Network Analysis of the Association Between Symptoms of Parental Psychopathology and Children's Executive Functioning

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BACKGROUND

- Parent depression & anxiety are associated with lower child executive functioning (EF)[1,2].
- Associations between specific parent psychopathology symptoms and child EF are unclear.

AIM

Network analysis to explore the association of parental anxiety & depression symptoms with child EF.

METHODS

Recruitment
- Cross-sectional; online (2020-2021)
- 333 families (185 USA, 109 UK, 8 Asia)

Data Collection
- Parent Depression: Patient Health Questionnaire - 9 (PHQ-9)[3]
- Parent Anxiety: Generalized Anxiety Disorder - 7 (GAD-7)[4]
- Child EF: Behavior Rating Inventory of Executive Function–Preschool Version (BRIEF-P; Flexibility, Inhibition, Emerging meta-cognition [EMI])[5]

Analysis
- Exploratory Undirected Network Analysis: Gaussian Graphical Model; extended Bayesian Information Criterion
- Non-parametric bootstrapping (n = 1000)
- Case-dropping subset bootstrapping

RESULTS

Bootstrapping results revealed the following associations between variables (connected by blue edges).
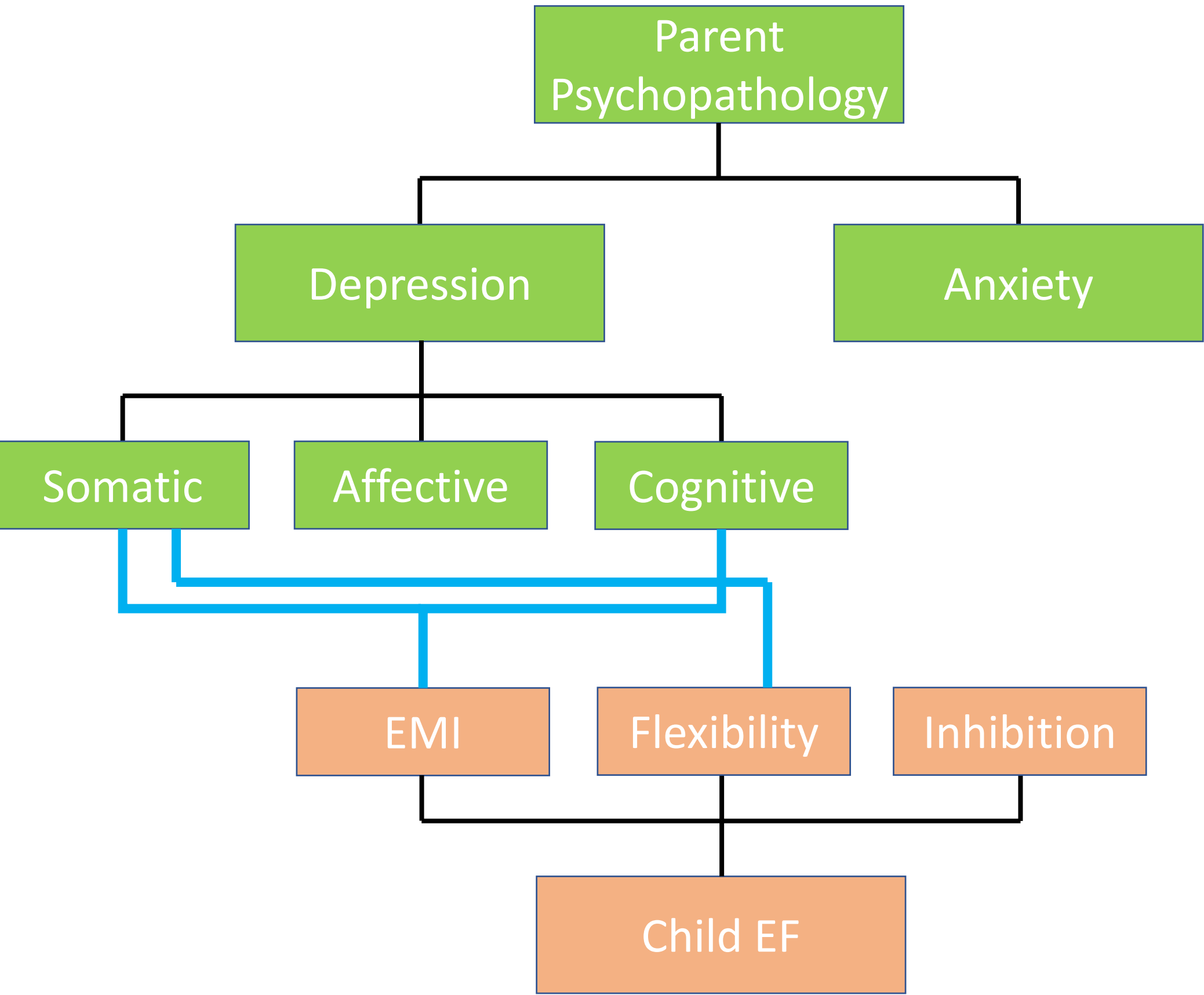
CONCLUSIONS

- Child EF associated more with parent depression than anxiety.
- Somatic → EMI/Flexibility; Affective → Inhibition; Cognitive → EMI

Child executive functioning is associated more with **parent depression** than **parent anxiety.**
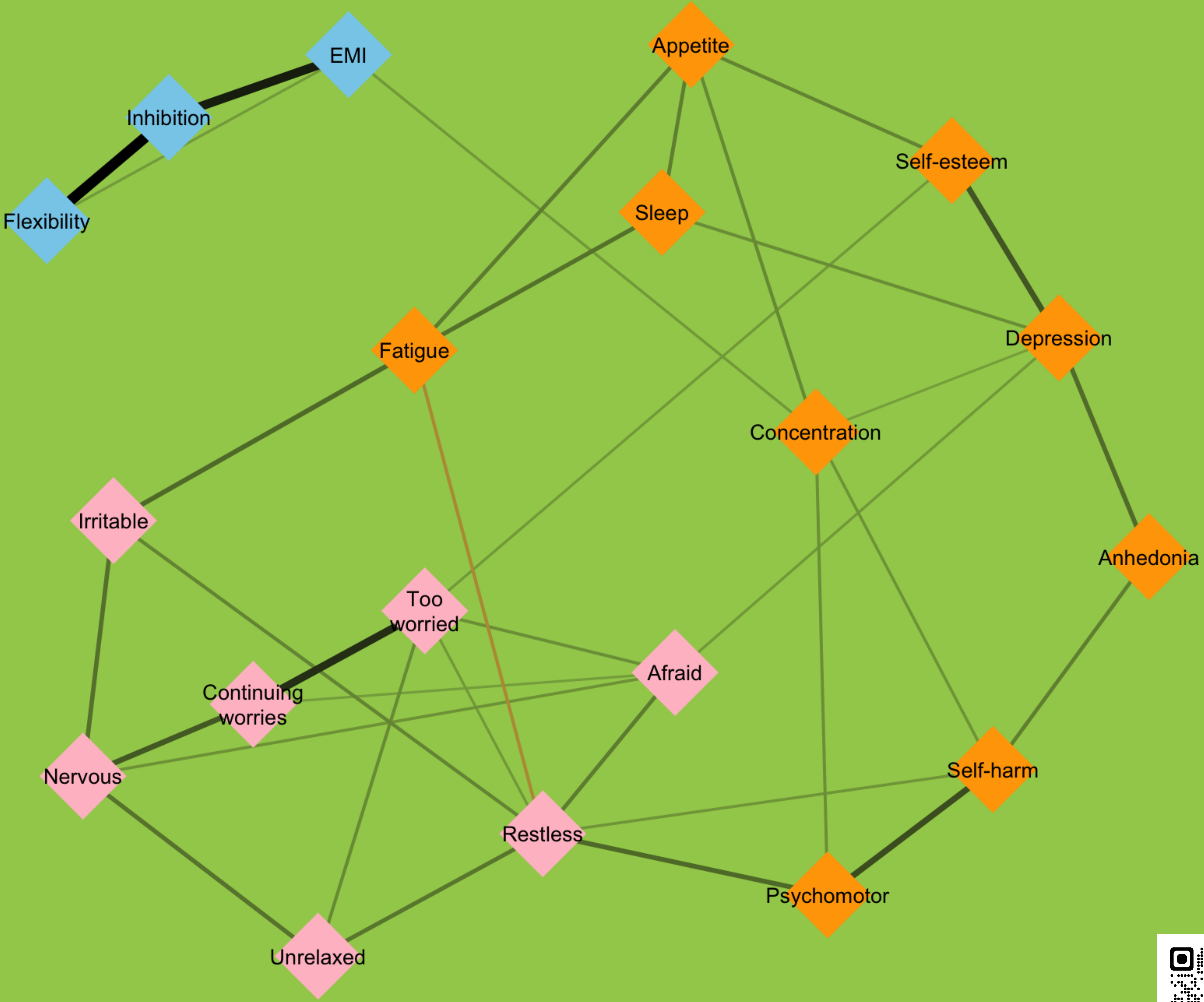
METHODS

Participant Demographics
- 234 participants were recruited through Prolific. Others were recruited through community outreach.

		Parent	Child
Income (%)	<10k = 4% - 12		
	10k-30k = 32% - 108		
	30k-50k = 22% - 72		
	50k-70k = 17% - 56		
	70k-100k = 13% - 43		
	100k-120k = 5% -		
	120k-150k = 3%		
	140k-160k = 2%		
	>160k = 2%		
Marital Status (%)	Married = 56%		
	Unmarried = 44%		
Gender (%)	She/her = 69%		She/her = 42%
	He/him = 30%		He/him = 57%
	They/them = 0.3%		They/them = 1%
Age (M; SD [range]) (years)	32.5; 5.9 [19, 51]		3.5; 1.0 [2, 7.2]
Race (%)	Asian =3%		Asian = 3%
	American Indian/Alaskan Native = 1%		American Indian/Alaskan Native = 1%
	Black = 17%		Black = 17%
	Native Hawaiian/Pacific Islander = 0.3%		Native Hawaiian/Pacific Islander = 0.3%
	Other = 1%		Other = 2%
	White = 77%		White = 77%

Data Analysis
- Missing data points handled through full information maximum likelihood.
- Least absolute shrinkage & selection operator—sparse network (R qgraph)[6].
- Centrality indices: strength, betweenness, closeness, expected influence (R Bootnet)[7].
- Strength—most stable—used for interpretation.

RESULTS
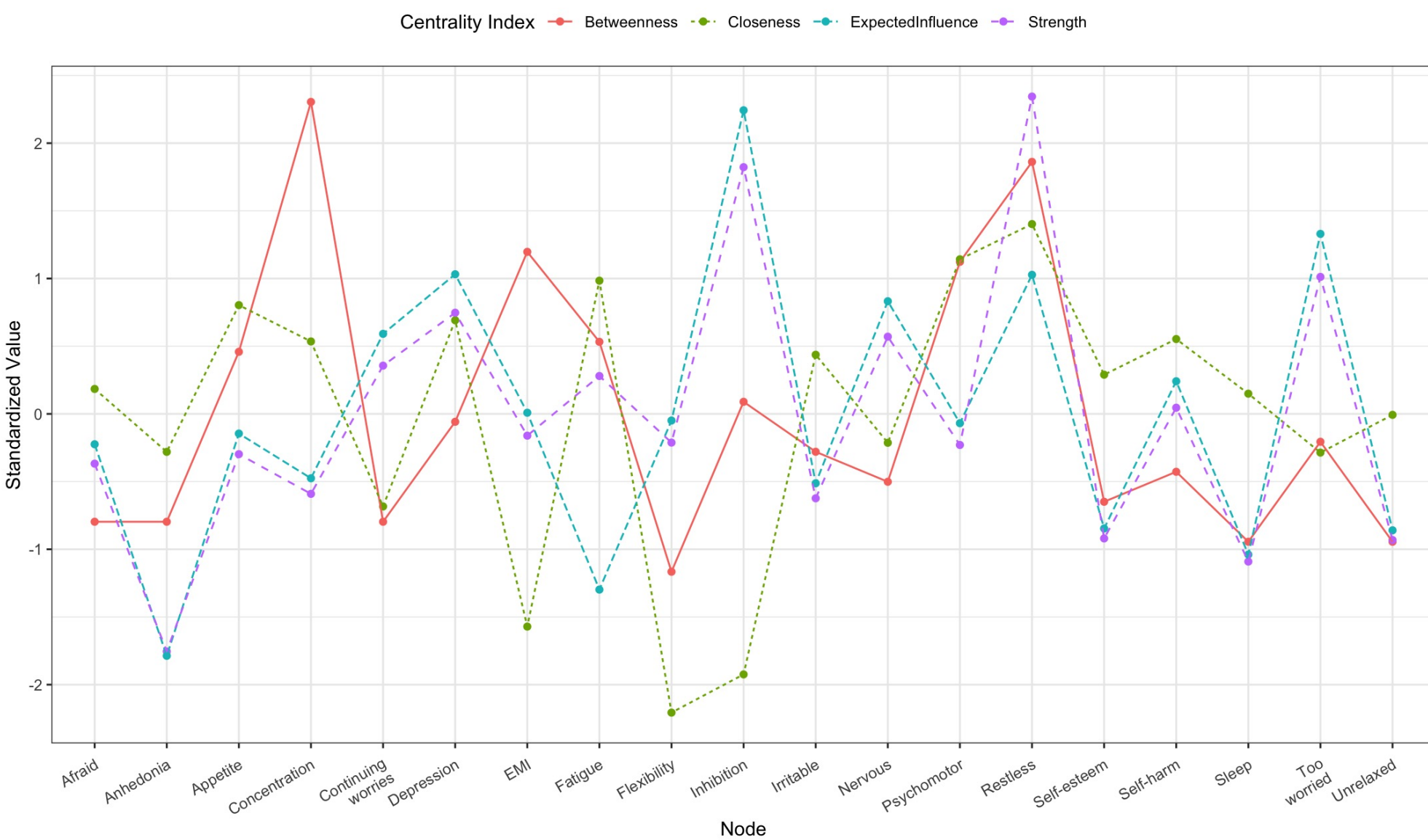
Standardized centrality indices for the overall network.
Strength: Restlessness (GAD-7) & inhibition (EF)
Closeness: Restlessness (GAD-7), psychomotor agitation/retardation (PHQ-9), Fatigue (PHQ-9)
Betweenness: Restlessness (GAD-7), Concentration (PHQ-9), EMI (EF), Psychomotor agitation/retardation (PHQ-9)
Influence: Inhibition (EF), Too worried (GAD-7)

LIMITATIONS & FUTURE DIRECTIONS

- Cross-sectional
- Child EF was parent-reported
  - Future research: Use task-based/observational EF data
- Sample size was small for network analysis
- Data collected during COVID-19 pandemic, low generalizability

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