

## **A convergent structure-function substrate of cognitive imbalances in autism**

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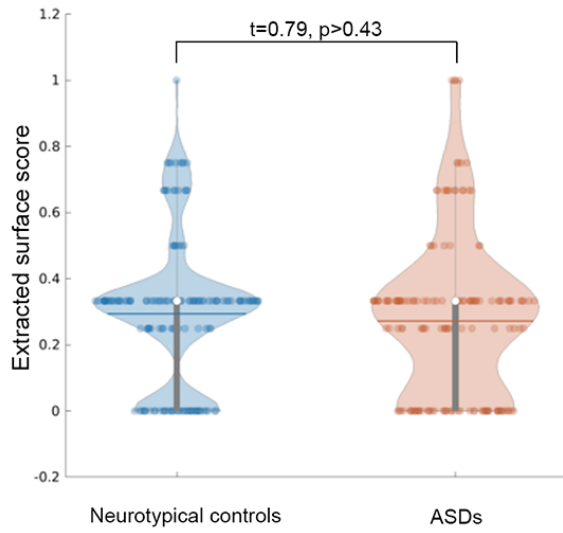
### **Supplementary Materials**

**Supplementary Table 1.** Clinical and demographic profiles of identified subtypes in the imaging cohort.

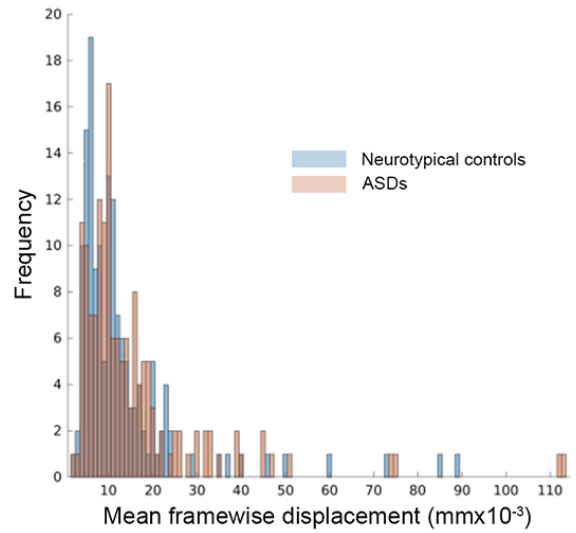
	Subtypes				p-value (ANOVA/Chi <sup>2</sup> )
	S1 (n=33)	S2 (n=41)	S3 (n=34)	S4 (n=47)	
Age (y) <sup>†</sup>	17.8±8.8	18.9±7.9	19.7±10.7	15.8±6.9	0.17
Sex (f/m)	2/31	2/39	1/34	1/46	0.23
Site (# of cases) PITT/USM/NYU/TCD	1/17/13/2	6/15/17/3	8/8/12/6	5/12/23/7	0.33
Full scale IQ <sup>†</sup>	82±7	106±6	127±6	104±9	>0.0001
Verbal IQ <sup>†</sup>	80±8	99±9	121±8	109±9	>0.0001
Non-verbal IQ <sup>†</sup>	88±12	113±7	126±9	97±9	>0.0001
vnIQ (z-score) <sup>†</sup>	-0.8±1.4	-1.1±0.8	-0.5±0.8	0.9±0.9	>0.0001
Calibrated ADOS <sup>†</sup>	7.2±2.0	6.5±2.1	6.0±2.0	6.1±1.9	0.039

†: Mean±SD

**A. Cortical surface extraction quality**

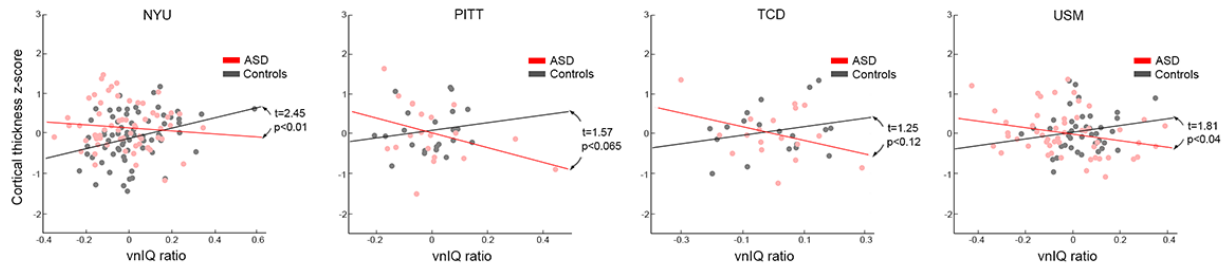


**B. Head motion in rs-fMRI data**

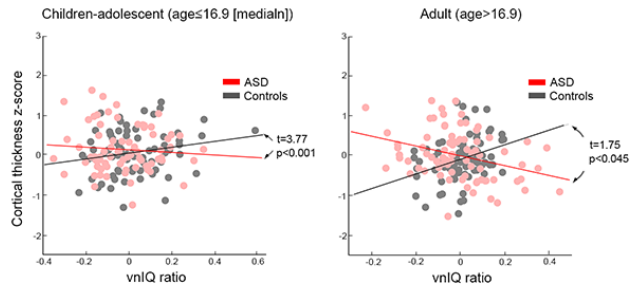


**Supplementary Figure 1. Quality of structural and functional MRI data.**

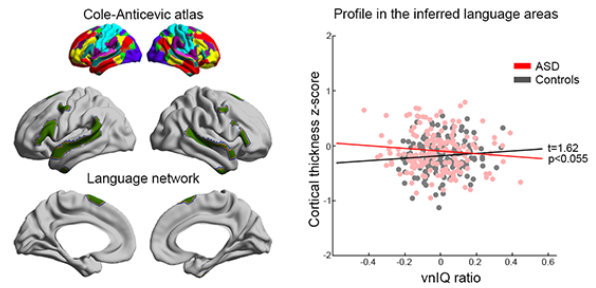
A. Cross-site reproducibility of group interaction effects between cortical thickness and vnlQ



B. Reproducibility between children and adult groups

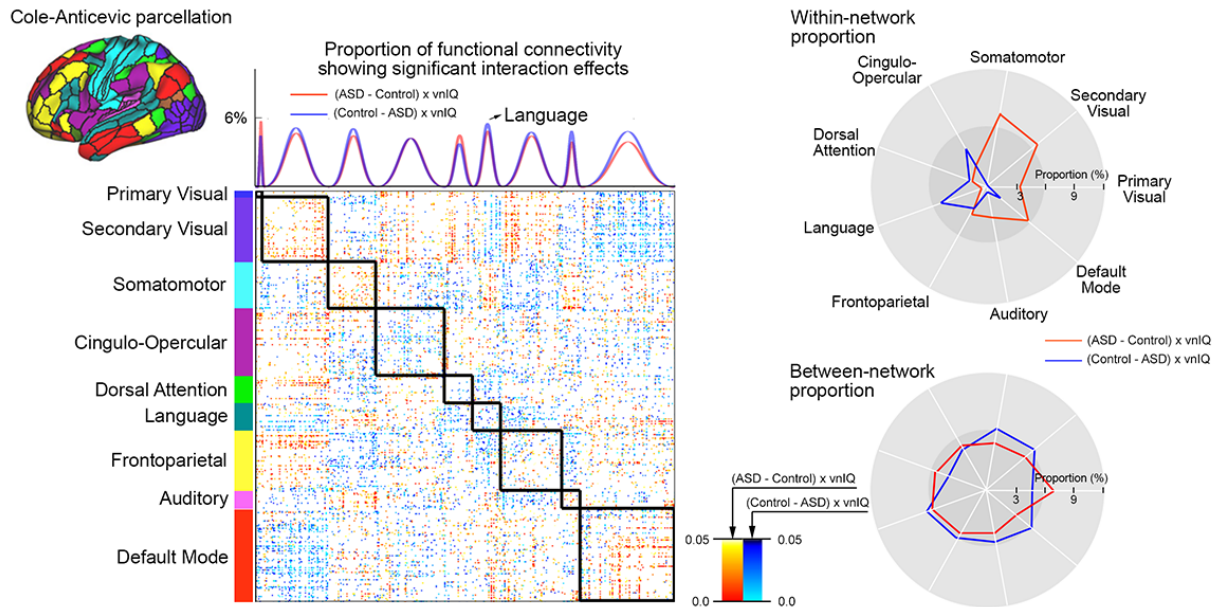


C. Atlas-based analysis targeting language networks



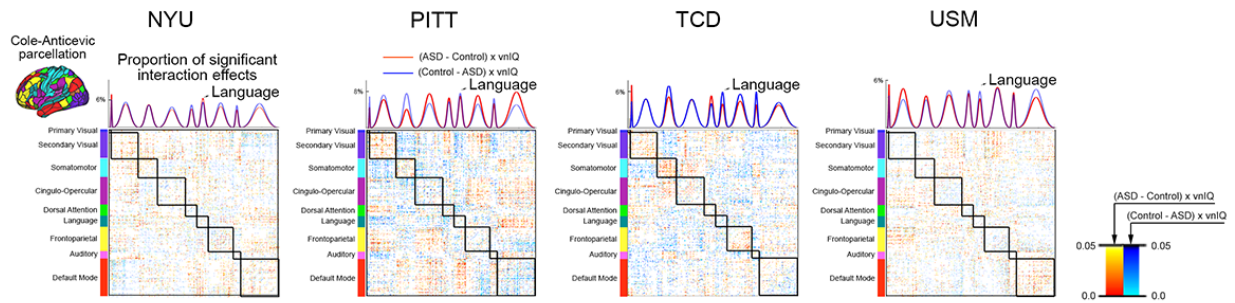
**Supplementary Figure 2. Cross-site and -age reproducibility test for correlative association of cortical thickness to vnlQ ratio**

Whole-brain interaction effects between functional connectivity and vniQ ratio after GSR

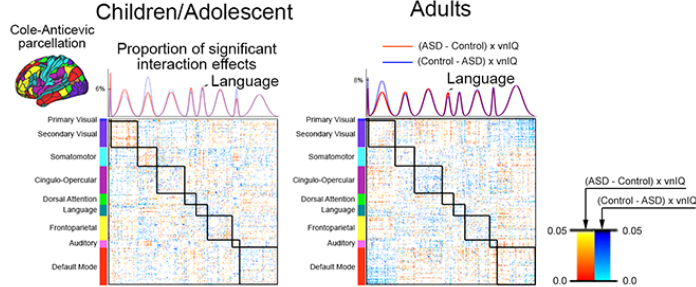


**Supplementary Figure 3. Reproducibility of interaction effect on whole-brain functional connectivity after global mean signal regression**

A. Site-wise reproducibility of interaction effects in functional connectivity

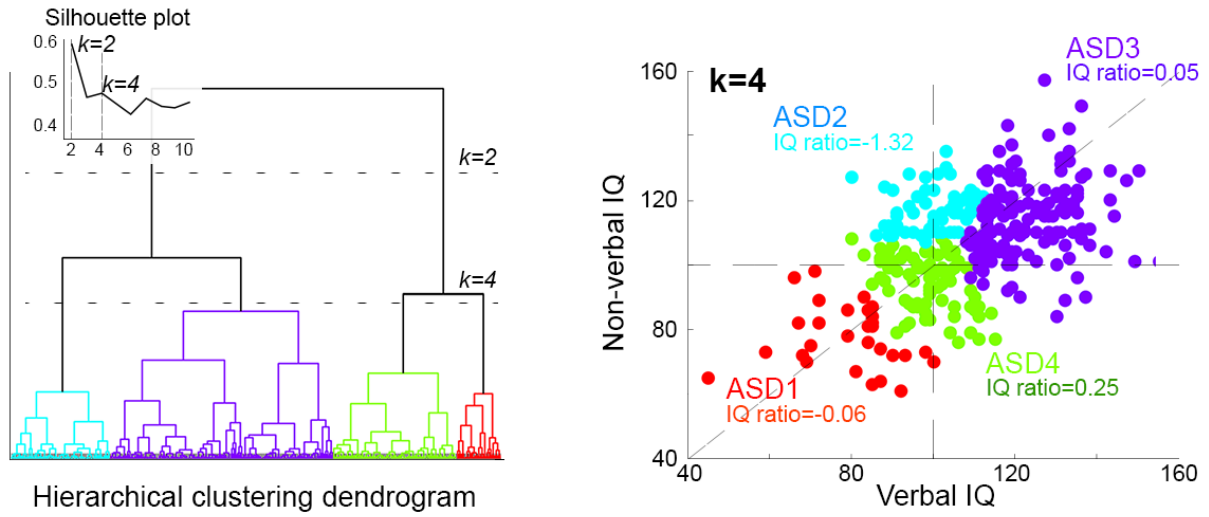


B. Age-wise reproducibility of interaction effects in functional connectivity

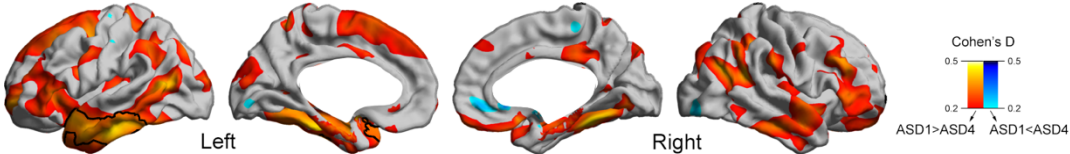


**Supplementary Figure 4. Reproducibility of interaction effect on whole-brain functional connectivity across different sites and age ranges.**

### Subtyping based on replication data



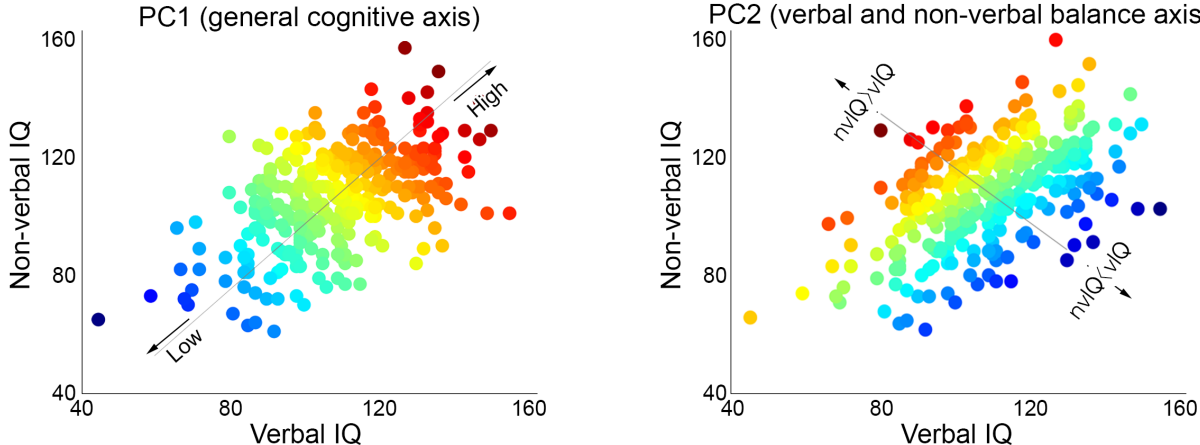
**Supplementary Figure 5. IQ clustering in the independent dataset.**



**Supplementary Figure 6. Cortical thickness group comparison between ASD-1 and -4 subtypes.**



### Principal components in IQ distribution based on replication data



**Supplementary Figure 7. Dimensional IQ components in the independent dataset.**