



Functional Connectivity Patterns Associated with Irritability in Children



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BACKGROUND

- Irritability, characterized by an increased proneness to frustration, is one of the most common reasons children and adolescents are referred for treatment evaluation¹
- It is also a transdiagnostic risk factor linked to the development of both internalizing and externalizing psychopathologies¹
- Neuroimaging studies have implicated large-scale brain networks, particularly those involved in emotion regulation and cognitive control, in the pathophysiology of irritability²
 - However, the neural mechanisms underlying irritability in youth remain poorly understood

Aim:

- Investigate the relationship between irritability and resting-state network connectivity in a large sample of children

SAMPLE

ABCD Study:³

N ~ 10,260

Age: 9-10 years

Sex: ~48% female

Race/Ethnicity: ~55% White, ~19% Hispanic, ~13% African American, ~12% Other

Income: ~ 55% > \$75,000

RESULTS

Irritability is associated with large-scale brain networks involved with **cognitive control, attentional engagement, auditory processing, and motor movement related to emotional expression**

BASELINE RESULTS

	Irritability
Within-Network	
Cingulo-Parietal Network	-0.002*
Dorsal Attention Network	-0.001*
Somatomotor Mouth Network	-0.002*
Between-Network	
Auditory to Cingulo-Opercular Network	0.001*
Auditory to Salience Network	0.001*
Cingulo-Opercular to Ventral Attention Network	0.001*
Cingulo-Parietal to SMH	0.001*
Default to Frontoparietal Network	0.001*
Dorsal Attention to Default Network	0.001*
Dorsal Attention to Ventral Attention Network	0.001*
Frontoparietal to Ventral Attention Network	0.001*

* p-value < .05

METHODS

Measures:

- **Irritability** → sum score of 6 items from the Child Behavior Checklist (CBCL)
- **Brain Metrics** → 306 connectivity network variables from the Gordon parcellation (12 within-network, 66 between-network, and 228 network-subcortical regions)
 - Derived using resting-state fMRI data

Statistical Analyses:

- Mixed effects models in R
- Multiple comparisons were accounted for using false discovery rate (FDR) correction

DISCUSSION

- Findings highlight associations of irritability with distinct large-scale brain networks
 - Contribute to a better understanding of the neural mechanisms underlying irritability and may inform targeted interventions for youth experiencing severe irritability

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