

Patterns of structural variation in human auditory cortex revealed by data-driven curvature-based clustering

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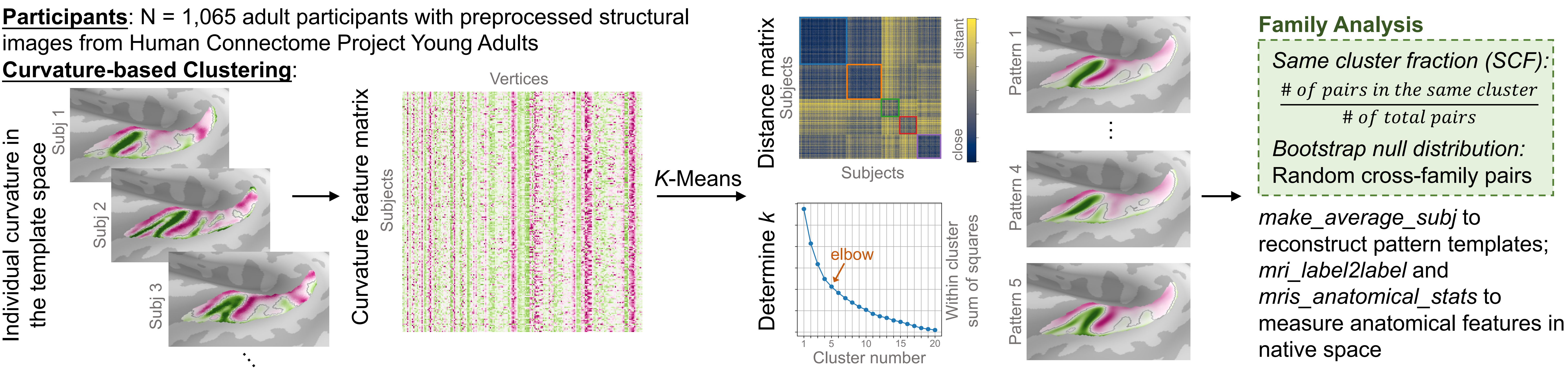
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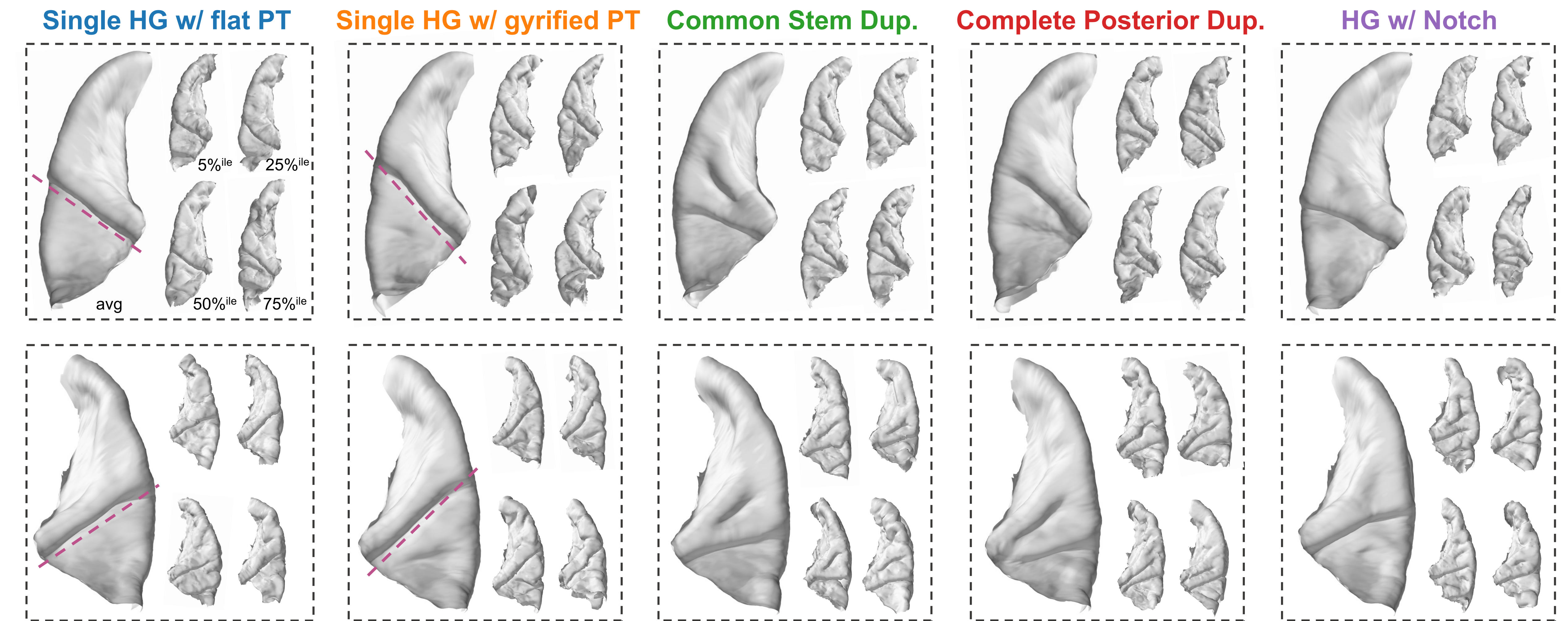
Summary

Heschl's gyrus (HG) has traditionally been described as having three distinct gyrification patterns^[3]: a single gyrus, a common stem duplication (CSD), or a complete posterior duplication (CPD). Gyrification of planum temporale (PT), lying posterior to HG, is also highly variable but less well characterized^[5]. Delineation of these folding patterns is typically based on manual inspection of brain volumes or surfaces. Here, we used an unsupervised data-driven clustering approach to characterize folding patterns of HG and PT. In contrast to the three classic categories, this approach suggested that superior temporal morphology was best characterized by five distinct gyrification patterns. We found distinct variations of the single HG morphotype and observed a previously undescribed curvature pattern consisting of a wider HG with a notch at the anterolateral end. These morphological variations are paralleled in the cortical microstructure variation.

Methods

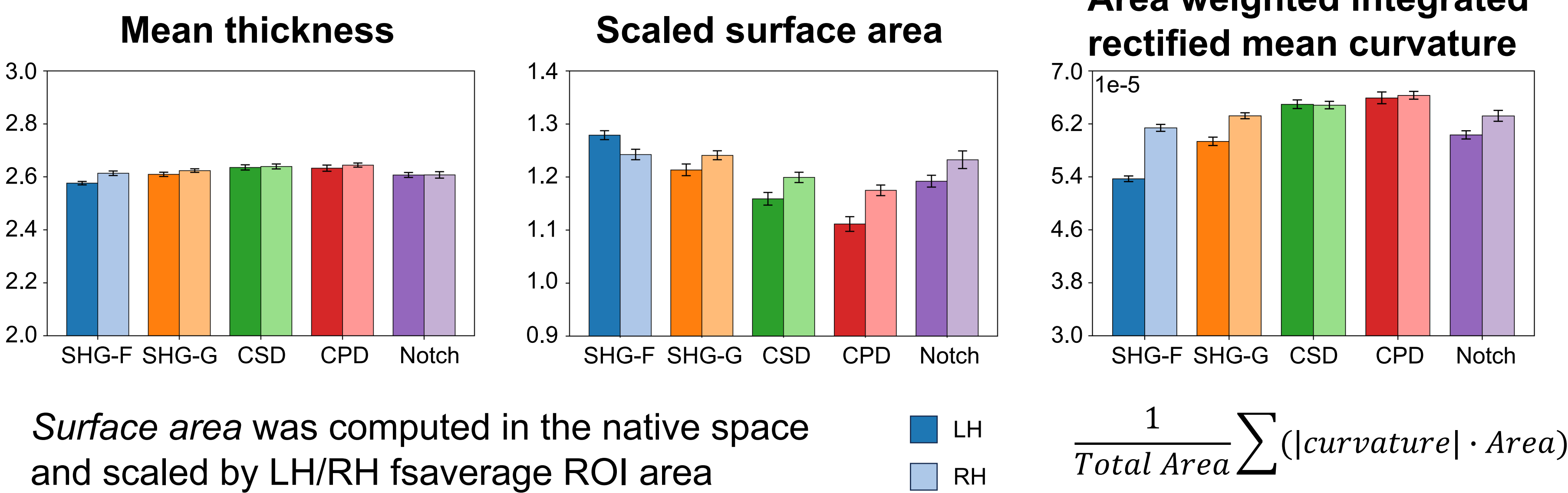


Distinct and Novel Curvature Patterns Revealed by Data-driven Clustering



Example Subjects:

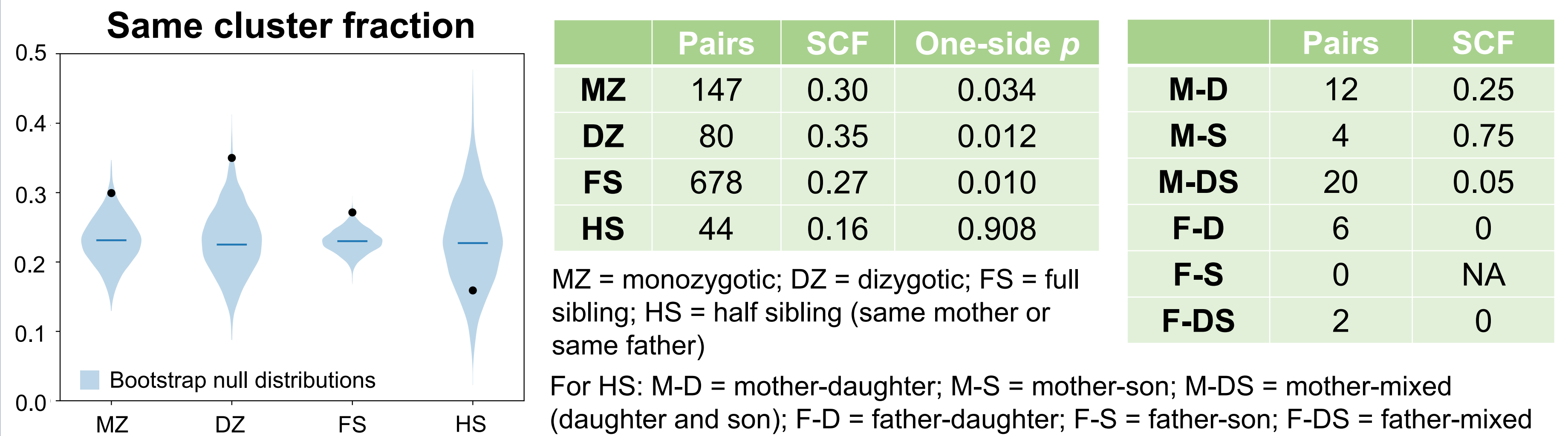
Rank subjects based on their overall similarity to other subjects within the cluster, and select subjects at the 5th (top left), 25th (top right), 50th (bottom left), and 75th (bottom right) percentiles



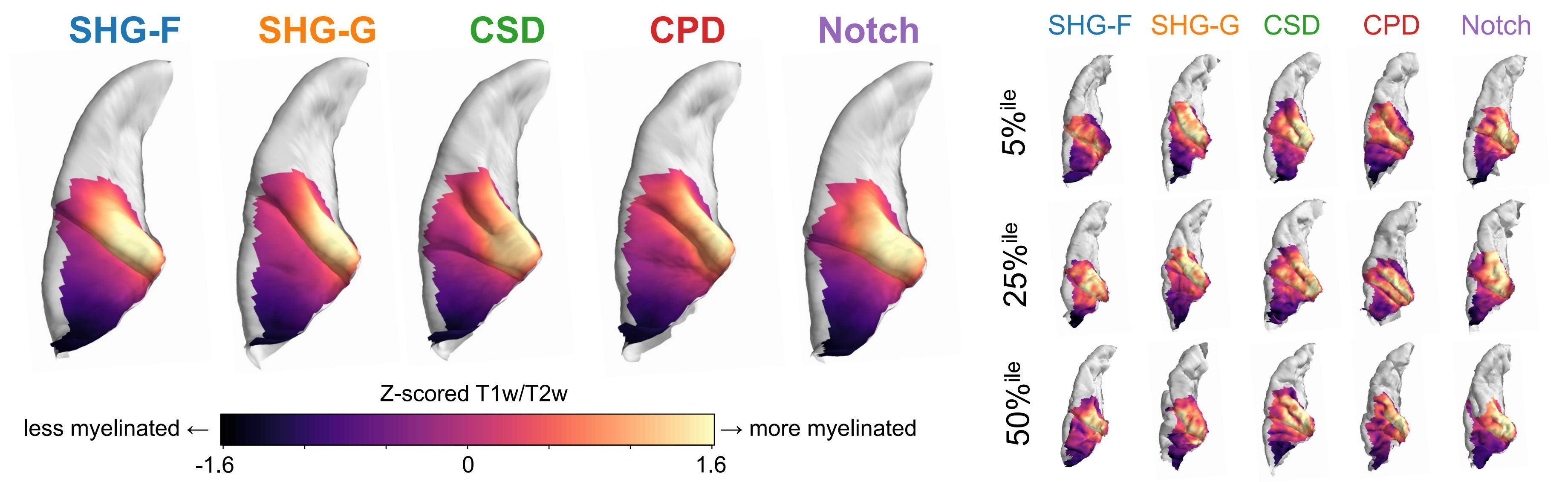
Distributions

	SHG-F	SHG-G	CSD	CPD	Notch
Left Hemisphere					
SHG-F	93	110	62	53	30
SHG-G	62	105	30	45	26
CSD	27	36	22	37	15
CPD	32	26	30	36	6
Notch	35	42	42	38	25
Right Hemisphere					

Heritability of the Morphology



Myelin Maps Parallel the Morphology



Patterns of Resting State Subregions

