Supplementary material for Wilson et al., 'Recovery from aphasia in the first year after stroke'

Supplementary Table 1 Initial QAB overall: model parameters

Variable	Estimate	SE	*t*
Intercept	9.792	0.849	11.54
Location NA	[Reference]		
Location F–	–1.059	0.519	–2.04
Location F+d	–2.916	0.752	–3.88
Location F+v	–3.960	0.756	–5.25
Location FTP	–3.401	1.012	–3.36
Location TP–	–0.6251	0.566	–1.10
Location TP+	–3.552	0.777	–4.57
Location P	0.0512	0.605	0.08
Location VT	–0.160	0.574	–0.28
Location BG	–0.147	0.442	–0.33
Location Th	–0.224	0.517	–0.43
Location M	–0.175	0.680	–0.26
Location O	1.192	0.610	1.95
Location R	0.861	0.635	1.36
Extent	–0.036	0.008	–4.52
Extent^2	6.83e–05	2.57e–05	2.66
Stroke type (H)	–0.968	0.304	–3.18
Age	–0.030	0.008	–3.68
Sex (F)	0.247	0.228	1.08
Handedness (L/A)	0.376	0.351	1.07
Education	0.050	0.039	1.30

Dependent variable: Initial QAB overall
Number of observations: 332
Error degrees of freedom: 311

Supplementary Table 2 Models of initial domain-specific subscores

	WC	SC	WF	GC	PE	SMP	SME	R
Full model r^2	46.0%	46.8%	57.4%	54.1%	42.3%	43.7%	22.7%	55.5%
Lesion location (p)	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	.0024
Lesion extent (p)	.0006	.066	<.0001	<.0001	.0008	<.0001	.0052	<.0001
Lesion loc/ext (Δr^2)	41.6%	37.4%	53.7%	50.7%	37.9%	41.6%	20.1%	51.2%
Stroke type (p)	.033	.45	.0086	.11	.66	.42	.97	.012
Stroke type (Δr^2)	0.8%	—	0.9%	—	—	—	—	0.9%
Age (p)	<.0001	<.0001	<.0001	.040	.0024	.95	.055	.0022
Age (Δr^2)	4.0%	4.9%	2.6%	0.6%	2.0%	—	—	1.4%
Sex (p)	.39	.0072	.11	.35	.049	.18	.0096	.17
Sex (Δr^2)	—	1.2%	—	—	0.8%	—	1.7%	—
Handedness (p)	.37	.84	.39	.016	.93	.55	.98	.29
Handedness (Δr^2)	—	—	—	0.9%	—	—	—	—
Education (p)	.28	.0060	.22	.10	.28	.41	.41	.0004
Education (Δr^2)	—	1.3%	—	—	—	—	—	1.9%

WC = Word comprehension; SC = Sentence comprehension; WF = Word finding; GC = Grammatical construction; PE = Phonological encoding; SMP = Speech motor programming; SME = Speech motor execution; R = Reading.

Supplementary Table 3 Recovery of QAB overall: model parameters

Variable	Estimate	SE	*t*
(Intercept)	0.800	0.122	6.58
Preceding score	0.024	0.017	1.45
Preceding score^2	–0.010	0.002	–6.24
Timepoint T1–T2	[Reference]		
Timepoint T2–T3	–0.058	0.031	–1.89
Timepoint T3–T4	–0.132	0.036	–3.68
Location NA	[Reference]		
Location F–	0.101	0.069	1.47
Location F+d	0.117	0.071	1.65
Location F+v	0.166	0.071	2.34
Location FTP	–0.203	0.086	–2.37
Location TP–	0.018	0.075	0.24
Location TP+	–0.046	0.079	–0.59
Location P	0.083	0.071	1.17
Location VT	0.066	0.070	0.94
Location BG	0.021	0.068	0.31
Location Th	0.036	0.075	0.49
Location M	0.187	0.087	2.15
Extent	–0.001	0.001	–1.88
Extent^2	2.19e–06	2.11e–06	1.04
Stroke type (H)	0.054	0.035	1.56
Age	–0.001	0.001	–1.29
Sex (F)	0.009	0.025	0.37
Handedness (L/A)	–0.048	0.039	–1.24
Education	0.008	0.004	1.83

Dependent variable: Change in QAB overall between consecutive timepoints (transformed)
Number of observations: 298
Fixed effects coefficients: 23
Random effects coefficients: 120
Covariance parameters: 2

Supplementary Table 4 Models of recovery of domain-specific subscores

	WC	SC	WF	GC	PE	SMP	SME	R
Full model r^2	62.8%	30.5%	51.3%	66.0%	46.7%	53.9%	75.9%	49.3%
Preceding score (p)	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
Timepoint (p)	.49	.38	.046	.0029	.17	.13	.050	.0018
Preceding/Time (Δr^2)	54.6%	25.5%	41.0%	46.6%	40.9%	23.3%	45.0%	37.6%
Lesion location (p)	.60	.011	.17	.0001	.19	.013	.91	.24
Lesion extent (p)	.28	.18	.0079	.85	.70	.96	.13	.45
Lesion loc/ext (Δr^2)	3.1%	11.2%	11.7%	9.9%	4.7%	6.9%	0.9%	3.7%
Stroke type (p)	.99	.90	.20	.0022	.64	.73	.83	.039
Stroke type (Δr^2)	—	—	—	1.2%	—	—	—	0.8%
Age (p)	.32	.23	.0005	.70	.095	.96	.78	.24
Age (Δr^2)	—	—	2.2%	—	—	—	—	—
Sex (p)	.43	.54	.61	.013	.37	.69	.78	.0006
Sex (Δr^2)	—	—	—	0.8%	—	—	—	2.2%
Handedness (p)	.15	.47	.77	.44	.42	.69	.19	.70
Handedness (Δr^2)	—	—	—	—	—	—	—	—
Education (p)	.18	.19	.73	.0022	.30	.54	.75	.011
Education (Δr^2)	—	—	—	1.2%	—	—	—	1.2%

WC = Word comprehension; SC = Sentence comprehension; WF = Word finding; GC = Grammatical construction; PE = Phonological encoding; SMP = Speech motor programming; SME = Speech motor execution; R = Reading.

Supplementary Dataset

PID	Aphasia	Age	SexF	HandLA	Educ	StrHem	Location	Extent	QAB_T1	QAB_T2	QAB_T3	QAB_T4	QAB_T1i	QAB_T2i	QAB_T3i	QAB_T4i
1527	1	80	0	0	19	1	VT	13.648	3.0900	--	6.5200	8.6500	3.0900	5.5013	6.5200	8.6500
1526	0	50	1	0	9	0	NA	4.864	8.5000	--	--	--	8.5000	--	--	--
1525	0	76	1	0	13	0	VT	6.160	8.1200	--	--	--	8.1200	--	--	--
1528	0	54	1	0	12	1	F–	6.232	8.7500	--	--	--	8.7500	--	--	--
1529	1	69	1	1	12	0	FTP	248.400	8.0000	--	--	--	8.0000	--	--	--
1530	1	68	0	0	8	0	O	23.192	6.9700	--	--	--	6.9700	--	--	--
1531	0	77	1	0	14	0	Th	0.488	8.8300	--	--	--	8.8300	--	--	--
1532	1	80	1	0	15	1	VT	33.504	5.8800	--	8.8200	8.9700	5.8800	7.9468	8.8200	8.9700
1533	1	57	0	0	12	1	BG	39.928	5.6900	--	--	--	5.6900	--	--	--
1534	1	84	1	0	8	0	BG	11.280	6.9100	--	--	--	6.9100	--	--	--
1539	1	42	1	0	18	0	F+d	261.424	-1.0000	--	--	7.3600	0.0000	4.8472	6.5965	7.3600
1535	1	53	0	0	12	0	FTP	199.512	-1.0000	--	2.4800	3.5800	0.0000	1.7434	2.4800	3.5800
1540	0	22	1	0	14	0	BG	15.336	9.5700	--	--	--	9.5700	--	--	--
1541	1	81	1	0	14	0	F+v	51.864	-1.0000	7.4600	8.0500	8.8100	0.0000	7.4600	8.0500	8.8100
1542	0	85	1	0	12	0	BG	1.784	9.0300	--	--	--	9.0300	--	--	--
1543	0	78	1	0	12	1	BG	2.208	9.0500	--	--	--	9.0500	--	--	--
1549	1	74	0	0	14	0	TP+	42.088	4.1300	5.9200	7.4500	--	4.1300	5.9200	7.4500	--
1548	1	63	0	1	12	0	NA	30.272	6.8400	--	--	--	6.8400	--	--	--
1550	1	56	1	0	12	0	F+v	94.944	1.9800	7.1600	--	--	1.9800	7.1600	--	--
1552	1	51	0	0	12	0	F+v	59.720	4.4600	--	--	--	4.4600	--	--	--
1553	1	80	1	0	20	0	BG	26.264	8.4600	--	--	--	8.4600	--	--	--
1554	1	43	1	0	15	0	F+d	112.400	2.5300	4.2400	6.7100	7.8600	2.5300	4.2400	6.7100	7.8600
1556	1	76	1	0	12	0	F+v	96.528	4.8200	7.7800	--	9.1500	4.8200	7.7800	8.7338	9.1500
1557	1	64	1	0	12	0	F–	13.256	9.2400	9.6700	9.8200	--	9.2400	9.6700	9.8200	--
1560	1	56	1	0	14	0	Th	2.408	8.4800	--	--	--	8.4800	--	--	--
1561	0	78	1	0	15	1	Th	2.304	8.9300	--	--	--	8.9300	--	--	--
1562	0	45	0	0	14	1	BG	1.904	9.7800	--	--	--	9.7800	--	--	--
1563	1	50	1	0	9	0	F+v	102.088	0.9900	2.6200	--	--	0.9900	2.6200	--	--
1564	1	81	1	0	12	0	TP–	42.544	8.2400	7.9000	8.8500	--	8.2400	7.9000	8.8500	--
1565	0	75	1	0	18	0	NA	1.960	8.6100	--	--	--	8.6100	--	--	--
1566	1	72	0	0	16	1	BG	4.896	8.3000	9.2300	9.5600	--	8.3000	9.2300	9.5600	--
1569	1	23	1	0	11	1	NA	118.728	-1.0000	--	3.4200	3.4500	0.0000	2.4042	3.4200	3.4500
1568	0	67	0	0	14	0	BG	2.408	9.4900	--	--	--	9.4900	--	--	--
1570	0	48	1	0	12	0	NA	10.032	9.1100	--	--	--	9.1100	--	--	--
1572	0	74	1	0	17	0	Th	1.240	10.0000	--	--	--	10.0000	--	--	--
1577	1	39	1	0	12	0	FTP	376.400	-1.0000	-1.0000	5.3100	--	0.0000	0.0000	5.3100	--
1575	0	60	0	0	9	1	BG	8.376	8.9300	--	--	--	8.9300	--	--	--
1573	1	74	0	1	18	0	P	33.464	5.6900	--	--	--	5.6900	--	--	--
1578	1	74	1	0	14	1	TP+	72.744	-1.0000	5.0600	--	--	0.0000	5.0600	--	--
1584	1	46	1	0	16	1	BG	25.120	7.9100	--	9.3000	9.2900	7.9100	8.8872	9.3000	9.2900
1588	1	48	1	0	16	0	BG	10.680	8.5000	--	--	--	8.5000	--	--	--
1589	1	29	1	0	16	0	TP+	102.560	4.8000	--	7.0800	7.1900	4.8000	6.4028	7.0800	7.1900
1590	0	52	1	1	15	0	Th	0.936	9.5700	--	--	--	9.5700	--	--	--
1593	1	58	0	0	14	1	Th	4.536	8.4000	9.8500	9.7500	--	8.4000	9.8500	9.7500	--
1594	1	41	0	0	14	0	F+v	46.720	5.2700	7.5200	9.4500	9.6100	5.2700	7.5200	9.4500	9.6100
1596	0	64	1	0	12	0	NA	5.968	9.8100	--	--	--	9.8100	--	--	--
1600	1	71	0	0	12	0	F+d	103.520	5.3100	--	--	--	5.3100	--	--	--
1598	0	63	1	1	12	0	VT	3.712	8.2400	--	--	--	8.2400	--	--	--
1601	0	75	1	0	12	0	R	1.656	9.5400	--	--	--	9.5400	--	--	--
1602	1	47	0	0	10	1	F–	12.472	8.5500	9.2200	9.9000	9.8800	8.5500	9.2200	9.9000	9.8800
1604	0	45	0	0	16	0	NA	5.736	10.0000	--	--	--	10.0000	--	--	--
1603	1	64	1	0	12	0	BG	8.736	8.4000	--	--	--	8.4000	--	--	--
1606	0	69	0	0	16	0	BG	18.672	9.3300	--	--	--	9.3300	--	--	--
1609	1	60	0	0	16	0	F+v	95.536	0.9800	3.1500	--	--	0.9800	3.1500	--	--
1610	1	80	1	0	12	0	F+d	64.032	0.1500	--	--	--	0.1500	--	--	--
1612	0	70	0	0	20	0	R	10.008	8.6800	--	--	--	8.6800	--	--	--
1611	0	55	1	0	12	1	O	9.104	9.0000	--	--	--	9.0000	--	--	--
1616	0	90	0	1	15	1	Th	1.696	9.1900	--	--	--	9.1900	--	--	--

1619	1	51	0	0	12	0	FTP	231.624	-1.0000	4.8600	3.4000	3.9400	0.0000	4.8600	3.4000	3.9400
1618	0	58	0	0	12	0	Th	1.304	9.3500	--	--	--	9.3500	--	--	--
1617	0	58	1	0	16	0	BG	5.640	9.7800	--	--	--	9.7800	--	--	--
1620	1	70	1	0	3	0	TP–	15.968	7.3400	--	--	--	7.3400	--	--	--
1622	0	84	1	0	12	0	F–	8.480	9.2500	--	--	--	9.2500	--	--	--
1630	1	21	1	0	12	1	F+d	67.872	2.7800	--	--	--	2.7800	--	--	--
1631	0	85	1	1	12	0	R	5.336	8.8700	--	--	--	8.8700	--	--	--
1634	1	73	0	0	11	0	NA	31.528	8.1400	8.3200	8.8300	9.2300	8.1400	8.3200	8.8300	9.2300
1638	1	62	0	0	12	0	F–	22.976	3.0700	--	--	--	3.0700	--	--	--
1640	0	49	0	0	16	0	M	23.616	9.2700	--	--	--	9.2700	--	--	--
1642	0	64	0	0	14	0	NA	1.656	9.4900	--	--	--	9.4900	--	--	--
1643	1	82	1	0	12	0	R	10.080	8.0400	--	--	--	8.0400	--	--	--
1644	0	46	0	0	12	0	BG	2.192	8.9000	--	--	--	8.9000	--	--	--
1646	1	65	1	0	14	0	NA	23.424	5.8700	--	--	--	5.8700	--	--	--
1647	1	46	1	1	16	0	FTP	198.856	4.6400	5.3200	--	4.8100	4.6400	5.3200	4.9650	4.8100
1648	0	87	1	0	15	0	NA	2.568	9.8000	--	--	--	9.8000	--	--	--
1649	1	51	0	0	12	0	F–	61.504	8.6100	9.5000	9.2500	--	8.6100	9.5000	9.2500	--
1651	1	44	1	0	16	0	F+d	145.472	3.8600	7.3400	8.9100	--	3.8600	7.3400	8.9100	--
1650	0	63	0	0	16	0	VT	51.160	9.8900	--	--	--	9.8900	--	--	--
1652	1	67	0	0	3	0	F+d	131.888	4.7900	7.3900	7.2800	7.7200	4.7900	7.3900	7.2800	7.7200
1653	0	65	0	0	17	0	O	8.536	9.6400	--	--	--	9.6400	--	--	--
1654	1	71	0	0	16	0	F+v	64.664	0.0000	3.1800	5.8100	6.8100	0.0000	3.1800	5.8100	6.8100
1656	1	80	1	0	12	0	F–	4.464	6.9600	7.7300	7.7600	8.6600	6.9600	7.7300	7.7600	8.6600
1657	1	75	1	0	18	0	TP–	1.192	9.3300	--	9.7300	--	9.3300	9.6112	9.7300	--
1658	0	67	0	0	12	0	F–	2.184	9.2200	--	--	--	9.2200	--	--	--
1659	1	76	1	0	18	0	TP+	87.296	0.8300	2.6800	--	--	0.8300	2.6800	--	--
1670	1	77	1	0	7	1	O	5.024	8.9300	--	--	--	8.9300	--	--	--
1661	0	68	1	0	20	0	BG	7.264	9.9500	--	--	--	9.9500	--	--	--
1663	1	42	1	1	12	0	P	172.776	8.3500	8.9700	9.0500	9.2400	8.3500	8.9700	9.0500	9.2400
1667	1	44	0	1	15	0	VT	145.240	6.8500	6.8500	--	--	6.8500	6.8500	--	--
1666	0	76	0	0	12	1	O	9.696	9.5900	--	--	--	9.5900	--	--	--
1671	1	42	0	0	12	1	BG	20.624	-1.0000	5.5200	8.1900	8.0100	0.0000	5.5200	8.1900	8.0100
1676	1	42	1	1	12	0	BG	39.576	7.7200	--	--	--	7.7200	--	--	--
1669	1	51	0	0	16	0	VT	35.024	8.4600	--	--	--	8.4600	--	--	--
1674	0	58	0	0	15	0	R	5.504	8.9200	--	--	--	8.9200	--	--	--
1678	0	49	1	0	11	0	NA	13.920	8.0500	--	--	--	8.0500	--	--	--
1681	1	73	0	0	20	0	BG	4.568	8.2700	--	9.6200	--	8.2700	9.2190	9.6200	--
1679	0	58	0	0	12	1	Th	1.176	10.0000	--	--	--	10.0000	--	--	--
1680	1	57	0	0	12	0	VT	62.504	8.1200	--	--	--	8.1200	--	--	--
1682	0	63	0	0	8	0	BG	5.680	9.0300	--	--	--	9.0300	--	--	--
1686	1	54	0	0	16	0	FTP	164.904	0.0800	0.2200	1.1000	2.1500	0.0800	0.2200	1.1000	2.1500
1685	1	67	1	0	8	0	Th	0.624	5.4800	--	--	--	5.4800	--	--	--
1688	1	50	1	0	12	1	Th	5.656	7.9800	9.0800	--	--	7.9800	9.0800	--	--
1689	0	72	1	0	12	0	BG	3.280	8.8600	--	--	--	8.8600	--	--	--
1690	0	42	1	1	16	0	BG	14.632	8.7100	--	--	--	8.7100	--	--	--
1691	0	77	0	0	16	0	--	NaN	9.7500	--	--	--	9.7500	--	--	--
1692	1	61	1	0	12	0	F+d	73.248	4.5200	--	--	--	4.5200	--	--	--
1699	0	51	1	0	12	1	M	29.624	9.0600	--	--	--	9.0600	--	--	--
1698	0	51	0	1	16	0	NA	3.400	9.5100	--	--	--	9.5100	--	--	--
1697	1	43	0	0	13	1	NA	13.496	8.6700	--	--	--	8.6700	--	--	--
1701	1	76	0	0	12	0	P	53.224	4.4000	--	--	--	4.4000	--	--	--
1700	0	63	1	0	16	0	NA	4.072	9.3200	--	--	--	9.3200	--	--	--
1702	1	80	0	0	12	0	P	22.016	6.7000	7.5200	8.1400	8.7100	6.7000	7.5200	8.1400	8.7100
1703	1	71	0	0	12	0	F+d	128.952	2.4700	--	--	--	2.4700	--	--	--
1704	0	60	1	0	16	0	O	12.928	9.8200	--	--	--	9.8200	--	--	--
1705	0	74	0	0	12	0	TP–	12.336	9.9000	--	--	--	9.9000	--	--	--
1706	0	71	1	0	12	0	BG	5.464	9.3700	--	--	--	9.3700	--	--	--
1707	0	28	0	0	13	0	NA	1.584	9.8000	--	--	--	9.8000	--	--	--
1709	1	65	0	0	9	1	M	42.832	5.4100	--	--	--	5.4100	--	--	--
1711	1	83	0	0	11	0	P	35.808	6.6500	6.8300	7.5800	--	6.6500	6.8300	7.5800	--
1710	1	60	0	1	13	0	F–	13.824	7.4400	--	--	--	7.4400	--	--	--
1712	1	48	0	0	12	0	BG	28.312	7.8100	8.5600	--	--	7.8100	8.5600	--	--
1713	1	61	1	0	14	0	F–	38.432	3.5300	6.9700	8.0300	8.6600	3.5300	6.9700	8.0300	8.6600
1714	0	81	1	0	12	1	BG	5.200	9.9300	--	--	--	9.9300	--	--	--
1717	0	49	0	0	9	1	BG	14.592	7.3600	--	--	--	7.3600	--	--	--
1715	0	61	0	0	14	0	NA	4.560	9.6100	--	--	--	9.6100	--	--	--

1716	1	60	0	0	17	0	VT	80.608	7.8200	--	--	--	7.8200	--	--	--
1718	0	64	1	0	16	0	NA	3.808	9.8200	--	--	--	9.8200	--	--	--
1719	0	77	0	0	12	0	--	NaN	9.6500	--	--	--	9.6500	--	--	--
1722	1	79	1	0	12	0	VT	84.104	4.9400	--	--	--	4.9400	--	--	--
1720	1	75	0	0	8	0	Th	1.288	7.8700	--	--	--	7.8700	--	--	--
1724	1	64	1	0	14	0	F–	20.592	7.4500	9.1200	9.2700	9.2000	7.4500	9.1200	9.2700	9.2000
1727	1	66	0	0	12	0	P	12.600	8.0700	--	--	--	8.0700	--	--	--
1734	1	57	0	0	11	1	Th	0.848	8.7000	8.1300	8.5300	8.4000	8.7000	8.1300	8.5300	8.4000
1741	1	64	1	0	12	1	F+d	65.488	5.7400	7.7800	8.9500	8.9700	5.7400	7.7800	8.9500	8.9700
1742	1	56	1	0	14	0	F+d	73.568	5.7900	--	8.5600	--	5.7900	7.7373	8.5600	--
1750	0	72	1	0	12	1	BG	6.832	9.6500	--	--	--	9.6500	--	--	--
1755	1	62	1	0	12	1	VT	39.696	8.1800	--	--	--	8.1800	--	--	--
1764	0	28	1	0	12	0	F–	27.392	9.4200	--	--	--	9.4200	--	--	--
1774	0	76	0	0	10	0	BG	1.904	7.8600	--	--	--	7.8600	--	--	--
1776	1	60	0	0	12	0	P	8.440	7.0100	8.5000	8.6100	8.6100	7.0100	8.5000	8.6100	8.6100
1775	0	54	1	0	14	0	R	3.688	9.1700	--	--	--	9.1700	--	--	--
1777	0	35	1	0	13	0	R	12.992	9.4600	--	--	--	9.4600	--	--	--
1779	0	62	0	1	12	1	BG	8.048	8.1600	--	--	--	8.1600	--	--	--
1781	1	62	0	0	11	1	F–	42.352	1.6100	--	--	--	1.6100	--	--	--
1782	1	60	1	0	13	1	Th	17.832	2.0700	--	9.6200	10.000	2.0700	7.3776	9.6200	10.000
1783	1	68	0	0	8	1	TP–	28.760	7.9300	--	--	--	7.9300	--	--	--
1786	1	69	0	0	13	1	VT	22.000	6.8900	9.3000	9.7200	9.4200	6.8900	9.3000	9.7200	9.4200
1787	0	73	0	0	18	0	R	5.184	9.9300	--	--	--	9.9300	--	--	--
1788	0	78	0	0	9	0	Th	3.016	8.4500	--	--	--	8.4500	--	--	--
1789	1	67	1	0	11	0	VT	43.184	3.4900	--	--	--	3.4900	--	--	--
1790	1	64	0	1	18	0	F+d	155.040	0.0800	--	--	--	0.0800	--	--	--
1793	1	55	0	0	16	0	BG	25.864	8.1400	--	--	--	8.1400	--	--	--
1791	0	84	1	0	16	0	R	1.424	8.8500	--	--	--	8.8500	--	--	--
1794	0	69	1	0	12	0	BG	2.248	9.2000	--	--	--	9.2000	--	--	--
1795	1	70	1	0	3	0	TP+	80.344	0.0000	--	--	--	0.0000	--	--	--
1804	1	69	0	0	14	1	Th	29.688	-1.0000	6.4200	7.9400	8.9400	0.0000	6.4200	7.9400	8.9400
1796	0	54	0	0	12	0	BG	5.664	9.3700	--	--	--	9.3700	--	--	--
1797	0	50	1	0	9	1	R	23.248	9.4300	--	--	--	9.4300	--	--	--
1801	0	65	0	0	16	0	O	2.504	9.9500	--	--	--	9.9500	--	--	--
1802	0	80	1	0	16	0	NA	1.312	9.9700	--	--	--	9.9700	--	--	--
1808	1	48	0	0	12	1	BG	23.480	2.3300	8.3700	8.5800	9.0600	2.3300	8.3700	8.5800	9.0600
1809	0	55	0	1	12	0	R	20.336	9.6000	--	--	--	9.6000	--	--	--
1810	0	68	0	0	12	0	Th	2.128	9.2400	--	--	--	9.2400	--	--	--
1812	1	75	0	0	12	0	TP–	24.424	1.7600	4.7700	6.1000	6.6400	1.7600	4.7700	6.1000	6.6400
1814	1	62	0	0	12	1	BG	7.552	8.4500	--	--	--	8.4500	--	--	--
1815	0	89	0	0	20	0	O	8.760	9.5000	--	--	--	9.5000	--	--	--
1817	0	26	0	1	12	1	TP–	14.312	9.9200	9.7200	--	--	9.9200	9.7200	--	--
1821	1	83	0	0	16	0	Th	0.728	8.5600	9.5100	9.7700	9.4200	8.5600	9.5100	9.7700	9.4200
1823	1	59	1	0	12	0	F–	35.312	2.3200	--	--	--	2.3200	--	--	--
1825	1	81	1	0	12	0	FTP	156.752	-1.0000	0.0000	1.3800	--	0.0000	0.0000	1.3800	--
1824	1	77	1	0	7	1	TP–	21.432	5.7900	--	--	--	5.7900	--	--	--
1826	1	78	0	0	12	0	Th	5.480	6.1800	--	8.1700	8.4200	6.1800	7.5790	8.1700	8.4200
1829	1	62	1	0	12	0	NA	2.864	8.7000	--	--	--	8.7000	--	--	--
1833	1	65	0	1	14	1	F–	11.072	1.0800	--	7.5500	7.7000	1.0800	5.6283	7.5500	7.7000
1828	1	84	1	0	12	0	F+v	57.608	4.1200	6.4300	6.9900	7.5400	4.1200	6.4300	6.9900	7.5400
1834	1	70	1	0	12	0	BG	30.008	7.3000	--	--	--	7.3000	--	--	--
1836	1	77	1	0	10	1	BG	24.776	4.7100	--	--	--	4.7100	--	--	--
1843	1	46	1	0	12	0	F+v	93.288	2.5500	--	--	--	2.5500	--	--	--
1846	0	65	0	0	8	1	BG	3.512	8.4800	--	--	--	8.4800	--	--	--
1848	0	66	0	0	12	0	BG	5.512	9.4800	--	--	--	9.4800	--	--	--
1847	1	57	1	0	16	0	P	30.680	8.4000	8.9300	8.9200	9.1000	8.4000	8.9300	8.9200	9.1000
1853	0	65	0	0	16	0	NA	11.512	8.8800	--	--	--	8.8800	--	--	--
1854	0	46	0	0	12	1	Th	4.904	9.7100	--	--	--	9.7100	--	--	--
1855	1	61	1	0	11	0	TP+	121.176	2.0000	4.4000	5.1500	5.2500	2.0000	4.4000	5.1500	5.2500
1856	1	77	1	0	12	0	P	23.376	4.6500	--	--	--	4.6500	--	--	--
1857	1	53	0	1	12	0	VT	25.768	8.3200	--	--	--	8.3200	--	--	--
1858	0	65	1	1	12	0	O	13.456	10.0000	--	--	--	10.0000	--	--	--
1862	1	54	1	0	16	1	BG	36.240	-1.0000	5.4200	8.8100	9.3400	0.0000	5.4200	8.8100	9.3400
1859	1	78	1	0	9	0	TP–	18.560	7.4900	8.4500	8.6700	8.2900	7.4900	8.4500	8.6700	8.2900
1861	1	61	1	0	13	0	P	3.336	9.2300	9.2900	9.4100	9.4900	9.2300	9.2900	9.4100	9.4900
1865	1	39	1	0	14	0	F+d	99.512	4.3300	--	--	--	4.3300	--	--	--

1869	1	86	0	0	10	0	F–	18.208	2.4300	--	--	--	2.4300	--	--	--
1870	1	65	0	0	20	0	BG	5.184	9.1700	--	--	--	9.1700	--	--	--
1874	1	71	1	0	12	1	M	73.888	7.9000	--	--	--	7.9000	--	--	--
1875	1	60	0	0	15	0	F–	34.440	8.2600	--	--	--	8.2600	--	--	--
1878	1	61	0	0	12	0	NA	187.848	1.9700	4.7200	5.4500	--	1.9700	4.7200	5.4500	--
1877	0	81	1	0	12	0	BG	14.120	8.7500	--	--	--	8.7500	--	--	--
1880	1	63	0	0	12	0	NA	8.256	7.1000	--	--	--	7.1000	--	--	--
1881	0	76	1	0	12	1	P	6.584	9.1400	--	--	--	9.1400	--	--	--
1882	1	46	0	0	20	0	BG	18.584	9.2700	--	--	--	9.2700	--	--	--
1886	1	55	0	0	12	0	NA	12.760	7.8000	--	--	--	7.8000	--	--	--
1885	1	62	0	0	12	0	Th	1.472	8.9000	9.5700	9.4800	9.2900	8.9000	9.5700	9.4800	9.2900
1888	1	79	0	0	10	0	TP+	111.952	0.9700	--	--	--	0.9700	--	--	--
1889	1	60	0	0	12	0	BG	9.992	4.0100	--	--	--	4.0100	--	--	--
1897	1	67	0	1	20	0	FTP	307.008	-1.0000	-1.0000	0.1500	0.9000	0.0000	0.0000	0.1500	0.9000
1892	1	53	1	0	12	0	BG	12.632	7.7000	8.6800	8.7100	--	7.7000	8.6800	8.7100	--
1893	0	69	1	0	12	0	F–	12.032	9.4700	--	--	--	9.4700	--	--	--
1894	1	64	0	1	10	0	F–	19.176	8.2100	8.5900	9.5600	--	8.2100	8.5900	9.5600	--
1895	1	60	1	0	12	0	F+v	106.176	3.0300	6.5600	--	--	3.0300	6.5600	--	--
1898	0	63	1	0	13	0	NA	4.504	9.1200	--	--	--	9.1200	--	--	--
1899	0	34	0	0	15	1	BG	9.848	9.8500	--	--	--	9.8500	--	--	--
1909	0	51	1	0	11	0	NA	7.880	9.1700	--	--	--	9.1700	--	--	--
1912	1	64	0	1	9	0	P	28.040	4.4000	7.7000	8.7200	8.8300	4.4000	7.7000	8.7200	8.8300
1915	1	50	1	1	15	0	O	12.216	9.0000	8.8000	9.3500	--	9.0000	8.8000	9.3500	--
1916	1	71	1	0	14	0	TP–	34.320	6.3100	--	--	--	6.3100	--	--	--
1917	1	67	0	0	14	1	Th	9.552	2.2500	7.2700	8.2300	9.2100	2.2500	7.2700	8.2300	9.2100
1918	1	78	0	0	16	0	F–	11.520	5.8100	--	--	--	5.8100	--	--	--
1923	1	38	1	0	13	0	FTP	144.360	-1.0000	3.5900	5.3300	--	0.0000	3.5900	5.3300	--
1921	0	49	0	0	12	0	Th	1.464	9.0900	--	--	--	9.0900	--	--	--
1924	1	51	0	0	12	0	F–	29.648	7.8400	--	--	--	7.8400	--	--	--
1925	1	63	0	0	16	0	BG	12.128	8.3500	--	--	--	8.3500	--	--	--
1926	1	62	1	0	12	0	F+d	101.768	3.1500	7.2000	8.2600	8.2500	3.1500	7.2000	8.2600	8.2500
1932	1	62	0	0	12	0	FTP	122.640	0.0000	--	--	--	0.0000	--	--	--
1934	1	77	0	0	12	0	BG	20.592	6.4700	--	7.8600	--	6.4700	7.4472	7.8600	--
1938	1	57	0	0	12	0	TP–	6.440	5.7900	--	--	--	5.7900	--	--	--
1940	1	57	1	1	12	0	F–	48.032	7.4300	--	9.2300	9.6000	7.4300	8.6954	9.2300	9.6000
1941	1	75	0	0	12	0	F+d	77.888	0.9700	2.7500	4.7700	5.9500	0.9700	2.7500	4.7700	5.9500
1945	1	83	1	0	5	0	F+d	71.864	5.1600	--	--	--	5.1600	--	--	--
1946	1	44	1	0	14	1	Th	8.968	4.6600	--	--	--	4.6600	--	--	--
1948	1	51	0	0	12	1	BG	18.008	8.6000	--	--	--	8.6000	--	--	--
1947	1	59	0	0	13	0	BG	6.824	5.8700	8.1300	8.7400	8.8100	5.8700	8.1300	8.7400	8.8100
1950	0	56	0	0	12	0	O	15.112	9.7000	--	--	--	9.7000	--	--	--
1953	0	59	1	0	15	1	Th	6.144	9.4000	--	--	--	9.4000	--	--	--
1952	0	63	0	0	13	0	O	5.384	9.4100	--	--	--	9.4100	--	--	--
1957	1	59	0	0	12	0	BG	22.048	6.4400	6.8300	8.5100	--	6.4400	6.8300	8.5100	--
1954	0	59	1	0	14	0	P	61.928	9.7900	--	--	--	9.7900	--	--	--
1956	0	37	0	0	12	0	TP–	26.496	9.4300	--	--	--	9.4300	--	--	--
1955	0	34	1	0	16	0	O	4.904	9.8400	--	--	--	9.8400	--	--	--
1960	1	72	0	0	16	0	VT	49.008	7.2400	7.4600	8.3600	8.8600	7.2400	7.4600	8.3600	8.8600
1962	0	51	0	0	12	0	R	3.456	9.4100	--	--	--	9.4100	--	--	--
1964	1	83	0	0	10	0	VT	46.872	2.7300	3.6100	5.3300	--	2.7300	3.6100	5.3300	--
1965	0	47	0	0	11	1	P	4.744	9.7500	--	--	--	9.7500	--	--	--
1966	1	49	0	0	7	0	BG	29.864	7.6500	--	--	--	7.6500	--	--	--
1967	1	50	0	0	15	0	F–	22.624	8.7100	9.4000	--	--	8.7100	9.4000	--	--
1971	1	78	1	0	15	0	NA	2.072	9.0300	--	--	--	9.0300	--	--	--
1968	1	23	1	0	14	0	TP–	33.888	9.5500	--	--	--	9.5500	--	--	--
1969	1	56	1	0	19	0	F–	14.424	6.9800	8.1800	--	8.7400	6.9800	8.1800	8.5699	8.7400
1970	1	76	1	1	6	0	TP+	106.792	3.2400	3.1700	3.8500	--	3.2400	3.1700	3.8500	--
1973	1	87	0	0	13	0	TP–	20.480	5.4400	8.3400	--	--	5.4400	8.3400	--	--
1974	1	49	0	0	16	0	VT	50.296	9.7500	9.7100	9.5700	9.7400	9.7500	9.7100	9.5700	9.7400
1977	1	53	0	0	10	0	BG	33.736	6.3100	--	7.2700	--	6.3100	6.9849	7.2700	--
1978	1	69	0	0	16	0	BG	11.136	8.0300	9.1100	8.9900	8.8900	8.0300	9.1100	8.9900	8.8900
1979	1	72	0	0	10	0	NA	2.592	7.7500	--	--	--	7.7500	--	--	--
1980	1	59	0	0	12	0	TP+	54.936	2.1400	5.6800	6.4800	--	2.1400	5.6800	6.4800	--
1981	1	65	1	0	14	0	FTP	143.256	0.0000	0.3800	0.7100	--	0.0000	0.3800	0.7100	--
1983	1	63	0	0	16	0	F+d	93.344	3.5200	6.7200	7.6200	8.4300	3.5200	6.7200	7.6200	8.4300
1982	1	55	0	1	12	0	TP–	36.840	6.0000	--	--	--	6.0000	--	--	--

1985	1	74	1	1	12	0	FTP	221.256	-1.0000	-1.0000	5.9200	6.9000	0.0000	0.0000	5.9200	6.9000
1986	0	56	0	0	16	0	VT	48.568	9.5500	--	--	--	9.5500	--	--	--
1988	1	43	0	0	12	0	F+v	106.048	2.8700	4.8000	6.6400	8.5500	2.8700	4.8000	6.6400	8.5500
1992	1	54	0	0	12	0	FTP	175.424	1.0500	--	--	--	1.0500	--	--	--
1990	1	52	1	0	14	1	VT	9.232	2.5500	9.2000	9.4600	9.8000	2.5500	9.2000	9.4600	9.8000
1989	1	81	0	0	20	0	BG	8.728	6.9100	--	--	--	6.9100	--	--	--
1995	1	73	1	0	12	1	P	16.464	8.5200	9.7000	--	--	8.5200	9.7000	--	--
1996	1	41	0	0	19	0	NA	14.184	8.0500	9.7100	9.8600	9.9000	8.0500	9.7100	9.8600	9.9000
1998	1	78	0	0	16	0	FTP	261.024	3.1400	4.7600	5.9100	4.6100	3.1400	4.7600	5.9100	4.6100
2000	0	61	1	0	7	0	Th	2.344	8.6100	--	--	--	8.6100	--	--	--
2004	1	62	0	0	10	0	Th	1.200	8.8100	--	--	--	8.8100	--	--	--
2007	1	58	0	0	16	1	M	80.296	8.8700	9.6600	--	--	8.8700	9.6600	--	--
2009	1	50	0	0	12	0	TP+	126.456	4.6900	--	--	--	4.6900	--	--	--
2011	1	66	1	0	12	0	F+d	198.536	0.5300	--	--	--	0.5300	--	--	--
2014	1	33	0	0	12	1	BG	22.824	8.3000	9.6900	9.6600	--	8.3000	9.6900	9.6600	--
2013	1	76	0	0	8	1	TP–	17.288	6.3700	8.9700	9.1300	--	6.3700	8.9700	9.1300	--
2010	1	38	1	0	12	1	BG	9.024	7.3500	--	--	--	7.3500	--	--	--
2015	0	30	1	0	15	0	P	5.384	9.9000	--	--	--	9.9000	--	--	--
2016	0	38	1	1	16	0	BG	30.520	9.9000	--	--	--	9.9000	--	--	--
2017	0	74	1	0	14	0	Th	2.056	8.0800	--	--	--	8.0800	--	--	--
2018	1	80	1	0	9	0	NA	12.224	8.2000	8.6900	9.5600	8.8900	8.2000	8.6900	9.5600	8.8900
2019	1	63	0	0	13	0	TP+	90.752	3.6400	--	--	--	3.6400	--	--	--
2021	0	56	0	1	16	0	M	45.688	9.7300	--	--	--	9.7300	--	--	--
2022	0	62	1	1	14	0	O	17.952	9.0700	--	--	--	9.0700	--	--	--
2024	0	72	1	0	12	0	O	9.448	9.8200	--	--	--	9.8200	--	--	--
2026	1	47	0	1	12	0	F+v	54.496	-1.0000	5.7900	7.9800	9.0700	0.0000	5.7900	7.9800	9.0700
2025	1	79	1	0	8	0	VT	21.552	7.6100	--	--	--	7.6100	--	--	--
2027	1	67	0	0	16	0	VT	68.688	8.5400	9.3000	9.3600	9.9000	8.5400	9.3000	9.3600	9.9000
2028	0	56	1	1	12	1	M	13.088	9.6500	10.000	--	--	9.6500	10.000	--	--
2032	0	82	0	0	12	0	F–	15.952	9.5100	--	--	--	9.5100	--	--	--
2031	0	68	0	0	12	0	R	4.744	9.8100	--	--	--	9.8100	--	--	--
2033	1	74	1	0	9	0	TP–	14.912	7.4500	--	--	--	7.4500	--	--	--
2034	1	71	0	1	15	0	TP+	86.824	3.2000	--	--	--	3.2000	--	--	--
2036	1	64	1	0	12	0	NA	32.520	9.1000	--	--	--	9.1000	--	--	--
2038	1	57	1	0	10	0	P	50.552	8.9200	--	--	--	8.9200	--	--	--
2039	1	55	0	0	16	0	FTP	171.088	2.4200	4.9000	4.7800	5.6200	2.4200	4.9000	4.7800	5.6200
2037	0	23	1	0	16	0	Th	9.168	9.9000	--	--	--	9.9000	--	--	--
2041	1	73	1	0	18	0	TP–	14.424	7.4200	--	--	--	7.4200	--	--	--
2049	1	72	1	0	12	0	P	12.664	7.0400	9.0200	9.4100	9.5100	7.0400	9.0200	9.4100	9.5100
2050	0	77	1	0	16	0	NA	2.832	9.5800	--	--	--	9.5800	--	--	--
2051	1	62	1	1	14	0	NA	11.000	9.6300	--	--	--	9.6300	--	--	--
2052	1	76	1	0	12	0	Th	2.776	8.0300	--	--	--	8.0300	--	--	--
2055	1	67	1	0	12	0	F–	26.480	5.3600	8.0800	8.7900	8.9300	5.3600	8.0800	8.7900	8.9300
2056	1	57	0	0	12	0	F–	11.928	8.0400	9.9300	9.7900	--	8.0400	9.9300	9.7900	--
2059	1	78	0	0	13	0	TP+	77.984	3.0700	7.1100	7.9900	--	3.0700	7.1100	7.9900	--
2058	0	74	0	0	20	1	M	26.536	8.4400	--	--	--	8.4400	--	--	--
2060	0	81	1	0	17	0	Th	0.904	9.5800	--	--	--	9.5800	--	--	--
2061	1	71	1	0	12	0	TP–	22.472	4.3300	7.7400	8.0600	8.5100	4.3300	7.7400	8.0600	8.5100
2063	0	34	1	0	14	1	M	21.496	9.7600	--	--	--	9.7600	--	--	--
2066	1	62	0	0	16	0	TP–	30.936	6.8000	7.9100	8.0600	8.6800	6.8000	7.9100	8.0600	8.6800
2067	1	64	1	0	20	0	F–	67.760	9.1900	--	--	--	9.1900	--	--	--
2070	0	21	1	0	12	0	BG	6.256	9.9500	--	--	--	9.9500	--	--	--
2072	1	63	0	0	20	1	Th	4.888	8.1700	--	--	--	8.1700	--	--	--
2074	1	67	0	1	13	0	BG	15.960	8.2100	8.7800	8.8200	8.8300	8.2100	8.7800	8.8200	8.8300
2077	1	60	0	0	12	1	VT	10.472	8.3700	--	--	--	8.3700	--	--	--
2096	1	68	0	0	12	0	VT	25.432	5.8300	--	--	--	5.8300	--	--	--
2085	1	85	1	0	0	0	TP+	42.312	0.0000	--	--	--	0.0000	--	--	--
2089	0	54	0	0	13	0	O	13.416	9.8600	--	--	--	9.8600	--	--	--
2090	1	90	0	0	18	1	BG	32.904	0.7900	8.0200	--	8.4700	0.7900	8.0200	8.3333	8.4700
2091	0	67	1	1	12	0	R	14.008	9.9200	--	--	--	9.9200	--	--	--
2092	1	79	0	0	12	0	TP–	29.456	5.0600	6.7000	--	--	5.0600	6.7000	--	--
2103	1	65	1	0	18	0	M	6.032	-1.0000	8.0500	--	9.1300	0.0000	8.0500	8.8019	9.1300
2094	0	77	0	1	11	0	O	6.088	9.6200	--	--	--	9.6200	--	--	--
2102	1	81	1	0	12	0	F–	29.448	1.4000	--	--	--	1.4000	--	--	--
2105	1	47	0	0	18	0	M	30.832	5.8900	8.7000	9.3900	9.8600	5.8900	8.7000	9.3900	9.8600
2108	1	52	0	0	16	0	F+d	101.016	3.2300	7.3100	8.2500	--	3.2300	7.3100	8.2500	--

2110	0	72	1	0	15	0	NA	15.992	8.6500	--	--	--	8.6500	--	--	--
2111	1	55	0	0	12	0	TP–	14.640	6.4000	--	--	--	6.4000	--	--	--
2109	1	54	1	0	16	0	M	16.008	7.3700	--	9.3100	--	7.3700	8.7338	9.3100	--
2113	1	50	1	0	12	0	F+v	97.888	3.3600	--	--	--	3.3600	--	--	--
2112	0	89	1	0	20	0	BG	13.352	8.9800	--	--	--	8.9800	--	--	--
2115	1	61	1	0	8	0	VT	27.840	6.1200	--	8.8300	9.5200	6.1200	8.0251	8.8300	9.5200
2116	1	51	1	0	12	0	F+d	184.544	-1.0000	2.0300	--	5.9600	0.0000	2.0300	4.7659	5.9600
2119	1	76	1	1	14	0	F+d	70.408	-1.0000	--	4.2600	4.7600	0.0000	2.9947	4.2600	4.7600
2120	1	21	0	1	14	1	M	39.616	6.1900	9.8000	--	--	6.1900	9.8000	--	--
2121	1	47	1	0	12	0	M	8.672	5.0000	9.8100	--	--	5.0000	9.8100	--	--
2123	0	79	0	0	12	0	R	2.688	8.4100	--	--	--	8.4100	--	--	--
2125	1	84	0	0	12	0	NA	2.584	3.8900	--	--	--	3.8900	--	--	--

Supplementary Matlab Code

```
% read dataset
tbl = readtable('supp_dataset.txt', 'ReadVariableNames', true, 'TreatAsEmpty', '--');

% exclude two patients with no lesion available
tbl = tbl(~strcmp(tbl.Location, '--'), :);
% reorder Location categories so that NA is reference level
tbl.Location = categorical(tbl.Location);
tbl.Location = reordercats(tbl.Location, {'NA', 'F-', 'F+d', 'F+v', 'FTP', 'TP-',
'TP+', 'P', 'VT', 'BG', 'Th', 'M', 'O', 'R'});

% ------------------
% Initial evaluation
% ------------------

fprintf('\nMODEL OF INITIAL SCORES\n\n');

% full model
mdl = fitlm(tbl, 'QAB_T1i ~ Age + SexF + HandLA + Educ + StrHem + Location + Extent +
Extent^2')

mdl_intercept = fitlm(tbl, 'QAB_T1i ~ 1');
r2 = 1 - exp(-2 / mdl.NumObservations * (mdl.LogLikelihood -
mdl_intercept.LogLikelihood)); % Magee (1990), works for LMM too

fprintf('Variance accounted for by full model: %.1f%%\n', r2 * 100);

% use model comparison approach to test effects of interet

% Lesion location
mdl_reduced = fitlm(tbl, 'QAB_T1i ~ Age + SexF + HandLA + Educ + StrHem + Extent +
Extent^2');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
fprintf('Effect of lesion location: χ^2(%d) = %.2f, p = %.4f\n', df, lr, pval);

% Lesion extent
mdl_reduced = fitlm(tbl, 'QAB_T1i ~ Age + SexF + HandLA + Educ + StrHem + Location');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
fprintf('Effect of lesion extent: χ^2(%d) = %.2f, p = %.4f\n', df, lr, pval);

% Differential variance
mdl_reduced = fitlm(tbl, 'QAB_T1i ~ Age + SexF + HandLA + Educ + StrHem');
r2r = 1 - exp(-2 / mdl_reduced.NumObservations * (mdl_reduced.LogLikelihood -
mdl_intercept.LogLikelihood));
delta_r2 = (r2 - r2r) * 100;
fprintf('Δr^2 = %.1f%%\n', delta_r2);

% Other factors
mdl_reduced = fitlm(tbl, 'QAB_T1i ~ Age + SexF + HandLA + Educ + Location + Extent +
Extent^2');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
r2r = 1 - exp(-2 / mdl_reduced.NumObservations * (mdl_reduced.LogLikelihood -
mdl_intercept.LogLikelihood));
delta_r2 = (r2 - r2r) * 100;
```

```
fprintf('Effect of stroke type: χ^2(%d) = %.2f, p = %.4f, Δr^2 = %.1f%%\n', df, lr,
pval, delta_r2);

mdl_reduced = fitlm(tbl, 'QAB_T1i ~ SexF + HandLA + Educ + StrHem + Location + Extent
+ Extent^2');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
r2r = 1 - exp(-2 / mdl_reduced.NumObservations * (mdl_reduced.LogLikelihood -
mdl_intercept.LogLikelihood));
delta_r2 = (r2 - r2r) * 100;
fprintf('Effect of age: χ^2(%d) = %.2f, p = %.4f, Δr^2 = %.1f%%\n', df, lr, pval,
delta_r2);

mdl_reduced = fitlm(tbl, 'QAB_T1i ~ Age + HandLA + Educ + StrHem + Location + Extent +
Extent^2');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
r2r = 1 - exp(-2 / mdl_reduced.NumObservations * (mdl_reduced.LogLikelihood -
mdl_intercept.LogLikelihood));
delta_r2 = (r2 - r2r) * 100;
fprintf('Effect of sex: χ^2(%d) = %.2f, p = %.4f, Δr^2 = %.1f%%\n', df, lr, pval,
delta_r2);

mdl_reduced = fitlm(tbl, 'QAB_T1i ~ Age + SexF + Educ + StrHem + Location + Extent +
Extent^2');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
r2r = 1 - exp(-2 / mdl_reduced.NumObservations * (mdl_reduced.LogLikelihood -
mdl_intercept.LogLikelihood));
delta_r2 = (r2 - r2r) * 100;
fprintf('Effect of handedness: χ^2(%d) = %.2f, p = %.4f, Δr^2 = %.1f%%\n', df, lr,
pval, delta_r2);

mdl_reduced = fitlm(tbl, 'QAB_T1i ~ Age + SexF + HandLA + StrHem + Location + Extent +
Extent^2');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
r2r = 1 - exp(-2 / mdl_reduced.NumObservations * (mdl_reduced.LogLikelihood -
mdl_intercept.LogLikelihood));
delta_r2 = (r2 - r2r) * 100;
fprintf('Effect of education: χ^2(%d) = %.2f, p = %.4f, Δr^2 = %.1f%%\n', df, lr,
pval, delta_r2);

% --------
% Recovery
% --------

fprintf('\nMODEL OF RECOVERY\n\n');

% create a new table with one row for each pair of adjacent observations
tbl2 = table;
n = size(tbl, 1);
i = 0;
warning off
for s = 1:n
  if tbl.Aphasia(s) && tbl.Location(s) ~= 'O' && tbl.Location(s) ~= 'R'
    for t = 1:3
      y1 = tbl.(sprintf('QAB_T%di', t))(s); % score at earlier timepoint
      y2 = tbl.(sprintf('QAB_T%di', t + 1))(s); % score at later timepoint
```

```
      if ~isnan(y1) && ~isnan(y2)
        i = i + 1;

        % copy variables across to new table
        tbl2.PID(i) = tbl.PID(s);
        tbl2.Age(i) = tbl.Age(s);
        tbl2.SexF(i) = tbl.SexF(s);
        tbl2.HandLA(i) = tbl.HandLA(s);
        tbl2.Educ(i) = tbl.Educ(s);
        tbl2.StrHem(i) = tbl.StrHem(s);
        tbl2.Location(i) = tbl.Location(s);
        tbl2.Extent(i) = tbl.Extent(s);

        % timepoint and preceding score predictors
        tbl2.Timepoint{i} = sprintf('T%d%d', t, t + 1);
        tbl2.Preceding(i) = y1;

        % inverse hyperbolic sine transformation of difference score
        lambda = 4;
        tbl2.DeltaQAB(i) = asinh((y2 - y1) * lambda) / lambda;
      end
    end
  end
end
warning on
tbl2.Location = removecats(tbl2.Location);

% full model
mdl = fitlme(tbl2, 'DeltaQAB ~ Preceding + Preceding^2 + Timepoint + Age + SexF +
HandLA + Educ + StrHem + Location + Extent + Extent^2 + (1 | PID)')

mdl_intercept = fitlme(tbl2, 'DeltaQAB ~ 1');
r2 = 1 - exp(-2 / mdl.NumObservations * (mdl.LogLikelihood -
mdl_intercept.LogLikelihood));

fprintf('Variance accounted for by full model: %.1f%%\n', r2 * 100);

% use model comparison approach to test effects of interet

% Preceding score
mdl_reduced = fitlme(tbl2, 'DeltaQAB ~ Timepoint + Age + SexF + HandLA + Educ + StrHem
+ Location + Extent + Extent^2 + (1 | PID)');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
fprintf('Effect of preceding score: χ^2(%d) = %.2f, p = %.4f\n', df, lr, pval);

% Timepoint
mdl_reduced = fitlme(tbl2, 'DeltaQAB ~ Preceding + Preceding^2 + Age + SexF + HandLA +
Educ + StrHem + Location + Extent + Extent^2 + (1 | PID)');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
fprintf('Effect of timepoint: χ^2(%d) = %.2f, p = %.4f\n', df, lr, pval);

% Differential variance
mdl_reduced = fitlme(tbl2, 'DeltaQAB ~ Age + SexF + HandLA + Educ + StrHem + Location
+ Extent + Extent^2 + (1 | PID)');
r2r = 1 - exp(-2 / mdl_reduced.NumObservations * (mdl_reduced.LogLikelihood -
mdl_intercept.LogLikelihood));
delta_r2 = (r2 - r2r) * 100;
fprintf('Δr^2 = %.1f%%\n', delta_r2);
```

```
% Lesion location
mdl_reduced = fitlme(tbl2, 'DeltaQAB ~ Preceding + Preceding^2 + Timepoint + Age +
SexF + HandLA + Educ + StrHem + Extent + Extent^2 + (1 | PID)');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
fprintf('Effect of lesion location: χ^2(%d) = %.2f, p = %.4f\n', df, lr, pval);

% Lesion extent
mdl_reduced = fitlme(tbl2, 'DeltaQAB ~ Preceding + Preceding^2 + Timepoint + Age +
SexF + HandLA + Educ + StrHem + Location + (1 | PID)');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
fprintf('Effect of lesion extent: χ^2(%d) = %.2f, p = %.4f\n', df, lr, pval);

% Differential variance
mdl_reduced = fitlme(tbl2, 'DeltaQAB ~ Preceding + Preceding^2 + Timepoint + Age +
SexF + HandLA + Educ + StrHem + (1 | PID)');
r2r = 1 - exp(-2 / mdl_reduced.NumObservations * (mdl_reduced.LogLikelihood -
mdl_intercept.LogLikelihood));
delta_r2 = (r2 - r2r) * 100;
fprintf('Δr^2 = %.1f%%\n', delta_r2);

% Other factors
mdl_reduced = fitlme(tbl2, 'DeltaQAB ~ Preceding + Preceding^2 + Timepoint + Age +
SexF + HandLA + Educ + Location + Extent + Extent^2 + (1 | PID)');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
r2r = 1 - exp(-2 / mdl_reduced.NumObservations * (mdl_reduced.LogLikelihood -
mdl_intercept.LogLikelihood));
delta_r2 = (r2 - r2r) * 100;
fprintf('Effect of stroke type: χ^2(%d) = %.2f, p = %.4f, Δr^2 = %.1f%%\n', df, lr,
pval, delta_r2);

mdl_reduced = fitlme(tbl2, 'DeltaQAB ~ Preceding + Preceding^2 + Timepoint + SexF +
HandLA + Educ + StrHem + Location + Extent + Extent^2 + (1 | PID)');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
r2r = 1 - exp(-2 / mdl_reduced.NumObservations * (mdl_reduced.LogLikelihood -
mdl_intercept.LogLikelihood));
delta_r2 = (r2 - r2r) * 100;
fprintf('Effect of age: χ^2(%d) = %.2f, p = %.4f, Δr^2 = %.1f%%\n', df, lr, pval,
delta_r2);

mdl_reduced = fitlme(tbl2, 'DeltaQAB ~ Preceding + Preceding^2 + Timepoint + Age +
HandLA + Educ + StrHem + Location + Extent + Extent^2 + (1 | PID)');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
r2r = 1 - exp(-2 / mdl_reduced.NumObservations * (mdl_reduced.LogLikelihood -
mdl_intercept.LogLikelihood));
delta_r2 = (r2 - r2r) * 100;
fprintf('Effect of sex: χ^2(%d) = %.2f, p = %.4f, Δr^2 = %.1f%%\n', df, lr, pval,
delta_r2);

mdl_reduced = fitlme(tbl2, 'DeltaQAB ~ Preceding + Preceding^2 + Timepoint + Age +
SexF + Educ + StrHem + Location + Extent + Extent^2 + (1 | PID)');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
```

```
r2r = 1 - exp(-2 / mdl_reduced.NumObservations * (mdl_reduced.LogLikelihood -
mdl_intercept.LogLikelihood));
delta_r2 = (r2 - r2r) * 100;
fprintf('Effect of handedness: χ^2(%d) = %.2f, p = %.4f, Δr^2 = %.1f%%\n', df, lr,
pval, delta_r2);

mdl_reduced = fitlme(tbl2, 'DeltaQAB ~ Preceding + Preceding^2 + Timepoint + Age +
SexF + HandLA + StrHem + Location + Extent + Extent^2 + (1 | PID)');
lr = 2 * (mdl.LogLikelihood - mdl_reduced.LogLikelihood);
df = mdl.NumEstimatedCoefficients - mdl_reduced.NumEstimatedCoefficients;
pval = 1 - chi2cdf(lr, df);
r2r = 1 - exp(-2 / mdl_reduced.NumObservations * (mdl_reduced.LogLikelihood -
mdl_intercept.LogLikelihood));
delta_r2 = (r2 - r2r) * 100;
fprintf('Effect of education: χ^2(%d) = %.2f, p = %.4f, Δr^2 = %.1f%%\n', df, lr,
pval, delta_r2);
```