

## SUPPLEMENT

### **Atypical Functional Network Properties and Associated Dimensions of Youth Psychopathology During Rest and Task Performance**

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## **Representativeness of the ABCD sample**

Garavan and colleagues (2018) thoroughly detail the ABCD Study participant recruitment process (1). Briefly, there were 21 ABCD Study-designated sites across the United States, each with independent catchment areas. Within each catchment area, researchers engaged in probability sampling of schools to recruit eligible children. Sociodemographic factors were considered in sample recruitment, including age, gender, race/ethnicity, socio-economic status, and urbanicity. Target numbers for each of these factors came from: (1) the American Community Survey (ACS), a large annual survey by the U.S. Census Bureau; and (2) the National Center for Education Statistics' school enrollment data. Although the individual ABCD Study sites do not perfectly reflect the U.S. population, each site implemented the same unbiased recruitment. Additionally, post-stratification weights derived by the researchers of the ABCD Study were used in our analyses to adjust the sample to be more representative of the US population.

*Dependencies in families and sites.* The ABCD Study involves complex survey data with known dependencies. For example, this study includes multiple children from the same family including siblings and multiple births (i.e., twins, triplets). Additionally, since the ABCD Study sample was collected at 21 sites across the U.S., families are nested within site. To address relatedness and nesting among the participants, we cluster by family ID using the CLUST command and stratify by site using the STRAT command in Mplus. These approaches are recommended for the analysis of complex survey data in the SEM framework in Mplus (2). All effects of interest in the current study were estimated using this approach.

*Weighting by post-stratification weights.* The ABCD Study participant recruitment process is detailed in Garavan et al., (2018) (1). In brief, 21 sites across the United States

collected data for the ABCD Study, each with independent catchment areas. Eligible children within each catchment area were recruited through probability sampling of schools. Sampling recruitment took into account sociodemographic factors including age, gender, race/ethnicity, socioeconomic status, and urbanicity taken from the U.S. Census Bureau American Community Survey (ACS) and the National Center for Education Statistics' school enrollment data. Notably, while this sampling procedure attempted to be unbiased, the ABCD Study sites are not a perfect representation of the U.S. population. Thus, the ABCD Study analytics group calculated and provided post-stratification weights to adjust the sample to be more representative of the U.S. population.

### **Child Behavior Checklist and the Bifactor Model**

As previously described in Moore et al. (2020), our data was split into two samples for an exploratory SEM analysis and a confirmatory bifactor analysis. Child Behavior Checklist (CBCL) items that did not reflect the most strongly associated aspects of psychopathology were removed (3). Reasons for item elimination included: (1) items that did not reflect symptoms of psychopathology (e.g., constipation); (2) items that were more age appropriate for certain ages over others (e.g., substance use items); (3) items that showed lack of sufficient endorsement (ratings above 0) within the sample; and (4) items that reflected similar behaviors to another item, in which case a composite was created. As a result, only items that were strongly associated with psychopathology were included in these analyses. The exploratory SEM analysis identified three factors of psychopathology: internalizing problems, attention-deficit/hyperactivity disorder symptoms, and conduct problems. In the second half of the data, a confirmatory bifactor analysis modeled these three factors plus a general psychopathology factor to define shared psychopathology symptoms across all participants. In total, these four

orthogonal factors represent shared and dissociable dimensions of psychopathology. Each CBCL item loads onto the general psychopathology factor, as well as one of the three specific factors. Additional details regarding the calculations, bifactor modeling results, and validity and reliability of the psychopathology dimensions are published elsewhere (3–5).

### **fMRI Tasks**

The stop-signal task probes inhibition and impulse control. Participants see a “go” signal, as indicated by an arrow pointing to the left or right of the screen. At this signal, participants are instructed to indicate the direction of the arrow via button press, except when a “stop” signal appears, as indicated by an upright arrow. Responses are evaluated for speed and accuracy during two runs, approximately six minutes each. Performance is measured as reaction time, quantified as the mean stop-signal delay subtracted from the mean reaction time on correct go trials, and the proportion correct on ‘go’ trials (6,7). As per ABCD Study’s quantification, stop signal reaction times are reverse scored, so that higher scores indicate better performance.

The emotional n-back task probes working memory and emotion regulation processes. Participants performed an emotional n-back task with memory loads varying from low (0-back) to high (2-back). During 0-back conditions, participants are shown a target stimulus (faces of varying emotions) and instructed to indicate whether subsequent stimuli match or do not match the target. During 2-back conditions, participants are instructed to press “match” when a picture is identical to the one seen two trials back. Data are collected during two runs, approximately five minutes each. Performance is based on rate of accuracy for 2-back trials.

The monetary incentive delay task probes aspects of reward processing, including anticipation and motivation. At the start of each trial, participants are informed that, depending on their performance, they will win \$.20 or \$5, lose \$.20 or \$5, or earn \$0. After 1500-4000 ms,

a target stimulus appears for 150-500 ms. Participants are instructed to press a button within that time period in order to receive the reward or avoid the loss for that trial. Data are collected during two runs, approximately 5.5 minutes each. Performance is based on total monetary earnings.

### **Image Acquisition, Processing, and Quality Assurance**

Accounting for differences between scanners. The ABCD Study imaging data was collected using 3 tesla (3T) scanners from three vendors: Siemens, General Electric, and Phillips. Within these three vendors, five different scanner models were used: General Electric Discovery MR750, Siemens Prisma, Siemens Prisma Fit, Phillips Achieva dStream, and Phillips Ingenia. To account for differences between scanners, we include scanner model as a covariate in all analyses.

*Imaging Acquisition.* The present study used an imaging protocol developed by the Adolescent Brain Cognitive Development (ABCD) Study Data Analysis and Informatics Center (DAIC) and the ABCD Imaging Acquisition Workgroup. The protocol was harmonized across all scanner platforms and sites. Imaging data was collected on a number of models of 3 tesla (3T) scanners from three different vendors: General Electric Discovery MR750, Siemens Prisma, Siemens Prisma Fit, Phillips Achieva dStream, and Phillips Ingenia. Resting state data was acquired with four rs-fMRI series and task-based data was acquired with two fMRI series for each of the three tasks. All fMRI acquisitions were multiband EPI (2.4 mm isotropic, TR=800 ms, slice acceleration factor 6) and included fieldmap scans for B0 distortion correction.

Participants completed scanning during one to two sessions; this included 3D T1- and 3D T2-weighted images of brain structure, a localizer, resting state scan, diffusion tensor imaging (DTI), and task-based scans. Task-based scans included rest, emotional n-back (two runs, ~five

minutes each), monetary incentive delay (two runs, ~5.5 minutes each), and the stop signal task (two runs, ~six minutes each). Imaging parameters are described in detail in Casey et al. (2018).

*Data processing.* Those scanned on the Phillips brand scanner were excluded because of an error that occurred in the phase encoding direction when converting files from DICOM to NIFTI. Structural and functional MRI scans were downloaded from the ABCD Study data portal (<https://nda.nih.gov/abcd>) and underwent minimal processing including motion correction, B<sub>0</sub> distortion correction, gradient warping correction and resampling to an isotropic space (7–9). Data were preprocessed with a custom version of FM RIPREP, a Nipype based tool (8–11). Each structural T1w (T1-weighted) scan was first defaced with pydeface (12). Each participant’s T1w volume had been previously skull-stripped and underwent correction for intensity non-uniformity (INU) via N4BiasFieldCorrection v2.1.0 (13). Spatial normalization to the standard MNI template included with FSL—the MNI152 non-linear 6th generation template—was performed through nonlinear registration via the ANTs v2.1.0’s antsRegistration tool; this used brain-extracted versions of T1w volume and template (14). Brain tissue segmentation of cerebrospinal fluid (CSF), white-matter (WM) and gray-matter (GM) was performed on the brain-extracted T1w using FSL v5.0.9’s fast (15). Functional data was co-registered to the respective T1w anatomical image using FSL’s flirt boundary-based registration with six degrees of freedom (16). Motion correcting transformations (based on minimally processed data motion parameters), BOLD-to-T1w transformation, and T1w-to-template (MNI) warp were concatenated and applied in a single step via ANTs v2.1.0’s antsApplyTransforms using Lanczos interpolation. Physiological noise regressors were extracted and applied from tissue masks (17). Framewise displacement was calculated for each functional run using the implementation of Nipype. See <https://fmriprep.readthedocs.io> for further detail of the pipeline.



Furthermore, 36 parameter confound regressions were performed including the timecourses of mean CSF signal, mean global signal, mean WM signal, the 6 standard affine motion parameters (x, y, z, pitch, roll and yaw), their squares, their derivatives, and the squared derivatives of these signals. Linear and quadratic trends were simultaneously regressed out in order to remove drift-related signals, followed up by the application of a bandpass filter with a highpass cutoff of .008 Hz and a lowpass cutoff of .12 Hz via the 3dBandpass command in AFNI (18). The cleaned volumetric BOLD images were spatially averaged into the Shen-268 atlas. For the Siemens scanners, the first eight volumes were removed because they were used as the multiband reference. For those GE scanners using DV25 software, five volumes were removed; the first 12 volumes were used as the multiband reference and then combined into a single volume and saved as the initial TR leaving a total of five frames to be discarded. For those GE scanners running DV26 software, 16 volumes were removed (19). Runs included 362 whole-brain volumes following the discarding of these acquisitions.

Finally, all structural and functional scans were visually inspected for scanner abnormalities, and to assess the accuracy of the registration and tissue segmentation processes. Participants were included for analysis if they had passing structural scans and at least one passing functional scan.

### **Graph Theory Metric Calculation**

A network can be represented graphically by  $G(N,K)$ , where  $N$  indicates the number of nodes, and  $K$  indicates the number of edges. We aimed to examine attributes on a network-wide scale. As stated in Sporns (2018), network-wide graph attributes can be well-captured by measures of path length and efficiency (20). As such, we implemented measures of path length

and diameter, as well as local efficiency, small world efficiency, and modularity metrics, as defined and calculated in prior literature (20,21).

Average shortest path length is defined by the average number of edges along the shortest path for all possible node pairs. Note that graph theory mathematically conceptualizes efficiency, and while it highlights the most efficient path, signal may or may not traverse this path.

$$L = \frac{1}{N*(N-1)} * \sum_{i \neq j} d(i, j),$$
 where  $d(i, j)$  represents the shortest path between two vertices of the graph.

Local efficiency is a measure of local fault tolerance within a node neighborhood. The local efficiency of node  $i$  is defined by how well information is transferred by a node neighborhood when node  $i$  is removed.

$$E_{loc} = \frac{1}{N} \sum_{i \in N} E_{loc,i} = \frac{1}{N} \sum_{i \in N} \frac{\sum_{j,h \in N, j \neq i} a_{ij} a_{ih} [d_{jh}(N_i)]^{-1}}{k_i(k_i-1)},$$
 where  $E_{loc,i}$  is the efficiency of node  $i$ ,  $d_{jh}(N_i)$  is the length of the shortest path between  $j$  and  $h$  that contains only neighbors of node  $i$ , and  $a_{ij}$  is the  $i$ th row and  $j$ th column element of adjacency matrix  $A$ .

Diameter is a measure of the overall size of the graph and is calculated as the maximum eccentricity across all nodes. For a single node the eccentricity is the maximum distance from that node to all other nodes in the graph.

$$D = \max_j \max_i (d(i, j))$$
 where  $d(i, j)$  is the shortest distance between nodes  $i$  and  $j$ .

Both small world sigma and small world omega measure the balance between local clustering and long-range connections, where small world graphs are characterized by a high degree of local clustering but short path lengths, the latter thanks to a small number of long-range connections between clusters.

Sigma metrics benchmark clustering and shortest path lengths against random reference graphs, whereas omega metrics benchmark clustering against a reference lattice graph but

benchmarks shortest path length against a random reference graph. Thus, omega metrics further allow the characterization of whether graphs are more random or more lattice-like in their deviations from small-worldness. Sigma is defined as:

$$\sigma = \frac{CC_r}{LL_r},$$

where  $C$  and  $L$  are the clustering coefficient and shortest path length respectively and  $C_r$  and  $L_r$  are the same for the random reference graph.

Omega is defined as:

$$\omega = \frac{L}{L_r} - \frac{C}{C_l},$$

where  $C$  and  $L$  are the clustering coefficient and shortest path length respectively and  $C_l$  and  $L_r$  are the same for, respectively, the lattice reference graph and the random reference graph.

Modularity is a measure of a system's balance of within-network connectivity and between-network connectivity via the extent to which a network can be subdivided into distinct and separate communities. It is defined by the strength of division of a network into modules.

$$Q = \sum_{c=1}^n \left[ \frac{L_c}{m} - \left( \frac{k_c}{2m} \right)^2 \right],$$

where  $m$  is the total number of edges in the graph,  $L_c$  is the number of intra-community edges for community  $c$ ,  $k_c$  is the sum of degrees of nodes in community  $c$ , and  $n$  is the total number of communities in the partition.

### **Louvain Community Detection**

We ran a Louvain community detection algorithm on each participant's thresholded functional connectivity matrices to determine individualized partitions per task (22). We set the resolution parameter ( $\gamma$ ), which determines the size of each network within the whole-brain graph, to three different values of  $\gamma \in [.4, .65, .9]$  which yielded partitions with  $\sim 25$ ,  $\sim 7$ , and  $\sim 2-3$  communities respectively. Because the Louvain community detection algorithm is stochastic, we built a consensus community for each subject by running the algorithm 250 times. We assigned

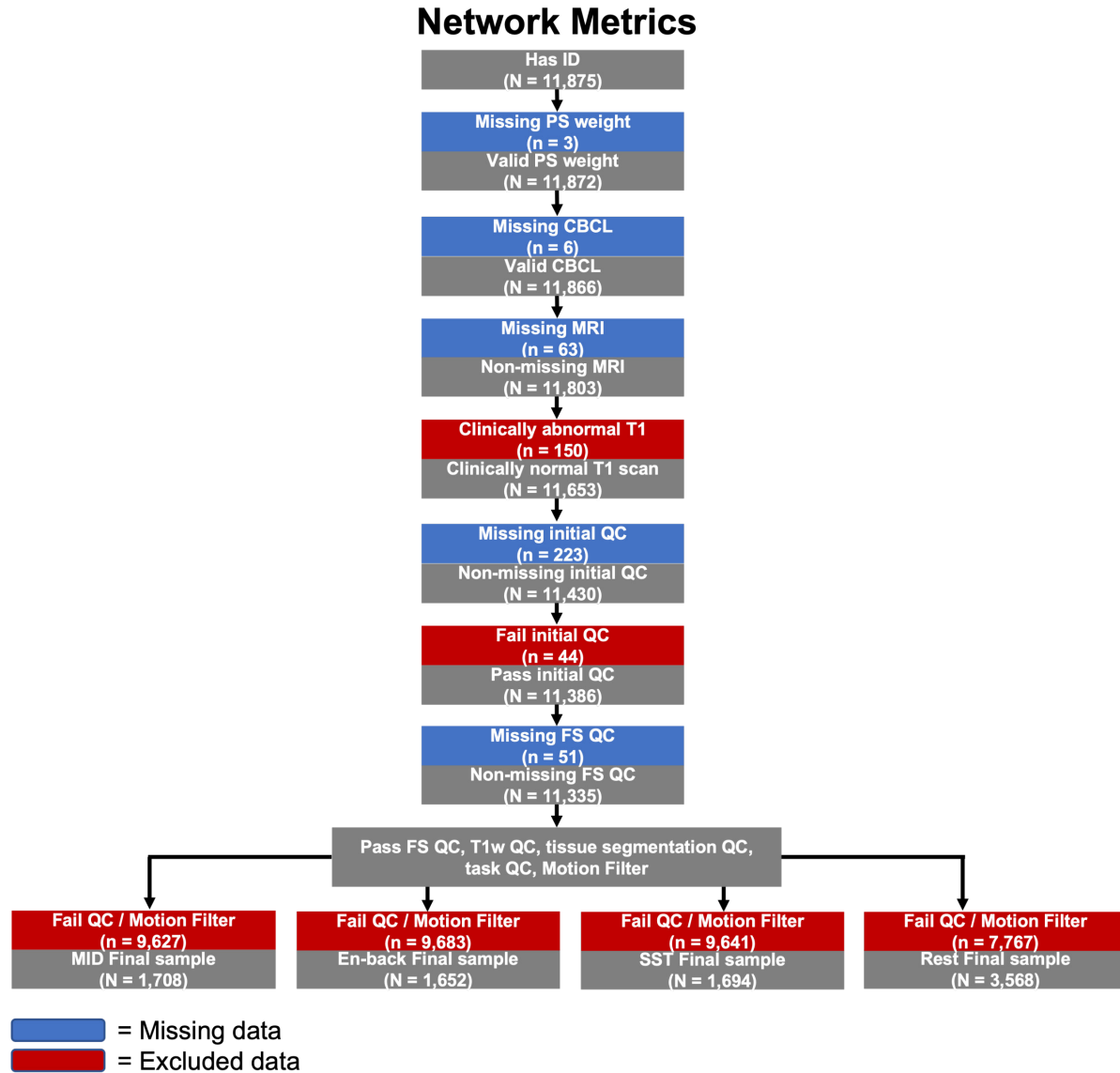
nodes to the same community if they were grouped together at least 50% of the time; if node pairs were not assigned to the same network at least 50% of the time, their agreement was set to 0. Across small, medium, and large Louvain-derived networks, there were no significant associations found between any psychopathology dimensions and graph theory metrics (modularity, average shortest path, local efficiency, diameter, small world sigma, and small world omega).

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**Figure S1.** Flowchart indicating exclusions for primary analyses with psychopathology dimensions and network efficiency metrics on resting state, monetary incentive delay (MID), Emotional n-back (En-back), and stop signal task (SST). QC = Quality Control; FS = Free Surfer



Table S1a. Results examining the relationship between psychopathology dimensions and Shen-268 network local efficiency at threshold 10%

	Brain network Threshold 10%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	-0.008	.977	-0.062	.432	0.027	.696	-0.131	<.001	0.05
	Motor	-0.004	.977	0.032	.781	0.047	.563	-0.104	.091	0.04
	Medial Frontal	-0.016	.977	-0.075	.472	0.014	.878	-0.025	.781	0.01
	Frontoparietal	0.151	.52	-0.168	.432	0.047	.878	-0.303	.091	0.21
	Default Mode	-0.001	.977	0.095	.432	-0.055	.563	-0.016	.781	0.04
	Visual 2	-0.039	.520	0.006	.977	0.004	.878	0.039	.390	0.05
	Visual 1	0.002	.977	0.013	.977	0.044	.563	-0.036	.557	0.03
	Visual Association	0.036	.977	0.002	.979	-0.023	.878	-0.072	.390	0.03
En-back	Subcortical Cerebellar	0.038	.958	-0.002	.997	-0.012	.757	-0.130	.144	0.06
	Motor	0.008	.958	0.092	.549	0.034	.702	-0.133	.200	0.06
	Medial Frontal	0.120	.958	-0.107	.674	0.059	.702	-0.131	.377	0.10
	Frontoparietal	-0.046	.958	-0.043	.997	-0.054	.702	-0.293	.200	0.16
	Default Mode	-0.017	.958	0.133	.549	0.098	.680	0.009	.904	0.12
	Visual 2	0.016	.958	0.000	.997	0.029	.702	0.031	.648	0.07
	Visual 1	0.002	.958	0.091	.549	-0.025	.702	0.065	.377	0.03
	Visual Association	0.004	.958	0.074	.674	-0.039	.702	0.089	.377	0.08
MID	Subcortical Cerebellar	0.049	.474	-0.135	<b>.024</b>	0.041	.475	-0.081	.752	0.09
	Motor	-0.029	.869	-0.003	.965	0.031	.587	-0.032	.896	0.02
	Medial Frontal	-0.227	<b>.024</b>	0.331	<b>.008</b>	0.222	<b>.032</b>	-0.005	.962	0.26
	Frontoparietal	0.194	.059	0.128	.414	-0.085	.496	0.100	.752	0.27
	Default Mode	0.142	<b>.024</b>	-0.040	.655	0.072	.298	-0.072	.752	0.13
	Visual 2	-0.005	.903	-0.141	<b>.024</b>	0.065	.298	-0.003	.962	0.07
	Visual 1	0.011	.896	0.014	.899	0.057	.298	0.053	.752	0.03
	Visual Association	0.022	.896	0.079	.424	-0.030	.696	0.040	.896	0.07
SST	Subcortical Cerebellar	-0.022	.840	-0.013	.950	0.059	.648	-0.092	.222	0.04
	Motor	-0.009	.856	0.234	<.001	0.021	.939	0.092	.258	0.08
	Medial Frontal	0.054	.840	0.008	.950	0.006	.939	-0.297	<.001	0.13
	Frontoparietal	0.063	.840	-0.157	.420	0.186	.648	-0.172	.372	0.33
	Default Mode	0.067	.840	-0.059	.752	0.018	.939	-0.067	.449	0.07
	Visual 2	0.078	.840	0.053	.752	0.019	.939	0.016	.783	0.04
	Visual 1	0.040	.840	-0.005	.950	-0.004	.939	-0.104	.222	0.06
	Visual Association	0.019	.840	-0.038	.950	-0.043	.939	-0.135	.222	0.04

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S1b. Results examining the relationship between psychopathology dimensions and Shen-268 network local efficiency at threshold 16.67%

	Brain network Threshold 16.67%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	-0.016	.582	-0.037	.485	0.037	.824	-0.078	.096	0.06
	Motor	0.049	.168	-0.025	.654	0.034	.824	-0.113	<b>.008</b>	0.07
	Medial Frontal	0.059	.168	-0.061	.485	0.002	.952	-0.081	.125	0.03
	Frontoparietal	0.042	.279	0.015	.842	-0.010	.901	-0.059	.347	0.07
	Default Mode	0.050	.168	-0.057	.485	-0.007	.901	-0.025	.601	0.05
	Visual 2	-0.043	.170	-0.036	.538	-0.008	.901	0.051	.230	0.04
	Visual 1	0.008	.799	0.015	.842	-0.019	.901	-0.003	.946	0.03
	Visual Association	-0.045	.214	0.003	.933	0.009	.901	-0.024	.601	0.03
En-back	Subcortical Cerebellar	0.066	.616	-0.026	.749	-0.029	.906	-0.106	.096	0.07
	Motor	0.049	.616	-0.006	.904	-0.026	.906	-0.153	<b>.024</b>	0.05
	Medial Frontal	-0.014	.819	0.037	.749	0.020	.906	-0.008	.919	0.03
	Frontoparietal	0.019	.819	-0.152	.184	0.012	.906	-0.110	.264	0.06
	Default Mode	0.029	.819	-0.053	.749	-0.003	.938	-0.066	.420	0.09
	Visual 2	0.021	.819	0.022	.749	0.046	.906	0.026	.816	0.06
	Visual 1	-0.010	.819	0.025	.749	-0.033	.906	0.045	.664	0.01
	Visual Association	0.059	.616	0.037	.749	-0.018	.906	0.005	.919	0.04
MID	Subcortical Cerebellar	0.054	.443	-0.097	.300	0.022	.826	-0.089	.504	0.09
	Motor	-0.054	.443	-0.002	.960	-0.033	.682	0.011	.945	0.04
	Medial Frontal	-0.035	.643	0.071	.592	0.012	.826	-0.016	.945	0.03
	Frontoparietal	0.057	.443	-0.019	.935	0.021	.826	0.001	.987	0.03
	Default Mode	0.042	.443	0.019	.935	0.064	.682	-0.035	.945	0.06
	Visual 2	0.018	.643	-0.071	.315	0.044	.682	-0.022	.945	0.06
	Visual 1	0.039	.443	-0.010	.935	-0.008	.826	-0.014	.945	0.03
	Visual Association	0.022	.643	-0.109	.300	-0.046	.682	-0.043	.945	0.06
SST	Subcortical Cerebellar	-0.030	.685	-0.028	.899	0.107	<b>.024</b>	-0.072	.365	0.06
	Motor	0.013	.861	0.014	.950	0.011	.781	-0.009	.860	0.03
	Medial Frontal	-0.112	.104	-0.075	.747	0.016	.781	-0.113	.232	0.05
	Frontoparietal	0.042	.685	0.008	.950	0.092	.267	0.030	.754	0.04
	Default Mode	0.034	.685	-0.027	.899	0.011	.781	-0.063	.448	0.05
	Visual 2	0.024	.729	0.058	.747	0.013	.781	-0.049	.486	0.03
	Visual 1	0.064	.560	-0.003	.950	-0.032	.781	-0.034	.754	0.01
	Visual Association	0.006	.900	-0.061	.747	0.073	.267	-0.107	.252	0.04

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S1c. Results examining the relationship between psychopathology dimensions and Shen-268 network local efficiency at threshold 23%

	Brain network Threshold 23%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	-0.029	.387	-0.043	.365	0.035	.520	-0.061	.232	0.06
	Motor	0.033	.378	-0.008	.882	0.045	.464	-0.106	<b>.008</b>	0.06
	Medial Frontal	-0.001	.965	-0.019	.788	0.008	.887	-0.043	.520	0.02
	Frontoparietal	0.012	.857	0.049	.365	-0.015	.877	-0.014	.685	0.06
	Default Mode	0.033	.378	-0.026	.699	0.003	.893	-0.017	.685	0.05
	Visual 2	-0.032	.378	-0.057	.365	0.008	.887	0.036	.520	0.04
	Visual 1	-0.003	.965	-0.025	.699	-0.034	.549	-0.014	.685	0.03
	Visual Association	-0.049	.378	-0.004	.887	0.022	.834	0.023	.685	0.03
En-back	Subcortical Cerebellar	0.065	.288	-0.050	.436	-0.014	.754	-0.131	<b>.024</b>	0.08
	Motor	0.014	.867	0.030	.624	-0.025	.728	-0.099	.152	0.05
	Medial Frontal	0.035	.650	-0.036	.624	-0.037	.728	0.024	.836	0.02
	Frontoparietal	-0.012	.867	-0.095	.144	0.026	.728	-0.009	.836	0.03
	Default Mode	0.054	.376	-0.086	.144	-0.017	.754	-0.087	.267	0.09
	Visual 2	-0.006	.871	0.011	.811	0.035	.728	0.012	.836	0.04
	Visual 1	0.065	.288	-0.109	.144	-0.038	.728	-0.039	.836	0.02
	Visual Association	0.041	.650	0.030	.624	0.011	.779	0.022	.836	0.02
MID	Subcortical Cerebellar	0.022	.713	-0.120	.056	0.034	.676	-0.135	<b>.016</b>	0.12
	Motor	-0.057	.378	-0.002	.957	-0.011	.933	0.000	.999	0.04
	Medial Frontal	-0.015	.834	-0.072	.402	-0.004	.933	-0.103	.168	0.03
	Frontoparietal	0.049	.378	-0.072	.387	-0.012	.933	-0.004	.999	0.03
	Default Mode	0.054	.378	-0.007	.957	0.054	.517	-0.059	.406	0.07
	Visual 2	0.001	.973	-0.066	.387	0.048	.517	-0.035	.572	0.06
	Visual 1	0.044	.378	-0.045	.428	-0.005	.933	-0.095	.096	0.03
	Visual Association	0.023	.713	-0.058	.402	-0.052	.517	-0.042	.572	0.04
SST	Subcortical Cerebellar	-0.039	.469	-0.058	.539	0.065	.464	-0.067	.372	0.07
	Motor	0.030	.579	0.002	.965	0.037	.585	-0.004	.929	0.04
	Medial Frontal	-0.052	.469	-0.045	.539	0.008	.851	-0.099	.372	0.03
	Frontoparietal	0.085	.264	-0.042	.539	0.047	.585	0.043	.445	0.05
	Default Mode	0.038	.469	-0.036	.539	0.028	.585	-0.043	.445	0.07
	Visual 2	0.022	.655	0.040	.539	0.027	.585	-0.058	.372	0.03
	Visual 1	0.049	.469	0.005	.965	0.011	.851	-0.048	.445	0.02
	Visual Association	0.001	.981	-0.044	.539	0.057	.464	-0.093	.372	0.04

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S1d. Results examining the relationship between psychopathology dimensions and Shen-268 network local efficiency at threshold 30%

	Brain network Threshold 30%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	-0.026	.371	-0.060	.296	0.028	.402	-0.070	.088	0.08
	Motor	0.032	.371	-0.012	.868	0.035	.397	-0.109	<b>.008</b>	0.06
	Medial Frontal	-0.028	.371	-0.018	.868	0.022	.402	0.005	.987	0.02
	Frontoparietal	0.047	.371	0.041	.435	-0.049	.296	-0.040	.424	0.05
	Default Mode	0.029	.371	-0.032	.520	0.023	.402	-0.038	.424	0.06
	Visual 2	-0.019	.480	-0.058	.320	0.002	.938	0.005	.987	0.03
	Visual 1	-0.007	.781	-0.006	.868	-0.045	.312	0.012	.987	0.02
	Visual Association	-0.031	.371	-0.005	.868	0.026	.402	0.001	.987	0.03
En-back	Subcortical Cerebellar	0.109	<b>.016</b>	-0.039	.802	-0.022	.578	-0.161	<b>&lt;.001</b>	0.09
	Motor	0.016	.758	0.033	.842	-0.024	.578	-0.069	.397	0.04
	Medial Frontal	0.038	.484	-0.006	.903	-0.010	.786	-0.015	.901	0.01
	Frontoparietal	0.010	.781	-0.104	.256	0.030	.578	-0.047	.694	0.03
	Default Mode	0.038	.484	-0.073	.324	-0.037	.578	-0.092	.296	0.08
	Visual 2	-0.035	.484	0.009	.903	0.053	.578	-0.004	.937	0.05
	Visual 1	0.080	.108	-0.043	.802	-0.028	.578	-0.019	.901	0.01
	Visual Association	0.040	.484	0.005	.903	-0.033	.578	-0.032	.838	0.02
MID	Subcortical Cerebellar	0.001	.969	-0.101	.088	0.035	.516	-0.123	<b>.024</b>	0.11
	Motor	-0.015	.907	-0.021	.746	0.004	.897	0.018	.651	0.04
	Medial Frontal	-0.032	.907	-0.029	.711	0.032	.516	-0.142	<b>.024</b>	0.04
	Frontoparietal	0.072	.272	-0.085	.140	0.006	.897	-0.022	.651	0.03
	Default Mode	0.025	.907	-0.003	.941	0.049	.516	-0.046	.497	0.06
	Visual 2	-0.003	.969	-0.124	.088	0.039	.516	-0.042	.497	0.07
	Visual 1	0.047	.628	-0.052	.376	-0.028	.516	-0.074	.155	0.04
	Visual Association	0.018	.907	-0.085	.140	-0.054	.516	-0.057	.384	0.04
SST	Subcortical Cerebellar	-0.044	.376	-0.089	.288	0.064	.456	-0.068	.396	0.09
	Motor	0.029	.567	-0.015	.805	0.013	.887	-0.046	.469	0.04
	Medial Frontal	-0.083	.132	-0.034	.728	0.004	.908	-0.101	.312	0.04
	Frontoparietal	0.055	.307	-0.008	.863	0.029	.887	0.001	.981	0.04
	Default Mode	0.044	.376	-0.024	.728	0.020	.887	-0.055	.396	0.06
	Visual 2	-0.016	.773	0.032	.728	0.010	.887	-0.054	.396	0.03
	Visual 1	0.123	<b>.008</b>	-0.073	.572	0.019	.887	-0.038	.517	0.03
	Visual Association	-0.010	.773	-0.051	.589	0.012	.887	-0.045	.497	0.03

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S2a. Results examining the relationship between psychopathology dimensions and Shen-268 network average shortest path length at threshold 10%

	Brain network Threshold 10%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	0.034	.419	0.094	<b>.032</b>	-0.058	.140	0.077	.224	0.05
	Motor	0.001	.982	0.067	.411	-0.061	.210	0.064	.248	0.04
	Medial Frontal	0.013	.914	0.064	.656	-0.043	.561	0.055	.350	0.02
	Frontoparietal	-0.183	.232	0.429	<b>&lt;.001</b>	0.198	.140	-0.070	.325	0.39
	Default Mode	-0.042	.419	0.021	.830	0.063	.210	-0.046	.358	0.03
	Visual 2	0.026	.419	-0.024	.677	0.014	.717	-0.033	.358	0.06
	Visual 1	0.066	.232	0.008	.853	-0.040	.394	0.011	.786	0.04
	Visual Association	-0.044	.419	0.035	.677	0.001	.980	-0.037	.358	0.03
En-back	Subcortical Cerebellar	-0.064	.301	0.031	.863	0.059	.532	0.132	<b>.048</b>	0.07
	Motor	-0.041	.742	-0.116	.708	-0.031	.751	0.056	.680	0.08
	Medial Frontal	-0.184	.301	0.179	.708	0.121	.532	0.109	.680	0.15
	Frontoparietal	0.103	.630	-0.174	.723	-0.096	.751	0.127	.680	0.20
	Default Mode	0.084	.301	-0.045	.863	-0.045	.751	-0.018	.999	0.05
	Visual 2	0.014	.863	-0.005	.999	-0.024	.751	-0.003	.999	0.08
	Visual 1	-0.014	.863	-0.028	.863	-0.013	.854	-0.064	.680	0.04
	Visual Association	-0.081	.999	-0.100	.999	0.019	.999	-0.100	.999	0.09
MID	Subcortical Cerebellar	0.005	.999	0.126	.420	-0.022	.790	0.094	.810	0.10
	Motor	0.033	.999	0.039	.620	0.011	.920	-0.002	.999	0.05
	Medial Frontal	0.047	.999	-0.064	.999	0.001	.999	0.144	.999	0.08
	Frontoparietal	-0.240	.180	0.177	.620	0.214	.250	-0.085	.999	0.24
	Default Mode	-0.121	.180	0.093	.620	0.043	.790	0.108	.860	0.07
	Visual 2	-0.004	.999	0.117	.520	-0.075	.250	-0.001	.999	0.06
	Visual 1	0.009	.999	-0.056	.620	-0.024	.790	-0.007	.999	0.03
	Visual Association	-0.100	.576	-0.083	.620	0.084	.790	-0.086	.999	0.07
SST	Subcortical Cerebellar	0.042	.880	0.114	.128	-0.096	.136	0.121	.148	0.07
	Motor	0.019	.880	-0.035	.904	-0.085	.232	0.030	.874	0.05
	Medial Frontal	0.028	.880	0.058	.904	0.034	.950	0.256	.104	0.12
	Frontoparietal	-0.030	.880	0.062	.904	-0.238	.232	0.120	.874	0.23
	Default Mode	-0.011	.880	0.161	.164	0.01	.950	-0.028	.874	0.04
	Visual 2	-0.065	.880	0.003	.967	-0.015	.950	0.009	.881	0.03
	Visual 1	-0.016	.880	-0.023	.904	0.004	.950	0.020	.874	0.05
	Visual Association	-0.036	.880	0.021	.904	0.036	.950	0.141	.171	0.03

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S2b. Results examining the relationship between psychopathology dimensions and Shen-268 network average shortest path length at threshold 16.67%

Brain network Threshold 16.67%		General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	0.017	.821	0.055	.560	-0.021	.545	0.077	.224	0.04
	Motor	0.012	.821	0.014	.768	-0.045	.32	0.064	.248	0.05
	Medial Frontal	-0.026	.821	0.044	.632	-0.010	.741	0.055	.350	0.02
	Frontoparietal	-0.020	.821	-0.051	.632	0.036	.545	-0.070	.325	0.03
	Default Mode	0.005	.960	0.021	.768	0.029	.545	-0.046	.358	0.02
	Visual 2	0.026	.821	0.034	.632	0.021	.545	-0.033	.358	0.04
	Visual 1	0.001	.960	0.018	.768	0.060	.312	0.011	.786	0.02
	Visual Association	0.050	.821	-0.001	.974	-0.017	.643	-0.037	.358	0.03
En-back	Subcortical Cerebellar	-0.072	.360	0.024	.978	-0.003	.934	0.083	.592	0.06
	Motor	-0.001	.985	-0.042	.978	-0.029	.934	0.014	.896	0.04
	Medial Frontal	-0.047	.602	-0.002	.978	-0.016	.934	0.086	.896	0.02
	Frontoparietal	0.013	.912	0.092	.788	-0.031	.934	-0.020	.896	0.06
	Default Mode	0.035	.602	0.001	.978	0.004	.934	0.000	.999	0.02
	Visual 2	0.024	.763	-0.016	.978	-0.049	.934	0.015	.896	0.06
	Visual 1	-0.034	.602	0.013	.978	0.021	.934	-0.016	.896	0.03
	Visual Association	-0.049	.602	-0.116	.304	0.004	.934	-0.045	.896	0.03
MID	Subcortical Cerebellar	-0.041	.645	0.124	.080	-0.008	.822	0.094	.432	0.11
	Motor	0.055	.645	0.033	.537	0.010	.822	0.006	.897	0.08
	Medial Frontal	0.008	.866	-0.063	.537	0.042	.822	0.080	.452	0.03
	Frontoparietal	-0.036	.760	-0.065	.435	0.042	.822	-0.055	.595	0.04
	Default Mode	-0.013	.848	-0.083	.152	0.015	.822	0.027	.744	0.03
	Visual 2	-0.018	.848	0.064	.256	-0.020	.822	0.019	.761	0.06
	Visual 1	-0.025	.760	-0.018	.722	0.014	.822	0.044	.595	0.02
	Visual Association	-0.057	.645	0.111	.176	0.061	.822	0.067	.573	0.05
SST	Subcortical Cerebellar	0.036	.820	0.100	.152	-0.073	.320	0.119	.056	0.08
	Motor	0.049	.760	0.038	.639	-0.051	.472	0.078	.269	0.09
	Medial Frontal	0.139	<b>.016</b>	0.094	.152	-0.021	.935	0.186	<b>&lt;.001</b>	0.08
	Frontoparietal	-0.017	.979	0.059	.639	-0.013	.935	-0.009	.881	0.06
	Default Mode	-0.024	.867	-0.008	.860	-0.002	.953	-0.039	.491	0.01
	Visual 2	-0.004	.979	-0.040	.639	-0.027	.935	0.049	.487	0.03
	Visual 1	-0.034	.820	-0.026	.677	0.017	.935	-0.053	.487	0.02
	Visual Association	-0.001	.979	0.065	.416	-0.071	.360	0.078	.362	0.04

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S2c. Results examining the relationship between psychopathology dimensions and Shen-268 network average shortest path length at threshold 23%

	Brain network Threshold 23%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	0.022	.918	0.058	.368	-0.033	.456	0.073	.104	0.06
	Motor	0.002	.929	0.015	.957	-0.045	.304	0.070	.104	0.07
	Medial Frontal	0.013	.918	0.012	.957	-0.013	.719	-0.006	.857	0.01
	Frontoparietal	0.007	.918	-0.033	.829	0.015	.719	-0.048	.413	0.04
	Default Mode	0.007	.918	0.000	.991	0.003	.912	-0.022	.691	0.02
	Visual 2	0.008	.918	0.035	.829	0.017	.719	-0.013	.782	0.04
	Visual 1	-0.013	.918	-0.023	.957	0.048	.304	-0.044	.413	0.02
	Visual Association	0.024	.918	0.007	.957	-0.028	.590	-0.037	.413	0.02
En-back	Subcortical Cerebellar	-0.092	.072	0.043	.529	0.019	.842	0.104	.176	0.08
	Motor	0.011	.989	-0.040	.529	-0.018	.842	0.026	.984	0.06
	Medial Frontal	-0.007	.989	-0.069	.529	0.008	.842	0.019	.984	0.01
	Frontoparietal	0.081	.144	0.041	.529	-0.007	.842	-0.080	.288	0.06
	Default Mode	0.000	.989	-0.015	.839	0.018	.842	0.023	.984	0.02
	Visual 2	0.034	.804	-0.054	.529	-0.043	.842	0.000	.992	0.06
	Visual 1	-0.046	.496	0.048	.529	0.026	.842	0.002	.992	0.02
	Visual Association	-0.006	.989	-0.008	.874	-0.015	.842	-0.092	.323	0.02
MID	Subcortical Cerebellar	-0.002	.961	0.095	.188	-0.023	.704	0.104	.123	0.11
	Motor	0.028	.961	0.034	.742	0.016	.704	0.030	.741	0.07
	Medial Frontal	0.039	.961	0.048	.710	0.015	.720	0.096	.123	0.02
	Frontoparietal	-0.014	.961	-0.007	.996	0.084	.064	-0.012	.830	0.06
	Default Mode	-0.021	.961	-0.067	.301	0.023	.704	0.057	.426	0.04
	Visual 2	-0.011	.961	0.088	.188	-0.017	.704	0.010	.830	0.05
	Visual 1	-0.017	.961	0.000	.996	0.021	.704	0.091	.123	0.04
	Visual Association	-0.002	.961	0.009	.996	0.056	.544	0.026	.747	0.03
SST	Subcortical Cerebellar	0.050	.662	0.098	.144	-0.062	.576	0.101	.085	0.08
	Motor	0.007	.918	0.053	.350	-0.026	.928	0.095	.085	0.09
	Medial Frontal	0.081	.352	0.058	.350	-0.005	.962	0.132	<b>.048</b>	0.04
	Frontoparietal	-0.028	.810	0.060	.350	-0.018	.962	-0.069	.298	0.06
	Default Mode	-0.037	.662	-0.023	.620	0.028	.928	-0.012	.853	0.01
	Visual 2	0.004	.918	-0.052	.400	-0.041	.928	0.060	.298	0.03
	Visual 1	-0.035	.662	-0.036	.458	-0.004	.962	-0.009	.853	0.02
	Visual Association	0.016	.879	0.071	.350	-0.002	.962	0.064	.301	0.04

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S2d. Results examining the relationship between psychopathology dimensions and Shen-268 network average shortest path length at threshold 30%

	Brain network Threshold 30%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	0.018	.950	0.072	.120	-0.024	.374	0.086	<b>.028</b>	0.06
	Motor	-0.003	.987	0.042	.491	-0.029	.374	0.090	<b>.028</b>	0.07
	Medial Frontal	0.023	.950	0.031	.549	-0.034	.374	0.010	.872	0.01
	Frontoparietal	-0.024	.950	-0.028	.549	0.046	.374	-0.021	.684	0.03
	Default Mode	0.003	.987	-0.009	.776	-0.005	.839	-0.025	.684	0.02
	Visual 2	0.008	.987	0.049	.488	0.029	.374	0.002	.938	0.04
	Visual 1	0.000	.987	-0.019	.776	0.034	.374	-0.046	.547	0.01
	Visual Association	0.020	.950	0.008	.776	-0.025	.374	-0.025	.684	0.02
En-back	Subcortical Cerebellar	-0.100	<b>.040</b>	0.058	.281	0.025	.688	0.119	.056	0.09
	Motor	0.006	.908	-0.066	.281	-0.031	.688	0.022	.875	0.06
	Medial Frontal	-0.024	.721	-0.057	.281	-0.012	.944	-0.012	.875	0.01
	Frontoparietal	0.024	.721	0.064	.281	0.002	.944	-0.018	.875	0.04
	Default Mode	-0.004	.908	0.026	.526	0.034	.688	0.053	.875	0.03
	Visual 2	0.034	.721	-0.057	.281	-0.055	.688	-0.016	.875	0.06
	Visual 1	-0.046	.704	0.040	.477	0.007	.944	-0.047	.875	0.03
	Visual Association	-0.032	.721	-0.059	.281	0.044	.688	0.009	.875	0.02
MID	Subcortical Cerebellar	0.008	.926	0.082	.268	-0.029	.836	0.095	.144	0.10
	Motor	0.015	.926	0.032	.766	-0.002	.973	0.015	.795	0.07
	Medial Frontal	0.000	.999	0.071	.288	0.001	.973	0.109	.144	0.03
	Frontoparietal	-0.025	.926	0.006	.901	0.057	.608	-0.040	.590	0.05
	Default Mode	-0.026	.926	-0.058	.408	0.015	.896	0.062	.380	0.04
	Visual 2	-0.034	.926	0.104	.192	-0.032	.836	0.012	.795	0.06
	Visual 1	-0.024	.926	-0.011	.901	0.021	.890	0.075	.237	0.04
	Visual Association	-0.009	.926	0.021	.832	0.032	.836	0.028	.689	0.04
SST	Subcortical Cerebellar	0.047	.386	0.094	.152	-0.059	.664	0.080	.192	0.08
	Motor	0.013	.942	0.043	.673	-0.034	.931	0.067	.192	0.08
	Medial Frontal	0.119	<b>.016</b>	0.031	.673	0.001	.987	0.105	.160	0.04
	Frontoparietal	-0.009	.942	0.030	.673	-0.003	.987	-0.040	.544	0.04
	Default Mode	-0.050	.386	-0.010	.896	0.015	.987	0.000	.993	0.01
	Visual 2	-0.003	.942	-0.042	.673	-0.023	.987	0.086	.160	0.04
	Visual 1	-0.067	.252	-0.006	.896	0.004	.987	-0.033	.595	0.02
	Visual Association	0.003	.942	0.047	.673	0.031	.931	0.068	.240	0.03

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.



Table S3a. Results examining the relationship between psychopathology dimensions and Shen-268 network diameter at threshold 10%

	Brain network Threshold 10%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	0.018	.801	0.021	.801	-0.030	.392	0.071	.224	0.01
	Motor	0.033	.801	-0.018	.801	-0.055	.288	0.011	.899	0.02
	Medial Frontal	0.027	.801	0.094	.801	-0.017	.751	-0.020	.899	0.02
	Frontoparietal	-0.034	.851	0.028	.801	0.393	<b>&lt;.001</b>	0.226	.224	0.33
	Default Mode	-0.006	.863	-0.020	.801	0.082	.152	0.008	.899	0.02
	Visual 2	0.024	.801	-0.013	.801	0.032	.392	-0.021	.899	0.02
	Visual 1	0.059	.536	-0.044	.801	-0.044	.392	0.023	.899	0.03
	Visual Association	-0.035	.801	-0.014	.801	0.015	.751	0.060	.699	0.02
En-back	Subcortical Cerebellar	-0.062	.363	0.008	.996	0.102	<b>.008</b>	0.050	.857	0.03
	Motor	-0.020	.915	-0.003	.996	-0.016	.999	0.022	.864	0.05
	Medial Frontal	-0.057	.915	0.163	.421	0.002	.999	0.060	.857	0.10
	Frontoparietal	0.151	.363	-0.255	.232	0.024	.999	-0.122	.857	0.29
	Default Mode	0.130	.144	-0.152	.304	0.002	.999	-0.035	.857	0.09
	Visual 2	-0.005	.915	0.002	.996	-0.024	.999	0.029	.857	0.04
	Visual 1	0.006	.915	-0.060	.638	-0.002	.999	-0.097	.592	0.03
	Visual Association	-0.090	.915	-0.021	.996	0.000	.999	-0.114	.930	0.08
MID	Subcortical Cerebellar	0.001	.977	0.095	.160	-0.047	.720	0.025	.915	0.02
	Motor	0.069	.392	-0.056	.635	0.004	.929	-0.073	.915	0.07
	Medial Frontal	0.030	.977	-0.030	.978	0.122	.837	0.162	.915	0.09
	Frontoparietal	-0.213	.224	0.138	.635	0.173	.480	-0.064	.915	0.21
	Default Mode	-0.083	.336	0.027	.906	0.055	.736	-0.004	.957	0.05
	Visual 2	0.024	.907	0.097	.160	-0.077	.384	0.029	.915	0.04
	Visual 1	-0.003	.977	-0.013	.906	0.007	.929	-0.003	.957	0.02
	Visual Association	-0.096	.392	-0.098	.635	0.047	.837	-0.062	.915	0.06
SST	Subcortical Cerebellar	-0.051	.546	0.095	.592	-0.079	.268	0.053	.798	0.03
	Motor	-0.032	.805	-0.004	.995	-0.024	.989	0.064	.768	0.04
	Medial Frontal	-0.025	.974	0.051	.995	-0.011	.989	0.198	.996	0.08
	Frontoparietal	-0.157	.536	0.054	.995	-0.080	.989	-0.001	.996	0.29
	Default Mode	0.033	.868	0.063	.995	-0.022	.989	-0.117	.768	0.04
	Visual 2	-0.092	.536	0.019	.995	-0.014	.989	0.016	.996	0.02
	Visual 1	-0.072	.546	-0.014	.995	0.006	.989	-0.007	.996	0.06
	Visual Association	0.005	.974	-0.008	.995	0.113	.224	0.088	.768	0.05

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S3b. Results examining the relationship between psychopathology dimensions and Shen-268 network diameter at threshold 16.67%

Brain network Threshold 16.67%		General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	-0.015	.668	0.035	.682	-0.010	.893	0.001	.975	0.01
	Motor	0.029	.668	0.028	.691	-0.029	.684	0.030	.667	0.02
	Medial Frontal	-0.022	.668	0.024	.691	0.005	.893	0.021	.701	0.01
	Frontoparietal	-0.016	.668	-0.043	.682	0.027	.798	-0.045	.667	0.03
	Default Mode	0.014	.668	0.071	.368	0.027	.684	-0.035	.667	0.03
	Visual 2	0.020	.668	0.017	.691	0.029	.684	-0.029	.667	0.01
	Visual 1	0.019	.668	-0.005	.903	0.061	.184	0.024	.701	0.02
	Visual Association	0.058	.368	-0.037	.682	-0.004	.893	-0.030	.667	0.02
En-back	Subcortical Cerebellar	-0.046	.533	0.036	.683	-0.011	.835	0.008	.956	0.02
	Motor	-0.041	.554	-0.001	.989	-0.016	.835	0.003	.956	0.01
	Medial Frontal	-0.045	.637	-0.009	.989	-0.036	.835	0.129	.232	0.03
	Frontoparietal	0.015	.937	0.072	.683	-0.035	.835	0.028	.921	0.04
	Default Mode	0.072	.272	-0.010	.989	-0.013	.835	-0.089	.232	0.04
	Visual 2	0.003	.937	0.049	.683	-0.040	.835	0.035	.822	0.04
	Visual 1	-0.008	.937	-0.046	.683	-0.009	.835	-0.035	.822	0.02
	Visual Association	-0.065	.488	-0.079	.683	0.012	.835	-0.043	.822	0.02
MID	Subcortical Cerebellar	-0.040	.737	0.082	.200	0.020	.764	0.048	.812	0.03
	Motor	0.013	.737	0.058	.338	0.078	.216	0.004	.935	0.05
	Medial Frontal	0.026	.737	-0.058	.632	0.033	.764	0.010	.935	0.01
	Frontoparietal	-0.038	.737	-0.106	.187	0.048	.764	-0.030	.812	0.03
	Default Mode	0.016	.737	-0.078	.187	-0.002	.946	-0.035	.812	0.02
	Visual 2	-0.013	.737	-0.009	.845	0.013	.805	0.023	.812	0.01
	Visual 1	-0.023	.737	0.028	.675	0.040	.764	0.068	.684	0.02
	Visual Association	-0.065	.737	0.141	.187	0.035	.764	0.118	.264	0.06
SST	Subcortical Cerebellar	-0.022	.933	0.068	.765	-0.008	.992	0.092	.268	0.02
	Motor	0.085	.192	-0.041	.765	0.004	.992	0.044	.438	0.04
	Medial Frontal	0.087	.356	0.040	.765	0.000	.992	0.050	.409	0.02
	Frontoparietal	0.004	.949	-0.007	.912	0.058	.992	0.045	.464	0.07
	Default Mode	-0.054	.395	-0.011	.912	-0.008	.992	-0.083	.275	0.03
	Visual 2	-0.016	.933	-0.021	.912	-0.054	.992	0.070	.280	0.03
	Visual 1	-0.005	.949	-0.045	.765	-0.004	.992	-0.107	.268	0.02
	Visual Association	-0.020	.933	0.037	.765	-0.010	.992	0.082	.280	0.03

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S3c. Results examining the relationship between psychopathology dimensions and Shen-268 network diameter at threshold 23%

	Brain network Threshold 23%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	0.013	.858	0.003	.958	-0.024	.763	0.030	.598	0.01
	Motor	0.001	.977	0.011	.958	-0.014	.763	0.029	.598	0.02
	Medial Frontal	-0.013	.858	-0.028	.958	-0.003	.945	-0.019	.698	0.01
	Frontoparietal	-0.008	.858	0.009	.958	0.016	.763	-0.049	.547	0.03
	Default Mode	0.042	.680	-0.002	.958	-0.002	.945	-0.042	.547	0.02
	Visual 2	0.008	.858	0.016	.958	0.033	.763	0.006	.866	0.01
	Visual 1	-0.017	.858	0.009	.958	0.044	.712	-0.017	.698	0.01
	Visual Association	0.019	.858	-0.017	.958	-0.020	.763	-0.047	.547	0.01
En-back	Subcortical Cerebellar	-0.044	.716	0.038	.808	0.049	.384	-0.015	.919	0.02
	Motor	0.002	.945	-0.021	.950	0.001	.998	0.013	.919	0.01
	Medial Frontal	0.008	.945	-0.167	<b>.008</b>	-0.036	.722	0.000	.997	0.03
	Frontoparietal	0.066	.640	-0.017	.950	0.000	.998	-0.093	.236	0.04
	Default Mode	0.022	.945	-0.092	.184	0.000	.998	-0.083	.269	0.03
	Visual 2	0.007	.945	-0.010	.950	-0.083	.120	-0.040	.611	0.03
	Visual 1	-0.011	.945	-0.039	.808	0.024	.870	-0.044	.611	0.01
	Visual Association	0.017	.945	-0.002	.967	-0.060	.384	-0.135	.192	0.03
MID	Subcortical Cerebellar	0.004	.911	0.069	.566	-0.025	.515	0.027	.763	0.07
	Motor	0.018	.911	-0.082	.400	-0.025	.515	0.047	.522	0.04
	Medial Frontal	0.044	.911	-0.006	.957	0.059	.426	0.013	.888	0.01
	Frontoparietal	-0.009	.911	-0.059	.566	0.050	.426	0.007	.889	0.03
	Default Mode	-0.052	.911	0.048	.566	0.058	.426	0.089	.284	0.03
	Visual 2	-0.010	.911	0.042	.566	-0.001	.975	0.031	.763	0.02
	Visual 1	-0.027	.911	0.010	.957	0.036	.498	0.108	.160	0.03
	Visual Association	0.014	.911	0.003	.957	0.047	.426	0.051	.522	0.02
SST	Subcortical Cerebellar	-0.007	.836	0.083	.232	-0.021	.908	0.102	.200	0.03
	Motor	0.032	.836	-0.028	.659	0.017	.908	0.046	.644	0.06
	Medial Frontal	0.043	.836	-0.053	.547	-0.027	.908	-0.061	.547	0.02
	Frontoparietal	-0.019	.836	0.095	.232	-0.027	.908	-0.002	.966	0.05
	Default Mode	-0.010	.836	0.019	.745	0.006	.908	-0.037	.648	0.01
	Visual 2	0.010	.836	-0.046	.547	-0.030	.908	0.068	.400	0.02
	Visual 1	-0.029	.836	-0.043	.547	-0.013	.908	-0.022	.883	0.02
	Visual Association	0.015	.836	0.005	.911	-0.005	.908	-0.012	.937	0.02

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S3d. Results examining the relationship between psychopathology dimensions and Shen-268 network diameter at threshold 30%

	Brain network Threshold 30%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	-0.002	.921	-0.013	.989	-0.004	.993	0.015	.732	0.01
	Motor	0.009	.921	0.048	.632	-0.006	.993	0.050	.560	0.03
	Medial Frontal	-0.024	.628	-0.004	.989	0.003	.993	0.021	.732	0.01
	Frontoparietal	0.004	.921	-0.032	.821	0.006	.993	-0.023	.732	0.03
	Default Mode	0.024	.628	0.042	.632	0.000	.993	-0.024	.732	0.02
	Visual 2	0.030	.628	-0.024	.872	0.011	.993	-0.011	.732	0.01
	Visual 1	-0.017	.829	0.001	.989	0.024	.993	-0.053	.560	0.01
	Visual Association	0.026	.628	0.002	.989	-0.035	.993	-0.011	.732	0.01
En-back	Subcortical Cerebellar	-0.069	.999	0.118	.999	0.057	.999	0.019	.999	0.03
	Motor	0.009	.999	-0.078	.999	-0.091	.999	-0.001	.999	0.03
	Medial Frontal	-0.003	.999	-0.104	.999	-0.004	.999	0.018	.999	0.02
	Frontoparietal	0.071	.999	-0.012	.999	-0.019	.999	-0.025	.999	0.02
	Default Mode	0.034	.999	0.067	.999	0.021	.999	-0.038	.999	0.02
	Visual 2	-0.020	.999	-0.007	.999	-0.090	.999	-0.096	.999	0.03
	Visual 1	-0.018	.999	0.025	.999	0.025	.999	-0.049	.999	0.01
	Visual Association	0.030	.999	-0.098	.999	0.019	.999	-0.072	.999	0.02
MID	Subcortical Cerebellar	-0.045	.515	0.044	.678	-0.058	.737	-0.043	.742	0.02
	Motor	-0.013	.965	0.067	.429	-0.027	.737	0.005	.919	0.03
	Medial Frontal	0.004	.965	0.017	.819	0.031	.737	-0.010	.919	0.01
	Frontoparietal	0.048	.515	-0.203	<.001	-0.020	.737	-0.111	.072	0.08
	Default Mode	0.047	.515	-0.069	.429	0.013	.737	-0.022	.919	0.02
	Visual 2	-0.017	.965	0.005	.913	-0.030	.737	-0.009	.919	0.01
	Visual 1	-0.036	.616	0.033	.750	0.023	.737	0.075	.420	0.02
	Visual Association	0.002	.965	0.025	.785	0.006	.875	0.037	.742	0.02
SST	Subcortical Cerebellar	0.021	.755	0.071	.445	-0.022	.930	0.020	.846	0.02
	Motor	0.045	.624	-0.061	.445	-0.043	.930	0.052	.720	0.04
	Medial Frontal	0.079	.312	-0.059	.445	0.012	.930	-0.009	.847	0.02
	Frontoparietal	-0.036	.624	0.012	.791	-0.003	.930	-0.018	.846	0.02
	Default Mode	0.024	.755	-0.039	.525	0.024	.930	-0.015	.846	0.01
	Visual 2	0.015	.770	-0.043	.445	-0.005	.930	0.054	.720	0.02
	Visual 1	-0.041	.624	-0.053	.445	-0.008	.930	-0.052	.720	0.02
	Visual Association	-0.009	.812	0.025	.674	0.016	.930	0.049	.720	0.01

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S4a. Results examining the relationship between psychopathology dimensions and Shen-268 network small world sigma at threshold 10%

Brain network Threshold 10%		General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	0.034	.683	0.013	.936	-0.043	.849	0.041	.643	0.06
	Motor	-0.021	.683	0.038	.852	-0.021	.849	0.060	.643	0.02
	Medial Frontal	0.033	.999	0.085	.999	-0.022	.999	0.030	.999	0.02
	Frontoparietal	-0.096	.683	-0.028	.936	-0.054	.849	0.055	.714	0.10
	Default Mode	-0.027	.683	0.013	.936	-0.016	.849	0.040	.714	0.02
	Visual 2	0.003	.999	0.055	.800	0.008	.849	0.037	.643	0.05
	Visual 1	0.025	.683	0.062	.800	-0.031	.849	0.026	.714	0.02
	Visual Association	-0.033	.683	-0.079	.800	0.030	.849	0.043	.714	0.04
En-back	Subcortical Cerebellar	-0.062	.999	-0.026	.999	0.017	.999	0.108	.999	0.05
	Motor	-0.006	.999	-0.057	.999	0.011	.999	0.041	.999	0.02
	Medial Frontal	-0.077	.999	-0.150	.999	-0.036	.999	-0.048	.999	0.16
	Frontoparietal	-0.022	.999	0.198	.999	-0.030	.999	0.446	.999	0.36
	Default Mode	-0.153	.999	0.284	.999	0.029	.999	0.231	.999	0.25
	Visual 2	0.085	.999	-0.163	.999	-0.056	.999	-0.057	.999	0.09
	Visual 1	0.091	.999	-0.211	.999	0.026	.999	-0.020	.999	0.07
	Visual Association	0.007	.999	-0.096	.999	-0.018	.999	-0.059	.999	0.03
MID	Subcortical Cerebellar	0.007	.999	0.032	.999	0.000	.999	0.046	.999	0.08
	Motor	0.002	.999	0.100	.999	0.048	.999	0.014	.999	0.03
	Medial Frontal	0.111	.999	-0.290	.999	-0.035	.999	0.085	.999	0.15
	Frontoparietal	-0.142	.999	-0.116	.999	0.162	.999	0.133	.999	0.18
	Default Mode	-0.055	.999	0.067	.999	0.022	.999	0.180	.999	0.12
	Visual 2	-0.014	.999	0.051	.999	-0.031	.999	-0.078	.999	0.03
	Visual 1	0.035	.999	-0.046	.999	-0.025	.999	-0.053	.999	0.02
	Visual Association	0.087	.999	-0.319	.999	0.007	.999	-0.189	.999	0.17
SST	Subcortical Cerebellar	0.159	<b>&lt;.001</b>	-0.037	.745	-0.018	.873	0.045	.499	0.09
	Motor	0.088	.252	-0.167	.200	-0.163	<b>.016</b>	-0.073	.499	0.08
	Medial Frontal	0.063	.252	-0.022	.745	0.017	.873	0.081	.123	0.07
	Frontoparietal	-0.276	.996	0.270	.999	-0.244	.996	-0.011	.999	0.27
	Default Mode	-0.124	.252	0.098	.628	0.059	.872	0.237	<b>.020</b>	0.12
	Visual 2	0.020	.859	-0.029	.745	-0.017	.873	0.033	.499	0.03
	Visual 1	0.049	.645	-0.055	.745	-0.046	.872	-0.192	<b>.020</b>	0.06
	Visual Association	-0.002	.996	-0.167	.675	-0.089	.872	0.119	.499	0.07

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S4b. Results examining the relationship between psychopathology dimensions and Shen-268 network small world sigma at threshold 16.67%

	Brain network Threshold 16.67%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	0.043	.260	0.023	.609	-0.031	.475	0.012	.799	0.05
	Motor	-0.020	.533	0.020	.609	-0.038	.475	0.052	.424	0.01
	Medial Frontal	0.004	.906	0.051	.609	0.002	.942	0.047	.424	0.02
	Frontoparietal	-0.039	.426	-0.055	.609	0.063	.475	-0.039	.691	0.02
	Default Mode	-0.073	.056	0.037	.609	0.006	.942	0.083	.208	0.04
	Visual 2	0.029	.426	-0.033	.609	-0.013	.891	-0.014	.799	0.05
	Visual 1	-0.031	.426	0.005	.897	0.004	.942	-0.031	.691	0.01
	Visual Association	0.016	.605	0.024	.609	0.023	.772	0.006	.856	0.02
En-back	Subcortical Cerebellar	-0.043	.428	-0.034	.627	0.024	.940	0.059	.46	0.06
	Motor	-0.004	.923	-0.007	.895	0.003	.940	0.049	.528	0.03
	Medial Frontal	-0.089	.124	0.096	.246	0.127	<b>.008</b>	0.154	.152	0.08
	Frontoparietal	0.014	.906	0.008	.895	-0.057	.685	-0.052	.528	0.05
	Default Mode	-0.062	.296	0.117	.083	-0.004	.940	0.135	.072	0.07
	Visual 2	0.087	.124	-0.207	<b>&lt;.001</b>	-0.051	.476	-0.066	.432	0.10
	Visual 1	-0.018	.693	0.058	.416	0.003	.940	-0.036	.528	0.04
	Visual Association	-0.039	.632	-0.132	.083	-0.008	.940	-0.025	.691	0.03
MID	Subcortical Cerebellar	0.016	.851	0.038	.405	-0.043	.710	0.057	.600	0.06
	Motor	0.043	.682	0.077	.184	0.021	.710	0.040	.654	0.04
	Medial Frontal	0.077	.232	-0.045	.405	0.009	.808	0.082	.072	0.04
	Frontoparietal	-0.038	.682	0.095	.184	0.057	.710	-0.041	.669	0.07
	Default Mode	-0.033	.694	0.053	.344	0.027	.710	0.106	.092	0.05
	Visual 2	-0.039	.682	0.083	.194	0.018	.710	-0.011	.820	0.05
	Visual 1	-0.002	.976	-0.094	.184	-0.027	.710	-0.013	.820	0.02
	Visual Association	0.001	.976	0.073	.280	0.047	.710	0.039	.654	0.02
SST	Subcortical Cerebellar	0.124	<b>&lt;.001</b>	-0.013	.931	-0.091	<b>.028</b>	0.060	.428	0.09
	Motor	0.042	.957	0.072	.360	-0.063	.272	0.095	.200	0.04
	Medial Frontal	0.103	.957	0.085	.931	-0.042	.913	0.184	.892	0.07
	Frontoparietal	-0.034	.957	-0.016	.931	-0.051	.512	-0.081	.428	0.07
	Default Mode	-0.002	.957	0.063	.360	0.050	.430	0.103	.200	0.05
	Visual 2	0.002	.957	-0.077	.360	0.004	.913	0.003	.942	0.03
	Visual 1	-0.007	.957	-0.055	.598	-0.004	.913	-0.022	.892	0.01
	Visual Association	0.016	.957	0.008	.931	-0.144	<b>&lt;.001</b>	-0.008	.942	0.03

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S4c. Results examining the relationship between psychopathology dimensions and Shen-268 network small world sigma at threshold 23%

	Brain network Threshold 23%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	0.034	.312	0.058	.304	-0.047	.240	0.010	.848	0.05
	Motor	0.012	.601	0.008	.797	-0.042	.240	0.041	.563	0.01
	Medial Frontal	0.040	.299	0.032	.642	-0.044	.240	0.003	.926	0.03
	Frontoparietal	-0.018	.579	-0.021	.642	0.027	.388	-0.017	.804	0.04
	Default Mode	-0.027	.422	-0.016	.642	-0.010	.762	0.043	.563	0.03
	Visual 2	0.039	.299	0.025	.642	-0.001	.953	-0.015	.804	0.05
	Visual 1	-0.025	.444	-0.034	.642	0.04	.240	-0.033	.714	0.01
	Visual Association	0.054	.299	0.038	.304	-0.039	.240	-0.041	.563	0.02
En-back	Subcortical Cerebellar	-0.075	.999	-0.001	.999	0.037	.999	0.131	.999	0.07
	Motor	-0.007	.999	-0.017	.999	-0.011	.999	0.027	.999	0.04
	Medial Frontal	0.018	.999	-0.062	.999	0.039	.999	0.042	.999	0.02
	Frontoparietal	0.027	.999	0.054	.999	-0.024	.999	-0.043	.999	0.06
	Default Mode	-0.017	.999	0.094	.999	0.008	.999	0.102	.999	0.05
	Visual 2	0.046	.999	-0.181	.999	-0.026	.999	-0.010	.999	0.08
	Visual 1	-0.031	.999	-0.057	.999	-0.044	.999	-0.136	.999	0.04
	Visual Association	-0.083	.999	-0.088	.999	0.013	.999	0.048	.999	0.02
MID	Subcortical Cerebellar	0.014	.815	0.075	.253	-0.039	.832	0.071	.468	0.07
	Motor	0.021	.815	0.078	.253	0.007	.832	0.017	.844	0.04
	Medial Frontal	0.049	.815	0.028	.931	-0.008	.832	0.116	.128	0.04
	Frontoparietal	-0.015	.815	0.009	.981	0.023	.832	-0.057	.587	0.09
	Default Mode	0.023	.815	-0.001	.981	-0.007	.832	0.042	.710	0.02
	Visual 2	0.007	.815	0.042	.672	-0.019	.832	-0.014	.844	0.03
	Visual 1	0.033	.815	-0.071	.253	-0.048	.832	-0.007	.844	0.02
	Visual Association	-0.013	.815	0.007	.981	0.019	.832	0.010	.844	0.06
SST	Subcortical Cerebellar	0.093	<b>.048</b>	0.030	.666	-0.050	.640	0.064	.161	0.06
	Motor	0.000	.991	0.088	.171	0.003	.945	0.063	.210	0.03
	Medial Frontal	0.075	.264	0.126	<b>.008</b>	-0.019	.855	0.219	<b>&lt;.001</b>	0.09
	Frontoparietal	-0.013	.944	0.022	.847	0.013	.855	-0.078	.161	0.08
	Default Mode	-0.046	.458	-0.002	.965	0.016	.855	0.069	.161	0.04
	Visual 2	-0.046	.458	-0.005	.965	0.015	.855	0.014	.766	0.02
	Visual 1	0.007	.944	-0.023	.847	-0.046	.855	-0.096	.131	0.02
	Visual Association	-0.017	.912	0.079	.171	0.024	.855	0.110	.072	0.02

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S4d. Results examining the relationship between psychopathology dimensions and Shen-268 network small world sigma at threshold 30%

	Brain network Threshold 30%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	0.044	.475	0.060	.323	-0.048	.110	0.028	.581	0.04
	Motor	0.025	.604	0.044	.355	-0.029	.384	0.042	.557	0.02
	Medial Frontal	0.030	.475	0.027	.469	-0.046	.110	-0.005	.876	0.01
	Frontoparietal	-0.033	.475	-0.046	.323	0.050	.110	-0.009	.876	0.08
	Default Mode	-0.015	.693	0.012	.754	0.015	.573	0.047	.544	0.02
	Visual 2	0.007	.760	0.041	.355	0.001	.979	-0.019	.709	0.03
	Visual 1	0.015	.693	-0.054	.323	0.016	.573	-0.071	.384	0.01
	Visual Association	0.010	.760	0.008	.793	-0.051	.110	-0.030	.581	0.01
En-back	Subcortical Cerebellar	-0.079	.072	0.001	.976	0.032	.674	0.101	.108	0.05
	Motor	-0.009	.835	-0.058	.488	-0.053	.656	-0.030	.637	0.04
	Medial Frontal	-0.050	.435	-0.046	.488	-0.019	.744	0.032	.637	0.02
	Frontoparietal	0.021	.759	0.044	.501	-0.003	.937	-0.073	.354	0.06
	Default Mode	-0.008	.835	0.052	.488	0.020	.744	0.096	.179	0.03
	Visual 2	0.048	.435	-0.146	<b>.008</b>	-0.020	.744	-0.028	.637	0.07
	Visual 1	-0.029	.435	-0.068	.488	-0.045	.656	-0.131	.108	0.05
	Visual Association	-0.115	<b>.008</b>	-0.028	.605	0.042	.656	0.013	.802	0.02
MID	Subcortical Cerebellar	0.007	.920	0.071	.403	-0.035	.677	0.082	.260	0.06
	Motor	0.004	.920	0.086	.403	0.011	.759	0.018	.805	0.05
	Medial Frontal	0.022	.920	0.023	.834	0.014	.759	0.126	.016	0.03
	Frontoparietal	0.017	.920	-0.009	.834	0.047	.677	-0.066	.269	0.11
	Default Mode	0.014	.920	-0.029	.834	0.027	.677	0.064	.286	0.02
	Visual 2	-0.030	.920	0.070	.403	-0.038	.677	0.011	.805	0.04
	Visual 1	-0.024	.920	-0.022	.834	-0.041	.677	0.042	.488	0.03
	Visual Association	-0.035	.920	-0.014	.834	0.012	.759	0.018	.805	0.01
SST	Subcortical Cerebellar	0.056	.267	0.018	.915	-0.058	.288	0.066	.201	0.05
	Motor	0.022	.897	0.101	.056	-0.030	.664	0.087	.084	0.05
	Medial Frontal	0.071	.267	0.106	<b>.048</b>	-0.027	.664	0.172	<b>&lt;.001</b>	0.06
	Frontoparietal	0.005	.897	-0.004	.921	-0.001	.971	-0.069	.201	0.09
	Default Mode	-0.015	.897	-0.007	.921	0.003	.971	0.048	.322	0.02
	Visual 2	-0.005	.897	0.014	.921	-0.025	.664	-0.002	.967	0.01
	Visual 1	0.048	.267	-0.077	.216	0.073	.024	-0.114	.084	0.04
	Visual Association	-0.017	.897	0.033	.882	0.033	.664	0.110	.084	0.02

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.



Table S5a. Results examining the relationship between psychopathology dimensions and Shen-268 network small world omega at threshold 10%

	Brain network Threshold 10%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	-0.022	.609	-0.049	.448	0.071	.128	-0.076	.064	0.04
	Motor	0.017	.609	-0.088	.448	0.004	.895	-0.071	.357	0.02
	Medial Frontal	-0.031	.609	-0.029	.718	0.027	.843	-0.015	.829	0.02
	Frontoparietal	0.138	.440	0.062	.718	-0.039	.843	-0.264	.272	0.13
	Default Mode	0.074	.416	-0.068	.491	-0.022	.843	-0.053	.788	0.03
	Visual 2	-0.028	.560	-0.024	.702	-0.009	.843	0.007	.829	0.05
	Visual 1	-0.039	.440	-0.007	.851	0.034	.843	0.013	.829	0.02
	Visual Association	0.022	.609	0.055	.684	-0.026	.843	-0.017	.829	0.02
En-back	Subcortical Cerebellar	0.016	.999	-0.001	.999	-0.049	.999	-0.101	.999	0.03
	Motor	0.104	.999	0.007	.999	-0.012	.999	-0.097	.999	0.05
	Medial Frontal	0.099	.999	-0.144	.999	-0.170	.999	-0.139	.999	0.14
	Frontoparietal	-0.090	.999	-0.055	.999	0.044	.999	-0.316	.999	0.23
	Default Mode	0.076	.999	-0.221	.999	-0.012	.999	-0.120	.999	0.13
	Visual 2	-0.069	.999	0.124	.999	0.068	.999	0.081	.999	0.09
	Visual 1	-0.021	.999	0.077	.999	0.031	.999	0.050	.999	0.04
	Visual Association	0.021	.999	0.104	.999	0.048	.999	0.071	.999	0.05
MID	Subcortical Cerebellar	-0.012	.999	-0.024	.999	0.049	.999	-0.039	.999	0.07
	Motor	-0.004	.999	-0.015	.999	-0.052	.999	-0.002	.999	0.03
	Medial Frontal	-0.060	.999	0.155	.999	-0.008	.999	-0.029	.999	0.08
	Frontoparietal	0.196	.999	-0.102	.999	-0.284	.999	-0.090	.999	0.24
	Default Mode	0.085	.999	-0.155	.999	-0.056	.999	-0.199	.999	0.10
	Visual 2	0.023	.999	-0.100	.999	0.096	.999	0.019	.999	0.05
	Visual 1	0.039	.999	0.035	.999	0.005	.999	-0.060	.999	0.02
	Visual Association	-0.058	.999	0.257	.999	0.023	.999	0.207	.999	0.13
SST	Subcortical Cerebellar	-0.091	.999	-0.001	.999	0.106	.999	-0.112	.999	0.07
	Motor	-0.015	.999	0.087	.999	0.090	.999	0.028	.999	0.04
	Medial Frontal	-0.055	.999	-0.017	.999	0.018	.999	-0.203	.999	0.09
	Frontoparietal	0.237	.999	-0.073	.999	0.214	.999	0.057	.999	0.25
	Default Mode	0.065	.999	-0.100	.999	-0.042	.999	-0.154	.999	0.06
	Visual 2	0.063	.999	-0.074	.999	0.023	.999	-0.006	.999	0.03
	Visual 1	-0.098	.999	0.052	.999	-0.002	.999	0.083	.999	0.04
	Visual Association	0.032	.999	0.099	.999	0.002	.999	-0.111	.999	0.03

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S5b. Results examining the relationship between psychopathology dimensions and Shen-268 network small world omega at threshold 16.67%

	Brain network Threshold 16.67%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	-0.034	.266	-0.025	.611	0.018	.536	-0.020	.597	0.03
	Motor	0.003	.914	-0.047	.485	0.046	.222	-0.048	.517	0.01
	Medial Frontal	0.021	.622	-0.042	.611	0.025	.547	-0.035	.517	0.02
	Frontoparietal	0.042	.328	0.024	.715	-0.088	.184	0.038	.517	0.04
	Default Mode	0.039	.266	-0.055	.485	-0.045	.222	-0.035	.517	0.03
	Visual 2	-0.035	.266	-0.015	.715	-0.023	.536	0.035	.517	0.03
	Visual 1	0.051	.266	-0.007	.846	-0.054	.222	-0.080	.232	0.02
	Visual Association	-0.028	.496	-0.048	.485	0.007	.819	0.008	.826	0.03
En-back	Subcortical Cerebellar	0.034	.490	0.023	.591	-0.008	.789	-0.062	.432	0.04
	Motor	0.012	.840	-0.023	.591	0.030	.639	-0.031	.788	0.02
	Medial Frontal	0.103	.240	0.081	.354	-0.036	.639	-0.202	<b>.008</b>	0.07
	Frontoparietal	-0.089	.240	0.177	.064	0.088	.308	0.110	.432	0.12
	Default Mode	0.008	.840	-0.079	.274	-0.022	.639	-0.057	.562	0.02
	Visual 2	-0.071	.240	0.083	.212	0.063	.308	0.017	.788	0.06
	Visual 1	0.067	.262	-0.050	.517	-0.038	.639	-0.015	.788	0.03
	Visual Association	0.039	.521	0.099	.245	-0.032	.639	0.030	.788	0.02
MID	Subcortical Cerebellar	0.033	.529	-0.094	.240	0.027	.603	-0.060	.468	0.08
	Motor	-0.039	.529	-0.040	.613	-0.014	.711	-0.003	.941	0.05
	Medial Frontal	-0.034	.529	0.070	.613	-0.030	.576	-0.077	.244	0.04
	Frontoparietal	0.002	.959	-0.031	.613	-0.054	.516	0.084	.427	0.08
	Default Mode	0.039	.529	0.035	.613	-0.060	.516	-0.089	.244	0.03
	Visual 2	0.030	.529	-0.020	.629	0.011	.711	-0.009	.941	0.04
	Visual 1	0.012	.787	0.109	.136	0.034	.516	-0.045	.523	0.03
	Visual Association	0.052	.529	-0.048	.613	-0.061	.516	-0.023	.929	0.03
SST	Subcortical Cerebellar	-0.073	.180	-0.064	.468	0.086	.056	-0.084	.277	0.05
	Motor	-0.038	.843	-0.043	.584	0.068	.235	-0.071	.304	0.03
	Medial Frontal	-0.111	<b>.048</b>	-0.081	.468	0.039	.632	-0.143	<b>.016</b>	0.05
	Frontoparietal	0.000	.995	0.007	.950	0.027	.632	0.074	.402	0.08
	Default Mode	0.004	.995	-0.041	.584	-0.029	.632	-0.051	.445	0.02
	Visual 2	-0.006	.995	0.023	.844	0.029	.632	-0.031	.552	0.02
	Visual 1	0.001	.995	0.072	.584	0.021	.632	0.106	.188	0.03
	Visual Association	-0.001	.995	0.003	.950	0.132	<b>.008</b>	-0.029	.556	0.04

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/Hyperactivity Disorder  
 $R^2$  reflects all predictors in each model, including covariates.

Table S5c. Results examining the relationship between psychopathology dimensions and Shen-268 network small world omega at threshold 23%

	Brain network Threshold 23%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	-0.031	.844	-0.065	.152	0.042	.147	-0.030	.641	0.03
	Motor	-0.036	.844	-0.013	.899	0.042	.147	-0.019	.641	0.01
	Medial Frontal	-0.017	.986	-0.012	.899	0.046	.147	0.026	.641	0.01
	Frontoparietal	0.000	.986	0.042	.587	-0.028	.348	0.036	.641	0.07
	Default Mode	0.001	.986	-0.004	.899	-0.004	.870	-0.013	.699	0.03
	Visual 2	-0.021	.986	-0.009	.899	-0.011	.759	0.029	.641	0.03
	Visual 1	0.006	.986	0.048	.587	-0.048	.147	0.022	.641	0.01
	Visual Association	-0.007	.986	-0.028	.820	0.058	.147	0.026	.641	0.02
En-back	Subcortical Cerebellar	0.065	.156	-0.018	.911	-0.029	.920	-0.082	.304	0.03
	Motor	-0.004	.995	0.050	.741	0.033	.920	-0.037	.658	0.04
	Medial Frontal	-0.017	.995	0.094	.328	0.020	.920	-0.031	.658	0.02
	Frontoparietal	-0.102	.088	0.007	.998	0.009	.920	0.093	.304	0.08
	Default Mode	-0.012	.995	-0.031	.911	-0.011	.920	-0.034	.658	0.01
	Visual 2	-0.056	.995	0.099	.998	0.013	.999	-0.015	.999	0.06
	Visual 1	0.020	.995	-0.033	.911	-0.009	.920	0.037	.658	0.03
	Visual Association	0.034	.973	0.152	.160	0.012	.920	0.039	.658	0.03
MID	Subcortical Cerebellar	-0.004	.900	-0.082	.208	0.007	.962	-0.044	.546	0.06
	Motor	-0.027	.900	-0.068	.238	0.002	.965	-0.012	.905	0.06
	Medial Frontal	-0.040	.900	-0.014	.788	0.042	.642	-0.051	.546	0.02
	Frontoparietal	-0.009	.900	0.016	.788	-0.067	.384	0.055	.546	0.11
	Default Mode	-0.011	.900	0.101	.072	-0.033	.642	-0.042	.546	0.03
	Visual 2	0.005	.900	-0.042	.443	0.030	.642	0.004	.925	0.03
	Visual 1	0.025	.900	0.069	.208	0.034	.642	-0.048	.546	0.03
	Visual Association	-0.005	.900	0.126	.072	-0.008	.962	0.033	.688	0.03
SST	Subcortical Cerebellar	-0.055	.540	-0.072	.098	0.061	.504	-0.062	.246	0.04
	Motor	0.015	.928	-0.110	.068	0.012	.777	-0.120	<b>.032</b>	0.05
	Medial Frontal	-0.084	.256	-0.100	.068	0.011	.777	-0.150	<b>&lt;.001</b>	0.05
	Frontoparietal	0.002	.979	-0.022	.643	-0.018	.777	0.074	.246	0.10
	Default Mode	0.001	.979	0.024	.643	-0.015	.777	0.000	.992	0.02
	Visual 2	0.045	.571	0.052	.459	0.010	.777	-0.034	.512	0.02
	Visual 1	0.016	.928	-0.018	.643	-0.032	.777	-0.035	.499	0.02
	Visual Association	0.020	.928	-0.086	.098	0.061	.504	-0.087	.235	0.03

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/Hyperactivity Disorder  
 $R^2$  reflects all predictors in each model, including covariates.

Table S5d. Results examining the relationship between psychopathology dimensions and Shen-268 network small world omega at threshold 30%

	Brain network Threshold 30%	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
Rest	Subcortical Cerebellar	-0.020	.779	-0.051	.396	0.031	.392	-0.036	.906	0.02
	Motor	-0.055	.112	-0.059	.396	0.006	.815	0.003	.961	0.01
	Medial Frontal	-0.046	.112	-0.028	.555	0.054	.144	0.026	.906	0.01
	Frontoparietal	0.020	.779	0.037	.428	-0.040	.213	0.033	.906	0.10
	Default Mode	-0.016	.779	0.010	.746	-0.024	.475	-0.002	.961	0.03
	Visual 2	-0.006	.828	-0.044	.428	-0.018	.568	0.024	.906	0.02
	Visual 1	0.013	.812	0.026	.625	-0.021	.504	0.020	.950	0.01
	Visual Association	0.005	.828	-0.011	.746	0.049	.213	0.004	.961	0.01
En-back	Subcortical Cerebellar	0.071	.256	-0.033	.700	-0.027	.890	-0.055	.514	0.03
	Motor	-0.001	.983	0.083	.328	0.066	.440	0.056	.514	0.04
	Medial Frontal	0.016	.770	0.069	.328	0.026	.890	-0.007	.978	0.02
	Frontoparietal	-0.055	.469	-0.018	.700	-0.021	.890	0.073	.514	0.07
	Default Mode	-0.024	.770	-0.021	.700	-0.012	.890	-0.030	.829	0.01
	Visual 2	-0.027	.770	0.066	.328	-0.002	.958	-0.001	.978	0.05
	Visual 1	0.017	.770	-0.026	.700	0.009	.890	0.094	.440	0.03
	Visual Association	0.051	.469	0.118	.064	-0.014	.890	0.027	.829	0.02
MID	Subcortical Cerebellar	-0.001	.987	-0.030	.656	0.042	.584	-0.034	.665	0.03
	Motor	-0.001	.987	-0.080	.304	0.006	.954	-0.020	.717	0.06
	Medial Frontal	0.007	.987	-0.025	.656	-0.008	.954	-0.100	.141	0.02
	Frontoparietal	-0.028	.987	0.051	.452	-0.076	.144	0.082	.141	0.13
	Default Mode	-0.001	.987	0.060	.452	-0.054	.428	-0.082	.141	0.03
	Visual 2	0.044	.987	-0.095	.304	0.025	.854	-0.017	.717	0.04
	Visual 1	0.013	.987	0.046	.469	0.020	.954	-0.037	.665	0.03
	Visual Association	-0.014	.987	-0.013	.743	0.002	.954	-0.028	.665	0.02
SST	Subcortical Cerebellar	-0.034	.683	-0.090	.072	0.056	.464	-0.074	.214	0.04
	Motor	-0.069	.328	-0.074	.220	0.031	.659	-0.079	.214	0.04
	Medial Frontal	-0.129	<b>.008</b>	-0.022	.863	0.034	.659	-0.064	.214	0.04
	Frontoparietal	-0.030	.683	0.003	.939	-0.006	.879	0.060	.263	0.10
	Default Mode	0.006	.901	0.018	.863	-0.015	.751	-0.002	.970	0.03
	Visual 2	0.004	.901	0.020	.863	0.029	.659	-0.054	.263	0.02
	Visual 1	-0.037	.675	0.068	.301	-0.022	.732	0.060	.263	0.04
	Visual Association	0.013	.901	-0.013	.863	-0.054	.464	-0.086	.214	0.03

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/Hyperactivity Disorder

$R^2$  reflects all predictors in each model, including covariates.

Table S6. Results examining the relationship between psychopathology dimensions and Louvain community modularity across 10%, 16.67%, 23%, and 30% thresholds.

Threshold	Louvain	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$	
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$		
10%	Rest	Low	0.013	.735	-0.029	.670	-0.008	.833	-0.005	.892	0.02
		Medium	0.014	.626	-0.026	.694	0.001	.983	-0.024	.550	0.03
		High	0.004	.968	-0.025	.969	-0.013	.598	-0.014	.893	0.03
	En-back	Low	0.009	.797	-0.072	.630	0.032	.526	0.030	.886	0.06
		Medium	0.009	.853	-0.113	<b>.048</b>	0.030	.727	0.007	.887	0.07
		High	0.021	.743	-0.110	.054	0.020	.653	0.011	.817	0.07
	MID	Low	-0.007	.836	-0.058	.585	-0.012	.737	-0.028	.800	0.05
		Medium	0.000	.988	-0.047	.332	-0.025	.504	-0.009	.982	0.06
		High	0.011	.986	-0.054	.257	-0.028	.485	0.006	.907	0.07
SST	Low	0.083	.150	-0.052	.312	-0.015	.809	-0.058	.334	0.03	
	Medium	0.073	.288	-0.036	.590	-0.010	.857	-0.051	.423	0.02	
	High	0.077	.216	-0.032	.684	0.008	.826	-0.026	.694	0.02	
16.67%	Rest	Low	-0.004	.876	-0.039	.934	-0.004	.867	-0.012	.822	0.02
		Medium	0.015	.983	-0.045	.843	-0.006	.845	-0.034	.452	0.04
		High	0.004	.853	-0.044	.694	-0.005	.941	-0.027	.814	0.04
	En-back	Low	0.010	.849	-0.070	.357	0.049	.304	0.014	.952	0.07
		Medium	0.021	.813	-0.109	.078	0.027	.638	-0.010	.830	0.07
		High	0.028	.947	-0.110	<b>.042</b>	0.027	.505	0.009	.963	0.06
	MID	Low	0.010	.770	-0.063	.308	-0.014	.838	-0.040	.748	0.06
		Medium	-0.009	.813	-0.054	.522	-0.009	.920	-0.014	.736	0.06
		High	0.017	.906	-0.076	.166	-0.009	.772	-0.006	.898	0.07
SST	Low	0.082	.156	-0.066	.378	0.000	.994	-0.077	.456	0.03	
	Medium	0.076	.168	-0.034	.418	0.010	.779	-0.055	.874	0.03	
	High	0.080	.054	-0.033	.619	0.029	.920	-0.049	.988	0.03	
23%	Rest	Low	-0.015	.948	-0.047	.360	0.005	.835	-0.015	.968	0.02
		Medium	0.005	.814	-0.050	.214	-0.003	.901	-0.041	.894	0.04
		High	0.001	.961	-0.043	.328	-0.013	.651	-0.031	.449	0.04
	En-back	Low	0.021	.562	-0.073	.159	0.042	.474	0.010	.874	0.07
		Medium	0.013	.712	-0.104	.090	0.036	.558	-0.005	.931	0.07
		High	0.030	.615	-0.102	.072	0.026	.757	0.009	.837	0.06
	MID	Low	0.002	.941	-0.072	.330	0.003	.932	-0.026	.986	0.06
		Medium	-0.007	.957	-0.070	.350	-0.008	.794	-0.017	.678	0.07
		High	0.022	.905	-0.103	.081	0.007	.889	-0.027	.706	0.07
SST	Low	0.079	.078	-0.048	.744	0.010	.782	-0.064	.274	0.03	
	Medium	0.073	.306	-0.029	.869	0.022	.740	-0.046	.837	0.04	
	High	0.070	.342	-0.033	.534	0.044	.825	-0.050	.888	0.04	
30%	Rest	Low	-0.008	.972	-0.044	.459	0.007	.840	-0.028	.829	0.02
		Medium	0.006	.813	-0.043	.303	-0.002	.922	-0.040	.869	0.04
		High	-0.001	.981	-0.039	.698	-0.015	.957	-0.032	.644	0.04
	En-back	Low	0.019	.594	-0.080	.132	0.042	.444	-0.003	.959	0.07
		Medium	0.028	.652	-0.109	.060	0.033	.379	-0.018	.892	0.06
		High	0.033	.724	-0.111	<b>.042</b>	0.028	.892	-0.006	.893	0.07

## Atypical Network Topology in Psychopathology

MID	<i>Low</i>	0.006	.971	-0.101	.150	-0.004	.981	-0.055	.578	0.07
	<i>Medium</i>	0.001	.984	-0.078	.374	-0.005	.959	-0.039	.538	0.07
	<i>High</i>	0.021	.951	-0.103	.102	-0.003	.934	-0.028	.659	0.03
SST	<i>Low</i>	0.079	.111	-0.069	.424	0.020	.633	-0.068	.615	0.04
	<i>Medium</i>	0.072	.324	-0.030	.696	0.036	.495	-0.053	.702	0.04
	<i>High</i>	0.066	.144	-0.031	.728	0.047	.368	-0.039	.792	0.07

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/Hyperactivity Disorder

R<sup>2</sup> reflects all predictors in each model, including covariates.

Table S7. Results examining the relationship between psychopathology dimensions and Louvain community local efficiency across 10%, 16.67%, 23%, and 30% thresholds.

Threshold	Louvain	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$	
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$		
10%	Rest	Low	-0.009	.735	0.007	.821	0.019	.833	-0.008	.892	0.01
		Medium	-0.015	.626	0.019	.694	0.005	.983	0.002	.948	0.01
		High	0.044	.270	-0.011	.969	-0.040	.154	-0.011	.893	0.01
	En-back	Low	-0.047	.273	0.036	.68	-0.023	.569	-0.014	.886	0.03
		Medium	-0.010	.853	0.035	.502	0.027	.727	0.019	.887	0.03
		High	-0.053	.743	0.018	.787	0.033	.534	-0.018	.817	0.03
	MID	Low	-0.011	.836	0.015	.902	-0.039	.729	-0.034	.800	0.02
		Medium	-0.003	.988	0.087	.180	-0.062	.120	-0.069	.582	0.04
		High	0.015	.986	-0.057	.257	-0.029	.485	-0.059	.543	0.02
SST	Low	-0.013	.864	-0.060	.288	0.009	.820	-0.008	.909	0.01	
	Medium	-0.025	.790	-0.033	.590	-0.006	.857	0.046	.423	0.01	
	High	-0.037	.573	0.021	.740	0.018	.826	0.017	.694	0.01	
16.67%	Rest	Low	0.008	.876	-0.003	.934	0.046	.534	-0.013	.822	0.01
		Medium	0.002	.983	-0.020	.843	0.015	.845	-0.002	.957	0.01
		High	0.050	.062	0.021	.694	-0.002	.941	-0.010	.833	0.01
	En-back	Low	0.006	.849	-0.086	.357	-0.037	.476	-0.064	.783	0.03
		Medium	-0.008	.813	-0.023	.773	0.021	.638	-0.024	.661	0.02
		High	0.003	.947	-0.046	.705	0.016	.584	-0.083	.420	0.05
	MID	Low	-0.030	.602	-0.010	.977	0.007	.838	-0.028	.748	0.01
		Medium	0.024	.813	-0.069	.522	-0.033	.748	-0.088	.192	0.03
		High	0.002	.963	-0.090	.166	0.030	.751	-0.086	.384	0.02
SST	Low	-0.046	.347	-0.009	.824	0.049	.232	0.047	.531	0.01	
	Medium	0.005	.888	-0.077	.258	-0.014	.779	-0.026	.874	0.02	
	High	-0.002	.966	-0.028	.619	-0.009	.920	0.006	.988	0.01	
23%	Rest	Low	-0.001	.975	0.029	.428	-0.011	.761	0.001	.968	0.01
		Medium	0.006	.814	0.044	.218	-0.029	.305	0.025	.894	0.01
		High	0.023	.796	0.012	.812	0.012	.651	-0.046	.417	0.01
	En-back	Low	-0.053	.204	-0.016	.726	0.003	.916	-0.017	.874	0.01
		Medium	-0.031	.696	0.012	.918	-0.008	.793	-0.035	.771	0.01
		High	-0.041	.478	0.053	.538	-0.014	.757	-0.018	.837	0.02
	MID	Low	-0.031	.850	0.049	.618	-0.018	.676	-0.007	.986	0.02
		Medium	-0.004	.957	-0.053	.368	-0.033	.794	-0.087	.098	0.02
		High	-0.019	.905	-0.075	.180	0.034	.680	-0.061	.706	0.03
SST	Low	-0.040	.319	-0.015	.859	0.027	.562	0.044	.339	0.01	
	Medium	-0.026	.593	0.023	.869	-0.005	.890	0.028	.837	0.01	
	High	-0.042	.380	0.004	.927	0.037	.825	0.032	.888	0.01	
30%	Rest	Low	0.047	.174	0.002	.931	-0.005	.840	-0.007	.829	0.02
		Medium	-0.006	.813	0.054	.303	-0.072	.008	0.006	.869	0.02
		High	0.049	.228	-0.010	.748	-0.044	.474	-0.046	.644	0.01
	En-back	Low	-0.098	.024	0.082	.132	0.002	.942	0.010	.959	0.02
		Medium	-0.043	.624	0.029	.746	0.109	<b>.006</b>	0.006	.892	0.03

## Atypical Network Topology in Psychopathology

	<i>High</i>	0.075	.132	-0.062	.686	0.035	.892	-0.077	.614	0.03
MID	<i>Low</i>	-0.037	.971	0.054	.648	0.002	.838	0.001	.976	0.02
	<i>Medium</i>	0.088	<b>.033</b>	-0.037	.518	0.002	.959	-0.033	.538	0.02
	<i>High</i>	0.048	.870	-0.008	.897	0.003	.934	-0.116	.045	0.02
SST	<i>Low</i>	-0.045	.498	-0.046	.424	-0.018	.633	0.002	.968	0.01
	<i>Medium</i>	-0.019	.667	-0.003	.950	-0.007	.846	0.032	.815	0.01
	<i>High</i>	-0.052	.269	0.046	.728	-0.017	.613	-0.028	.792	0.02

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

R<sup>2</sup> reflects all predictors in each model, including covariates.



Table S8. Results examining the relationship between psychopathology dimensions and Louvain community average shortest path length across 10%, 16.67%, 23%, and 30% thresholds.

Threshold	Louvain	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$	
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$		
10%	Rest	Low	-0.008	.735	-0.009	.821	0.005	.833	0.008	.892	0.01
		Medium	-0.011	.626	-0.026	.694	0.002	.983	-0.052	.230	0.01
		High	-0.011	.968	0.001	.969	0.043	.154	0.001	.964	0.01
	En-back	Low	0.058	.273	-0.034	.680	-0.037	.526	0.015	.886	0.02
		Medium	-0.016	.853	-0.046	.502	-0.018	.727	-0.012	.887	0.02
		High	0.017	.743	-0.022	.787	-0.038	.534	-0.034	.742	0.03
	MID	Low	0.018	.836	0.015	.902	0.028	.729	-0.012	.800	0.02
		Medium	-0.038	.676	0.090	.180	0.005	.889	0.023	.902	0.02
		High	0.003	.986	0.075	.250	0.007	.856	0.055	.543	0.02
SST	Low	-0.017	.864	0.084	.288	-0.046	.362	-0.005	.909	0.02	
	Medium	-0.003	.930	0.069	.333	-0.040	.429	-0.037	.515	0.02	
	High	0.032	.573	-0.002	.962	-0.009	.826	0.038	.694	0.01	
16.67%	Rest	Low	0.006	.876	0.004	.934	-0.004	.867	0.034	.822	0.01
		Medium	-0.001	.983	-0.006	.843	0.008	.845	-0.035	.452	0.01
		High	-0.046	.081	-0.029	.694	0.026	.438	-0.007	.833	0.01
	En-back	Low	0.051	.232	0.018	.787	0.002	.946	0.001	.978	0.02
		Medium	0.054	.704	-0.043	.773	-0.020	.638	-0.062	.302	0.02
		High	-0.003	.947	-0.015	.748	-0.064	.194	0.030	.963	0.03
	MID	Low	0.043	.602	0.001	.985	0.012	.838	-0.020	.808	0.02
		Medium	-0.010	.813	-0.003	.945	-0.001	.981	0.052	.438	0.01
		High	0.011	.906	0.053	.432	-0.026	.751	0.019	.898	0.01
SST	Low	0.010	.792	0.067	.378	-0.046	.241	-0.021	.648	0.02	
	Medium	-0.024	.826	0.096	.192	-0.034	.526	0.025	.874	0.02	
	High	0.082	.054	0.058	.477	-0.013	.920	-0.002	.988	0.02	
23%	Rest	Low	0.010	.948	-0.017	.589	0.028	.496	0.005	.968	0.02
		Medium	-0.007	.814	-0.048	.214	0.051	.111	-0.004	.957	0.01
		High	-0.013	.844	-0.031	.446	0.012	.651	0.029	.449	0.01
	En-back	Low	0.059	.204	-0.064	.174	-0.010	.916	-0.008	.874	0.02
		Medium	0.022	.696	-0.009	.918	-0.016	.746	0.030	.771	0.01
		High	0.049	.478	0.007	.882	-0.019	.757	0.076	.648	0.03
	MID	Low	0.019	.850	-0.034	.671	0.053	.240	0.008	.986	0.01
		Medium	-0.033	.957	0.073	.350	-0.015	.794	0.082	.098	0.02
		High	0.011	.905	0.053	.465	-0.023	.794	0.025	.706	0.01
SST	Low	0.037	.319	0.062	.726	-0.026	.562	-0.051	.339	0.02	
	Medium	0.023	.593	0.057	.869	-0.018	.740	-0.011	.837	0.01	
	High	0.049	.380	0.059	.298	0.008	.825	0.009	.888	0.02	
30%	Rest	Low	-0.016	.966	-0.031	.520	0.005	.840	-0.025	.829	0.02
		Medium	-0.016	.813	-0.033	.303	0.071	<b>.008</b>	0.009	.869	0.01
		High	-0.019	.650	-0.032	.698	0.024	.957	0.033	.644	0.01
	En-back	Low	0.079	.052	-0.071	.132	-0.031	.598	-0.064	.504	0.03
		Medium	0.032	.652	-0.002	.958	-0.066	.116	-0.030	.892	0.01

## Atypical Network Topology in Psychopathology

	<i>High</i>	-0.010	.791	0.043	.686	-0.006	.892	0.052	.614	0.02
MID	<i>Low</i>	0.019	.971	-0.001	.992	-0.001	.981	-0.037	.610	0.02
	<i>Medium</i>	-0.077	<b>.046</b>	0.064	.374	-0.004	.959	0.032	.538	0.02
	<i>High</i>	-0.001	.992	0.006	.897	-0.012	.934	0.050	.604	0.01
SST	<i>Low</i>	0.023	.548	0.053	.424	0.045	.576	0.056	.615	0.01
	<i>Medium</i>	0.015	.667	0.051	.580	-0.033	.495	-0.011	.815	0.01
	<i>High</i>	0.089	.051	-0.046	.728	-0.017	.613	-0.024	.792	0.02

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/Hyperactivity Disorder

R<sup>2</sup> reflects all predictors in each model, including covariates.

Table S9. Results examining the relationship between psychopathology dimensions and Louvain community diameter across 10%, 16.67%, 23%, and 30% thresholds.

Threshold	Louvain	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$	
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$		
10%	Rest	Low	-0.030	.603	0.009	.821	0.006	.833	-0.004	.892	0.01
		Medium	-0.013	.626	-0.014	.694	0.011	.983	-0.054	.230	0.01
		High	-0.003	.968	-0.003	.969	0.043	.154	-0.021	.893	0.01
	En-back	Low	0.048	.273	-0.041	.680	-0.014	.665	0.007	.886	0.02
		Medium	-0.007	.853	-0.038	.502	0.007	.836	-0.012	.887	0.01
		High	0.034	.743	-0.032	.787	-0.010	.760	-0.052	.742	0.02
	MID	Low	0.008	.836	-0.006	.902	0.063	.360	0.017	.800	0.02
		Medium	-0.034	.676	0.039	.408	0.068	.120	0.024	.902	0.01
		High	-0.001	.986	0.040	.381	0.058	.402	0.041	.664	0.02
SST	Low	-0.015	.864	0.065	.288	-0.057	.330	0.020	.909	0.02	
	Medium	-0.016	.814	0.089	.276	-0.056	.342	0.000	.993	0.03	
	High	0.009	.799	0.062	.468	0.022	.826	0.074	.606	0.02	
16.67%	Rest	Low	0.011	.876	-0.008	.934	-0.016	.867	-0.009	.822	0.01
		Medium	0.010	.983	-0.009	.843	0.005	.845	-0.066	.300	0.02
		High	-0.023	.394	-0.010	.723	0.039	.438	-0.035	.780	0.02
	En-back	Low	0.052	.232	-0.008	.859	-0.006	.946	-0.013	.952	0.01
		Medium	0.036	.704	-0.038	.773	-0.009	.783	-0.036	.610	0.02
		High	0.014	.947	-0.018	.748	-0.053	.194	-0.002	.963	0.02
	MID	Low	0.032	.602	-0.047	.453	0.051	.838	-0.032	.748	0.03
		Medium	-0.011	.813	-0.033	.572	0.032	.748	0.034	.523	0.02
		High	0.017	.906	-0.035	.523	0.018	.751	-0.007	.898	0.02
SST	Low	0.065	.230	0.045	.388	-0.055	.232	-0.043	.531	0.03	
	Medium	0.010	.888	0.068	.258	-0.033	.526	0.001	.979	0.03	
	High	0.085	.054	0.076	.312	-0.004	.920	0.001	.988	0.03	
23%	Rest	Low	0.024	.945	-0.037	.368	0.017	.730	-0.012	.968	0.01
		Medium	0.023	.658	-0.052	.214	0.043	.158	-0.024	.894	0.02
		High	0.009	.844	-0.047	.328	0.029	.651	-0.013	.713	0.02
	En-back	Low	0.060	.204	-0.101	<b>.045</b>	-0.004	.916	-0.013	.874	0.02
		Medium	0.032	.696	-0.038	.904	0.018	.746	0.004	.931	0.01
		High	0.111	<b>.006</b>	-0.035	.619	-0.025	.757	0.025	.837	0.04
	MID	Low	0.017	.850	-0.026	.671	0.036	.429	0.001	.986	0.01
		Medium	-0.024	.957	0.066	.350	0.030	.794	0.065	.192	0.02
		High	-0.003	.938	0.020	.810	0.045	.624	0.038	.706	0.02
SST	Low	0.074	.078	0.008	.866	-0.033	.562	-0.044	.339	0.02	
	Medium	0.020	.593	0.043	.869	-0.019	.740	-0.017	.837	0.01	
	High	0.060	.380	0.053	.298	0.022	.825	0.019	.888	0.02	
30%	Rest	Low	-0.005	.972	-0.052	.459	-0.006	.840	-0.027	.829	0.01
		Medium	0.007	.813	-0.038	.303	0.021	.456	-0.014	.869	0.01
		High	0.006	.950	-0.017	.698	0.009	.957	0.013	.861	0.02
	En-back	Low	0.073	.054	-0.071	.135	0.005	.942	-0.023	.959	0.01
		Medium	-0.009	.817	0.013	.926	-0.004	.908	0.014	.892	0.01

## Atypical Network Topology in Psychopathology

	<i>High</i>	0.015	.791	0.031	.686	0.025	.892	-0.030	.614	0.01
MID	<i>Low</i>	-0.001	.971	0.000	.992	-0.021	.838	0.026	.664	0.01
	<i>Medium</i>	-0.006	.984	-0.032	.518	0.048	.600	0.008	.872	0.01
	<i>High</i>	0.018	.951	-0.043	.714	0.038	.544	-0.020	.670	0.02
SST	<i>Low</i>	0.075	.111	0.003	.94	0.027	.632	-0.004	.968	0.01
	<i>Medium</i>	0.049	.576	0.021	.779	-0.051	.495	-0.028	.815	0.01
	<i>High</i>	0.092	.051	0.006	.899	-0.028	.610	-0.009	.844	0.02

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/ Hyperactivity Disorder

R<sup>2</sup> reflects all predictors in each model, including covariates.

Table S10. Results examining the relationship between psychopathology dimensions and Louvain community small word sigma across 10%, 16.67% 23%, and 30% thresholds.

Threshold	Louvain	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$	
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$		
10%	Rest	Low	-0.018	.735	-0.035	.670	0.020	.833	0.040	.892	0.01
		Medium	-0.024	.626	-0.013	.694	0.016	.983	-0.045	.265	0.01
		High	-0.038	.270	0.005	.969	0.028	.263	0.052	.816	0.01
	En-back	Low	0.075	<b>&lt;.001</b>	-0.010	.832	-0.062	<b>.042</b>	-0.050	.585	0.02
		Medium	-0.008	.853	-0.037	.502	-0.036	.727	-0.131	.096	0.02
		High	-0.028	.743	0.012	.787	-0.028	.534	-0.035	.742	0.01
	MID	Low	-0.068	.588	0.041	.840	-0.012	.737	0.013	.800	0.01
		Medium	-0.041	.676	0.078	.180	-0.073	.120	-0.001	.982	0.02
		High	-0.022	.986	0.108	.150	-0.053	.402	0.008	.907	0.02
SST	Low	0.047	.615	-0.010	.828	-0.085	.144	-0.139	<b>.006</b>	0.04	
	Medium	-0.021	.790	0.031	.590	-0.044	.429	-0.055	.423	0.02	
	High	0.024	.605	-0.055	.468	-0.033	.826	-0.021	.694	0.01	
16.67%	Rest	Low	0.014	.876	-0.008	.934	-0.005	.867	0.025	.822	0.01
		Medium	-0.039	.672	0.030	.843	0.018	.845	-0.010	.917	0.01
		High	-0.077	<b>.006</b>	-0.017	.694	0.026	.438	0.041	.780	0.01
	En-back	Low	0.061	.186	-0.036	.619	-0.091	<b>.048</b>	-0.032	.952	0.02
		Medium	0.010	.813	0.022	.773	-0.058	.638	-0.072	.302	0.02
		High	-0.026	.947	-0.025	.748	-0.057	.194	0.017	.963	0.02
	MID	Low	0.018	.743	-0.075	.308	-0.019	.838	-0.036	.748	0.01
		Medium	0.008	.813	0.024	.679	-0.065	.426	0.031	.523	0.01
		High	-0.067	.438	0.106	.166	-0.022	.751	0.011	.898	0.02
SST	Low	0.058	.230	0.060	.378	-0.069	.232	-0.043	.531	0.02	
	Medium	-0.020	.826	0.048	.304	-0.067	.162	-0.029	.874	0.01	
	High	0.036	.358	0.040	.619	-0.071	.294	0.001	.988	0.01	
23%	Rest	Low	0.063	<b>.042</b>	-0.076	<b>.030</b>	0.023	.496	-0.075	<b>.042</b>	0.02
		Medium	-0.030	.588	-0.044	.218	0.032	.261	0.002	.957	0.01
		High	-0.037	.606	0.036	.328	0.011	.651	0.035	.449	0.01
	En-back	Low	0.057	.204	-0.092	.106	-0.064	.420	-0.082	.237	0.03
		Medium	-0.017	.696	0.029	.904	-0.054	.225	-0.055	.525	0.01
		High	0.012	.731	0.030	.619	-0.034	.757	0.018	.837	0.01
	MID	Low	0.043	.850	-0.138	<b>.024</b>	0.063	.180	0.003	.986	0.04
		Medium	-0.006	.957	0.013	.783	0.073	<b>.030</b>	0.072	.060	0.02
		High	0.015	.905	-0.120	.081	0.066	.054	0.009	.754	0.02
SST	Low	0.087	.078	0.015	.859	-0.076	.234	-0.109	<b>.048</b>	0.04	
	Medium	0.024	.593	0.016	.869	-0.031	.740	-0.009	.837	0.01	
	High	0.023	.575	0.058	.298	0.016	.825	-0.007	.888	0.01	
30%	Rest	Low	-0.017	.966	-0.017	.712	0.048	.135	-0.016	.829	0.01
		Medium	-0.025	.813	-0.034	.303	0.063	<b>.008</b>	0.019	.869	0.01
		High	-0.023	.650	-0.018	.698	-0.002	.957	0.006	.861	0.01
	En-back	Low	0.064	.054	-0.061	.132	-0.055	.255	-0.064	.504	0.02
		Medium	0.023	.670	-0.087	.182	-0.033	.379	-0.104	.204	0.03

## Atypical Network Topology in Psychopathology

	<i>High</i>	-0.017	.791	0.025	.686	-0.008	.892	0.036	.614	0.02
MID	<i>Low</i>	0.034	.971	-0.006	.992	-0.02	.838	-0.049	.578	0.01
	<i>Medium</i>	-0.043	.300	0.055	.374	-0.007	.959	0.033	.538	0.01
	<i>High</i>	0.015	.951	-0.084	.102	-0.044	.544	-0.136	<b>.045</b>	0.03
SST	<i>Low</i>	0.026	.548	0.030	.768	0.045	.576	-0.010	.968	0.01
	<i>Medium</i>	-0.017	.667	0.051	.580	-0.03	.510	-0.012	.815	0.01
	<i>High</i>	0.041	.269	-0.036	.728	-0.068	.324	-0.023	.792	0.02

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/Hyperactivity Disorder

R<sup>2</sup> reflects all predictors in each model, including covariates.

Table S11. Results examining the relationship between psychopathology dimensions and Louvain community small word omega across 10%, 16.67% 23%, and 30% thresholds.

Threshold	Louvain	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$	
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$		
10%	Rest	Low	0.033	.603	0.041	.670	-0.022	.833	0.021	.892	0.01
		Medium	0.029	.626	0.045	.694	0.009	.983	0.103	<b>.006</b>	0.02
		High	-0.001	.968	0.030	.969	-0.044	.154	0.013	.893	0.01
	En-back	Low	-0.034	.400	0.009	.832	0.078	.087	0.094	.492	0.03
		Medium	0.021	.853	-0.012	.802	0.023	.727	0.094	.150	0.02
		High	-0.013	.743	0.013	.787	0.030	.534	0.069	.742	0.02
	MID	Low	0.036	.836	-0.057	.585	0.026	.729	0.025	.800	0.02
		Medium	0.011	.988	-0.055	.304	0.043	.309	-0.036	.902	0.01
		High	0.020	.986	-0.095	.150	0.029	.485	-0.005	.907	0.02
SST	Low	0.007	.864	0.022	.730	0.049	.330	0.122	.015	0.03	
	Medium	-0.042	.765	0.002	.959	0.074	.330	0.097	.204	0.03	
	High	-0.031	.573	0.078	.468	0.051	.826	0.035	.694	0.02	
16.67%	Rest	Low	-0.022	.876	0.003	.934	-0.019	.867	0.007	.822	0.01
		Medium	0.028	.729	0.008	.843	-0.022	.845	0.037	.452	0.01
		High	0.058	.051	0.021	.694	-0.031	.438	-0.010	.833	0.01
	En-back	Low	-0.058	.186	0.032	.619	0.054	.304	0.055	.783	0.02
		Medium	-0.036	.704	0.004	.933	0.038	.638	0.105	.174	0.03
		High	0.011	.947	-0.046	.744	0.052	.194	0.012	.963	0.02
	MID	Low	-0.038	.602	0.068	.308	-0.022	.838	0.009	.832	0.01
		Medium	-0.052	.276	0.037	.522	-0.013	.920	-0.035	.438	0.02
		High	0.044	.636	0.011	.832	-0.056	.348	-0.027	.898	0.02
SST	Low	-0.033	.408	-0.047	.388	0.050	.232	0.021	.648	0.02	
	Medium	0.069	.168	-0.038	.418	0.055	.270	0.011	.979	0.02	
	High	-0.075	.054	-0.020	.625	0.017	.920	-0.038	.988	0.01	
23%	Rest	Low	-0.007	.948	0.037	.368	-0.026	.496	0.031	.968	0.01
		Medium	0.033	.588	0.036	.303	-0.063	.066	-0.017	.903	0.01
		High	0.018	.796	-0.007	.813	-0.044	.390	-0.049	.417	0.01
	En-back	Low	-0.052	.204	0.133	<b>.012</b>	0.047	.474	0.100	.237	0.04
		Medium	-0.022	.696	-0.003	.918	0.030	.225	0.065	.090	0.01
		High	-0.014	.731	-0.053	.538	0.009	.789	-0.026	.837	0.01
	MID	Low	-0.013	.850	0.008	.846	-0.058	.222	0.003	.986	0.01
		Medium	-0.002	.957	-0.027	.674	-0.012	.794	-0.052	.188	0.01
		High	0.017	.905	0.008	.876	0.005	.889	0.050	.706	0.01
SST	Low	-0.046	.319	-0.015	.859	0.029	.562	0.117	<b>.024</b>	0.03	
	Medium	-0.024	.593	0.005	.907	0.053	.740	0.054	.837	0.01	
	High	0.005	.894	-0.078	.298	0.011	.825	-0.017	.888	0.02	
30%	Rest	Low	0.001	.972	-0.023	.496	-0.040	.135	0.007	.829	0.01
		Medium	0.022	.813	0.053	.303	-0.074	<b>.006</b>	-0.013	.869	0.01
		High	0.023	.650	0.023	.698	0.001	.957	0.007	.861	0.01
	En-back	Low	-0.081	<b>.006</b>	0.133	<b>.006</b>	0.066	.255	0.117	.270	0.05
		Medium	-0.038	.624	0.037	.182	0.029	.116	0.106	<b>&lt;.001</b>	0.02

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	<i>High</i>	-0.032	.724	0.010	.798	-0.004	.892	0.052	.614	0.01
MID	<i>Low</i>	-0.002	.971	-0.019	.992	0.035	.838	0.086	.558	0.02
	<i>Medium</i>	0.055	<b>.033</b>	-0.017	.518	-0.039	.600	-0.056	.108	0.01
	<i>High</i>	0.000	.992	0.024	.874	-0.040	.544	0.032	.659	0.01
SST	<i>Low</i>	-0.023	.548	-0.004	.940	-0.036	.576	-0.023	.968	0.01
	<i>Medium</i>	0.034	.667	-0.065	.580	0.042	.495	-0.054	.702	0.02
	<i>High</i>	-0.029	.391	0.019	.865	0.055	.368	0.030	.792	0.01

**Note:** En-back, Emotional N-back; MID, Monetary Incentive Delay; SST, Stop Signal Task; ADHD Attention-Deficit/Hyperactivity Disorder

R<sup>2</sup> reflects all predictors in each model, including covariates.



Table S12. Results examining the relationship between network variables and psychopathology dimensions with parental education, income, and medication as additional covariates at the 30% threshold.

Task	Network/Metric	General		Specific Conduct		Specific Internalizing		Specific ADHD		$R^2$
		$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	$\beta$	$p_{fdr}$	
En-back	Shen Modularity	0.052	.268	-0.082	.100	0.026	.454	-0.117	<b>.020</b>	0.14
MID	Shen Modularity	0.031	.441	-0.082	.100	-0.024	.454	-0.123	<b>.010</b>	0.14
SST	Shen Modularity	0.050	.268	-0.072	.120	0.036	.454	-0.136	<b>.008</b>	0.08
Rest	Shen Modularity	-0.001	.979	-0.060	.100	0.019	.454	-0.071	<b>.024</b>	0.06
Rest	Motor Local Efficiency	0.038	.268	-0.015	.637	0.033	.454	-0.103	<b>.005</b>	0.06

**Note:** En-back = emotional n-back; MID = monetary incentive delay; SST = stop signal task; ADHD = Attention-Deficit/ Hyperactivity Disorder.  
 $R^2$  reflects all predictors in each model, including covariates.