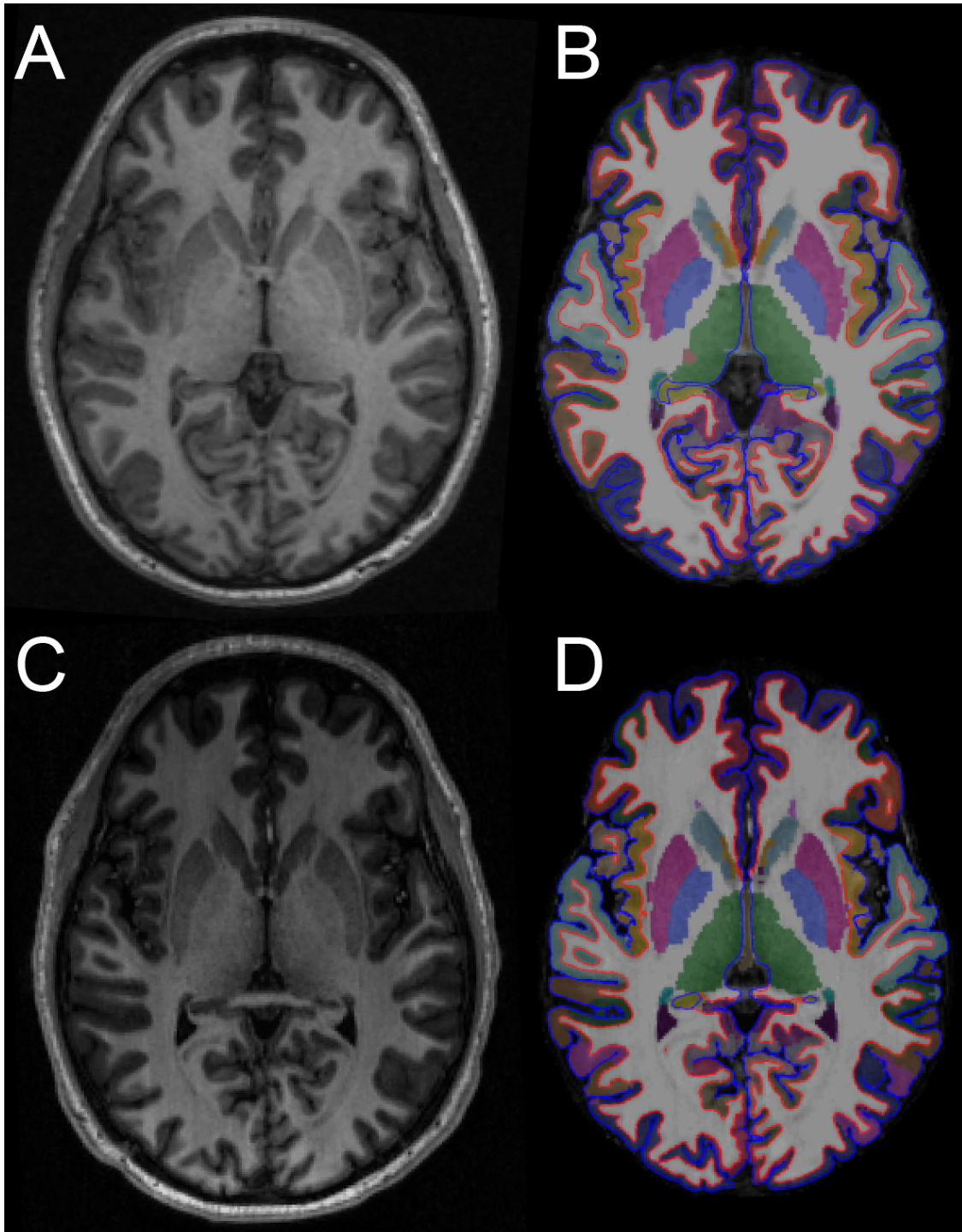
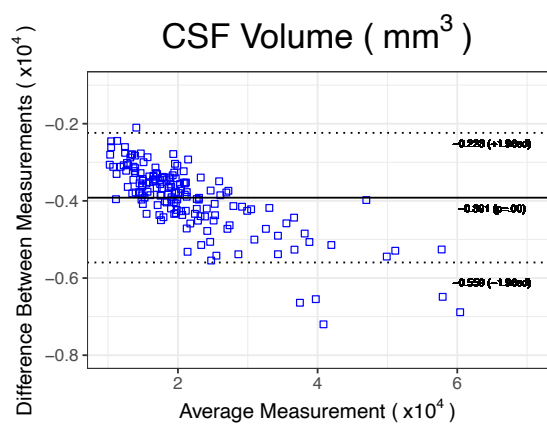
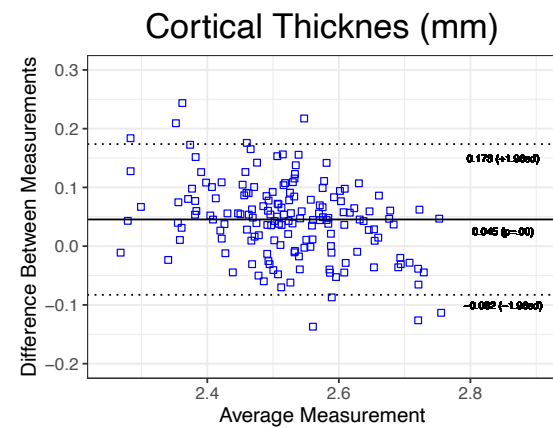
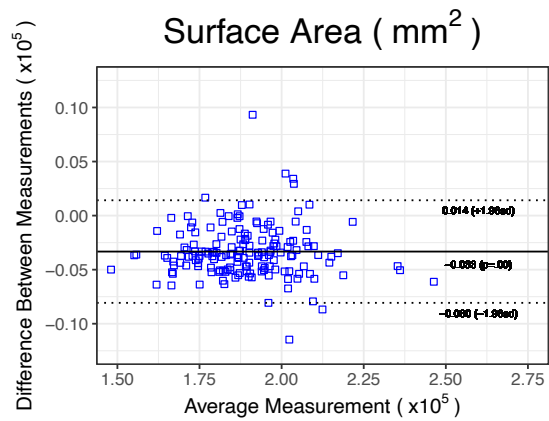
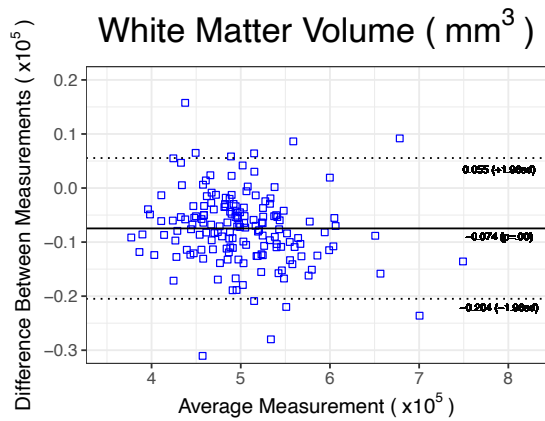
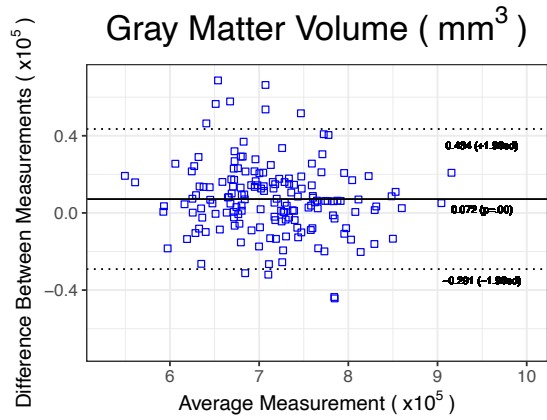
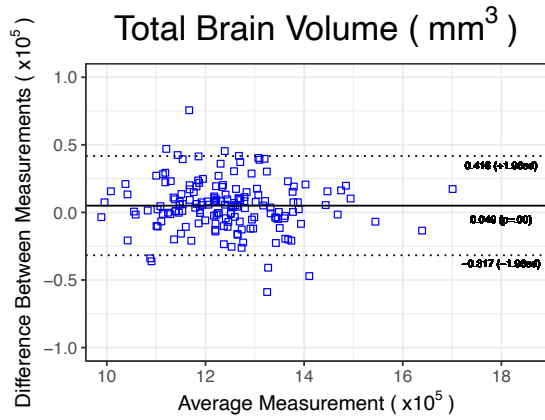


Supplementary Material

Supplementary Figure 1. MPRAGE and MP2RAGE images and FreeSurfer outputs. MPRAGE acquired on a Siemens Trio (12-channel head coil) (A) and the resulting FreeSurfer output (aparc+aseg.mgz) (B) and the same subject's MP2RAGE acquired on a Siemens Prisma (64-channel head coil) (C) and the resulting FreeSurfer output (D).



Supplementary Figure 2. Bland-Altman plots for average brain measures acquired using MPRAGE and MP2RAGE sequences. Difference scores represent Trio MPRAGE – Prisma MP2RAGE.



Supplementary Table 1. Intraclass correlation coefficient values for FreeSurfer derived cortical regions of interest

Region	Area (Left)	Area (Right)	Area Mean	Volume (Left)	Volume (Right)	Volume Mean	Thickness (Left)	Thickness (Right)	Thickness Mean
Bankssts	0.92	0.96	0.94	0.91	0.92	0.91	0.69	0.59	0.64
Caudalanteriorcingulate	0.95	0.94	0.95	0.95	0.96	0.96	0.64	0.73	0.69
Caudalmiddlefrontal	0.96	0.95	0.96	0.95	0.94	0.94	0.74	0.71	0.72
Cuneus	0.97	0.95	0.96	0.91	0.88	0.89	0.69	0.74	0.72
Entorhinal	0.83	0.83	0.83	0.67	0.76	0.71	0.58	0.65	0.62
Frontalpole	0.65	0.70	0.68	0.57	0.64	0.60	0.35	0.47	0.41
Fusiform	0.97	0.96	0.96	0.93	0.94	0.93	0.60	0.72	0.66
Inferiorparietal	0.97	0.97	0.97	0.92	0.94	0.93	0.70	0.53	0.61
Inferiortemporal	0.96	0.97	0.97	0.92	0.92	0.92	0.52	0.48	0.50
Insula	0.68	0.62	0.65	0.82	0.78	0.80	0.55	0.57	0.56
Isthmuscingulate	0.93	0.92	0.93	0.96	0.96	0.96	0.74	0.72	0.73
Lateraloccipital	0.96	0.97	0.96	0.84	0.93	0.88	0.75	0.64	0.70
Lateralorbitofrontal	0.88	0.80	0.84	0.89	0.82	0.86	0.60	0.57	0.59
Lingual	0.96	0.95	0.96	0.93	0.92	0.92	0.61	0.72	0.67
Medialorbitofrontal	0.76	0.88	0.82	0.79	0.88	0.83	0.74	0.74	0.74
Middletemporal	0.96	0.96	0.96	0.91	0.89	0.90	0.53	0.46	0.50
Paracentral	0.94	0.95	0.95	0.84	0.89	0.87	0.76	0.74	0.75
Parahippocampal	0.90	0.90	0.90	0.88	0.87	0.87	0.80	0.85	0.83
Parsopercularis	0.97	0.95	0.96	0.95	0.93	0.94	0.68	0.65	0.66
Parsorbitalis	0.90	0.86	0.88	0.89	0.88	0.89	0.61	0.54	0.57
Parstriangularis	0.96	0.94	0.95	0.95	0.93	0.94	0.70	0.68	0.69
Pericalcarine	0.95	0.93	0.94	0.88	0.87	0.88	0.49	0.50	0.50
Postcentral	0.94	0.93	0.94	0.81	0.87	0.84	0.70	0.70	0.70
Posteriorcingulate	0.94	0.95	0.95	0.96	0.96	0.96	0.73	0.63	0.68
Precentral	0.95	0.96	0.96	0.93	0.93	0.93	0.79	0.74	0.76
Precuneus	0.98	0.98	0.98	0.95	0.96	0.95	0.74	0.68	0.71
Rostralanteriorcingulate	0.92	0.95	0.94	0.92	0.91	0.92	0.56	0.54	0.55
Rostralmiddlefrontal	0.94	0.91	0.93	0.92	0.91	0.92	0.62	0.62	0.62
Superiorfrontal	0.95	0.92	0.94	0.94	0.91	0.93	0.73	0.67	0.70
Superiorparietal	0.96	0.95	0.95	0.85	0.86	0.85	0.71	0.74	0.72
Superiortemporal	0.98	0.96	0.97	0.95	0.94	0.95	0.72	0.74	0.73
Supramarginal	0.97	0.96	0.97	0.95	0.95	0.95	0.65	0.49	0.57
Temporalpole	0.65	0.63	0.64	0.62	0.58	0.60	0.37	0.34	0.35
Transversetemporal	0.95	0.91	0.93	0.94	0.88	0.91	0.83	0.79	0.81

Supplementary Table 2. Mean percent difference values for FreeSurfer derived cortical regions of interest

Region	Area (Left)	Area (Right)	Area Mean	Volume (Left)	Volume (Right)	Volume Mean	Thickness (Left)	Thickness (Right)	Thickness Mean
Bankssts	1.09	0.81	0.95	1.58	1.23	1.41	0.99	1.50	1.09
Caudalanteriorcingulate	1.43	1.50	1.47	1.32	1.29	1.30	1.46	1.21	1.43
Caudalmiddlefrontal	0.85	1.00	0.93	1.16	1.27	1.22	0.77	0.83	0.85
Cuneus	0.64	0.76	0.70	1.71	1.81	1.76	1.28	1.08	0.64
Entorhinal	2.66	2.51	2.58	3.39	2.61	3.00	1.78	1.68	2.66
Frontalpole	1.68	2.04	1.86	2.92	2.68	2.80	2.06	2.05	1.68
Fusiform	0.54	0.58	0.56	0.97	0.90	0.93	0.94	0.78	0.54
Inferiorparietal	0.79	0.67	0.73	1.31	0.96	1.14	0.83	1.21	0.79
Inferiortemporal	0.63	0.60	0.62	1.27	1.19	1.23	1.56	1.32	0.63
Insula	1.56	2.03	1.79	1.19	1.49	1.34	1.12	1.06	1.56
Isthmuscingulate	1.19	1.22	1.21	0.87	0.94	0.91	1.15	1.23	1.19
Lateraloccipital	0.69	0.63	0.66	1.57	1.05	1.31	0.72	0.98	0.69
Lateralorbitofrontal	1.01	1.33	1.17	1.04	1.44	1.24	1.17	1.36	1.01
Lingual	0.73	0.73	0.73	1.24	1.26	1.25	1.23	0.99	0.73
Medialorbitofrontal	1.69	1.05	1.37	1.77	1.28	1.53	0.95	1.10	1.69
Middletemporal	0.62	0.70	0.66	1.27	1.29	1.28	1.39	1.60	0.62
Paracentral	0.79	0.74	0.76	1.64	1.23	1.43	0.77	0.80	0.79
Parahippocampal	1.00	1.00	1.00	1.42	1.39	1.41	1.13	1.00	1.00
Parsopercularis	0.81	0.96	0.89	1.10	1.16	1.13	0.90	1.03	0.81
Parsorbitalis	1.11	1.38	1.24	1.42	1.41	1.42	1.37	1.58	1.11
Parstriangularis	0.86	0.98	0.92	1.13	1.22	1.18	0.96	1.01	0.86
Pericalcarine	1.06	1.20	1.13	2.07	2.00	2.04	2.11	1.97	1.06
Postcentral	0.71	0.72	0.71	1.80	1.54	1.67	0.83	0.86	0.71
Posteriorcingulate	0.92	0.96	0.94	0.82	0.96	0.89	1.03	1.23	0.92
Precentral	0.52	0.55	0.54	0.84	0.89	0.86	0.64	0.82	0.52
Precuneus	0.51	0.48	0.50	0.76	0.74	0.75	0.79	0.91	0.51
Rostralanteriorcingulate	1.62	1.19	1.40	1.74	1.77	1.75	1.58	1.62	1.62
Rostralmiddlefrontal	0.98	1.15	1.06	1.20	1.26	1.23	0.93	0.92	0.98
Superiorfrontal	0.77	0.89	0.83	0.92	0.99	0.96	0.81	0.89	0.77
Superiorparietal	0.69	0.71	0.70	1.65	1.57	1.61	0.75	0.76	0.69
Superiortemporal	0.52	0.57	0.55	0.84	0.82	0.83	0.85	0.86	0.52
Supramarginal	0.71	0.64	0.68	1.05	0.90	0.98	1.01	1.44	0.71
Temporalpole	2.12	1.90	2.01	2.91	2.44	2.67	2.25	2.10	2.12
Transversetemporal	1.03	1.21	1.12	1.34	1.79	1.56	0.92	1.08	1.03

Supplementary Figure 3. ASD vs TDC regional differences in Area, Volume or Thickness for MPRAGE and MP2RAGE sequences. In both sequences, decreased area and volume in right inferior temporal cortex and thinner insula was found in ASD. In the MPRAGE sequence, the ASD group had smaller area and volume in the left bank of the superior temporal sulcus and thinner left caudal anterior cingulate. In the MP2RAGE sequence, the ASD group showed smaller area and volume of bilateral middle temporal and rostral anterior cingulate, thinner left isthmus cingulate and thicker left medial orbitofrontal.

