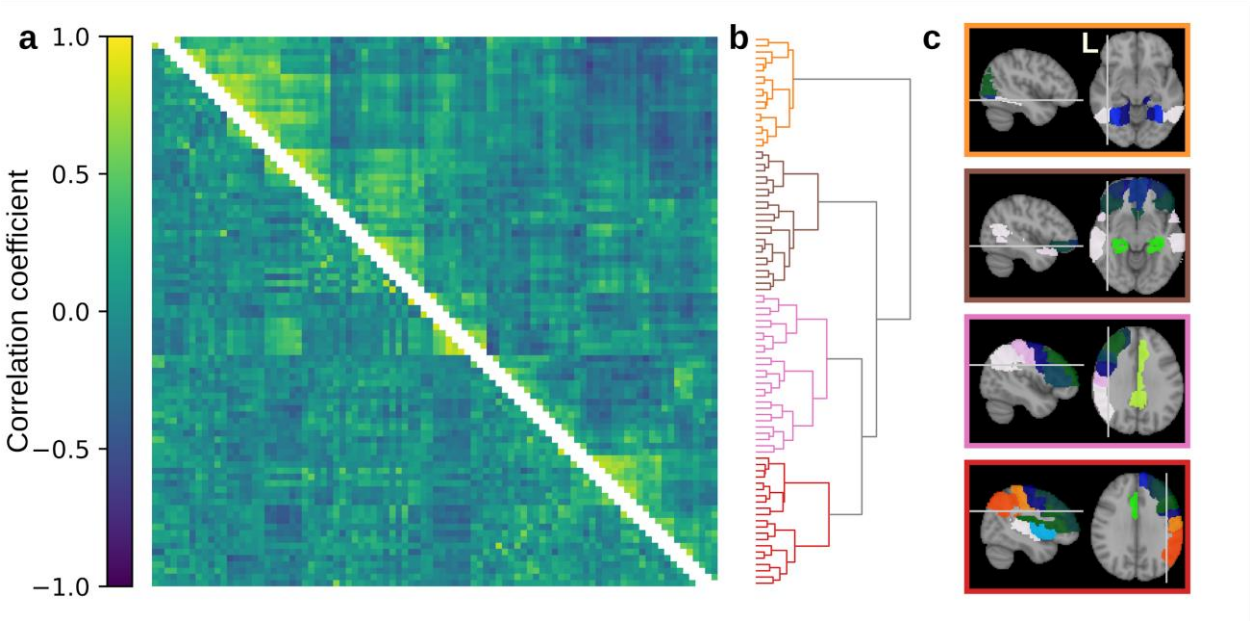
Supplementary Results

	Cluster 1 (left hemisphere)	Cluster 2 (right hemisphere)	Cluster 3 (inferior regions)
Cluster 1 (left hemisphere)	0.10	-0.15	-0.05
Cluster 2 (right hemisphere)	-0.15	0.30	-0.02
Cluster 3 (inferior regions)	-0.05	-0.02	0.45

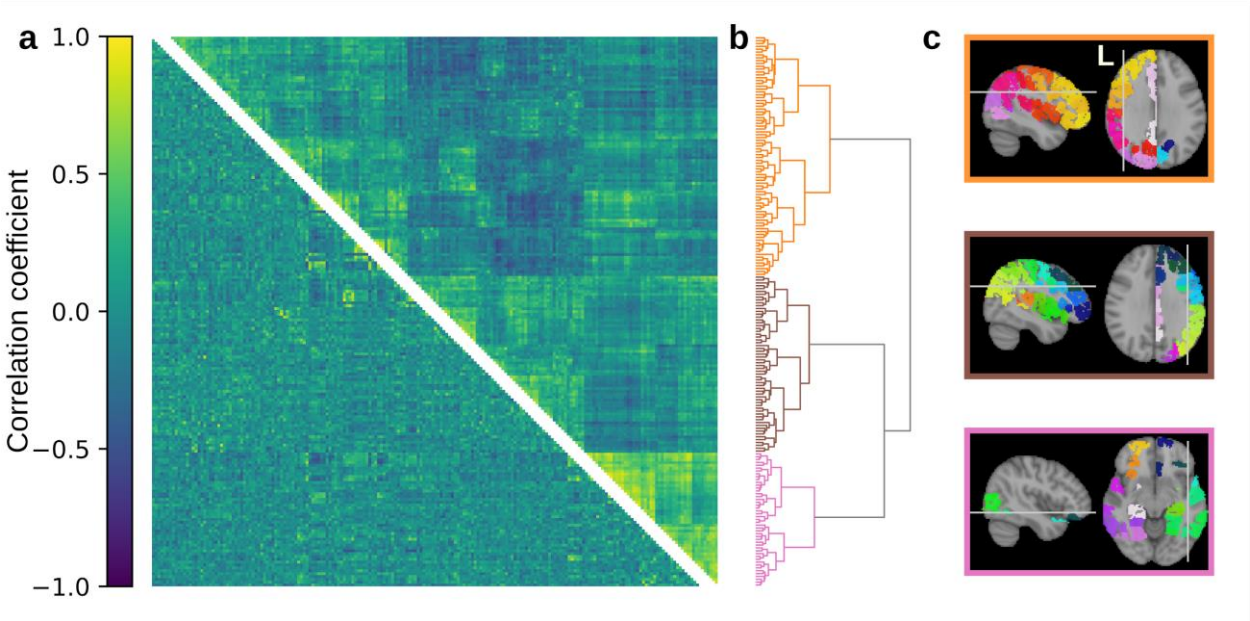
Supplementary Table 1: Average inter- and intra-cluster CBF covariance. Values are average CBF covariance (Pearson correlation coefficients) for all pairs of regions between the clusters denoted by the rows and columns.

CBF and Structural Covariance in Bipolar Disorder Participants

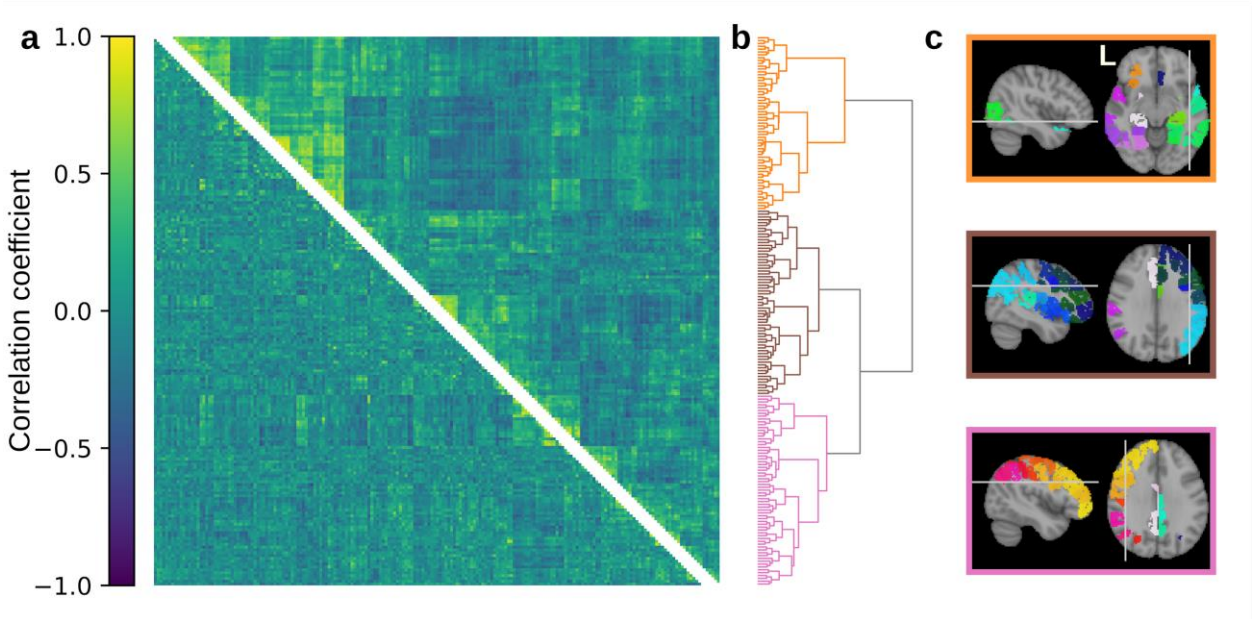


Supplementary Figure 1: Organization of CBF and structural covariances in adolescents with bipolar disorder. a CBF covariance (upper triangle) and structural covariance (lower triangle). Rows and columns represent regions in the AAL atlas and are ordered to align with the clustering tree on the right. **b** Tree representing the clustering of CBF covariance. Each branch at the left of the tree represents a brain region. Proximity of branches represents similarity of their regions' CBF covariance patterns. Colours correspond to the borders of the sets of regions to the right. **c** Brain regions belonging to the three clusters defined by the tree. Colours of brain regions delineate atlas region borders and indicate homologous regions but are otherwise arbitrary. Colours of panel borders indicate the regions' corresponding cluster in the dendrogram.

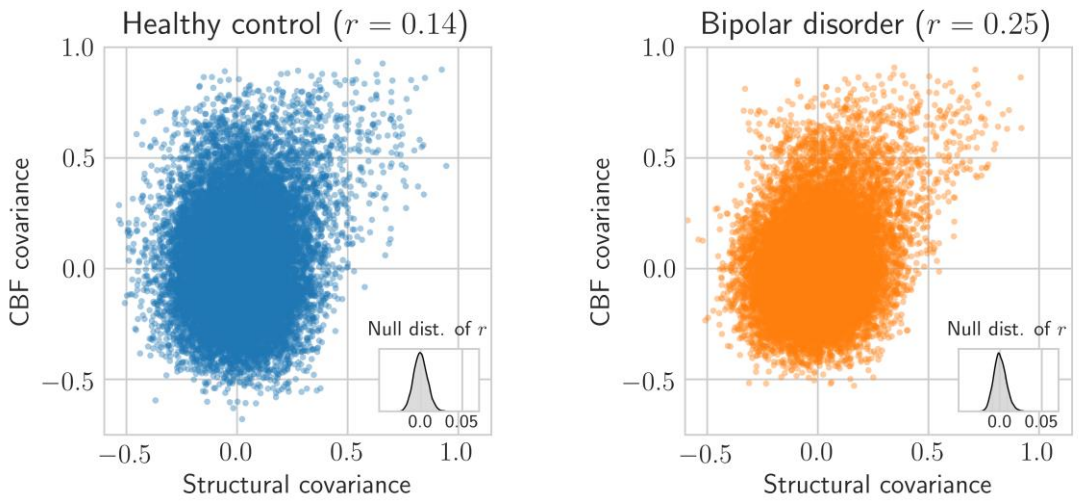
Repeat Analysis with Shen Functional Atlas



Supplementary Figure 2: Organization of CBF and structural covariance in healthy adolescents, processed using the Shen atlas. a CBF covariance (upper triangle) and structural covariance (lower triangle). Rows and columns represent regions in the Shen atlas and are ordered to align with the clustering tree on the right. **b** Tree representing the clustering of CBF covariance (cophenetic correlation c = 0.73). **c** Brain regions belonging to the three clusters defined by the tree. Figure details are matched with Supplementary Figure 1.

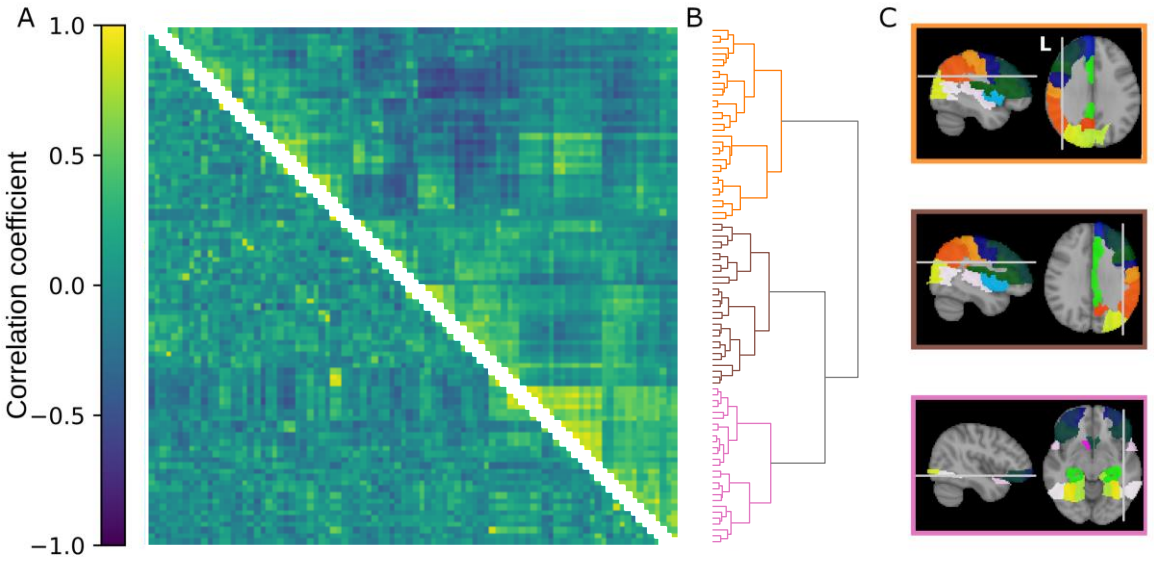


Supplementary Figure 3: Organization of CBF and structural covariance in adolescents with bipolar disorder, processed using the Shen atlas. a CBF covariance (upper triangle) and structural covariance (lower triangle). Rows and columns represent regions in the Shen atlas and are ordered to align with the clustering tree on the right. **b** Tree representing the clustering of CBF covariance (cophenetic correlation c = 0.61). **c** Brain regions belonging to the three clusters defined by the tree. Figure details are matched with Supplementary Figure 1.

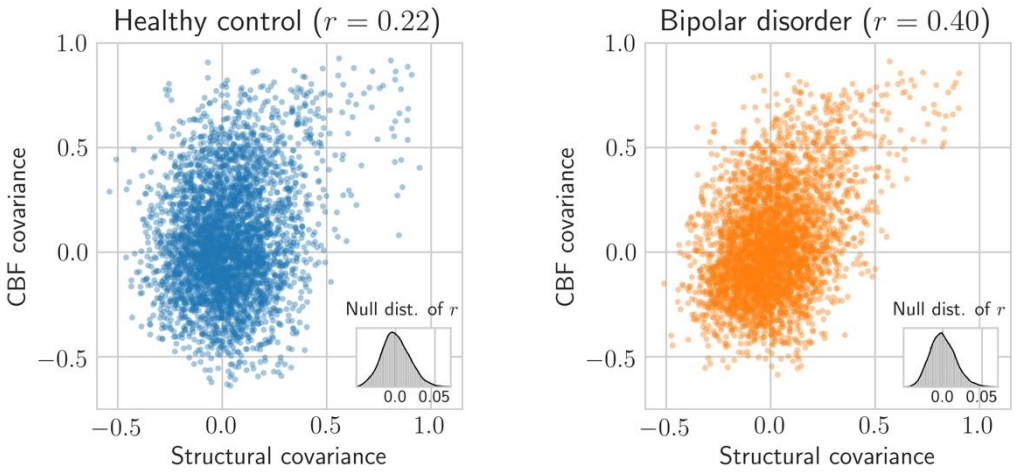


Supplementary Figure 4: Correspondence between CBF and structural covariances estimated via Shen parcellation. Correspondence is defined by r ≡ Pearson's correlation coefficient between CBF and structural covariances. **Left:** Atlas-wide CBF-structure correspondence in healthy controls (r = 0.14). Axis values are unitless correlation coefficients. **Right:** Atlas-wide CBF-structure correspondence in bipolar disorder participants (r = 0.25). CBF-structure correspondence is significantly higher in bipolar disorder (permutation test p = 0.0014). **Inset:** null distribution for the correlation coefficient *r*, estimated by 10,000 permutations of region labels for healthy control and bipolar disorder groups separately.

Repeat Analysis with Partial-Volume-Corrected (PVC) CBF



Supplementary Figure 5: Organization of CBF and structural covariance in adolescents with bipolar disorder, estimated with PVC CBF. A CBF covariance (upper triangle) and structural covariance (lower triangle). Rows and columns represent regions in the Shen atlas and are ordered to align with the clustering tree on the right. **B** Tree representing the clustering of CBF covariance (cophenetic correlation c = 0.71). **C** Brain regions belonging to the three clusters defined by the tree. Figure details are matched with Supplementary Figure 1.



Supplementary Figure 6: Correspondence between PVC CBF and structural covariances. Correspondence is defined by r ≡ Pearson's correlation coefficient between CBF and structural covariances. **Left:** Atlas-wide CBF-structure correspondence in healthy controls (r = 0.22). Axis values are unitless correlation coefficients. **Right:** Atlas-wide CBF-structure correspondence in bipolar disorder participants (r = 0.40). CBF-structure correspondence is significantly higher in bipolar disorder (permutation test p = 0.0018). **Inset:** null distribution for the correlation coefficient *r*, estimated by 10,000 permutations of region labels for healthy control and bipolar disorder groups separately.