>Unknown, not reported</u>
Behavioral data notes	No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions
Type of analysis	Complex
Statistical details	To investigate why some activation-behavior relationships did not remain significant when lesion extent was included as a covariate, models were constructed looking at the relationship between activation and behavior in patients with larger and smaller lesions.
Findings	Other
Findings notes	The three regions where this applied at T1, namely perilesional cortex, L IFG op, and L IFG orb, all showed positive correlations between activation and LRScomp in patients with larger lesions, but no correlations in patients with smaller lesions.
Complex analysis 14	
Complex analysis 14 First level contrast	Listening to normal sentences and making a plausibility judgment (paradigm 1) or listening to normal sentences (paradigm 2) vs listening to reversed speech
First level contrast Analysis class	normal sentences (paradigm 2) vs listening to reversed speech Longitudinal correlation with language or other measure
First level contrast Analysis class Group(s)	normal sentences (paradigm 2) vs listening to reversed speech Longitudinal correlation with language or other measure Aphasia T2 vs T1
First level contrast Analysis class Group(s) Covariate	normal sentences (paradigm 2) vs listening to reversed speech Longitudinal correlation with language or other measure Aphasia T2 vs T1 Interaction of Δ comprehension composite by lesion size
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved?	normal sentences (paradigm 2) vs listening to reversed speech Longitudinal correlation with language or other measure Aphasia T2 vs T1 Interaction of Δ comprehension composite by lesion size Yes
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the	normal sentences (paradigm 2) vs listening to reversed speech Longitudinal correlation with language or other measure Aphasia T2 vs T1 Interaction of Δ comprehension composite by lesion size
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level	normal sentences (paradigm 2) vs listening to reversed speech Longitudinal correlation with language or other measure Aphasia T2 vs T1 Interaction of Δ comprehension composite by lesion size Yes
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level	normal sentences (paradigm 2) vs listening to reversed speech Longitudinal correlation with language or other measure Aphasia T2 vs T1 Interaction of Δ comprehension composite by lesion size Yes <u>Unknown, not reported</u>
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast?	normal sentences (paradigm 2) vs listening to reversed speech         Longitudinal correlation with language or other measure         Aphasia T2 vs T1         Interaction of Δ comprehension composite by lesion size         Yes         Unknown, not reported         Unknown, not reported         No differences in proportion of expected button presses by group or time, but behavioral
First level contrast Analysis class Group(s) Covariate Is the second level contrast valid in terms of the group(s), time point(s), and measures involved? Is accuracy matched across the second level contrast? Is reaction time matched across the second level contrast? Behavioral data notes	normal sentences (paradigm 2) vs listening to reversed speech         Longitudinal correlation with language or other measure         Aphasia T2 vs T1         Interaction of Δ comprehension composite by lesion size         Yes         Unknown, not reported         Unknown, not reported         No differences in proportion of expected button presses by group or time, but behavioral data pooled across conditions

Findings notesThis applied to the R DLPFC in the T2 vs T1 analysis. This region showed a positive correlation<br/>between activation and LRScomp in patients with larger lesions, but no correlation in patients<br/>with smaller lesions.NotesROI analyses 27-32 and 45-50 were carried out with and without lesion extent as a covariate,<br/>but are coded only once, with notes as to which regions did not remain significant when the<br/>covariate was included