

On-line Table 1: ASPC between brain volumes derived from standard and Wave-MRPAGE scan-rescan experiments

Brain Region	Standard (Mean) (±SD)	Wave (Mean) (±SD)	Difference (Mean) (±SD)	Paired T Test (P Value)	ANOVA ^a (P Value)
Brain stem	1.91 (4.76)	2.40 (3.39)	1.44 (1.16)	.42	.28
Cerebellum	2.07 (1.73)	2.49 (1.33)	1.83 (1.16)	.56	.46
Cingulate	0.52 (0.54)	0.81 (0.88)	0.69 (0.81)	.4	.09
Frontal	1.04 (1.36)	1.40 (1.23)	0.63 (0.40)	.13	.25
Hippocampus	1.03 (0.97)	0.98 (0.76)	0.94 (0.78)	.9	.48
Insula	1.17 (0.75)	1.77 (1.04)	0.95 (0.63)	.09	1.00
Occipital	1.96 (1.25)	2.16 (1.97)	1.60 (1.65)	.79	.38
Parietal	0.99 (0.81)	1.10 (0.99)	0.63 (0.45)	.68	.44
Basal ganglia	0.84 (0.61)	0.53 (0.73)	0.75 (0.41)	.26	.64
Temporal	1.01 (0.91)	1.14 (0.89)	1.04 (0.80)	.77	.99
Total volume	0.84 (0.68)	1.17 (0.67)	0.56 (0.41)	.08	.80

^a ANOVA to evaluate the interaction of the head coil (20 or 32 channels).

On-line Table 2: Brain volume quantitative evaluation

Structure	Volume			ASPC (Mean) (±SD)	Pearson Coefficient	Dice Coefficient (Mean) (±SD)
	Standard (mL) Mean (±SD)	Wave (mL) Mean (±SD)	P Value ^a			
Left cerebral WM	220.8 (28.5)	216.3 (27.7)	.04	2.2 (1.5)	0.99 ^b	0.93 (0.02)
Right cerebral WM	221.0 (30.0)	216.4 (29.6)	.04	2.2 (1.4)	0.99 ^b	
Left frontal	72.1 (9.1)	71.4 (9.1)	.11	1.4 (1.5)	0.99 ^b	0.93 (0.03)
Right frontal	71.8 (9.6)	71.1 (9.6)	.26	1.7 (2.3)	0.98 ^b	
Left parietal	44.9 (5.7)	44.4 (5.7)	.18	1.6 (1.4)	0.99 ^b	0.92 (0.03)
Right parietal	46.8 (6.3)	46.2 (6.5)	.92	2.2 (1.8)	0.99 ^b	
Left temporal	31.7 (5.3)	30.9 (5.2)	.01	3.1 (2.3)	0.99 ^b	0.90 (0.03)
Right temporal	30.4 (5.1)	29.6 (5.0)	.01	3.2 (2.1)	0.99 ^b	
Left occipital	20.9 (3.1)	20.1 (3.2)	<.001	5.7 (4.1)	0.93 ^b	0.89 (0.03)
Right occipital	21.9 (3.2)	20.9 (3.1)	.01	5.8 (5.1)	0.90 ^b	
Left cingulate	12.9 (1.9)	12.9 (1.8)	<.001	1.5 (2.2)	0.99 ^b	0.92 (0.02)
Right cingulate	11.7 (1.9)	11.7 (1.8)	.89	1.7 (1.8)	0.99 ^b	
Left insula	9.2 (1.6)	9.3 (1.5)	<.001	1.9 (1.8)	0.99 ^b	0.89 (0.02)
Right insula	9.0 (1.6)	9.0 (1.6)	.001	1.9 (1.5)	0.99 ^b	
Left hippocampus	3.6 (0.6)	3.5 (0.6)	.01	4.8 (5.2)	0.95 ^b	0.91 (0.02)
Right hippocampus	3.7 (0.7)	3.6 (0.6)	<.001	3.5 (2.5)	0.99 ^b	
Left basal ganglia	27.0 (2.0)	26.7 (3.0)	.37	1.9 (2.3)	0.97 ^b	0.93 (0.02)
Right basal ganglia	27.3 (3.1)	26.9 (3.1)	.37	1.7 (1.3)	0.99 ^b	
Brain stem	21.1 (2.7)	21.2 (3.1)	.01	2.7 (4.0)	0.94 ^b	0.95 (0.03)
Left cerebellum	15.6 (2.5)	15.9 (2.9)	.01	5.4 (4.5)	0.99 ^b	0.86 (0.04)
Right cerebellum	14.7 (2.1)	15.1 (2.4)	<.001	5.1 (3.3)	0.99 ^b	

^a Paired t test;

^b P < .001.

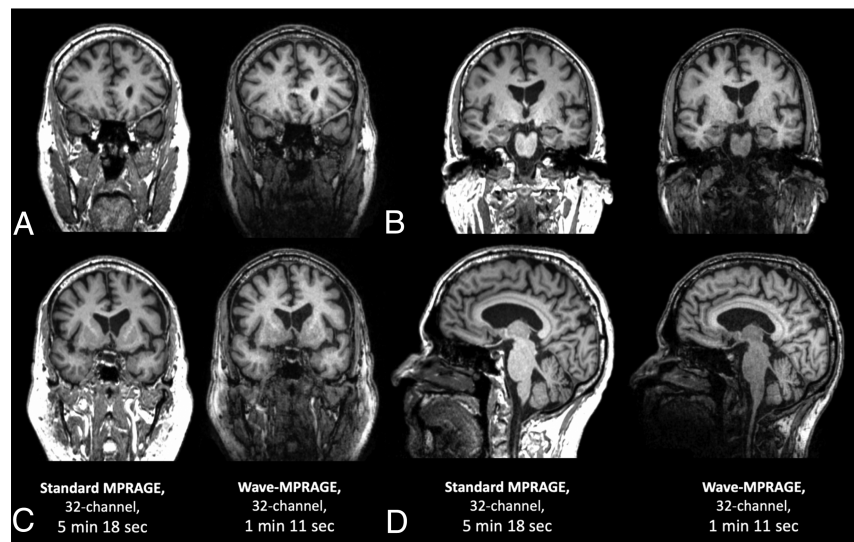
On-line Table 3: Basal ganglia subanalysis

Structure	Volume		ASPC (Mean) (±SD)	Pearson Coefficient
	Standard (mL) (Mean) (±SD)	Wave (mL) (Mean) (±SD)		
Left thalamus	6.7 (1.0)	6.8 (1.0)	3.3 (3.9)	0.94
Right thalamus	6.6 (1.0)	6.7 (1.0)	2.6 (3.1)	0.97
Left putamen	4.5 (0.6)	4.5 (0.6)	4.2 (3.7)	0.94
Right putamen	4.6 (0.6)	4.6 (0.6)	3.2 (2.6)	0.96
Left caudate	3.5 (0.5)	3.5 (0.5)	4.0 (3.7)	0.94
Right caudate	3.7 (0.5)	3.7 (0.5)	2.6 (2.1)	0.96
Left pallidum	2.0 (0.3)	1.9 (0.3)	8.7 (10.4)	0.7
Right pallidum	1.9 (0.3)	1.8 (0.3)	8.9 (11.0)	0.74

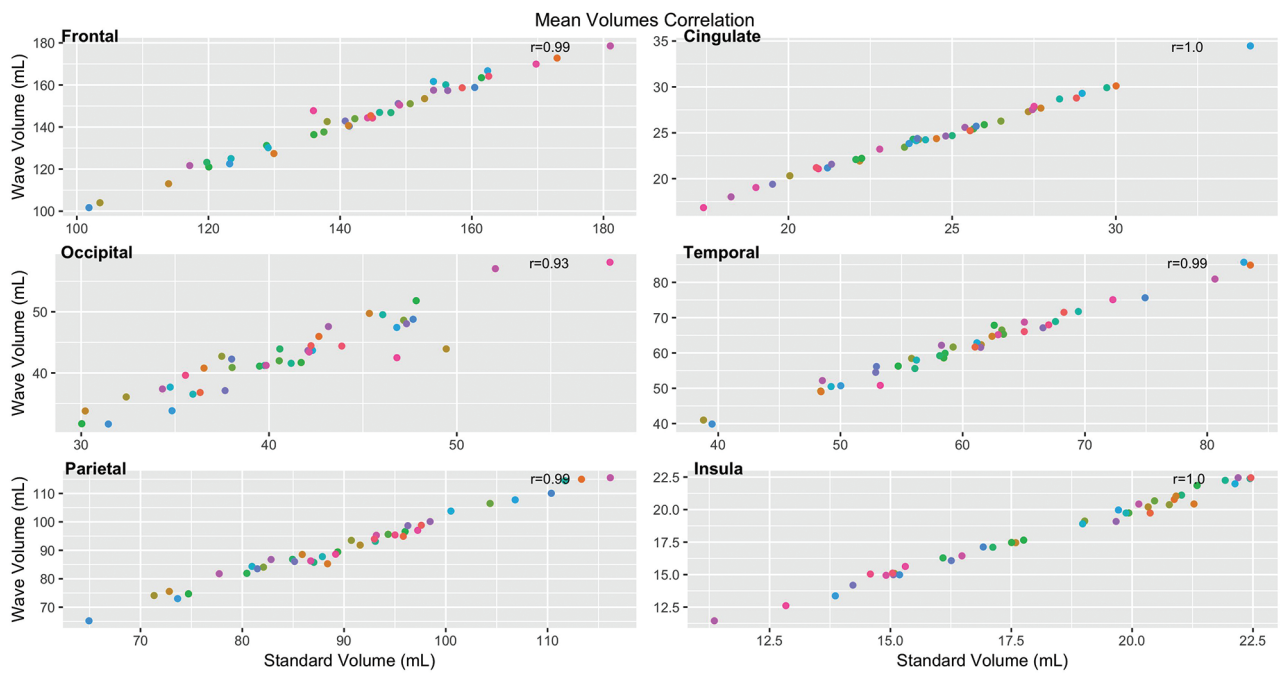
On-line Table 4: Visual rating scales P values for the TOST test, comparing the score difference means

Comparison	P Value	
	Lower Bound (-Δ)	Upper Bound (Δ)
Standard-Wave		
Anterior-temporal ^a	<.01	<.01
Cingulate	<.01	.01
Frontoinsular	<.01	<.01
MTA scale	<.01	.01
Orbitofrontal	<.01	.02
Posterior	<.01	<.01

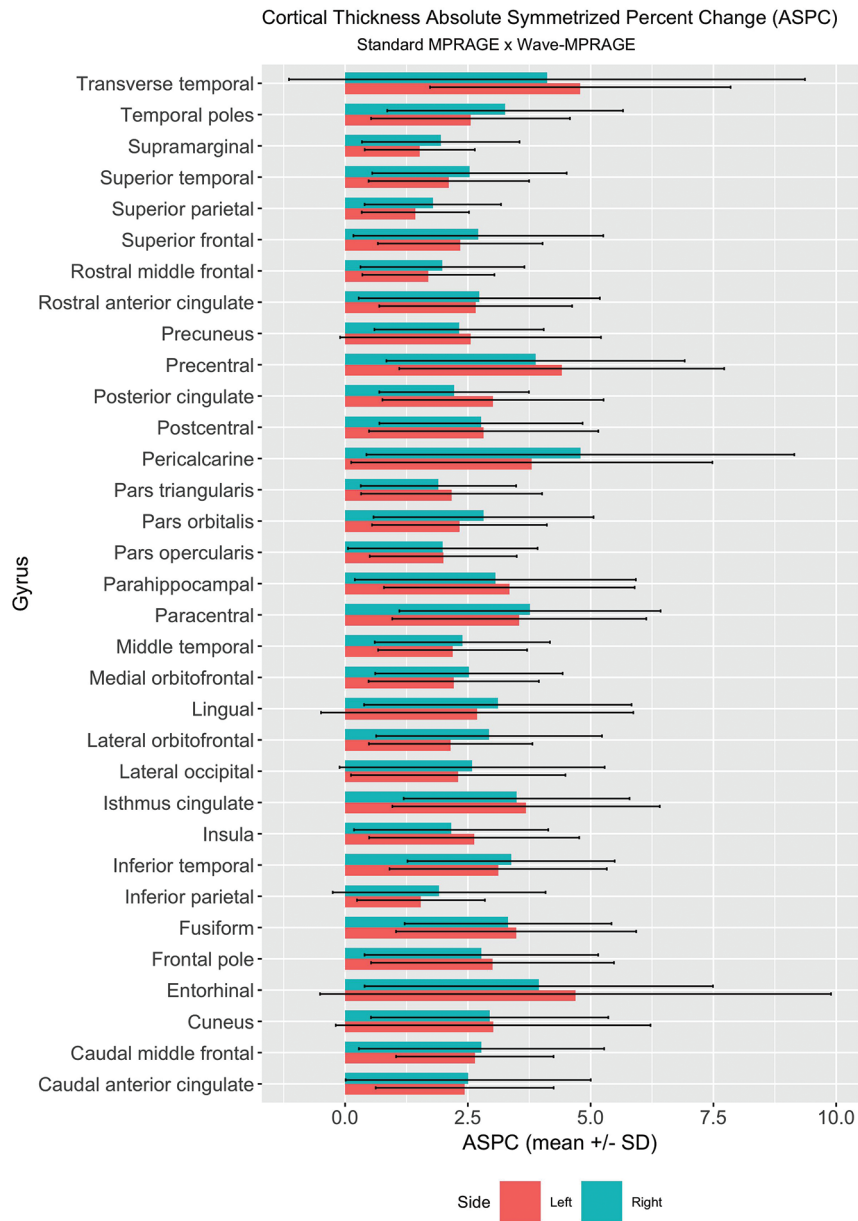
Note:—MTA indicates medial temporal lobe atrophy; TOST, two 1-sided t test.
^aNumbers mean not different from zero and equivalent to zero.



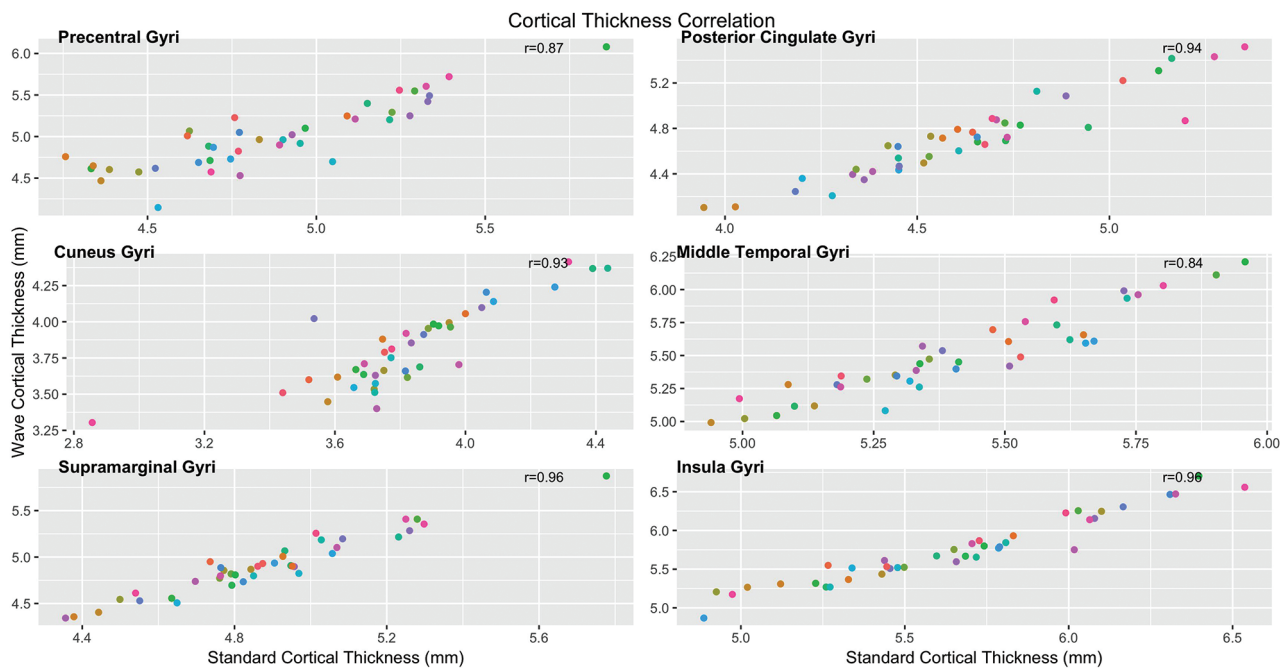
ON-LINE FIG 1. Comparison of standard and Wave-MPRAGE images in a patient with right fronto-insular-predominant atrophy. The images demonstrate the anatomic landmarks used for the visual rating scales: anterior cingulate and orbito-frontal (A), medial temporal (B), anterior temporal and fronto-insular (C), and posterior (D). The Wave-MPRAGE sequence showed an increase in image noise compared with standard MPRAGE, which did not affect the volume evaluation.



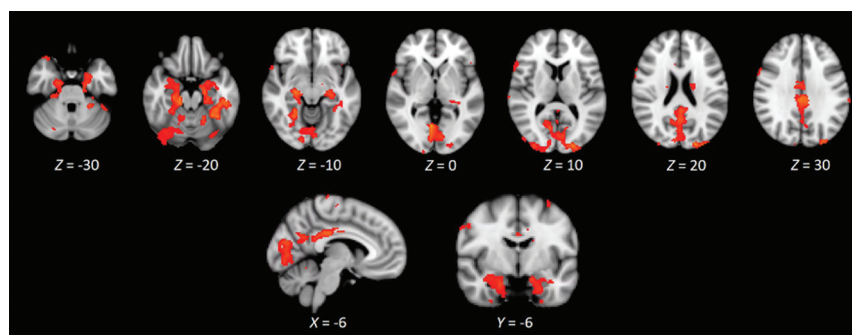
ON-LINE FIG 2. Scatterplot demonstrating the correlation of the average volume for each subject comparing the segmentation results for different brain regions using standard and Wave-MPRAGE. Each point and color represent 1 subject, including the volume of bilateral regions.



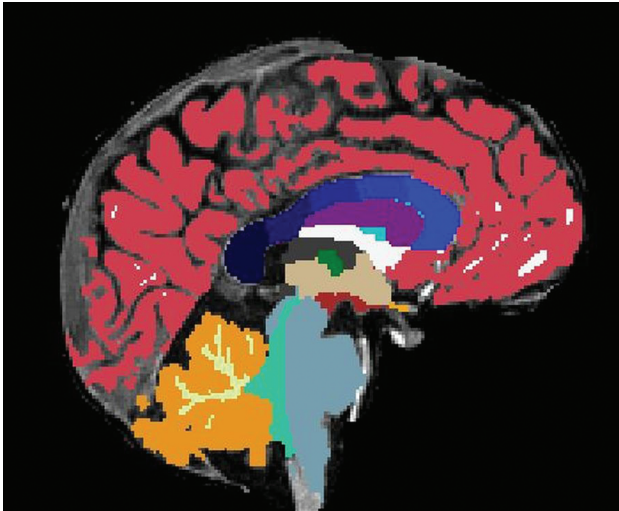
ON-LINE FIG 3. Barplot demonstrating the mean and SD of the ASPC for the cortical thickness measurements by region. The differences in thickness between the Wave-MPRAGE and standard MPRAGE sequences are similar to the results of test/retest studies using the same sequence.²⁹



ON-LINE FIG 4. Scatterplot demonstrating the correlation of the average cortical thickness for each subject comparing the standard and wave sequences segmentation for different brain regions. Each point and color represent 1 subject, including the area of bilateral gyri.



ON-LINE FIG 5. Clusters of voxels that differed significantly in signal intensity ($P < .05$, corrected for multiple comparisons across space using threshold-free cluster enhancement) between standard and Wave-MPRAGE images in 10 healthy volunteers for representative axial slices (*upper row*) and selected coronal and sagittal slices (*lower row*). Montreal Neurological Institute coordinates are shown below each section.



ON-LINE FIG 6. Example of segmentation of one of our healthy volunteers demonstrating imperfect cerebellar segmentation. The cerebellum (orange and yellow) segmentation is extending to the confluence of the transverse sinuses, and the segmentation of cerebellar gray and white matter is imperfect. These inaccuracies in segmentation likely contribute to the low Dice coefficient (0.86) compared with the other cortical regions, though it is still classified as almost perfect agreement in the general interpretation of the Dice coefficient.