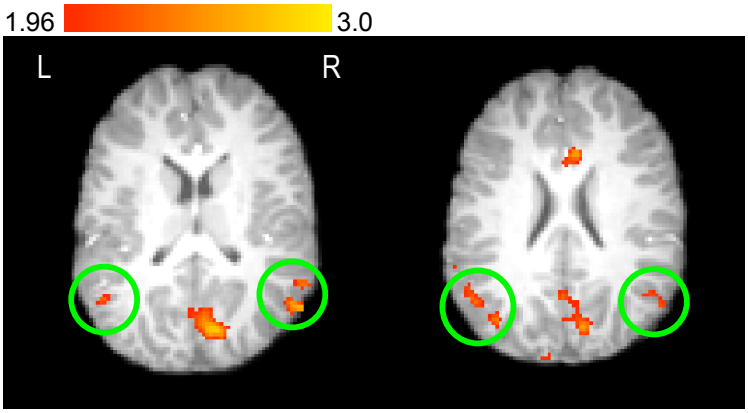
Supporting Information - Note: Analysis of OT group data at Session 1 matched to AR data

At Session 1, the mean number of runs included in the analysis differed significantly between OT and AR groups. (See Table 1, Number of usable runs, Session 1.) To examine whether the suprathreshold activations for the letter > false font contrast in the posterior dorsal region observed in the OT group, but not in the AR group, was due to the greater statistical power for the OT group data as compared to the AR group data, a supplementary analysis was conducted for the OT group reducing the number of runs included in the analysis to match the number of runs included for the AR group at Session 1. Six runs with the lowest mean absolute motion in the OT group were selected to be excluded so that the two groups would also be better matched on absolute motion (number of usable runs: M = 3.0, SD = 0.82; absolute motion (mm): M = 0.21, SD = 0.05). No more than two runs were excluded per participant so that there were at least two usable runs for each participant. This procedure resulted in the two groups matched on the number of usable runs ($t(12) = 0.0$, $p = 1.0$) and absolute motion ($t(12) = 0.69$, $p = 0.50$).

The single-subject multiple-run analysis for each participant and the group analysis were conducted as described in the methods section. Supporting Information – Figure 1 shows the statistical images of the matched analysis thresholded at $Z = 1.96$. As indicated by circles, the matched analysis revealed activations in the bilateral posterior dorsal regions similar in location to the activations observed in the unmatched analysis. Therefore, the activations found in the bilateral posterior dorsal regions in the OT group, but not AR group, at Session 1 was not attributable to the difference in the statistical power due to the larger number of runs included in the analysis of the OT group.

Supporting Information - Figure 1. Letter activations in the OT group at Session 1. The number of runs and motion in the data were matched to those in the AR group at Session 1. The circles indicate activations in the posterior dorsal region.



z = 16 z = 24

Supporting Information - Table 1. Regions showing activations for the letter > false font contrast in adults

Region	Volume (voxels)	Peak Z	p	MNI coordinates x	y	z
Frontal lobe						
L Superior frontal gyrus	183	2.79	< 0.005	-14	34	58
L Paracingulate gyrus	38	2.32	< 0.025	-4	48	24
L Frontal orbital cortex	32	2.96	< 0.005	-58	26	-10
L Frontal pole	13	2.48	< 0.01	-14	62	32
R Frontal pole	233	3.25	< 0.001	16	40	58
R Precentral gyrus	29	2.65	< 0.005	66	8	6
L/R Frontal medial cortex	48	2.42	< 0.01	-4	46	-22
L/R Subcallosal cortex	22	2.60	< 0.005	-2	28	-30
L/R Supplementary motor cortex	21	2.42	< 0.01	0	-4	62
Temporal lobe						
L Middle temporal gyrus, supramarginal gyrus	667	3.62	< 0.001	-68	-42	2
L Middle temporal, inferior temporal gyrus	323	3.15	< 0.001	-68	-16	-24
L Inferior temporal gyrus	38	2.80	< 0.005	-50	-10	-44
L Temporal pole	29	2.69	< 0.005	-48	4	-44
R Middle temporal gyrus	106	3.05	< 0.005	72	-20	-26
	12	2.22	< 0.025	68	-6	-14
Frontoparietal operculum						
L Central opercular cortex	81	2.88	< 0.005	-54	2	2
	19	2.37	< 0.01	-32	0	16
R Central opercular cortex	25	2.21	< 0.025	56	-8	8
Parietal lobe						
L Precuneus	221	2.74	< 0.005	-8	-56	30
L Postcentral gyrus	13	2.40	< 0.01	-58	-10	48
R Postcentral gyrus	52	2.99	< 0.005	40	-30	72
	30	3.02	< 0.005	48	-14	62
R Supramarginal gyrus	16	2.20	< 0.025	66	-46	40
Occipital lobe						
L Lateral occipital cortex	139	2.72	< 0.005	-52	-74	32
	29	2.27	< 0.025	-58	-66	20
L Occipital pole	41	2.49	< 0.01	-6	-94	16
L Lateral occipital cortex, angular gyrus	11	2.23	< 0.025	-40	-62	22
R Lateral occipital cortex, angular gyrus	167	2.93	< 0.005	64	-60	14

Supporting Information - Table 2. Regions showing activations for the letter > false font contrast in OT group at Session 1

Region	Volume (voxels)	Peak Z	p	MNI coordinates x	y	z
Frontal lobe						
L Frontal orbital cortex	170	2.63	< 0.005	-32	24	-18
	16	2.50	< 0.01	-26	18	-24
L Precentral gyrus	161	3.04	< 0.005	-16	-22	68
L Frontal medial cortex	13	2.67	< 0.005	-6	50	-20
	46	2.54	< 0.01	-4	40	-32
R Frontal orbital cortex	85	2.78	< 0.005	36	22	-14
	23	2.25	< 0.025	42	30	0
R Supplementary motor cortex	33	2.50	< 0.01	12	-6	46
L/R Subcallosal cortex	32	2.39	< 0.01	4	12	-18
	15	2.16	< 0.025	-4	6	-20
Temporal lobe						
L Inferior temporal gyrus	27	2.59	< 0.005	-54	-2	-40
L Middle temporal gyrus	22	2.25	< 0.025	-54	-60	2
L Superior temporal gyrus	10	2.08	< 0.025	-58	-38	2
R Superior temporal, middle temporal gyrus	327	2.72	< 0.005	54	-22	-10
R Temporal pole	24	2.30	< 0.025	32	8	-28
R Superior temporal gyrus	21	2.29	< 0.025	68	-34	8
R Inferior temporal gyrus	10	2.23	< 0.025	48	0	-40
Parietal lobe						
L Supramarginal gyrus	25	2.46	< 0.01	-64	-44	22
L Superior parietal lobule	22	2.27	< 0.025	-24	-48	68
R Angular gyrus	101	2.50	< 0.01	60	-52	14
R Precuneous cortex	59	2.61	< 0.005	24	-58	18
R Posterior cingulate gyrus	24	2.17	< 0.025	14	-34	44
	10	2.13	< 0.025	8	-20	44
R Superior parietal lobule	13	2.22	< 0.025	26	-48	56
R Supramarginal gyrus	12	2.11	< 0.025	66	-40	48
L/R Precuneous cortex	1197	2.78	< 0.005	-4	-58	54
Occipital lobe						
L Lateral occipital cortex, supramarginal, angular gyrus	166	2.52	< 0.01	-42	-66	18
R Lateral occipital cortex	66	2.42	< 0.01	44	-60	26
R Occipital pole	11	2.25	< 0.025	14	-94	16
L/R Supracalcarine, intracalcarin cortex, precuneus	62	2.27	< 0.025	-2	-68	16
Subcortical						
R Hippocampus	25	2.31	< 0.025	20	-12	-16

Supporting Information - Table 3. Regions showing activations for the letter > false font contrast in AR group at Session 1

Region	Volume (voxels)	Peak Z	p	MNI coordinates		
				x	y	z
Frontal lobe						
L Middle frontal gyrus	33	2.23	< 0.025	-44	30	42
R Middle frontal gyrus	175	2.58	< 0.005	38	24	52
R Frontal pole	15	2.27	< 0.025	42	50	28
Temporal lobe						
L Temporal pole	32	2.61	< 0.005	-38	6	-24

Supporting Information - Table 4. Regions showing activations for the letter > false font contrast in OT group at Session 2

Region	Volume (voxels)	Peak Z	p	MNI coordinates x	y	z
Frontal lobe						
L Middle frontal gyrus	33	2.33	< 0.01	-34	16	52
R Frontal pole	112	2.76	< 0.005	50	50	-16
Temporal lobe						
L Temporal pole	42	2.44	< 0.01	-30	26	-36
L Middle temporal gyrus	33	2.19	< 0.025	-66	-42	-12
R Middle temporal gyrus	91	2.34	< 0.01	72	-24	-18
R Temporal pole	16	2.33	= .01	60	6	-40
Parietal lobe						
L Postcentral gyrus	13	2.32	< 0.025	-40	-34	74
L/R Precuneous cortex	139	2.38	< 0.01	4	-58	32
Occipital lobe						
L Lateral occipital cortex, angular gyrus	1527	2.89	< 0.005	-42	-76	46
R Occipital pole	28	2.11	< 0.025	4	-94	30
R Lateral occipital cortex	24	2.25	< 0.025	56	-68	38
R Lateral occipital cortex, angular gyrus	17	2.25	< 0.025	64	-60	28

Supporting Information - Table 5. Regions showing activations for the letter > false font contrast in AR group at Session 2

Region	Volume (voxels)	Peak Z	p	MNI coordinates x	y	z
Frontal lobe						
L Middle frontal, inferior frontal gyrus, frontal pole	652	2.75	< 0.005	-40	34	18
L Precentral gyrus	57	2.48	< 0.01	-42	4	26
L Frontal pole	35	2.23	< 0.025	-26	50	-14
	30	2.13	< 0.025	-36	64	-4
L Middle frontal gyrus	33	2.21	< 0.025	-36	10	40
R Middle frontal, superior frontal gyrus, frontal pole	563	2.60	< 0.005	32	30	32
R Frontal pole	125	2.65	< 0.005	28	64	-10
R Precentral gyrus	19	2.17	< 0.025	36	0	36
L/R Anterior cingulate, paracingulate gyrus	1128	2.84	< 0.005	-4	30	30
L/R Anterior cingulate gyrus	86	2.54	< 0.01	6	34	8
Temporal lobe						
L Middle temporal, supramarginal gyrus	297	2.77	< 0.005	-68	-26	-4
Parietal lobe						
L Angular gyrus	16	2.31	< 0.025	-54	-54	50
R Supramarginal, angualr gyrus	120	2.38	< 0.01	54	-46	38
R Precuneous cortex	92	2.64	< 0.005	12	-64	42
R Postcentral gyrus	34	2.50	< 0.01	18	-36	58
Occipital lobe						
L Occipital pole	37	2.26	< 0.01	-10	-90	10
R Lingual gyrus	220	2.69	< 0.005	8	-86	-16

Supporting Information - Table 6. Regions showing differences in activations between OT and AR groups for letter > false font contrast at Session 1

Region	Volume (voxels)	Peak Z	p	MNI coordinates x	y	z
OT group > AR group						
Frontal lobe						
L Frontal orbital cortex	38	3.05	< 0.005	-40	26	-16
L Inferior frontal gyrus	21	3.17	< 0.001	-48	24	16
	13	3.22	< 0.001	-58	26	8
R Inferior frontal gyrus	29	3.20	< 0.001	56	28	20
R Superior frontal gyrus	12	2.88	< 0.005	12	4	66
R Anterior cingulate gyrus	12	2.82	< 0.005	10	-4	44
R Frontal orbital cortex	10	2.81	< 0.005	38	28	-14
L/R Precentral gyrus	981	4.19	< 0.0001	-10	-20	72
Temporal lobe						
L Inferior temporal gyrus	76	3.39	< 0.0005	-56	-46	-12
L Middle temporal gyus	11	2.81	< 0.005	-62	-8	-8
R Middle temporal gyrus	14	2.80	< 0.005	52	-18	-10
R Temporal fusiorm cortex	14	3.26	< 0.001	26	0	-40
R Superior temporal gyrus	12	2.83	< 0.005	48	-32	6
Parietal lobe						
L Superior parietal lobule	335	3.46	< 0.0005	-24	-48	68
L Supramarginal gyrus	111	3.22	< 0.0005	-64	-46	20
R Superior parietal lobule	36	3.01	< 0.005	26	-50	56
	10	2.89	< 0.005	34	-52	44
R Supramarginal gyrus	12	2.75	< 0.005	70	-38	14
Occipital lobe						
L Lateral occipital cortex	41	2.90	< 0.005	-60	-64	-4
	17	2.77	< 0.005	-46	-64	16
R Occipital pole	18	2.88	< 0.005	10	-104	-2
L/R Supracalcarine cortex	68	2.83	< 0.005	2	-68	16
Subcortical						
L Putamen	42	3.08	< 0.005	-20	-2	14
L Thalamus	13	2.89	< 0.005	-2	-14	0
R Putamen	618	3.65	< 0.0005	20	0	10
R Amygdala	90	3.02	< 0.005	22	-12	-14
AR group > OT group						
Frontal lobe						
R Frontal orbital cortex	20	3.30	= 0.0005	12	30	-22

Supporting Information - Table 7. Regions showing differences in activations between OT and AR groups for letter > false font contrast at Session 2

Region	Volume (voxels)	Peak Z	p	MNI coordinates x	y	z
OT group > AR group						
Occipital lobe						
L Lateral occipital cortex	41	3.09	< 0.005	-38	-78	40
AR group > OT group						
Frontal lobe						
L Precentral gyrus	54	2.96	< 0.005	-56	4	26
L Inferior frontal gyrus	20	2.93	< 0.005	-36	34	16
L Frontal pole	18	2.73	< 0.005	-22	54	2
	10	2.73	< 0.005	-34	42	22
R Superior frontal gyrus	167	3.30	= 0.0005	20	-10	62
R Middle frontal gryus	144	3.45	< 0.0005	32	14	28
R Precentral gyrus	50	3.07	< 0.005	34	0	36
R Anterior cingulate cortex	15	2.74	< 0.005	4	36	8
L/R Paracingulate gyrus	269	3.14	< 0.001	10	22	38
Temporal lobe						
R Planum temporale	11	2.93	< 0.005	54	-22	8
Frontoparietal operclulum						
R Frontal operculum cortex	37	2.86	< 0.005	42	26	2
Parietal lobe						
L Superior parietal lobule	19	2.88	< 0.005	-28	-56	54
	12	2.89	< 0.005	-28	-42	40
R Supramarginal gyrus	65	3.38	< 0.0005	60	-20	30
R Precuneous cortex	53	3.03	< 0.005	12	-68	50
R Postcentral gyrus	36	3.21	< 0.001	16	-42	56
Occipital lobe						
L Occipital pole	12	2.93	< 0.005	-8	-94	8
R Lateral occipital cortex	50	3.17	< 0.001	30	-64	56
R Lingual gyrus	37	3.45	< 0.0005	6	-86	-16

Supporting Information - Table 8. Regions showing differences in activations between Session 1 and Session 2 for letter > false font contrast in OT group

Region	Volume (voxels)	Peak Z	p	MNI coordinates x	y	z
Session 2 > Session 1						
Frontal lobe						
R Frontal pole	54	2.66	< 0.005	34	60	4
	40	2.75	< 0.005	46	54	-18
Temporal lobe						
R Temporo-occipital fusiform gyrus	37	2.71	< 0.005	48	-38	-30
Session 1 > Session 2						
Frontal lobe						
L Precentral gyrus	96	2.88	< 0.005	-14	-20	66
L Frontal orbital cortex	15	2.58	< 0.005	-32	34	-10
R Frontal orbital cortex	66	2.65	< 0.005	40	30	0
R Supplementary motor cortex	19	2.58	< 0.005	14	-6	44
Temporal lobe						
L Temporal pole	24	2.64	< 0.005	-46	4	-12
R Temporal pole	35	2.62	< 0.005	40	16	-18
Frontoparietal operclulum						
R Parietal operculum cortex	10	2.52	< 0.01	40	-20	22
Parietal lobe						
L Precuneous cortex	21	2.60	< 0.005	-14	-60	50
R Postcentral gyrus	124	2.64	< 0.005	18	-46	52
R Precuneous cortex	37	2.67	< 0.005	22	-58	18
R Supramarginal gyrus	18	2.80	< 0.005	66	-38	50
Occipital lobe						
R Lateral occipital cortex	15	2.53	< 0.01	14	-62	62
Subcortical						
R Putamen	31	2.68	< 0.005	16	4	-8

Supporting Information - Table 9. Regions showing differences in activations between Session 1 and Session 2 for letter > false font contrast in AR group

Region	Volume (voxels)	Peak Z	p	MNI coordinates x	y	z
Session 2 > Session 1						
Frontal lobe						
L Inferior frontal, precentral gyrus	738	3.02	< 0.005	-48	24	14
L Precentral gyrus	38	2.72	< 0.005	-20	-24	58
L Frontal pole	15	2.49	< 0.01	-20	66	4
L Frontal orbital cortex	15	2.41	< 0.01	-24	34	-16
R Precentral gyrus	80	2.71	< 0.005	56	8	24
	15	2.64	< 0.005	42	-2	26
R Frontal pole	58	2.62	< 0.005	16	36	42
R Middle frontal gyrus	58	2.66	< 0.005	38	16	30
R Inferior frontal gyrus	26	2.61	< 0.005	54	30	18
R Frontal pole	21	2.42	< 0.01	40	50	12
R Paracingulate cortex	16	2.50	< 0.01	10	10	46
R Superior frontal gyrus	15	2.48	< 0.01	18	-8	58
L/R Anterior cingualte cortex	529	2.79	< 0.005	6	30	12
Temporal lobe						
L Middle temporal gyrus	161	2.89	< 0.005	-66	-42	-10
	32	3.09	< 0.005	-68	-26	-4
L Superior temporal gyrus	29	2.72	< 0.005	-66	-14	-4
R Inferior temporal gyrus	18	2.55	< 0.01	54	-42	-18
R Planum temporale	14	2.54	< 0.01	62	-10	0
R Temporal fusiform cortex	12	2.70	< 0.005	26	-2	-40
Parietal lobe						
L Angular, supramarginal gyrus	164	2.93	< 0.005	-62	-50	12
L Postcentral gyrus	109	2.79	< 0.005	-22	-42	60
L Postcentral gyrus	64	2.66	< 0.005	-38	-38	46
L Superior parietal lobule	41	2.61	< 0.005	-28	-56	54
R Precuneous cortex	170	2.81	< 0.005	10	-70	46
R Postcentral gyrus	112	2.79	< 0.005	18	-32	74
R Postcentral gyrus	15	2.48	< 0.01	14	-40	54
R Angular gyrus	36	2.65	< 0.005	58	-46	14
R Superior parietal lobule	27	2.62	< 0.005	38	-46	60
R Supramarginal gyrus	19	2.60	< 0.005	54	-46	38
L/R Postserior cingulate gyrus	19	2.59	< 0.005	4	-40	26
Occipital lobe						
L Lateral occipital cortex	25	2.49	< 0.01	-48	-72	12
	10	2.47	< 0.01	-46	-82	12
L Cuneal cortex	18	2.49	< 0.01	-4	-74	26
R Lingual gyrus	142	2.74	< 0.005	10	-86	-14
R Lateral occipital cortex	18	2.65	< 0.005	38	-58	58
Subcortical						
L Putamen	41	2.65	< 0.005	-18	-8	14
	17	2.65	< 0.005	-20	4	0
L Thalamus	15	2.57	< 0.005	-12	-14	2
R Putamen	235	2.98	< 0.005	22	0	10
	16	2.50	< 0.01	28	-16	4
Session 1 > Session 2						
Temporal lobe						
L Tempral pole	30	2.57	< 0.005	-38	8	-22