

Supplementary Material for

Heritability of Neuroanatomical Shape

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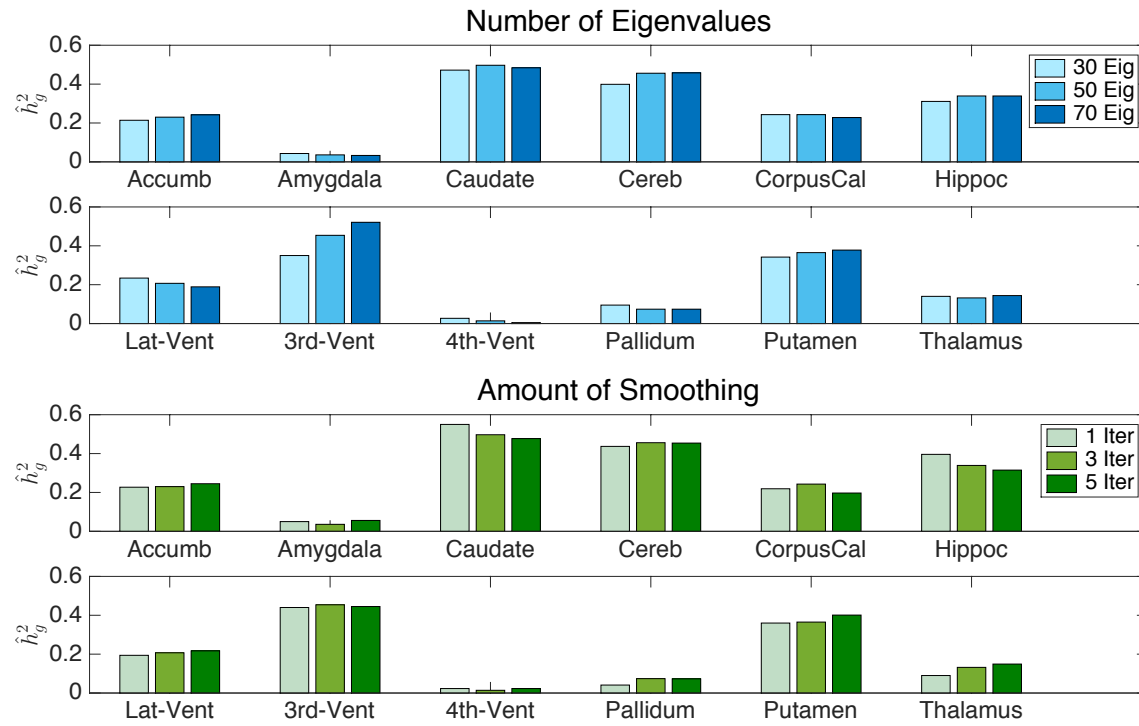


Figure S1: SNP heritability estimates of the shape of brain structures when incorporating different numbers of eigenvalues in the Laplace-Beltrami Spectrum (LBS) based shape descriptor with 3 iterations of geometric smoothing (upper panel), and when applying different amount of smoothing to the surface mesh representing the geometry of the object with the number of eigenvalues fixed at 50 (lower panel). The heritability estimates are largely robust to these parameter settings.

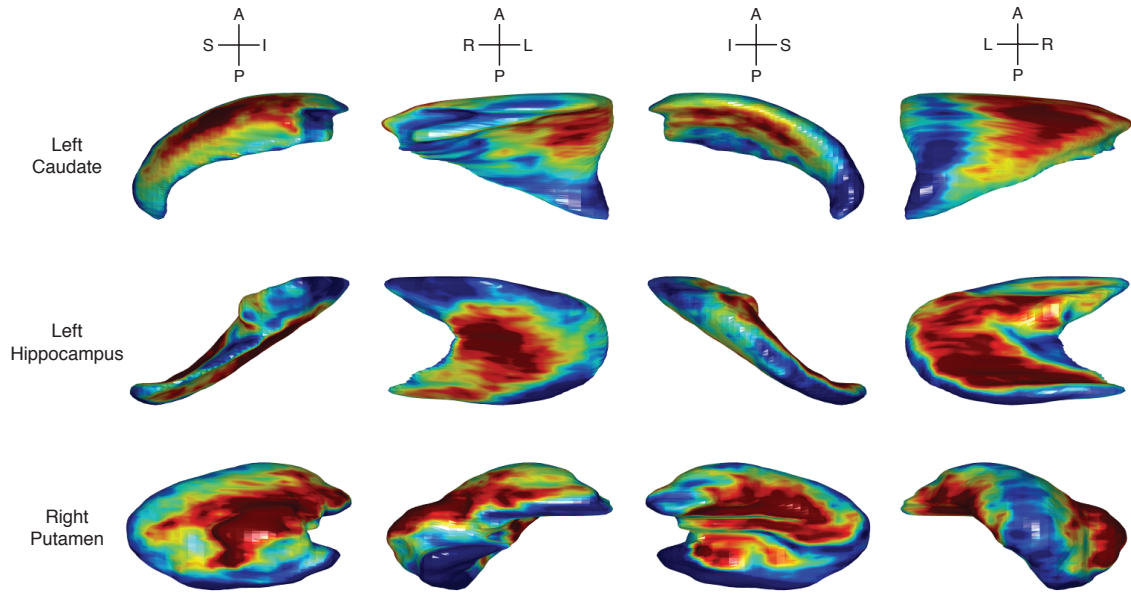


Figure S2: The principal mode of shape variation for the contralateral brain structures of those reported in the main text. Each structure is represented with a sample-specific population average, on which average shapes at the two extremes (± 2 standard deviation or SD) along the first principal component (PC) of the shape descriptor (-2 SD, blue; $+2$ SD, red) are depicted. Anatomical orientation is indicated with embedded coordinate axes. I: Inferior, S: Superior, A: Anterior, P: Posterior, L: Left, R: Right. For the left caudate, the first PC explains 79% of the shape variation and has a heritability of 0.46. For the left hippocampus, the first PC explains 70% of the shape variation and has a heritability of 0.38. For the right putamen, the first PC explains 65% of the shape variation and has a heritability of 0.38.

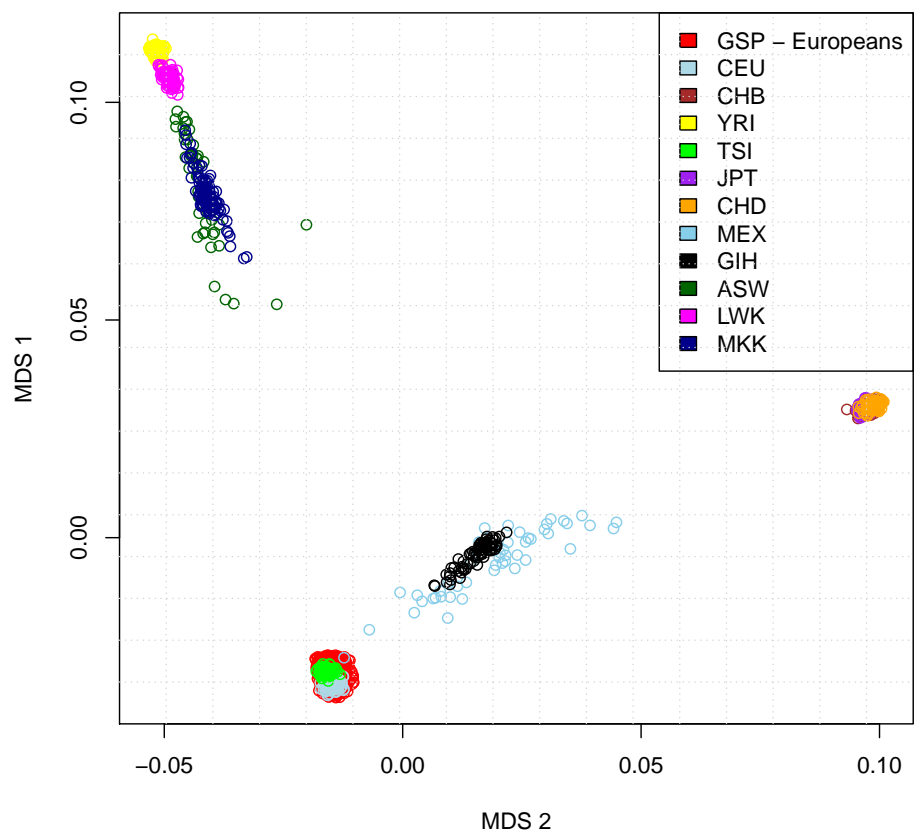


Figure S3: Multidimensional scaling plot (MDS) for the non-Hispanic European subjects in the Harvard/MGH Brain Genomics Superstruct Project (GSP), overlaid on samples from the 1000 Genomes Project.