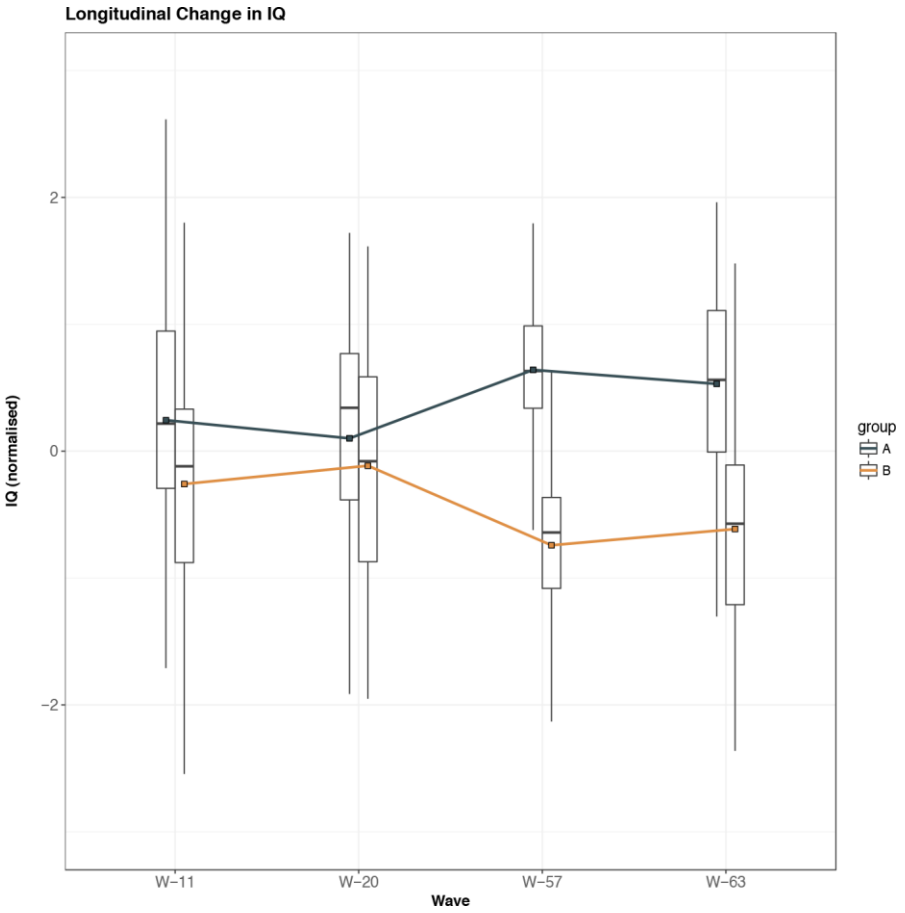
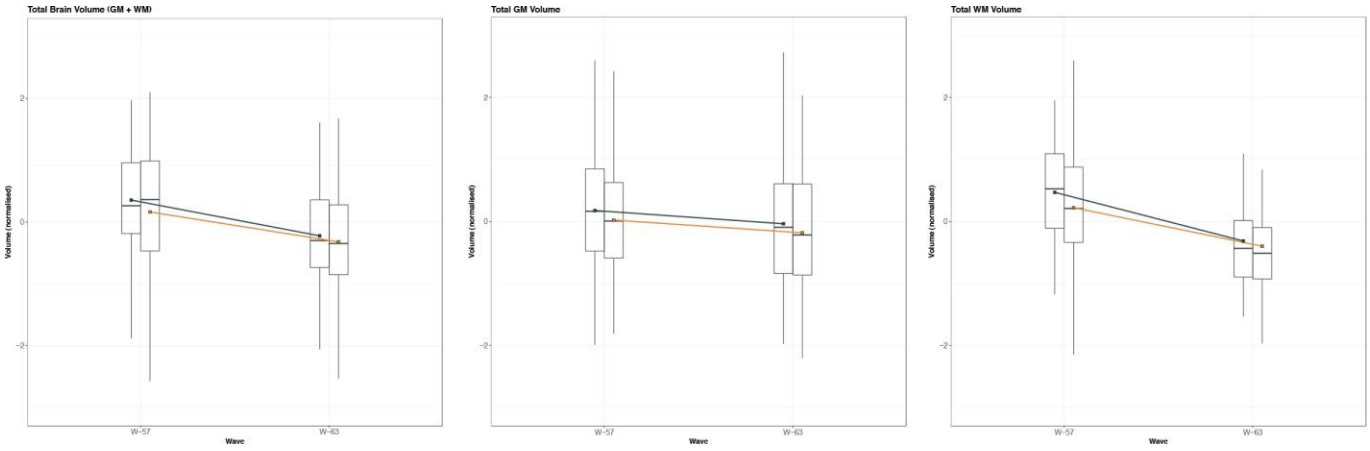
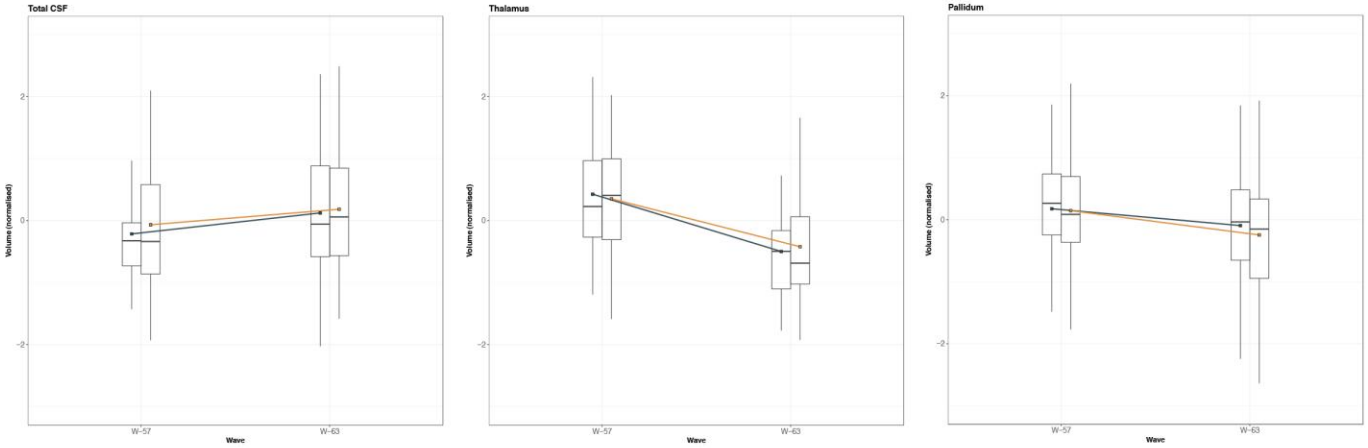
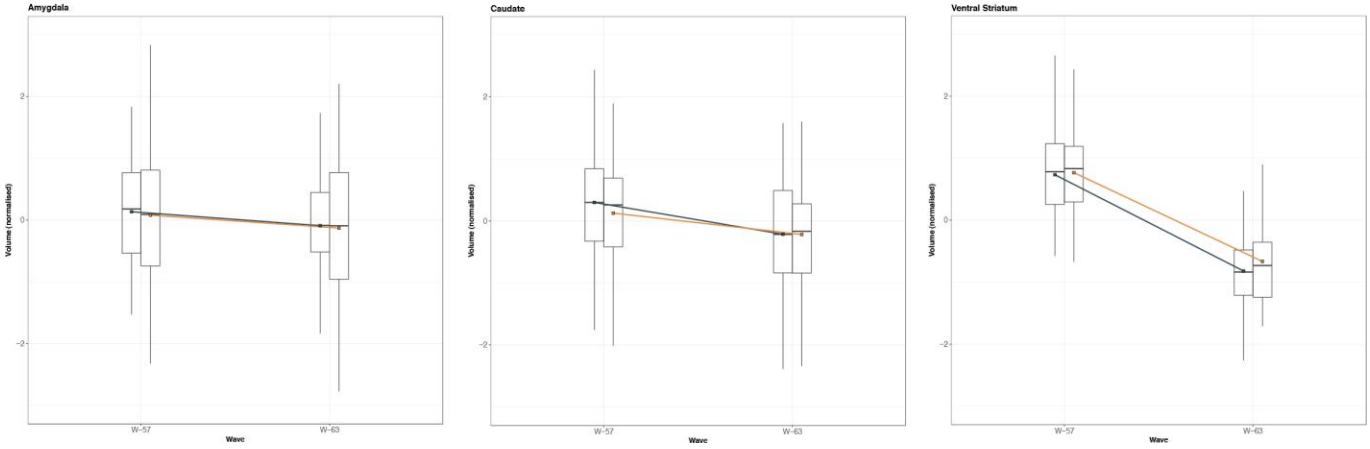
SUPPLEMENTARY FIGURES

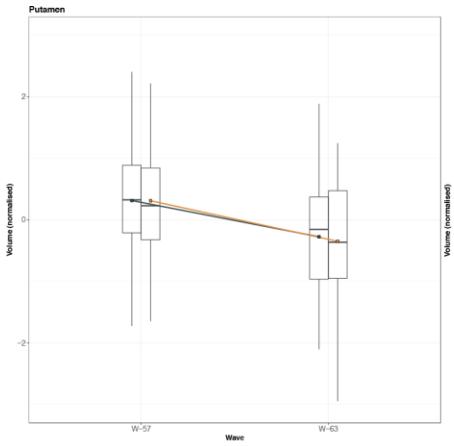


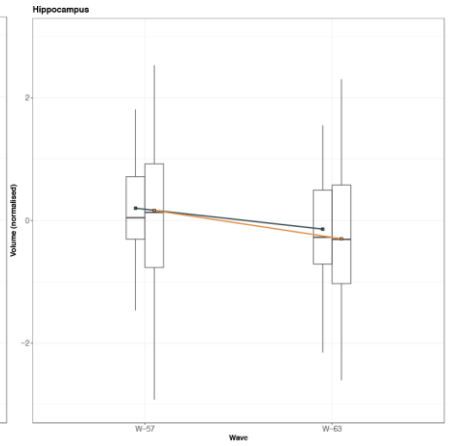
Supplementary Figure 1. Box-plot analysis showing group differences in the distribution of (normalized) intelligence quotient (IQ) scores from ages 11yrs (W-11) to 63yrs (W-63), with group membership identified by colour. IQ scores from time points W-20 (Wave-20) and W-57 (Wave-57) were used to define group members as "improvers" or "decliners" as part of the extreme group design i.e. using each subject's estimated change in IQ from W-20 when subjects were ~20yr of age (BP test) and W-57 when subjects were ~57 (IST test). Abbreviations: W-11 = IQ score at mean subject age ~11 years, W-20 = IQ score at mean subject age ~20 years, W-57 = IQ score at mean subject age ~57 years, W-63 = IQ score at mean subject age ~63 years, Group A = improvers (grey), Group B = decliners (orange) as identified by the Extreme Group Design.

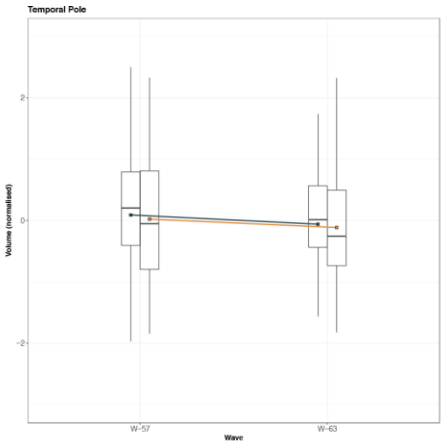

Total Brain Volume (GM + WM)
Total GM Volume
Total WM Volume
Volume (normalised)
2
0
−2
W−57
W−63
Wave

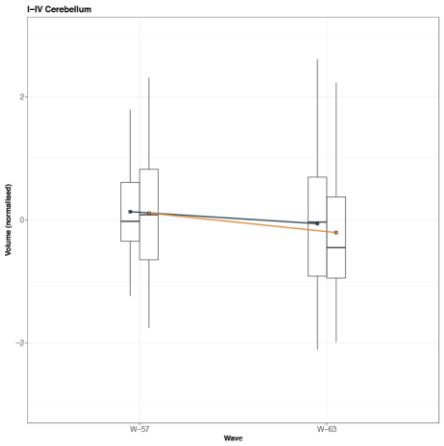

Total CSF
Thalamus
Pallidum
Volume (normalised)
2
0
−2
W−57
W−63
Wave

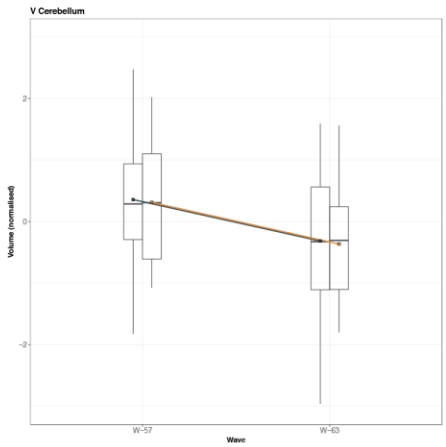

Amygdala
Caudate
Ventral Striatum
Volume (normalised)
2
0
−2
W−57
W−63
Wave

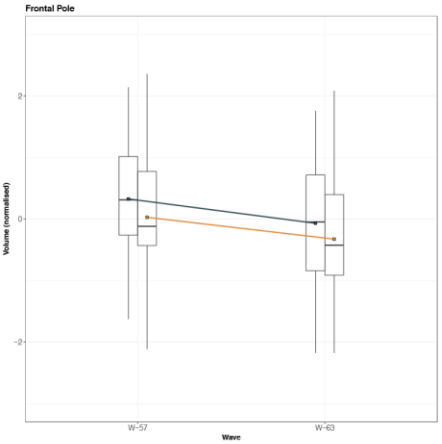

Putamen
Volume (normalised)
2
0
−2
W−57
W−63
Wave

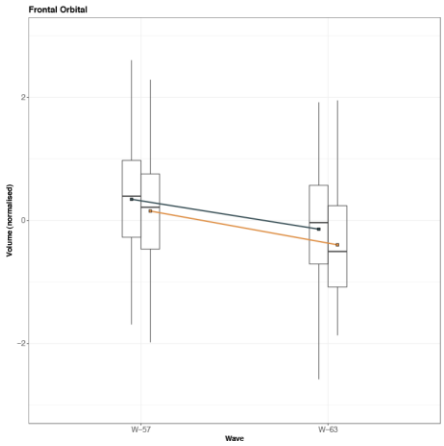

Hippocampus
Volume (normalised)
2
0
−2
W−57
W−63
Wave

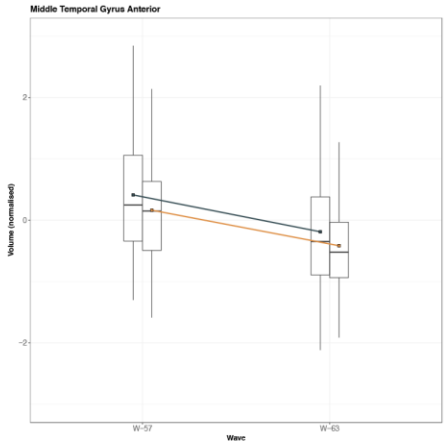

Temporal Pole
Volume (normalised)
2
0
−2
W−57
W−63
Wave

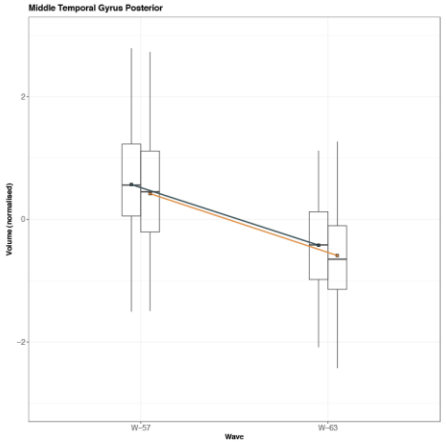

I–IV Cerebellum
Volume (normalised)
2
0
−2
W−57
W−63
Wave

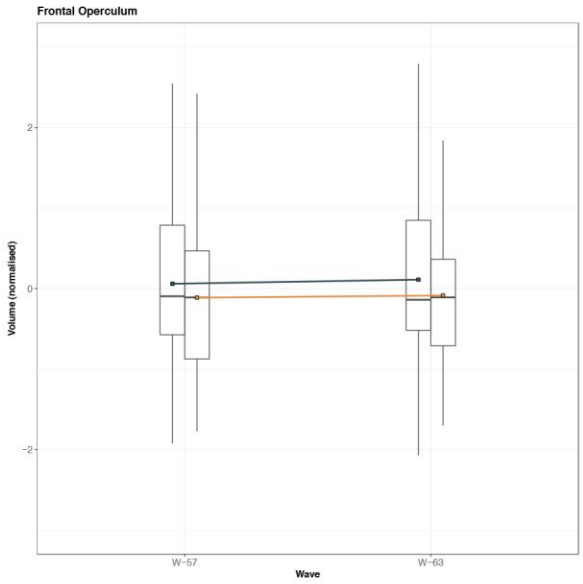

V Cerebellum
Volume (normalised)
2
0
−2
W−57
W−63
Wave

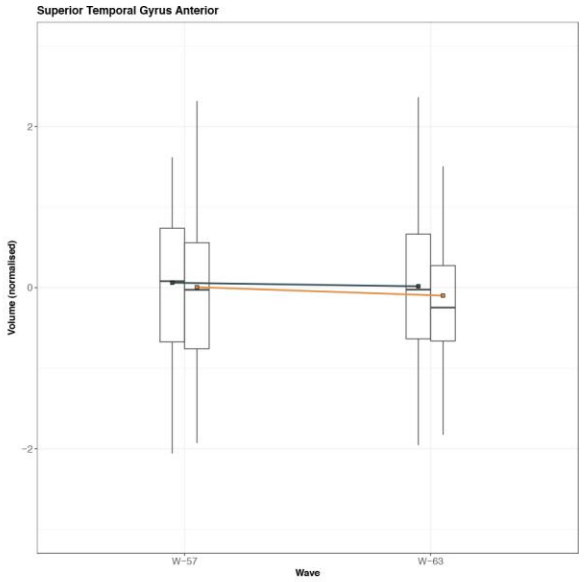

Frontal Pole
Volume (normalised)
2
0
−2
W−57
W−63
Wave

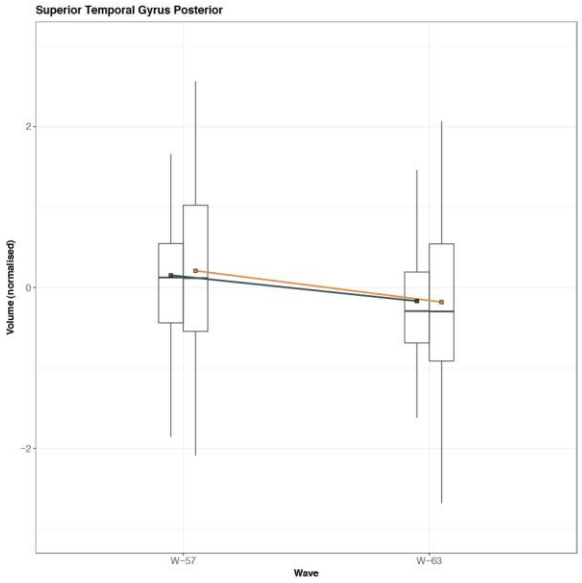

Frontal Orbital
Volume (normalised)
2
0
−2
W−57
W−63
Wave

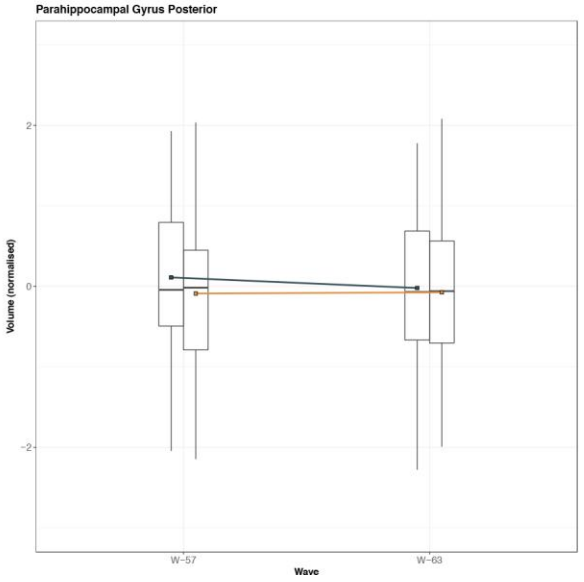

Middle Temporal Gyrus Anterior
Volume (normalised)
2
0
−2
W−57
W−63
Wave

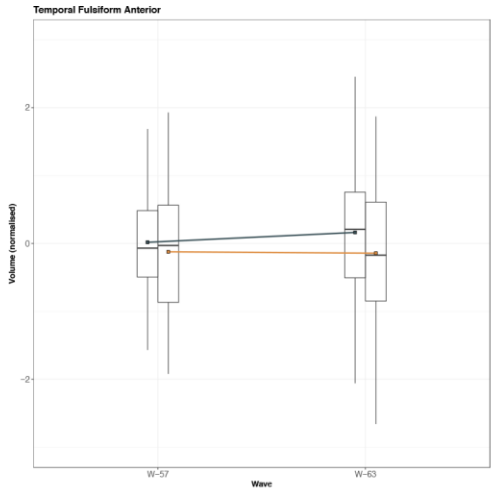

Middle Temporal Gyrus Posterior
Volume (normalised)
2
0
−2
W−57
W−63
Wave

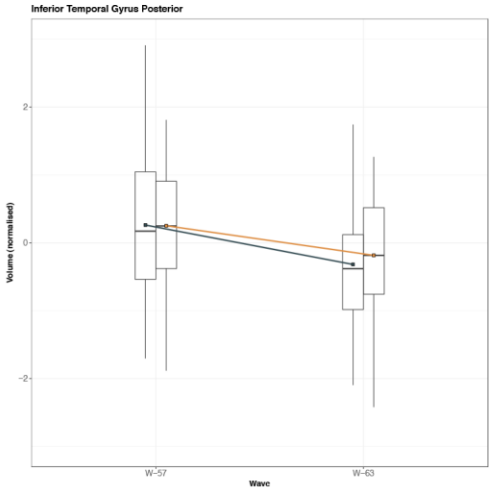

Frontal Operculum
Volume (normalised)
2
0
−2
W−57
W−63
Wave

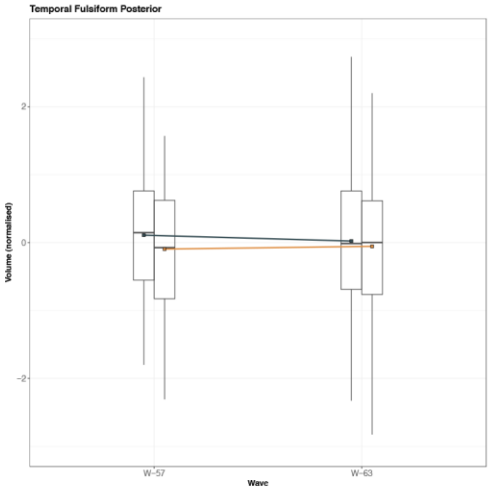

Superior Temporal Gyrus Anterior
Volume (normalised)
2
0
−2
W−57
W−63
Wave

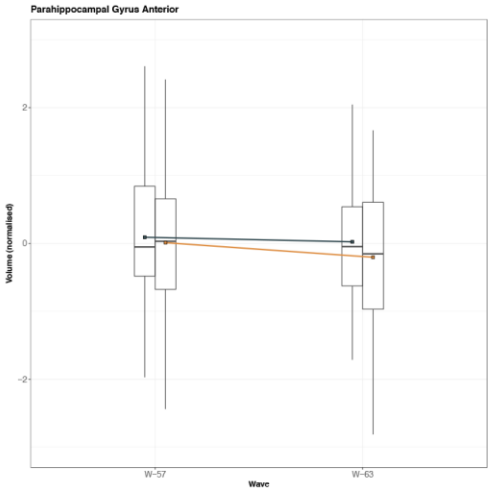

Superior Temporal Gyrus Posterior
Volume (normalised)
2
0
−2
W−57
W−63
Wave

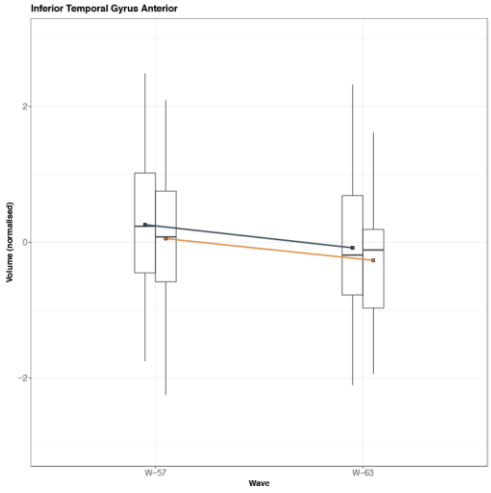

Parahippocampal Gyrus Posterior
Volume (normalised)
2
0
−2
W−57
W−63
Wave

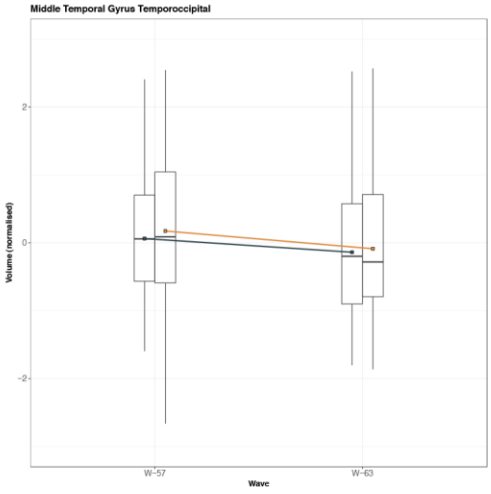

Temporal Fulsiform Anterior
Volume (normalised)
2
0
−2
W−57
W−63
Wave

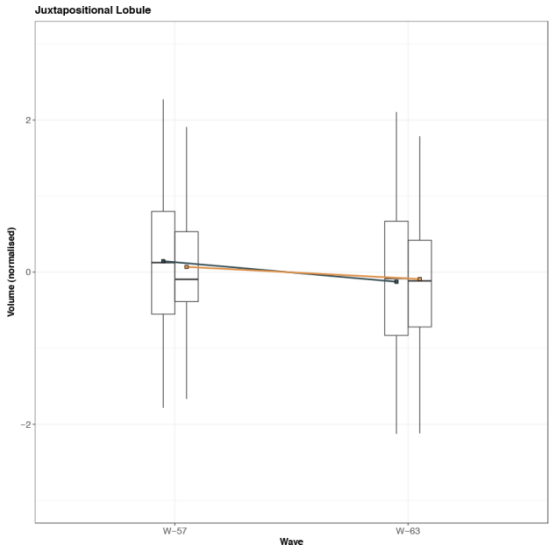

Inferior Temporal Gyrus Posterior
Volume (normalised)
2
0
−2
W−57
W−63
Wave


Temporal Fulsiform Posterior
Volume (normalised)
2
0
−2
W−57
W−63
Wave

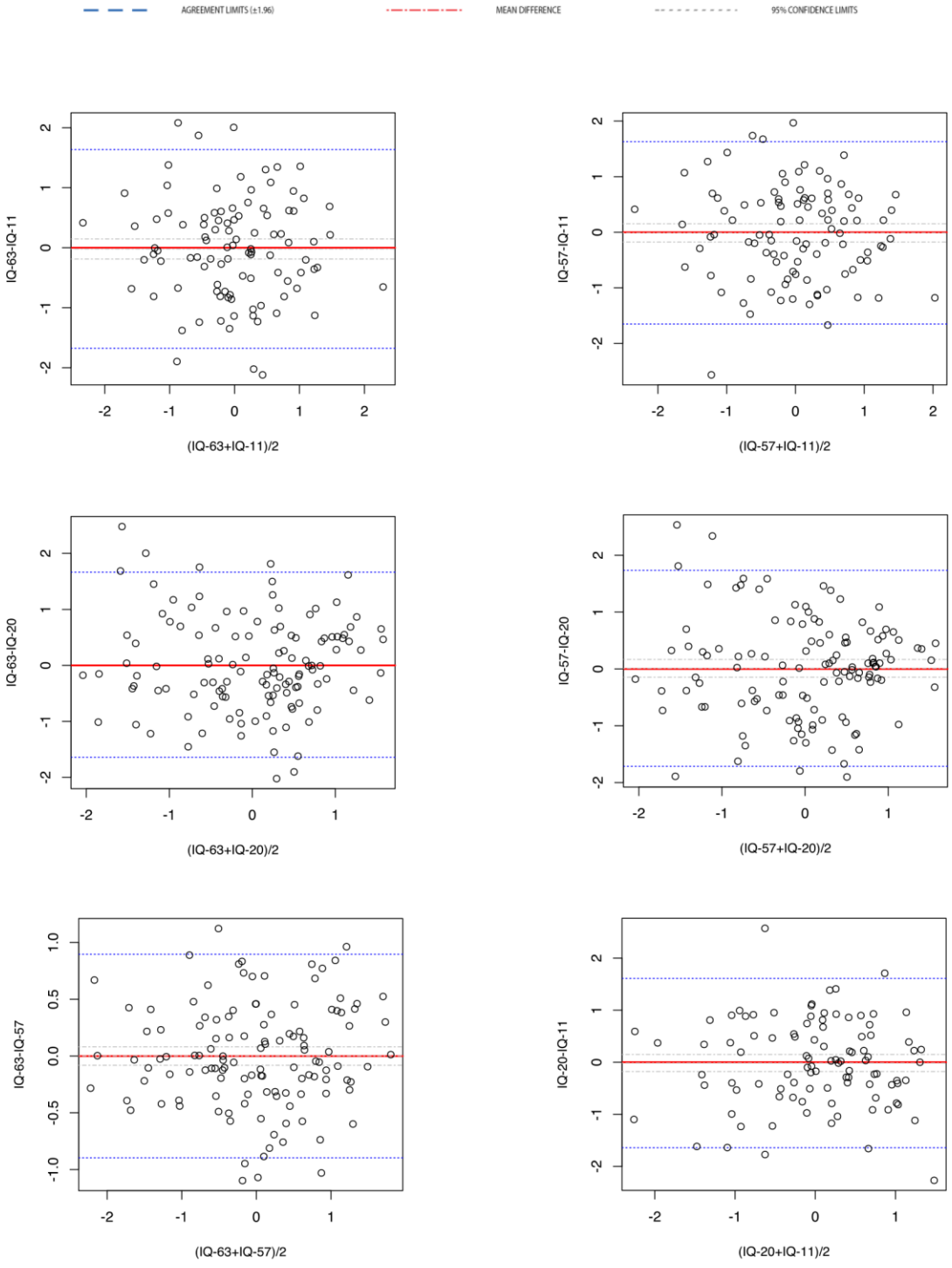

Parahippocampal Gyrus Anterior
Volume (normalised)
2
0
−2
W−57
W−63
Wave


Inferior Temporal Gyrus Anterior
Volume (normalised)
2
0
−2
W−57
W−63
Wave


Middle Temporal Gyrus Temporoccipital
Volume (normalised)
2
0
−2
W−57
W−63
Wave



Supplementary Fig*ure* 2. Box-plot analysis showing group differences in the distribution of volume of (normalized) imaging derived phenotypes (IDPs) from ages 57yrs (W-57) to 63yrs (W-63), with group membership identified by colour. Longitudinal change in normalized volumes are shown for global brain matter (grey matter and white matter combined), total grey matter (GM), total white matter (WM), cerebral spinal fluid (CSF), and in a subset of GM volume of regions-of-interest examined. Group A = improvers (grey), Group B = decliners (orange), as identified by the extreme group design.



Supplementary Fig*ure* 3. Bland-Altman "limits of agreement" plot. Fig*ure* 3 displays the differences between IQ scores acquired at 4 independent measurement periods (y-axis) plotted against the average of the two scores (x-axis). The BA plots show low agreement between the IQ tests used to assess general cognitive ability across time. Additionally, the plots also indicate that the direction and magnitude of change in IQ vs initial (mean) cognitive ability are unrelated in our sample. Abbreviations: IQ-11 = IQ score at ~11 years, IQ-20 = IQ score at ~20 years, IQ-57 = IQ score ~57 years, and IQ-63 = IQ score at ~63 years.