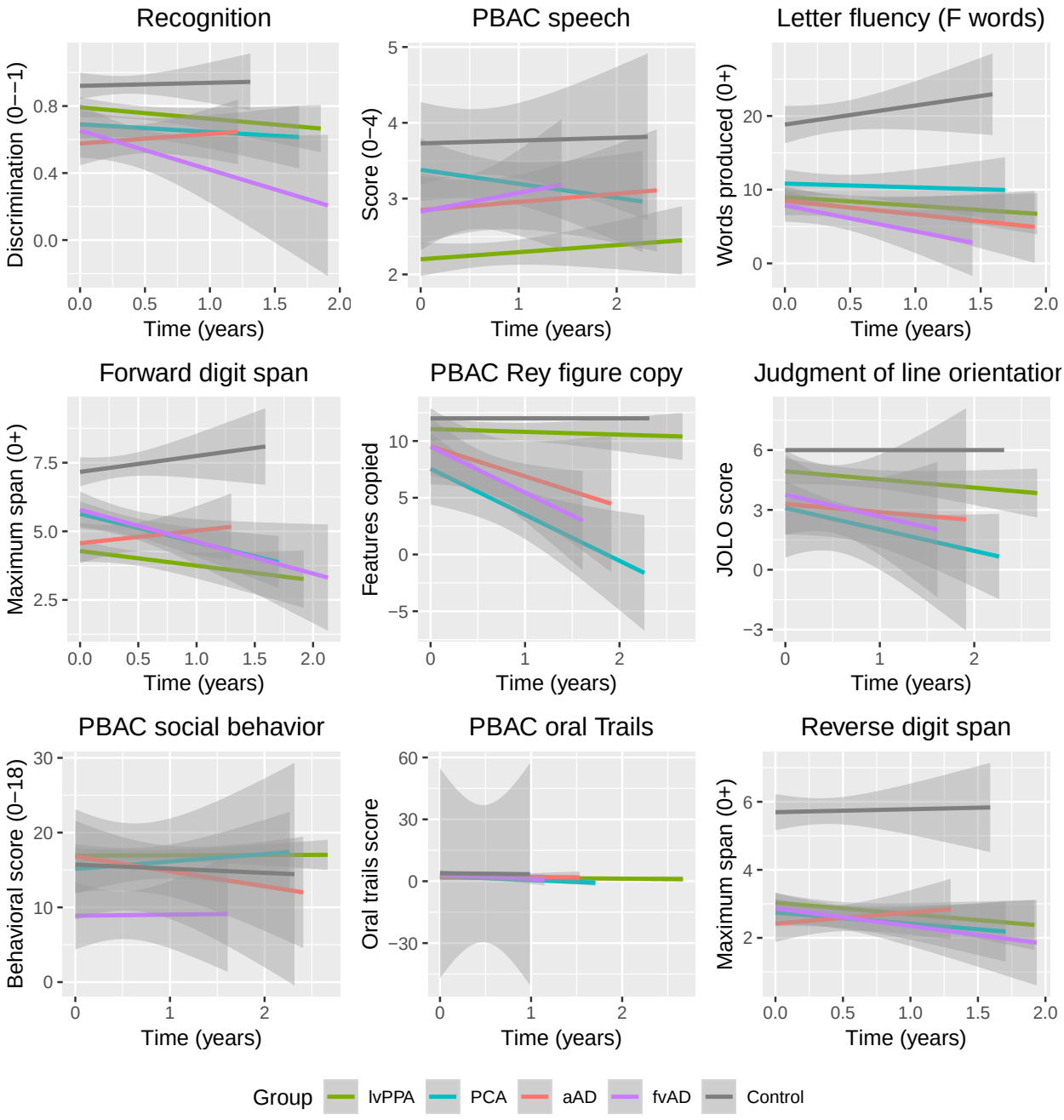
Supplementary Material: Longitudinal progression of grey matter atrophy in non-amnestic Alzheimer's disease

October 05, 2018

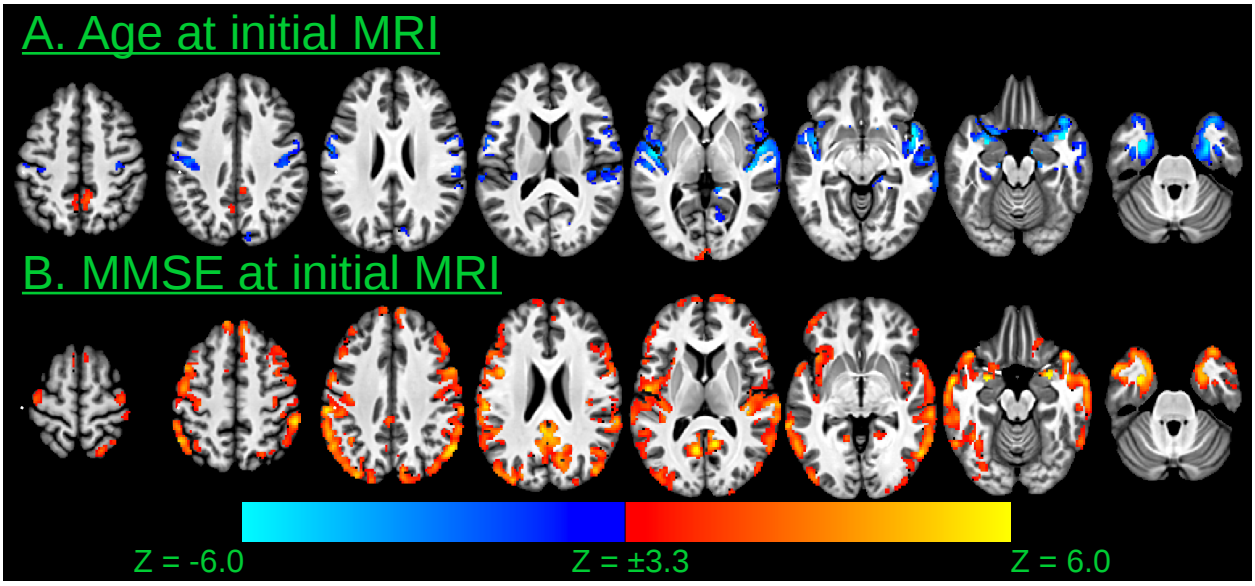
Neuropsychological performance at time of initial MRI

Longitudinal neuropsychological performance

Voxelwise analysis of cortical thinning



Supplementary Figure 1. Longitudinal change in neuropsychological performance. The x-axis indicates time (in years) from the first available assessment.



Supplementary Figure 2. Voxelwise associations of cortical thickness with age and MMSE score at initial MRI. Image overlays are t-statistic maps from linear mixed effects (LME) models, thresholded at voxelwise $p<0.001$ with a minimum cluster volume of 560 µl, corresponding to a corrected cluster-wise threshold of $p<0.05$. Warm colors indicate that cortical thickness over time is positively associated with each variable; cool colors indicate inverse associations.

Supplementary Table 1. Post-hoc comparisons of between group differences for neuropsychological assessments at time of initial MRI. P-values are given both before and after multiple-comparisons correction using FDR.

Measure	Effect	Mann-Whitney U	Estimated difference	Lower bound	Upper bound	P	P_{adj}
Age at initial MRI	Control>lvPPA	477	0.45	-3.3	3.7	0.84	0.94
	Control>PCA	361	3.4	-0.67	7.3	0.094	0.23
	Control<aAD	277	-0.02	-6.8	4	1	1
	Control<fvAD	117	-5.2	-12	0.32	0.079	0.23
	lvPPA>PCA	236	2.9	-0.88	7	0.18	0.3
	lvPPA<aAD	177	-0.91	-6	4.4	0.78	0.94
	lvPPA<fvAD	77	-5.2	-12	0.56	0.083	0.23
	PCA<aAD	82	-2.8	-11	2	0.21	0.3
	PCA<fvAD	32	-8.1	-16	-1.8	0.016	0.16
	aAD<fvAD	51	-4	-14	2.3	0.19	0.3
Initial MMSE	**Control>lvPPA**	**824.5**	**5**	**3**	**6.2**	**1.4e-07**	**4.8e-07**
	Control>PCA	**541.5**	**5.2**	**4**	**9.2**	**6.3e-08**	**4.8e-07**
	Control>aAD	**537**	**6**	**4**	**9**	**1.1e-07**	**4.8e-07**
	Control>fvAD	**351**	**4**	**3**	**6**	**1.1e-05**	**2.7e-05**
	lvPPA>PCA	217	1	-2	5	0.42	0.53
	lvPPA>aAD	216.5	1	-2	5	0.42	0.53
	lvPPA<fvAD	118.5	-5.5e-05	-4	3	0.83	0.92
	PCA<aAD	111	-2.4e-05	-4	4	0.97	0.97
	PCA<fvAD	54	-2	-6	2	0.25	0.51
	aAD<fvAD	57	-2	-6	2	0.33	0.53
Recognition	lvPPA>PCA	211	0.1	-5e-05	0.2	0.13	0.17
	lvPPA>aAD	**162.5**	**0.3**	**0.1**	**0.5**	**0.008**	**0.048**
	lvPPA>fvAD	149.5	0.1	-3.3e-05	0.3	0.15	0.17
	PCA>aAD	78.5	0.2	-3e-05	0.43	0.056	0.17
	PCA>fvAD	60	2.4e-05	-0.2	0.2	0.95	0.95
	aAD<fvAD	20	-0.2	-0.5	0.1	0.13	0.17
PBAC speech	**lvPPA<PCA**	**32.5**	**-1**	**-1.5**	**-0.2**	**0.0088**	**0.035**
	lvPPA<aAD	66.5	-7.2e-05	-0.5	0.5	1	1
	lvPPA<fvAD	**28.5**	**-1**	**-1.5**	**-0.2**	**0.012**	**0.035**
	PCA>aAD	52	1	4.1e-05	1.5	0.031	0.063
	PCA==fvAD	33	0	-0.5	0.5	0.8	0.96
	aAD<fvAD	10.5	-1	-1.5	-5.3e-05	0.044	0.066
Letter fluency (F words)	lvPPA<PCA	51.5	-6	-10	-1	0.023	0.11
	lvPPA>aAD	76	1	-3	6	0.6	0.6
	lvPPA<fvAD	41.5	-3	-7	1	0.15	0.23
	PCA>aAD	62	7	1	13	0.036	0.11
	PCA>fvAD	50.5	4	-3	8	0.3	0.36
	aAD<fvAD	10.5	-4	-10	5e-05	0.081	0.16
Forward digit span	lvPPA<PCA	128	-1	-1	3e-05	0.18	0.95
	lvPPA<aAD	41	-2e-05	-2	2	0.75	0.96
	lvPPA<fvAD	70	-1	-2	1	0.32	0.95
	PCA>aAD	33	1.2e-05	-1	3	0.8	0.96
	PCA<fvAD	59	-1.1e-05	-1	1	0.97	0.97
	aAD<fvAD	14	-0.56	-3	2	0.8	0.96
Rey figure copy	**lvPPA>PCA**	**131.5**	**10**	**1**	**12**	**0.0015**	**0.0092**
	lvPPA>aAD	101	7	9.1e-05	10	0.028	0.056
	lvPPA>fvAD	114.5	1	6.7e-05	3	0.026	0.056
	PCA<aAD	20.5	-1.4	-11	2	0.4	0.45
	PCA<fvAD	14	-6.8	-11	7.3e-06	0.063	0.094
	aAD<fvAD	21	-1.7	-9	2	0.45	0.45
Judgment of line orientation	**lvPPA>PCA**	**125**	**4**	**2**	**5**	**0.00066**	**0.0039**
	lvPPA>aAD	89.5	2	3.3e-05	5	0.037	0.074
	lvPPA>fvAD	78.5	4.7e-06	-1	2	0.49	0.49
	PCA<aAD	14.5	-1	-4	2	0.38	0.45
	PCA<fvAD	**2**	**-3**	**-5**	**-1**	**0.0042**	**0.013**
	aAD<fvAD	12	-2	-5	1	0.22	0.33
PBAC social behavior	lvPPA>PCA	117	1	-4.7e-05	3.5	0.1	0.18
	lvPPA>aAD	67	1e-05	-0.5	2	0.51	0.58
	lvPPA>fvAD	**138**	**6**	**1**	**9.5**	**0.00074**	**0.0045**
	PCA<aAD	22	-2.9e-05	-6	1	0.58	0.58
	PCA>fvAD	52.5	4	-0.25	7.8	0.12	0.18
	aAD>fvAD	42	5.6	1	12	0.022	0.066
Oral Trails	lvPPA<PCA	27	-7.9e-05	-2	2	1	1
	lvPPA<aAD	15.5	-5.1e-05	-3	3	0.94	1
	lvPPA<fvAD	12.5	-1	-4	1	0.23	0.72
	PCA<aAD	7.5	-1.5e-05	-3	4	1	1
	PCA<fvAD	5.5	-1	-4	2	0.32	0.72
	aAD<fvAD	3	-1	-5	2	0.36	0.72
Reverse digit span	lvPPA>PCA	208	1	-3.8e-05	1	0.12	0.71
	lvPPA>aAD	75.5	4.9e-05	-1	2	0.72	0.95
	lvPPA>fvAD	97.5	5.1e-05	-1e-05	1	0.8	0.95
	PCA<aAD	40	-8.7e-06	-1	2	0.9	0.95
	PCA<fvAD	44	-3.3e-05	-1	1	0.41	0.95
	aAD<fvAD	23	-4.8e-05	-2	1	0.95	0.95

Supplementary Table 2. Post-hoc comparisons of longitudinal recognition discrimination. Group mean: cross-sectional differences in average group performance, independent of time. Group x time: differences in rate of longitudinal cognitive change. P-values are FDR-corrected, with a significance threshold of $p<0.05$.

Effect	Comparison	Z	P
Group mean	PCA<lvPPA	1.7	0.19
	aAD<lvPPA	**3.0**	**0.023**
	fvAD<lvPPA	1.0	0.48
	Controls>lvPPA	1.9	0.16
	aAD<PCA	1.6	0.19
	fvAD>PCA	0.3	0.77
	Controls>PCA	**2.9**	**0.023**
	fvAD>aAD	1.6	0.19
	Controls>aAD	**3.9**	**0.0021**
	Controls>fvAD	2.4	0.091
Group x time	PCA>lvPPA	0.7	0.61
	aAD>lvPPA	1.2	0.35
	fvAD<lvPPA	1.6	0.19
	Controls>lvPPA	0.8	0.59
	aAD>PCA	0.6	0.61
	fvAD<PCA	1.9	0.16
	Controls>PCA	0.4	0.77
	fvAD<aAD	2.2	0.11
	Controls<aAD	0.1	0.89
	Controls>fvAD	1.7	0.19

Supplementary Table 3. Post-hoc comparisons of longitudinal language performance. Group mean: cross-sectional differences in average group performance, independent of time. Group x time: differences in rate of longitudinal cognitive change. P-values are FDR-corrected, with a significance threshold of $p<0.05$.

Task	Effect	Comparison	Z	P
Speech	Group mean	**PCA>lvPPA**	**4.0**	**0.00062**
		aAD>lvPPA	2.0	0.17
		fvAD>lvPPA	2.5	0.079
		Controls>lvPPA	**4.6**	**8.6e-05**
		PCA>aAD	1.6	0.28
		PCA>fvAD	1.1	0.48
		Controls>PCA	1.1	0.48
		fvAD>aAD	0.3	0.88
		Controls>aAD	2.4	0.093
		Controls>fvAD	2.2	0.11
	Group x time	lvPPA>PCA	1.6	0.28
		lvPPA>aAD	0.1	0.91
		fvAD>lvPPA	0.1	0.91
		lvPPA>Controls	0.6	0.83
		aAD>PCA	1.1	0.48
		fvAD>PCA	1.1	0.48
		Controls>PCA	0.5	0.83
		fvAD>aAD	0.2	0.91
		aAD>Controls	0.4	0.87
		fvAD>Controls	0.5	0.83
FLetterFluency	Group mean	PCA>lvPPA	2.0	0.17
		aAD>lvPPA	0.5	0.73
		lvPPA>fvAD	0.6	0.69
		Controls>lvPPA	**5.1**	**8e-06**
		PCA>aAD	1.2	0.41
		PCA>fvAD	2.0	0.17
		Controls>PCA	**2.9**	**0.017**
		aAD>fvAD	0.9	0.65
		Controls>aAD	**3.8**	**0.0011**
		Controls>fvAD	**4.9**	**1e-05**
	Group x time	PCA>lvPPA	0.0	0.99
		lvPPA>aAD	0.5	0.73
		lvPPA>fvAD	0.7	0.69
		Controls>lvPPA	1.4	0.36
		PCA>aAD	0.4	0.73
		PCA>fvAD	0.7	0.69
		Controls>PCA	1.3	0.39
		aAD>fvAD	0.2	0.86
		Controls>aAD	1.5	0.31
		Controls>fvAD	1.7	0.27
ForwardSpan	Group mean	**PCA>lvPPA**	**2.7**	**0.023**
		lvPPA>aAD	0.2	0.85
		fvAD>lvPPA	**2.4**	**0.041**
		Controls>lvPPA	**5.6**	**3.8e-07**
		PCA>aAD	**2.3**	**0.044**
		fvAD>PCA	0.2	0.85
		Controls>PCA	**2.9**	**0.021**
		fvAD>aAD	2.1	0.066
		Controls>aAD	**4.6**	**4.4e-05**
		Controls>fvAD	**2.3**	**0.043**
	Group x time	lvPPA>PCA	0.3	0.85
		aAD>lvPPA	1.4	0.25
		lvPPA>fvAD	1.0	0.41
		Controls>lvPPA	**2.6**	**0.023**
		aAD>PCA	1.5	0.21
		PCA>fvAD	0.7	0.55
		Controls>PCA	**2.7**	**0.023**
		aAD>fvAD	1.9	0.087
		Controls>aAD	1.0	0.41
		Controls>fvAD	**3.0**	**0.017**

Supplementary Table 4. Post-hoc comparisons of longitudinal visuospatial performance. Group mean: cross-sectional differences in average group performance, independent of time. Group x time: differences in rate of longitudinal cognitive change. P-values are FDR-corrected, with a significance threshold of $p<0.05$.

Task	Effect	Comparison	Z	P
ReyCopy	Group mean	lvPPA>PCA	2.4	0.12
		lvPPA>aAD	0.6	0.71
		lvPPA>fvAD	0.5	0.71
		Controls>lvPPA	0.5	0.71
		aAD>PCA	1.5	0.32
		fvAD>PCA	1.5	0.32
		Controls>PCA	2.0	0.17
		fvAD>aAD	0.1	0.92
		Controls>aAD	0.8	0.65
		Controls>fvAD	0.7	0.65
	Group x time	lvPPA>PCA	2.0	0.17
		lvPPA>aAD	1.4	0.32
		lvPPA>fvAD	**3.3**	**0.018**
		Controls>lvPPA	0.6	0.71
		aAD>PCA	0.2	0.87
		PCA>fvAD	1.3	0.32
		Controls>PCA	1.9	0.2
		aAD>fvAD	1.3	0.32
		Controls>aAD	1.5	0.32
		Controls>fvAD	**2.9**	**0.042**
JOLO	Group mean	lvPPA>PCA	1.7	0.46
		lvPPA>aAD	1.1	0.79
		lvPPA>fvAD	1.6	0.46
		Controls>lvPPA	1.0	0.82
		aAD>PCA	0.3	0.87
		fvAD>PCA	0.1	0.93
		Controls>PCA	1.9	0.46
		aAD>fvAD	0.2	0.87
		Controls>aAD	1.6	0.46
		Controls>fvAD	2.0	0.46
	Group x time	lvPPA>PCA	0.7	0.82
		aAD>lvPPA	0.3	0.87
		lvPPA>fvAD	0.2	0.87
		Controls>lvPPA	0.7	0.82
		aAD>PCA	0.7	0.82
		fvAD>PCA	0.2	0.87
		Controls>PCA	1.1	0.79
		aAD>fvAD	0.4	0.87
		Controls>aAD	0.2	0.87
		Controls>fvAD	0.7	0.82

Supplementary Table 5. Post-hoc comparisons of longitudinal behavioral and executive function. Group mean: cross-sectional differences in average group performance, independent of time. Group x time: differences in rate of longitudinal cognitive change. P-values are FDR-corrected, with a significance threshold of p<0.05.

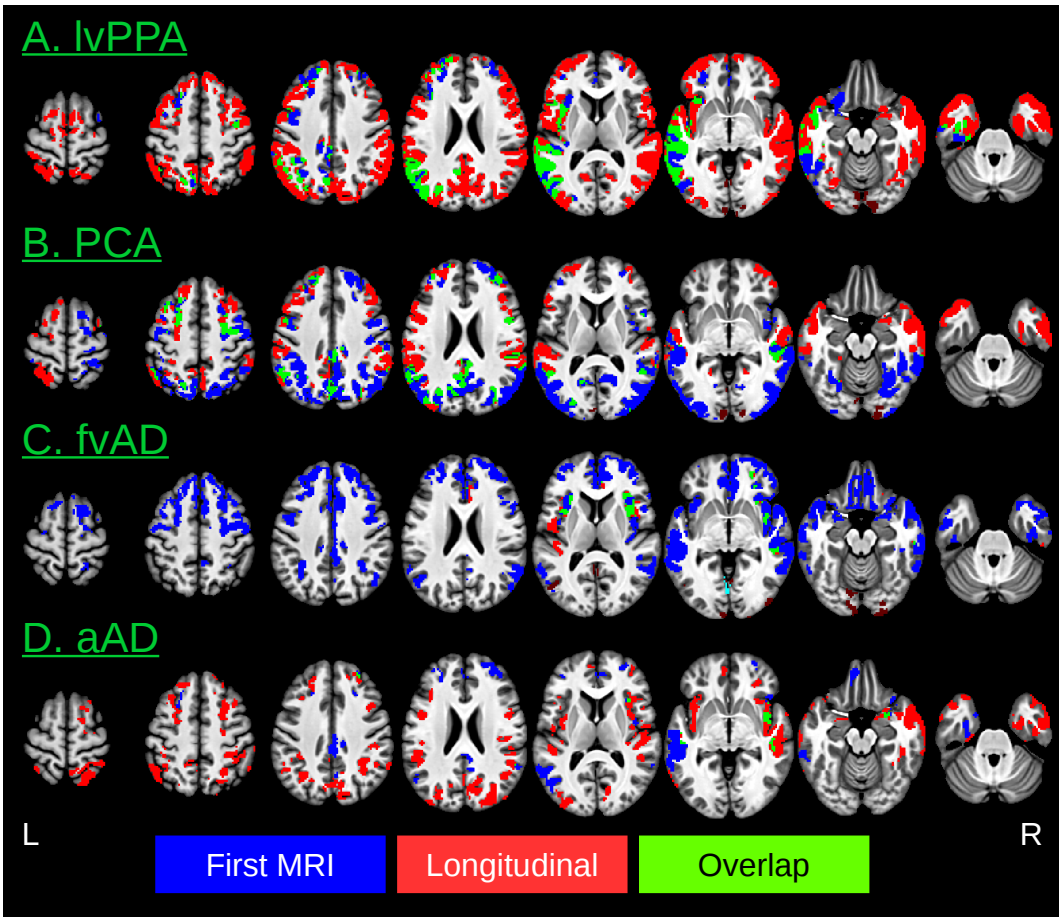
Task	Effect	Comparison	Z	P
BehavioralScale	Group mean	lvPPA>PCA	1.4	0.49
		lvPPA>aAD	0.3	0.85
		lvPPA>fvAD	**3.9**	**0.0022**
		lvPPA>Controls	0.6	0.83
		aAD>PCA	0.8	0.74
		PCA>fvAD	1.8	0.4
		Controls>PCA	0.5	0.83
		aAD>fvAD	2.3	0.2
		aAD>Controls	0.2	0.85
		Controls>fvAD	2.1	0.21
	Group x time	PCA>lvPPA	1.0	0.71
		lvPPA>aAD	1.1	0.71
		fvAD>lvPPA	0.1	0.92
		lvPPA>Controls	0.4	0.83
		PCA>aAD	1.6	0.41
		PCA>fvAD	0.6	0.83
		PCA>Controls	1.0	0.71
		fvAD>aAD	0.9	0.74
		Controls>aAD	0.4	0.83
		fvAD>Controls	0.4	0.83
OralTrails	Group mean	PCA>lvPPA	0.7	0.98
		aAD>lvPPA	0.7	0.98
		fvAD>lvPPA	1.0	0.98
		Controls>lvPPA	1.0	0.98
		PCA>aAD	0.0	0.98
		fvAD>PCA	0.2	0.98
		Controls>PCA	0.5	0.98
		fvAD>aAD	0.3	0.98
		Controls>aAD	0.6	0.98
		Controls>fvAD	0.4	0.98
	Group x time	lvPPA>PCA	1.5	0.98
		lvPPA>aAD	0.1	0.98
		lvPPA>fvAD	1.2	0.98
		lvPPA>Controls	0.1	0.98
		aAD>PCA	1.0	0.98
		PCA>fvAD	0.1	0.98
		Controls>PCA	0.5	0.98
		aAD>fvAD	1.0	0.98
		aAD>Controls	0.0	0.98
		Controls>fvAD	0.6	0.98
ReverseSpan	Group mean	lvPPA>PCA	0.5	0.82
		lvPPA>aAD	1.4	0.6
		lvPPA>fvAD	0.6	0.79
		Controls>lvPPA	**7.6**	**5.7e-13**
		PCA>aAD	0.9	0.67
		PCA>fvAD	0.2	0.95
		Controls>PCA	**7.1**	**6.9e-12**
		fvAD>aAD	0.6	0.79
		Controls>aAD	**7.3**	**3.5e-12**
		Controls>fvAD	**6.5**	**4e-10**
	Group x time	PCA>lvPPA	0.2	0.95
		aAD>lvPPA	1.1	0.65
		fvAD>lvPPA	0.0	0.98
		Controls>lvPPA	1.3	0.6
		aAD>PCA	0.8	0.67
		PCA>fvAD	0.1	0.95
		Controls>PCA	1.1	0.65
		aAD>fvAD	0.8	0.67
		Controls>aAD	0.2	0.95
		Controls>fvAD	1.1	0.65

Supplementary Table 6. Peak effects of initial cortical thinning for each patient group relative to controls. Reported values are t-statistics for the peak voxel (local minimum) within each anatomically-defined region at a cluster-wise significance threshold of $p<0.05$, as well as the volume of statistically significant voxels in microliters.

Region	aAD: T_{init}	aAD: Vol_{init}	lvPPA: T_{init}	lvPPA: Vol_{init}	PCA: T_{init}	PCA: Vol_{init}	fvAD: T_{init}	fvAD: Vol_{init}
Right ACgG anterior cingulate gyrus	—	—	—	—	—	—	-5.0	1602
Left ACgG anterior cingulate gyrus	—	—	—	—	—	—	-6.3	1360
Right AIns anterior insula	—	—	—	—	—	—	-5.3	2248
Left AIns anterior insula	—	—	-4.5	870	—	—	-5.0	1181
Right AOrG anterior orbital gyrus	-4.1	68	—	—	—	—	-5.4	487
Left AOrG anterior orbital gyrus	—	—	-4.3	233	—	—	—	—
Right AnG angular gyrus	—	—	—	—	-5.3	2804	-4.5	743
Left AnG angular gyrus	-4.1	114	-6.7	2194	-6.5	3296	—	—
Right Calc calcarine cortex	—	—	—	—	-5.0	235	—	—
Left Calc calcarine cortex	—	—	—	—	-3.7	3	—	—
Right CO central operculum	—	—	—	—	—	—	-4.3	210
Left CO central operculum	—	—	-4.8	139	—	—	—	—
Right Cun cuneus	—	—	—	—	-5.0	202	—	—
Left Cun cuneus	—	—	—	—	-4.7	163	—	—
Right Ent entorhinal area	—	—	—	—	—	—	-4.5	174
Left Ent entorhinal area	—	—	—	—	—	—	—	—
Right FO frontal operculum	—	—	—	—	—	—	-4.8	458
Left FO frontal operculum	—	—	-4.5	385	—	—	-5.0	321
Right FRP frontal pole	—	—	—	—	-3.7	29	-3.8	60
Left FRP frontal pole	—	—	—	—	—	—	—	—
Right FuG fusiform gyrus	—	—	—	—	-4.6	642	—	—
Left FuG fusiform gyrus	—	—	-4.8	855	—	—	—	—
Right GRe gyrus rectus	—	—	—	—	—	—	-5.0	510
Left GRe gyrus rectus	—	—	—	—	—	—	-4.3	108
Right IOG inferior occipital gyrus	—	—	—	—	-5.4	3653	—	—
Left IOG inferior occipital gyrus	—	—	-6.3	795	-5.2	962	—	—
Right ITG inferior temporal gyrus	—	—	—	—	-4.7	1146	-4.0	74
Left ITG inferior temporal gyrus	-3.9	24	-6.0	1791	-5.6	99	-4.8	89
Right LiG lingual gyrus	—	—	—	—	-5.0	479	—	—
Left LiG lingual gyrus	—	—	—	—	—	—	—	—
Right LOrG lateral orbital gyrus	—	—	—	—	—	—	-4.2	83
Left LOrG lateral orbital gyrus	—	—	-3.8	16	—	—	-3.9	12
Right MCgG middle cingulate gyrus	-5.0	569	—	—	-4.8	311	-5.2	1456
Left MCgG middle cingulate gyrus	-3.4	10	—	—	—	—	-4.1	134
Right MFC medial frontal cortex	—	—	—	—	—	—	-4.9	1187
Left MFC medial frontal cortex	—	—	—	—	—	—	-4.5	389
Right MFG middle frontal gyrus	-5.2	613	-4.3	168	-4.9	1237	-5.7	4019
Left MFG middle frontal gyrus	—	—	-5.0	936	—	—	-5.1	2599
Right MOG middle occipital gyrus	—	—	—	—	-6.4	3331	—	—
Left MOG middle occipital gyrus	—	—	-5.7	1312	-5.9	2672	—	—
Right MOrG medial orbital gyrus	—	—	—	—	—	—	-4.8	65
Left MOrG medial orbital gyrus	—	—	-4.9	313	—	—	—	—
Right MPrG precentral gyrus medial segment	-4.8	104	—	—	-4.6	199	-5.1	237
Right MSFG superior frontal gyrus medial segment	—	—	—	—	—	—	-5.1	2064
Left MSFG superior frontal gyrus medial segment	—	—	—	—	—	—	-5.5	893
Right MTG middle temporal gyrus	—	—	—	—	-5.6	2515	-5.5	3160
Left MTG middle temporal gyrus	-5.3	2197	-8.1	7215	-6.5	2548	-5.2	3556
Right OCP occipital pole	—	—	—	—	-4.3	145	—	—
Left OCP occipital pole	—	—	—	—	-4.3	204	—	—
Right OFuG occipital fusiform gyrus	—	—	—	—	-4.9	594	—	—
Left OFuG occipital fusiform gyrus	—	—	-4.3	47	—	—	—	—
Right OpIFG opercular part of the inferior frontal gyrus	—	—	—	—	—	—	-4.3	439
Left OpIFG opercular part of the inferior frontal gyrus	—	—	—	—	—	—	—	—
Right OrIFG orbital part of the inferior frontal gyrus	—	—	—	—	—	—	-4.6	67
Left OrIFG orbital part of the inferior frontal gyrus	—	—	-4.1	50	—	—	-3.9	60
Right PCgG posterior cingulate gyrus	-4.3	224	—	—	-5.7	1567	-4.4	483
Left PCgG posterior cingulate gyrus	-3.7	19	—	—	-4.7	286	-3.4	4
Right PCu precuneus	—	—	—	—	-5.1	2706	-3.6	22
Left PCu precuneus	—	—	—	—	-5.0	3414	—	—
Right PHG parahippocampal gyrus	—	—	—	—	—	—	—	—
Left PHG parahippocampal gyrus	—	—	—	—	—	—	—	—
Right PIns posterior insula	—	—	—	—	—	—	-4.6	640
Left PIns posterior insula	—	—	-4.3	11	—	—	-3.6	4
Right PO parietal operculum	—	—	—	—	—	—	—	—
Left PO parietal operculum	—	—	-5.0	106	-3.9	20	—	—
Right PoG postcentral gyrus	—	—	—	—	—	—	-3.5	2
Left PoG postcentral gyrus	—	—	—	—	—	—	—	—
Right POrG posterior orbital gyrus	—	—	—	—	—	—	-5.1	388
Left POrG posterior orbital gyrus	—	—	-4.9	475	—	—	—	—
Right PP planum polare	—	—	—	—	—	—	-4.9	336
Left PP planum polare	—	—	-4.5	142	—	—	-5.0	132
Right PrG precentral gyrus	—	—	—	—	-5.6	904	-4.7	911
Left PrG precentral gyrus	—	—	—	—	—	—	—	—
Right PT planum temporale	—	—	—	—	—	—	—	—
Left PT planum temporale	—	—	-4.6	544	—	—	—	—
Right SCA subcallosal area	—	—	—	—	—	—	-4.4	105
Left SCA subcallosal area	—	—	—	—	—	—	-3.5	6
Right SFG superior frontal gyrus	-5.2	383	-4.5	401	-4.6	1173	-5.7	4621
Left SFG superior frontal gyrus	—	—	-5.1	681	—	—	-5.2	2118
Right SMC supplementary motor cortex	-4.2	10	—	—	-3.6	5	-5.7	901
Left SMC supplementary motor cortex	—	—	—	—	—	—	-4.0	62
Right SMG supramarginal gyrus	—	—	—	—	-4.7	433	-3.7	74
Left SMG supramarginal gyrus	-3.7	8	-6.8	1306	-5.3	1845	—	—
Right SOG superior occipital gyrus	—	—	—	—	-6.4	859	—	—
Left SOG superior occipital gyrus	—	—	—	—	-5.7	778	—	—
Right SPL superior parietal lobule	—	—	—	—	-5.8	2042	—	—
Left SPL superior parietal lobule	—	—	—	—	-5.6	1608	—	—
Right STG superior temporal gyrus	—	—	—	—	-4.2	304	-5.5	829
Left STG superior temporal gyrus	-5.4	1504	-8.2	4174	-5.3	1284	-5.3	1672
Right TMP temporal pole	—	—	—	—	—	—	-4.0	1075
Left TMP temporal pole	—	—	—	—	—	—	-5.5	1213
Right TrIFG triangular part of the inferior frontal gyrus	—	—	—	—	—	—	-4.1	106
Left TrIFG triangular part of the inferior frontal gyrus	—	—	—	—	—	—	-4.3	85
Right TTG transverse temporal gyrus	—	—	—	—	—	—	-3.5	2
Left TTG transverse temporal gyrus	—	—	-4.5	65	—	—	—	—

Supplementary Table 7. Peak effects for contrasts of longitudinal change over time for each patient group relative to controls. Reported values are t-statistics for the peak voxel (local maximum) within each anatomically-defined region at a cluster-wise significance threshold of $p<0.05$, as well as the volume of statistically significant voxels in microliters.

Region	aAD: T_{long}	aAD: Vol_{long}	lvPPA: T_{long}	lvPPA: Vol_{long}	PCA: T_{long}	PCA: Vol_{long}	fvAD: T_{long}	fvAD: Vol_{long}
Right ACgG anterior cingulate gyrus	—	—	—	—	—	—	—	—
Left ACgG anterior cingulate gyrus	—	—	—	—	—	—	—	—
Right AIns anterior insula	4.8	861	3.7	3	—	—	4.4	253
Left AIns anterior insula	4.4	618	4.8	1234	—	—	—	—
Right AOrG anterior orbital gyrus	—	—	—	—	—	—	—	—
Left AOrG anterior orbital gyrus	—	—	4.5	215	—	—	—	—
Right AnG angular gyrus	5.0	852	6.3	3111	3.3	6	—	—
Left AnG angular gyrus	5.5	258	5.9	6065	4.0	285	—	—
Right Calc calcarine cortex	—	—	3.8	21	—	—	—	—
Left Calc calcarine cortex	—	—	—	—	—	—	—	—
Right CO central operculum	5.8	911	4.8	481	4.4	207	4.2	118
Left CO central operculum	—	—	4.8	1161	4.3	224	—	—
Right Cun cuneus	5.5	655	5.1	818	—	—	—	—
Left Cun cuneus	—	—	4.5	217	—	—	—	—
Right Ent entorhinal area	—	—	4.9	525	—	—	—	—
Left Ent entorhinal area	—	—	5.7	420	—	—	—	—
Right FO frontal operculum	—	—	3.6	14	—	—	4.2	217
Left FO frontal operculum	5.3	136	6.0	1022	—	—	—	—
Right FRP frontal pole	—	—	—	—	—	—	—	—
Left FRP frontal pole	—	—	4.0	203	3.6	28	—	—
Right FuG fusiform gyrus	4.8	1210	5.0	695	—	—	—	—
Left FuG fusiform gyrus	—	—	5.6	704	—	—	—	—
Right GRe gyrus rectus	—	—	—	—	—	—	—	—
Left GRe gyrus rectus	—	—	—	—	—	—	—	—
Right IOG inferior occipital gyrus	—	—	3.8	22	—	—	—	—
Left IOG inferior occipital gyrus	—	—	3.9	58	—	—	—	—
Right ITG inferior temporal gyrus	5.1	677	6.6	2572	6.0	892	—	—
Left ITG inferior temporal gyrus	—	—	5.5	1457	—	—	—	—
Right LiG lingual gyrus	—	—	5.2	198	—	—	—	—
Left LiG lingual gyrus	—	—	5.0	237	—	—	—	—
Right LOrG lateral orbital gyrus	—	—	5.1	575	—	—	—	—
Left LOrG lateral orbital gyrus	—	—	4.9	1026	—	—	—	—
Right MCgG middle cingulate gyrus	—	—	4.3	20	5.3	265	—	—
Left MCgG middle cingulate gyrus	—	—	—	—	4.5	119	—	—
Right MFC medial frontal cortex	—	—	—	—	—	—	—	—
Left MFC medial frontal cortex	—	—	—	—	—	—	—	—
Right MFG middle frontal gyrus	5.6	639	5.2	2448	5.4	1645	—	—
Left MFG middle frontal gyrus	—	—	5.4	4713	5.2	1497	—	—
Right MOG middle occipital gyrus	4.7	693	4.8	1027	—	—	—	—
Left MOG middle occipital gyrus	—	—	5.4	3120	—	—	—	—
Right MOrG medial orbital gyrus	—	—	3.7	3	—	—	—	—
Left MOrG medial orbital gyrus	—	—	—	—	—	—	—	—
Right MPrG precentral gyrus medial segment	—	—	—	—	3.4	4	—	—
Right MSFG superior frontal gyrus medial segment	—	—	4.3	222	—	—	—	—
Left MSFG superior frontal gyrus medial segment	—	—	3.9	86	—	—	—	—
Right MTG middle temporal gyrus	6.4	3682	6.7	10722	6.0	3918	—	—
Left MTG middle temporal gyrus	—	—	6.0	8648	5.0	904	—	—
Right OCP occipital pole	—	—	—	—	—	—	—	—
Left OCP occipital pole	—	—	—	—	—	—	—	—
Right OFuG occipital fusiform gyrus	—	—	4.6	77	—	—	—	—
Left OFuG occipital fusiform gyrus	—	—	4.5	97	—	—	—	—
Right OpIFG opercular part of the inferior frontal gyrus	—	—	4.9	1600	—	—	—	—
Left OpIFG opercular part of the inferior frontal gyrus	3.5	4	6.0	1897	4.6	757	—	—
Right OrIFG orbital part of the inferior frontal gyrus	—	—	4.6	179	—	—	—	—
Left OrIFG orbital part of the inferior frontal gyrus	—	—	4.9	259	—	—	—	—
Right PCgG posterior cingulate gyrus	—	—	5.2	860	5.4	624	—	—
Left PCgG posterior cingulate gyrus	—	—	4.5	304	4.7	336	—	—
Right PCu precuneus	5.1	1467	7.0	3391	4.8	464	—	—
Left PCu precuneus	4.2	84	7.0	3749	4.8	459	—	—
Right PHG parahippocampal gyrus	—	—	5.0	378	—	—	—	—
Left PHG parahippocampal gyrus	—	—	6.0	791	—	—	—	—
Right PIns posterior insula	5.7	1298	5.0	433	—	—	—	—
Left PIns posterior insula	4.0	23	4.4	525	—	—	—	—
Right PO parietal operculum	4.7	316	5.2	275	4.5	420	—	—
Left PO parietal operculum	—	—	6.4	877	5.8	1193	—	—
Right PoG postcentral gyrus	4.8	361	—	—	4.1	101	—	—
Left PoG postcentral gyrus	—	—	4.8	480	5.3	483	—	—
Right POrG posterior orbital gyrus	3.5	15	4.0	54	—	—	—	—
Left POrG posterior orbital gyrus	3.4	2	4.7	1	—	—	—	—
Right PP planum polare	5.1	293	5.0	655	3.4	1	—	—
Left PP planum polare	—	—	4.8	733	—	—	—	—
Right PrG precentral gyrus	—	—	4.6	1580	3.8	139	—	—
Left PrG precentral gyrus	—	—	5.3	1670	4.6	797	—	—
Right PT planum temporale	4.7	616	5.3	1432	4.8	698	—	—
Left PT planum temporale	—	—	5.8	1242	5.6	916	—	—
Right SCA subcallosal area	—	—	—	—	—	—	—	—
Left SCA subcallosal area	—	—	—	—	—	—	—	—
Right SFG superior frontal gyrus	5.0	81	4.2	268	4.0	248	—	—
Left SFG superior frontal gyrus	—	—	4.6	1368	5.1	2039	—	—
Right SMC supplementary motor cortex	—	—	—	—	—	—	—	—
Left SMC supplementary motor cortex	—	—	—	—	—	—	—	—
Right SMG supramarginal gyrus	5.2	801	5.8	4316	4.8	1294	—	—
Left SMG supramarginal gyrus	5.7	378	6.4	6813	5.6	1907	—	—
Right SOG superior occipital gyrus	4.7	585	4.5	218	—	—	—	—
Left SOG superior occipital gyrus	—	—	4.0	172	—	—	—	—
Right SPL superior parietal lobule	5.2	2256	5.6	497	—	—	—	—
Left SPL superior parietal lobule	4.7	579	4.8	2840	4.4	499	—	—
Right STG superior temporal gyrus	5.6	1407	6.4	6845	4.5	883	—	—
Left STG superior temporal gyrus	—	—	6.0	5191	6.1	1292	—	—
Right TMP temporal pole	6.0	669	6.1	4384	4.3	66	—	—
Left TMP temporal pole	—	—	6.1	5501	4.5	2086	—	—
Right TrIFG triangular part of the inferior frontal gyrus	—	—	4.3	341	—	—	—	—
Left TrIFG triangular part of the inferior frontal gyrus	—	—	5.6	902	3.4	24	—	—
Right TTG transverse temporal gyrus	4.7	266	4.6	221	3.9	32	—	—
Left TTG transverse temporal gyrus	—	—	3.8	21	4.0	11	—	—



Supplementary Figure 3. Voxelwise differences in cortical thickness relative to matched controls at a threshold of $p<0.01$, uncorrected for multiple comparisons. Results are for the same contrasts as shown in Figure 3, main text. Image overlays are binarized t-statistic maps for simple contrasts of controls minus each patient group. Blue: simple effect of group (patients<controls) from cross-sectional analysis of participants' initial MRI scans; red: group x time interaction from longitudinal LME models, indicating where patients have more rapid cortical thinning than controls; green: overlap between group and group x time effects. All results are displayed with a minimum cluster volume of 560 µl.