SUPPLEMENTAL MATERIALS 1

S1.1 EXCLUSION CRITERIA

- Treatment with the following groups of pharmacological agents will be considered as exclusion criteria for participation:
    - Antidepressants (MOA-inhibitors, Tricyclic antidepressants, SSRIs)
    - Antipsychotics (both first and second generation)
    - Anxiolytics/hypnotics (benzodiazepines, barbiturates)
    - Opiates
- History of alcohol or drug abuse.
- History of moderate to severe head injury.
- Individuals with low intelligence (mean age scaled WAIS-IV score below 4 (Raven's Matrices and Verbal similarities), corresponding to 2 standard deviations of the normal population).
- Major psychiatric comorbidity (i.e. psychosis, active suicidal ideation or acute exacerbation of other psychiatric condition in need of immediate treatment).
- Epilepsy
- History of severe memory loss
- Under treatment for metabolic disorders
- Severe primary sensory loss
- MRI specific criteria: contraindications for MRI (i.e. metallic or circuit-containing implants, severe claustrophobia)

S1.2 DIAGNOSIS OF ADHD PROBANDS

The ADHD diagnosis was established by a multistage and multisource procedure according to DSM-IV-TR criteria (American Psychiatric Association, 1994), with the Norwegian version of the structured Diagnostic Interview for ADHD in adults, second edition (DIVA 2.0; Kooij & Francken, 2010). Information was obtained from the patients themselves, through their medical records, and with information from other informant sources (i.e. parents, siblings, significant-others etc.). Co-morbid psychiatric disorders were screened with the MINI International Neuropsychiatric Interview Plus (M.I.N.I.-Plus; Sheehan et al., 1997). Only patients with established diagnosis of ADHD were asked to participate in the study.

After completion of the DIVA 2.0, participants needed to: 1) have at least six out of nine DSM-IV symptoms of inattention and/or hyperactivity/impulsivity in childhood, 2) have at least six out of the same nine DSM-IV symptoms for the last 6 months prior to examination currently as adults, 3) describe a chronic course from childhood to adulthood without any indication of ADHD-free periods, 4) have five out of nine symptom criteria for each symptom domain in adulthood given they had met full symptom criteria in childhood (DSM-IV: ADHD Not Otherwise Specified), 5) have current ADHD symptoms that cause clinically significant impairment in social, educational, or occupational functioning. In all 28 adults with ADHD were recruited to the fMRI-arm of the study.

Seven participants were drug-naïve at inclusion into the study. These were tested one initial time, with arterial spin labelling, before allocation into treatment group. These patients had been receiving MPH for at least 2 months before allocation into treatment groups.

S1.3 BLINDING PROCEDURES

To avoid co-occurring effects, patients were instructed to abstain from taking medication or drinking alcohol at least 20 hours prior to participation and to abstain from intake of caffeine 4 hours prior. Participants receiving doses not exactly within the 4 dose possibilities (1x10 mg *instant-release* (IR) tablet, 2x10 mg IR tablet, 1x20 mg *slow-release* (SR) capsule, or 2x20 mg SR capsule) were allocated to the group most closely corresponding to their normal dose (after conferring with their psychiatrist), and were never given a dose higher than their prescription. All study pills where pre-allocated to randomized ID numbers for each dose group (which in turn had randomized order of placebo and MPH per ID in blocks of 10 ID's), and the containers were sequentially numbered by dose. Participants were given ID's based on the next available ID for the closest fitting dose. The Ritalin™ capsules were over-encapsulated with CapsuGel DBcaps® AAel (Swedish Orange Opaque), and so were the corresponding placebo capsules. The MPH and placebo tablets were equal in shape and size, and the pills were taken with a strong squash mixture to mask possible taste differences. All pills were taken straight out of a light-isolating box, giving neither participant nor experimenter the possibility to identify the pills. Medication randomization was performed by a pharmacist at Kragerø Tablettfabrikk a/s. No study personnel were involved in the blinding procedure or randomization. The study key was not broken before the last participant of the fMRI-arm had completed the study.

S1.4 BLOOD ANALYSES

Blood samples were collected in red 10ml Becton Dickison Vacutainer® tubes (with clot activation) on average 2 hours (36 min SD) after intake of pills, between the 30 minute functional scans and the 30 minutes of structural and arterial spin labelling scans. Samples rested a minimum of 30 minutes (maximum 1 hour) before centrifuging at 1,100g for 10-minutes. Serum was extracted and frozen at –20°C within 12 hours from collection. Analyses of methylphenidate and ritalinic acid were performed at The Center for Psychopharmacology, Diakonhjemmet Hospital, Oslo, Norway.

Serum concentrations of MFS and MET were measured by an ultraperformance liquid chromatography-mass spectrometry (UPLC-MS/MS) method developed for routine TDM analyses. Serum samples were prepared with protein precipitation using acetonitrile. Analysis was performed using an Acquity UPLC linked to a Micromass Quattro Micro Tandem MS detector (Waters, Milford, MA, USA). Chromatographic separation was achieved using an Acquity UPLC BEH shield RP18 column (1.7µm, 1x100 mm; Waters) with gradient elution at 40 °C with a mix of ammonium acetate buffer (pH 4.8) and acetonitrile (20–50%) as mobile phase. The retention times were 0.62 and 0.99 min for MFS and MET, respectively. Detection with multiple reaction monitoring was performed at the following transitions: m/z 220-84 for MFS and m/z 234-84 for MET. Deuterated ritalinic acid was used as internal standard (m/z 230-93, retention time 0.61 min). The calibration curves were 200-4000 nM for MFS and 1-100 nM for MET.

	Condition	Mean	Std. Error	UB	LB	df	t	Pr(>|t|)
Ritalinic Acid (nM)	MPH	1301	123.86	1544	1058	15	-7.16	< 0.0001
	Placebo	214	151.84	512	-84			

TABLE S1. 4-1 BLOOD STATISTICS. Estimated means and standard errors from mixed model regressions indicate that levels of both methylphenidate and ritalinic acid from serum are substantially lower in the placebo condition compared to the MPH condition. This shows that participants adhered to the protocol and did not take medication in the 20 hours prior to testing. While such models do not provide inference statistics, estimated t-values with corresponding probability of the absolute t-value is here provided as reference. MPH = methylphenidate condition, Placebo = Placebo condition

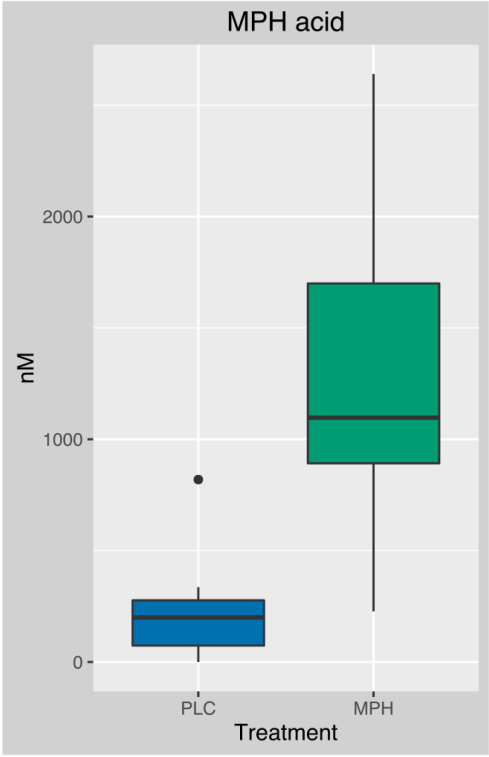


FIGURE S1. 4-1 BLOOD SUMARY. Box plot of blood-values of ritalinic acid from serum. Values are in nanomol. Boxes indicate the middle 50% of the distribution, the tails denote the outer 25%, and the midline within the box is the median.

S1.5 INDEPENDENT COMPONENTS

Spatial Correlations of independent components

Mowinckel2016	Smith2009	Correlation	Network
25	6	0.26	Auditory
15	4	0.73	Cereb.
0	3	0.53	DMN
19	3	0.31	DMN
4	7	0.3	Exec.Contr
1	8	0.32	Frontopari.
5	9	0.44	Frontopari.
6	8	0.31	Frontopari.
9	8	0.31	Frontopari.
10	9	0.2	Frontopari.
11	9	0.39	Frontopari.
26	NA	NA	OFC
12	5	0.54	Sensimotor
16	5	0.45	Sensimotor
28	7	0.14	Subcort.
3	2	0.48	Visual
7	0	0.61	Visual
8	0	0.57	Visual

TABLE S1.5-1. SPATIAL CORRELATIONS TO THE SMITH 2009 INDEPENDENT COMPONENTS.
Mowinckel2016 is the number for the IC presented in this paper, Smith2009 is the corresponding IC in the Smith et al. 2009 paper, with the spatial correlation (calculated with fslcc) between these two and which overarching network these were suggested to belong to in Smith et al. (2009).

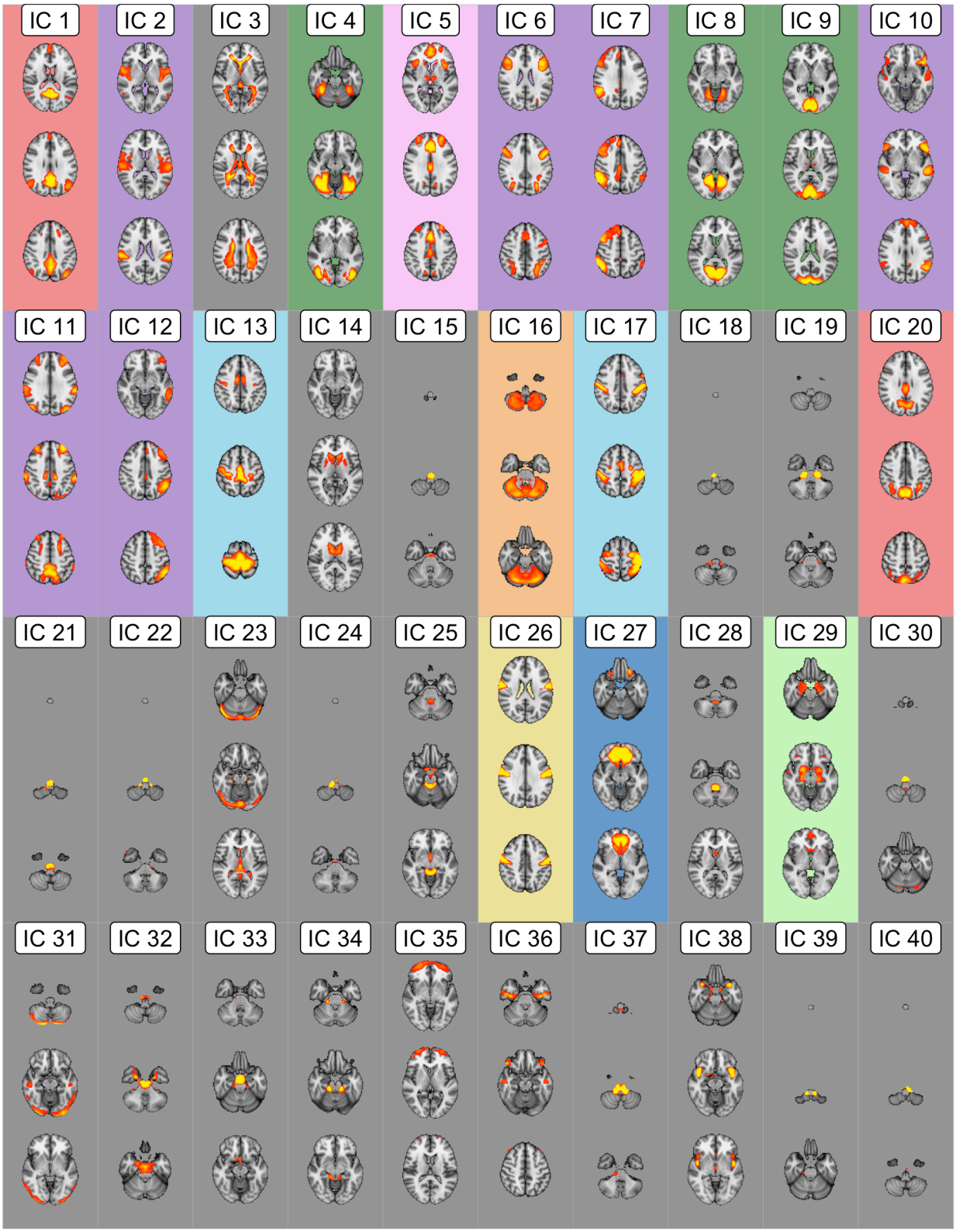
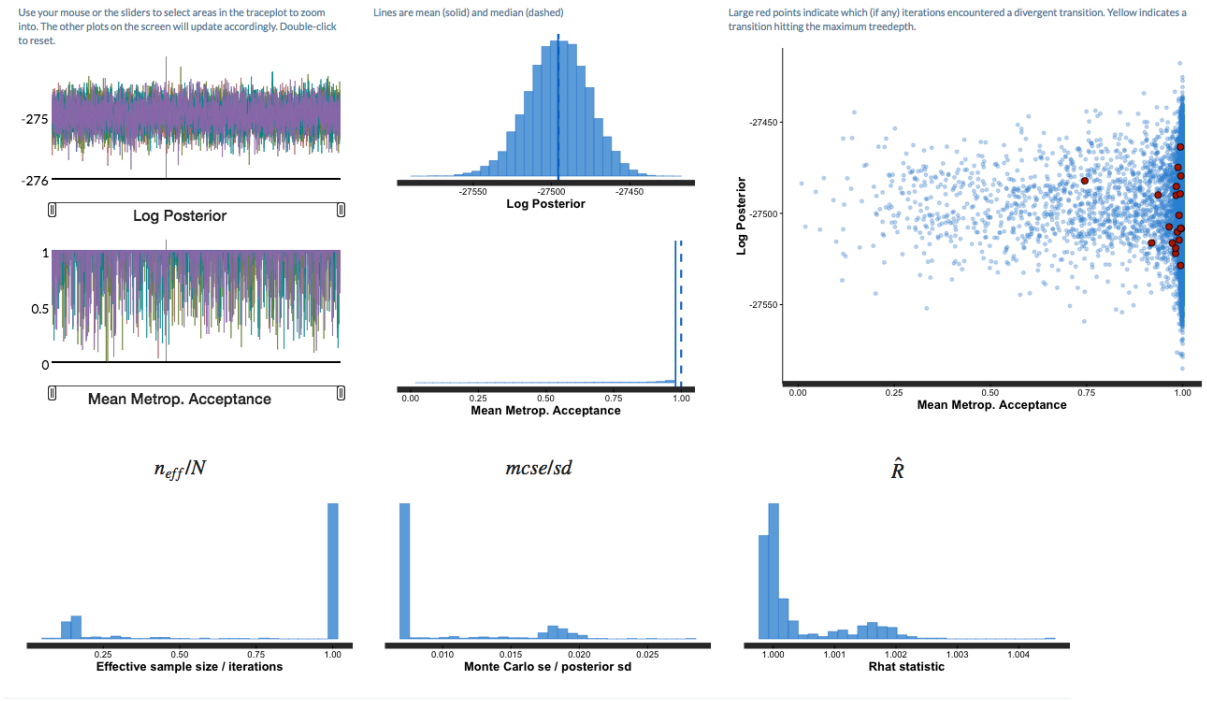


FIGURE S1. 5-1 ALL 40 ICA FROM MELODIC ANALYSIS. Purple = Frontoparietal network; Dark blue = Orbitofrontal cortex (OFC); Light blue = Sensorimotor; Orange = Cerebellum; Red = Default Mode Network (DMN); Dark green = Visual network; Yellow = Auditory network; Light green = Subcortical network; Pink = Executive control network (Exec.Contr.); Grey = Noise/ non-signal.

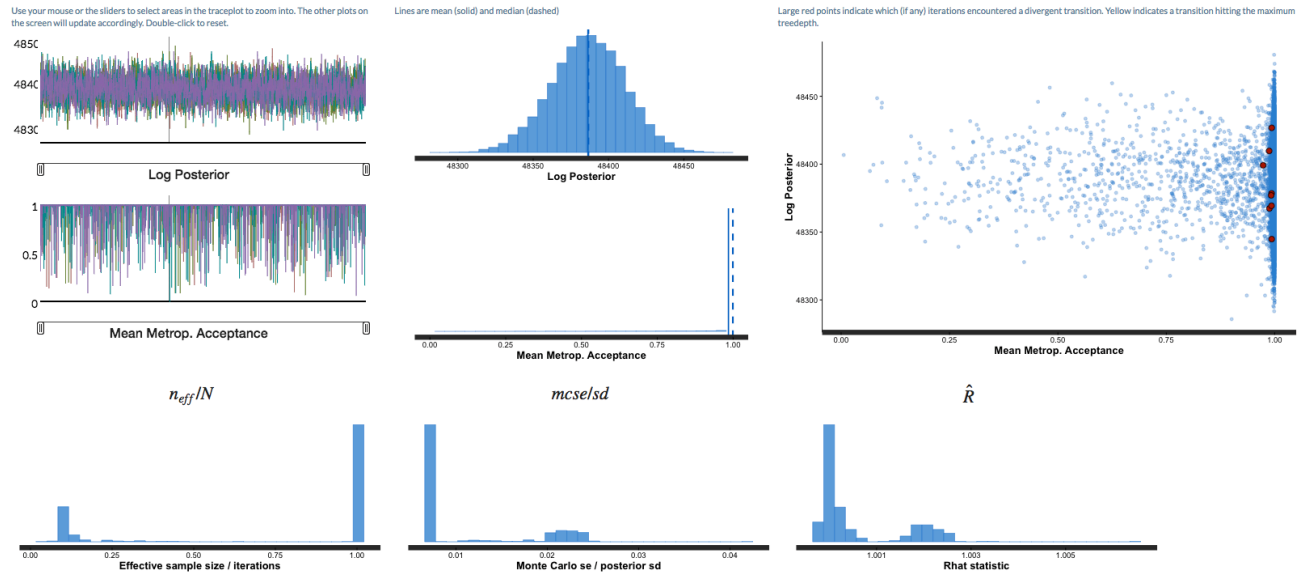
S1.6 MCMC DIAGNOSTIC PLOTS



WARNINGS -- Diverging error: 19 iterations.

	accept_stat	stepsize	treedepth	n_leapfrog	divergent
All chains	0.9784	0.0095	9.2005	627.2230	0.0010
chain1	0.9930	0.0040	10.0000	1023.0000	0.0000
chain2	0.9708	0.0118	8.9840	507.0520	0.0016
chain3	0.9806	0.0097	8.9986	510.7264	0.0008
chain4	0.9691	0.0125	8.8194	468.1136	0.0014

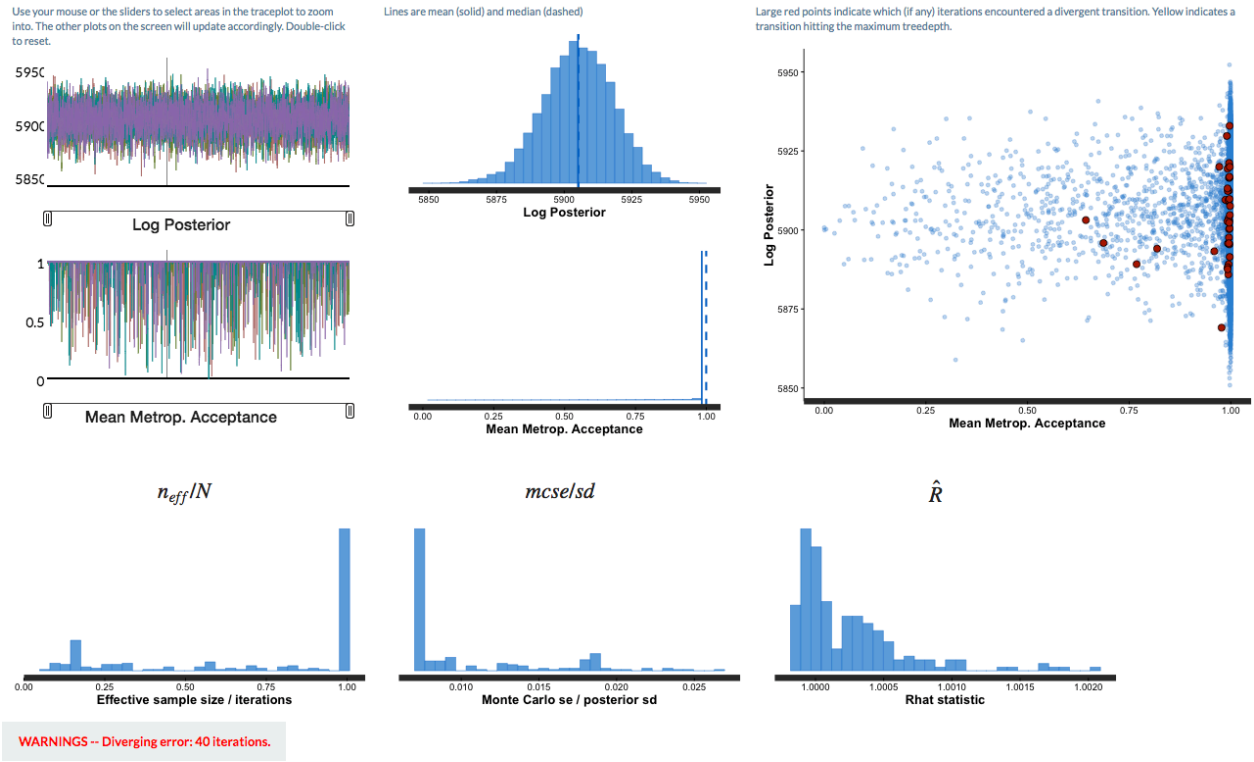
FIGURE S1. 6-0-1 MCMC DIAGNOSTIC PLOT FOR TASK GLM ANALYSIS. Common summary statistics and plots for MCMC sampling, including log posterior chain traces (top left) and distribution (top middle), and mean metropolis acceptance traces (2nd from the top) and distributions (2nd row middle). Blue bar-plots are histograms showing diagnostic values for all parameters. The bottom table displays key convergence statistics over 4 chains.



WARNINGS -- Diverging error: 8 iterations.

	accept_stat	stepsize	treedepth	n_leapfrog	divergent
All chains	0.9848	0.0084	9.2497	638.8914	0.0004
chain1	0.9935	0.0044	10.0000	1023.0000	0.0000
chain2	0.9903	0.0075	9.0000	511.0032	0.0004
chain3	0.9786	0.0109	8.9998	510.9098	0.0004
chain4	0.9770	0.0109	8.9990	510.6526	0.0008

FIGURE S1. 6-0-2 MCMC DIAGNOSTIC PLOT FOR ANALYSIS OF EDGE CORRELATIONS. . Common summary statistics and plots for MCMC sampling, including log posterior chain traces (top left) and distribution (top middle), and mean metropolis acceptance traces (2nd from the top) and distributions (2nd row middle). Blue bar-plots are histograms showing diagnostic values for all parameters. The bottom table displays key convergence statistics over 4 chains.



WARNINGS -- Diverging error: 40 iterations.

	accept_stat	stepsize	treedepth	n_leapfrog	divergent
All chains	0.9840	0.0047	9.9822	1014.2124	0.0020
chain1	0.9764	0.0058	9.9324	989.6138	0.0036
chain2	0.9888	0.0043	9.9992	1022.4708	0.0010
chain3	0.9835	0.0045	9.9974	1022.0686	0.0012
chain4	0.9872	0.0040	9.9996	1022.6966	0.0022

FIGURE S1. 6-0-3 MCMC DIAGNOSTIC PLOT FOR NODE VARIANCE. Common summary statistics and plots for MCMC sampling, including log posterior chain traces (top left) and distribution (top middle), and mean metropolis acceptance traces (2nd from the top) and distributions (2nd row middle). Blue bar-plots are histograms showing diagnostic values for all parameters. The bottom table displays key convergence statistics over 4 chains.

S1.7 LINEAR MIXED MODELS COMPARISON

Data	Dependent variable	Model	ELPD	SE
Full data-set	Task GLM	**Model 3**	**-42861.17**	**244.14**
		Model 2	-42866.50	243.84
		Model 1	-42936.77	242.34
	Node variance	**Model 3**	**2892.70**	**46.80**
		Model 2	2820.20	46.22
		Model 1	2819.00	46.35
	Edges	**Model 3**	**22221.10**	**120.00**
		Model 2	22116.10	119.87
		Model 1	22070.48	120.03
ADHD only	Task GLM	**Model 3**	**-18085.48**	**143.85**
		Model 1	-18095.45	143.61
	Node variance	**Model 3**	**1259.70**	**29.23**
		Model 1	1199.10	28.39
	Edges	**Model 3**	**9135.93**	**78.34**
		Model 1	9130.46	78.28

TABLE S1. 7-1 LEAVE-ONE-OUT CROSS VALIDATION MODEL COMPARISON SUMMARY. Model comparisons on both the full data set with all participants, and in the ADHD subset only. Estimates are calculated using leave-one-out cross validation. The higher the ELPD, the better the model fits the data. ELPD = expected predictive accuracy of the model. SE = standard error of the expected predictive accuracy.

Measure	ELPD	SE	Model
Task modulation	-42857.81	244.09	Model 3 w/Treatment + Relative motion FE
	-42857.94	244.12	Model 3 w/Relative motion FE
	-42861.16	244.07	Model 3 w/Treatment FE
	-42861.17	**244.14**	**Model 3**
Edge correlation	22124.46	119.95	Model 3 w/Relative motion FE
	22124.35	119.93	Model 3 w/Treatment + Relative motion FE
	22123.15	**119.90**	**Model 3**
	22121.95	119.91	Model 3 w/Treatment FE
Component Variance	2904.17	46.88	Model 3 w/Relative motion FE
	2904.17	46.88	Model 3 w/Treatment + Relative motion FE
	2877.41	**46.92**	**Model 3**
	2877.40	46.96	Model 3 w/Treatment FE

TABLE S1. 6-2 LEAVE-ONE-OUT CROSS VALIDATION MODEL COMPARISON WITH RELATIVE MOTION. Models including relative motion and treatment as fixed effects (FE) compared with leave-one-out cross-validation. Winning models are determined by highest expected log predictive density (ELPD) estimates. If several models show equal ELPD, the model with lowest complexity is thought to be best fitting.

S1.8 IN-SCANNER SUBJECT MOTION

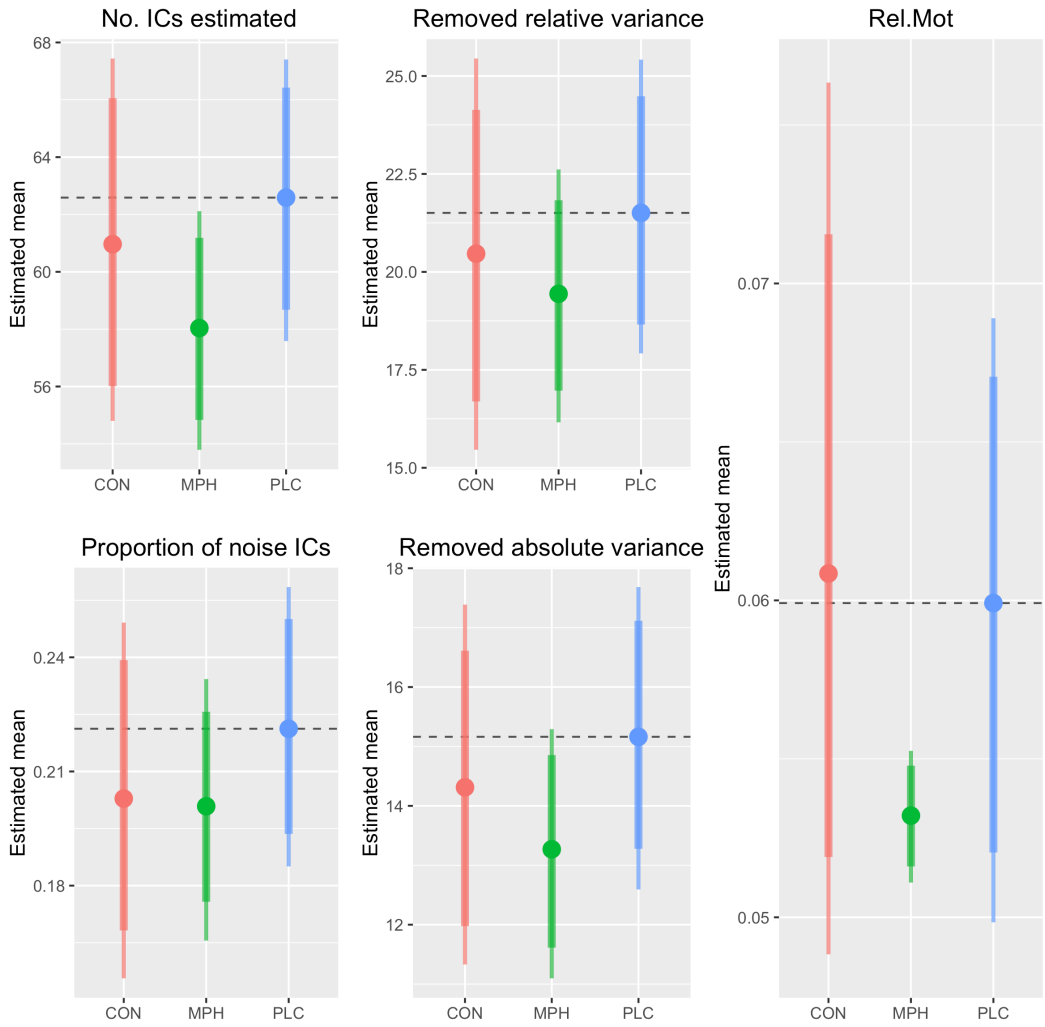


TABLE S1. 8-1 SUBJECT MOTION. Group differences in subject motion, number of estimated independent component, and noise removed by ICA-based Xnoisefier. Estimated were tested with Bayesian linear mixed models. Error bars summarize the 95% HDI (thick) and 99% HDI (thin).

S1.9 TASK GLM ON NODE TIME SERIES

Node				Mean	SD	90% HDI		95% HDI		**Prob > 0**
						lower	upper	lower	upper	
16	Difference	Decision phase	PLC-CON	-0.96	0.37	-1.58	-0.35	-1.69	-0.24	**0.00**
			PLC-MPH	-0.01	0.17	-0.31	0.26	-0.38	0.34	0.47
	Estimated		CON	4.43	0.38	3.83	5.09	3.66	5.17	
			PLC	3.48	0.40	2.82	4.12	2.66	4.22	
			MPH	3.47	0.41	2.78	4.12	2.66	4.25	
	Difference	Trial Accuracy	PLC-CON	-0.57	0.37	-1.16	0.04	-1.25	0.19	**0.06**
			PLC-MPH	-0.05	0.15	-0.30	0.19	-0.38	0.24	0.37
	Estimated		CON	1.37	0.38	0.73	1.99	0.59	2.09	
			PLC	0.80	0.39	0.16	1.45	0.03	1.56	
			MPH	0.75	0.40	0.11	1.43	-0.02	1.55	
1	Difference	Decision phase	PLC-CON	-0.69	0.39	-1.37	-0.08	-1.45	0.08	**0.04**
			PLC-MPH	-0.09	0.23	-0.49	0.27	-0.58	0.35	0.35
	Estimated		CON	-4.84	0.39	-5.47	-4.21	-5.61	-4.11	
			PLC	-5.53	0.41	-6.18	-4.85	-6.33	-4.74	
			MPH	-5.62	0.42	-6.28	-4.92	-6.40	-4.78	
	Difference	Trial Accuracy	PLC-CON	-0.39	0.37	-1.03	0.21	-1.12	0.35	0.15
			PLC-MPH	0.01	0.16	-0.26	0.27	-0.34	0.34	0.50
	Estimated		CON	-1.26	0.38	-1.87	-0.62	-2.00	-0.50	
			PLC	-1.66	0.40	-2.32	-1.02	-2.45	-0.90	
			MPH	-1.65	0.40	-2.32	-1.01	-2.41	-0.85	
5	Difference	Decision phase	PLC-CON	-0.08	0.37	-0.68	0.53	-0.80	0.64	0.41
			PLC-MPH	-0.01	0.17	-0.28	0.26	-0.34	0.34	0.50
	Estimated		CON	3.31	0.38	2.70	3.96	2.57	4.07	
			PLC	3.23	0.39	2.58	3.87	2.47	4.02	
			MPH	3.23	0.40	2.55	3.87	2.41	4.01	
	Difference	Trial Accuracy	PLC-CON	2.11	0.40	1.45	2.78	1.32	2.89	**1.00**
			PLC-MPH	0.10	0.24	-0.28	0.52	-0.36	0.61	0.66
	Estimated		CON	-4.45	0.39	-5.09	-3.82	-5.20	-3.68	
			PLC	-2.34	0.41	-2.99	-1.64	-3.17	-1.56	
			MPH	-2.24	0.42	-2.91	-1.52	-3.08	-1.43	
2	Difference	Decision phase	PLC-CON	1.05	0.37	0.43	1.66	0.32	1.79	**1.00**
			PLC-MPH	0.03	0.17	-0.24	0.31	-0.31	0.38	0.57
	Estimated		CON	-3.77	0.38	-4.39	-3.15	-4.50	-3.02	
			PLC	-2.72	0.39	-3.36	-2.08	-3.49	-1.96	
			MPH	-2.69	0.40	-3.33	-2.02	-3.45	-1.90	
	Difference	Trial Accuracy	PLC-CON	1.18	0.38	0.57	1.82	0.43	1.91	**1.00**
			PLC-MPH	0.08	0.20	-0.22	0.42	-0.29	0.50	0.66

	Estimated		CON	-0.03	0.38	-0.68	0.58	-0.75	0.74	
			PLC	1.15	0.40	0.50	1.80	0.36	1.91	
			MPH	1.23	0.41	0.54	1.88	0.44	2.04	
6	Difference	Decision phase	PLC-CON	-0.90	0.43	-1.62	-0.22	-1.73	-0.07	**0.02**
			PLC-MPH	0.04	0.33	-0.50	0.58	-0.62	0.70	0.55
	Estimated		CON	13.36	0.38	12.71	13.97	12.60	14.10	
			PLC	12.46	0.42	11.74	13.13	11.63	13.29	
			MPH	12.50	0.44	11.80	13.24	11.65	13.36	
	Difference	Trial Accuracy	PLC-CON	2.10	0.41	1.41	2.76	1.31	2.92	**1.00**
			PLC-MPH	0.13	0.26	-0.27	0.57	-0.35	0.69	0.70
	Estimated		CON	-2.09	0.39	-2.73	-1.46	-2.85	-1.33	
			PLC	0.01	0.41	-0.66	0.70	-0.81	0.81	
			MPH	0.14	0.43	-0.58	0.84	-0.69	0.99	
10	Difference	Decision phase	PLC-CON	0.71	0.38	0.08	1.31	-0.01	1.47	**0.97**
			PLC-MPH	-0.06	0.21	-0.42	0.26	-0.48	0.36	0.41
	Estimated		CON	-6.82	0.38	-7.45	-6.19	-7.58	-6.08	
			PLC	-6.11	0.40	-6.75	-5.45	-6.86	-5.31	
			MPH	-6.16	0.40	-6.79	-5.46	-6.93	-5.36	
	Difference	Trial Accuracy	PLC-CON	0.50	0.37	-0.11	1.09	-0.22	1.22	**0.91**
			PLC-MPH	0.04	0.16	-0.21	0.29	-0.26	0.40	0.59
	Estimated		CON	-2.90	0.39	-3.53	-2.27	-3.64	-2.13	
			PLC	-2.40	0.39	-3.05	-1.77	-3.14	-1.61	
			MPH	-2.36	0.40	-3.00	-1.68	-3.13	-1.58	
12	Difference	Decision phase	PLC-CON	1.12	0.38	0.49	1.75	0.36	1.87	**1.00**
			PLC-MPH	-0.03	0.18	-0.31	0.26	-0.39	0.34	0.46
	Estimated		CON	-2.86	0.39	-3.50	-2.24	-3.59	-2.08	
			PLC	-1.74	0.40	-2.39	-1.09	-2.50	-0.96	
			MPH	-1.76	0.40	-2.43	-1.11	-2.54	-0.99	
	Difference	Trial Accuracy	PLC-CON	-0.69	0.37	-1.29	-0.07	-1.40	0.05	**0.03**
			PLC-MPH	0.01	0.16	-0.25	0.27	-0.32	0.33	0.50
	Estimated		CON	0.81	0.38	0.18	1.43	0.03	1.55	
			PLC	0.13	0.39	-0.54	0.75	-0.65	0.89	
			MPH	0.13	0.40	-0.52	0.79	-0.67	0.90	
29	Difference	Decision phase	PLC-CON	0.38	0.37	-0.20	1.01	-0.32	1.12	0.85
			PLC-MPH	0.03	0.17	-0.24	0.29	-0.28	0.40	0.57
	Estimated		CON	-3.83	0.38	-4.45	-3.20	-4.57	-3.08	
			PLC	-3.45	0.39	-4.11	-2.82	-4.23	-2.69	
			MPH	-3.42	0.40	-4.07	-2.76	-4.20	-2.64	
	Difference	Trial Accuracy	PLC-CON	0.67	0.37	0.09	1.32	-0.04	1.44	**0.97**
			PLC-MPH	0.03	0.16	-0.22	0.30	-0.30	0.37	0.58
	Estimated		CON	-0.13	0.38	-0.72	0.54	-0.88	0.62	
			PLC	0.54	0.39	-0.11	1.19	-0.22	1.34	

			MPH	0.57	0.40	-0.06	1.25	-0.21	1.37	
4	Difference	Decision phase	PLC-CON	-1.44	0.39	-2.06	-0.79	-2.20	-0.68	**0.00**
			PLC-MPH	0.01	0.23	-0.36	0.38	-0.43	0.48	0.52
	Estimated		CON	8.31	0.38	7.69	8.93	7.59	9.06	
			PLC	6.87	0.40	6.23	7.54	6.08	7.64	
			MPH	6.88	0.41	6.22	7.59	6.07	7.70	
	Difference	Trial Accuracy	PLC-CON	-0.02	0.36	-0.63	0.57	-0.73	0.70	0.47
			PLC-MPH	-0.01	0.14	-0.25	0.22	-0.31	0.29	0.47
	Estimated		CON	1.01	0.38	0.35	1.60	0.27	1.75	
			PLC	0.99	0.39	0.36	1.64	0.21	1.74	
			MPH	0.97	0.40	0.33	1.63	0.18	1.74	
8	Difference	Decision phase	PLC-CON	-1.49	0.39	-2.12	-0.84	-2.29	-0.77	**0.00**
			PLC-MPH	0.03	0.20	-0.30	0.36	-0.36	0.46	0.55
	Estimated		CON	5.06	0.38	4.43	5.69	4.32	5.83	
			PLC	3.56	0.40	2.93	4.25	2.75	4.33	
			MPH	3.60	0.41	2.92	4.26	2.83	4.41	
	Difference	Trial Accuracy	PLC-CON	1.45	0.39	0.82	2.09	0.71	2.23	**1.00**
			PLC-MPH	0.03	0.20	-0.28	0.36	-0.35	0.45	0.58
	Estimated		CON	-1.88	0.38	-2.50	-1.24	-2.63	-1.14	
			PLC	-0.43	0.40	-1.06	0.24	-1.21	0.35	
			MPH	-0.39	0.40	-1.05	0.28	-1.19	0.39	
9	Difference	Decision phase	PLC-CON	-1.82	0.39	-2.47	-1.18	-2.60	-1.06	**0.00**
			PLC-MPH	-0.01	0.23	-0.38	0.37	-0.47	0.46	0.49
	Estimated		CON	7.70	0.38	7.04	8.30	6.94	8.44	
			PLC	5.87	0.40	5.21	6.54	5.08	6.66	
			MPH	5.87	0.41	5.20	6.56	5.08	6.71	
	Difference	Trial Accuracy	PLC-CON	0.70	0.37	0.09	1.32	-0.01	1.45	**0.97**
			PLC-MPH	0.03	0.16	-0.22	0.31	-0.28	0.39	0.58
	Estimated		CON	0.01	0.38	-0.63	0.62	-0.72	0.76	
			PLC	0.71	0.39	0.04	1.34	-0.07	1.48	
			MPH	0.74	0.40	0.08	1.41	-0.05	1.55	

TABLE S1. 9-1 SUMMARY OF POSTERIOR PROBABILITIES WITH CREDIBLE DIFFERENCES BETWEEN GROUPS. Table summarises the posterior distributions by providing the mean and standard deviations of the distributions, as well as the 90% and 95% highest density intervals of the distributions. The difference distributions additionally have the proportion of the distribution that is above zero, and credible differences are highlighted in bold. The leftmost column indicated which two nodes the edge connects. CON = control, PLC = placebo, MPH = methylphenidate

S1.10 NODE TEMPORAL VARIANCE

Node			Mean	SD	90% HDI		95% HDI		**Prob > 0**
					lower	upper	lower	upper	
1	Difference	PLC-CON	0.02	0.01	-0.01	0.04	-0.01	0.05	**0.90**
		PLC-MPH	0.01	0.02	-0.02	0.03	-0.03	0.04	0.68
	Estimated	CON	0.18	0.03	0.13	0.23	0.13	0.24	
		PLC	0.20	0.03	0.14	0.25	0.14	0.26	
		MPH	0.20	0.03	0.15	0.25	0.14	0.27	
2	Difference	PLC-CON	0.01	0.01	-0.01	0.03	-0.01	0.03	0.76
		PLC-MPH	0.02	0.02	0.00	0.05	-0.01	0.05	**0.92**
	Estimated	CON	0.22	0.03	0.17	0.26	0.16	0.27	
		PLC	0.23	0.03	0.18	0.28	0.17	0.29	
		MPH	0.25	0.03	0.19	0.30	0.18	0.31	
27	Difference	PLC-CON	0.00	0.01	-0.02	0.02	-0.02	0.03	0.52
		PLC-MPH	-0.02	0.02	-0.05	0.00	-0.05	0.01	**0.10**
	Estimated	CON	-0.22	0.03	-0.26	-0.17	-0.28	-0.16	
		PLC	-0.22	0.03	-0.27	-0.17	-0.27	-0.16	
		MPH	-0.24	0.03	-0.29	-0.18	-0.30	-0.17	
13	Difference	PLC-CON	0.00	0.01	-0.02	0.02	-0.02	0.03	0.47
		PLC-MPH	-0.03	0.02	-0.06	0.00	-0.07	0.00	**0.01**
	Estimated	CON	-0.18	0.03	-0.23	-0.13	-0.24	-0.12	
		PLC	-0.18	0.03	-0.23	-0.13	-0.24	-0.12	
		MPH	-0.21	0.03	-0.27	-0.16	-0.28	-0.15	
17	Difference	PLC-CON	0.00	0.01	-0.02	0.02	-0.02	0.02	0.47
		PLC-MPH	-0.02	0.01	-0.04	0.00	-0.05	0.01	**0.08**
	Estimated	CON	-0.08	0.03	-0.12	-0.03	-0.13	-0.02	
		PLC	-0.08	0.03	-0.13	-0.03	-0.14	-0.02	
		MPH	-0.10	0.03	-0.15	-0.04	-0.16	-0.03	

TABLE S1. 10-1 SUMMARY OF POSTERIOR PROBABILITIES WITH CREDIBLE DIFFERENCES BETWEEN GROUPS. Table summarises the posterior distributions by providing the mean and standard deviations of the distributions, as well as the 90% and 95% highest density intervals of the distributions. The difference distributions additionally have the proportion of the distribution that is above zero, and credible differences are highlighted in bold. The leftmost column indicated which two nodes the edge connects. CON = control, PLC = placebo, MPH = methylphenidate

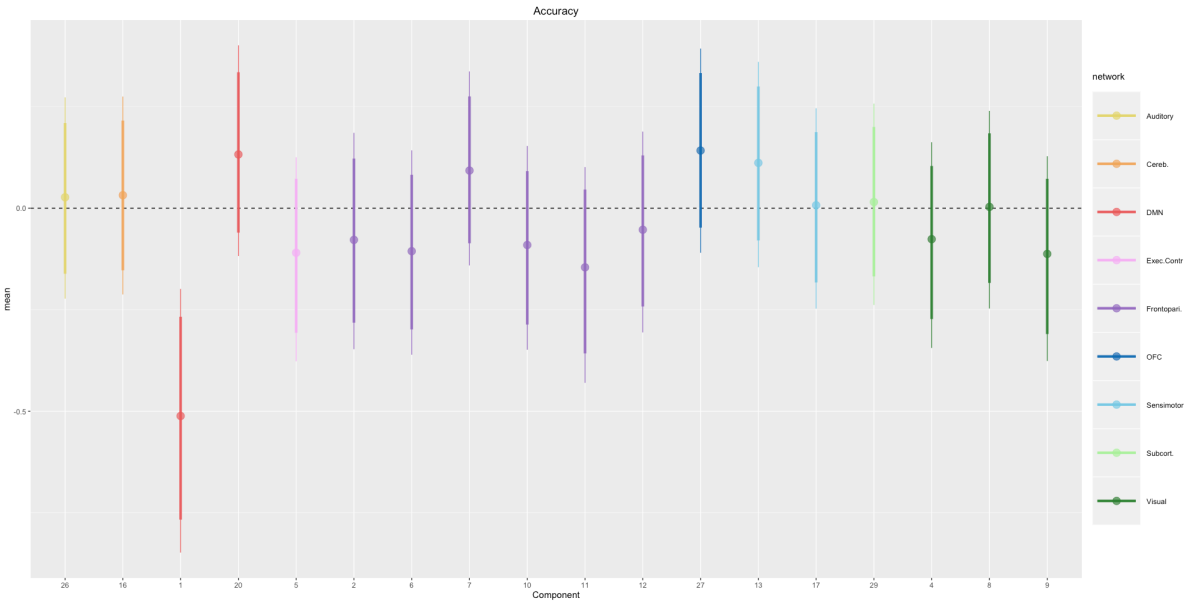


FIGURE S1. 10-1 POSTERIOR PROBABILITIES FOR THE ASSOCIATION BETWEEN TASK ACCURACY AND NODE VARIANCE.

Circles denote the mean of the posterior distribution for the association between task accuracy and node variance, think lines denote the 99% highest density interval (HDI) of the distribution, and the thick lines denote the 95% HDI. Circles are coloured by the functional network each node belongs to.

S1.11 BETWEEN NETWORK ANALYSES (EDGES)

Edge			Mean	SD	90% HDI		95% HDI		**Prob > 0**
					lower	upper	lower	upper	
12,1	Difference	PLC-CON	0.02	0.01	0.00	0.04	0.00	0.05	**0.97**
		PLC-MPH	0.01	0.01	-0.01	0.03	-0.02	0.03	0.71
	Estimated	CON	0.08	0.01	0.06	0.10	0.05	0.10	
		PLC	0.10	0.01	0.08	0.13	0.07	0.13	
		MPH	0.11	0.02	0.08	0.13	0.08	0.14	
12,10	Difference	PLC-CON	-0.03	0.01	-0.05	-0.01	-0.06	-0.01	**0.01**
		PLC-MPH	-0.02	0.01	-0.04	0.01	-0.04	0.01	0.12
	Estimated	CON	0.15	0.01	0.13	0.18	0.13	0.18	
		PLC	0.12	0.01	0.10	0.15	0.10	0.15	
		MPH	0.11	0.02	0.08	0.13	0.08	0.14	
17,13	Difference	PLC-CON	-0.02	0.01	-0.04	0.00	-0.05	0.00	**0.04**
		PLC-MPH	0.00	0.01	-0.02	0.02	-0.03	0.02	0.43
	Estimated	CON	0.24	0.01	0.22	0.26	0.22	0.27	
		PLC	0.22	0.01	0.20	0.25	0.20	0.25	
		MPH	0.22	0.02	0.19	0.24	0.19	0.25	
17,6	Difference	PLC-CON	-0.03	0.01	-0.05	-0.01	-0.06	0.00	**0.01**
		PLC-MPH	0.00	0.01	-0.03	0.02	-0.03	0.02	0.36
	Estimated	CON	0.19	0.01	0.17	0.21	0.16	0.21	
		PLC	0.16	0.01	0.13	0.18	0.13	0.18	
		MPH	0.15	0.02	0.13	0.18	0.12	0.18	
20,11	Difference	PLC-CON	-0.03	0.01	-0.05	-0.01	-0.05	0.00	**0.02**
		PLC-MPH	-0.01	0.01	-0.03	0.02	-0.03	0.02	0.34
	Estimated	CON	0.19	0.01	0.17	0.21	0.17	0.22	
		PLC	0.17	0.01	0.14	0.19	0.14	0.19	
		MPH	0.16	0.02	0.14	0.19	0.13	0.19	
20,12	Difference	PLC-CON	0.03	0.01	0.01	0.05	0.00	0.05	**0.98**
		PLC-MPH	-0.01	0.01	-0.03	0.02	-0.03	0.02	0.37
	Estimated	CON	0.06	0.01	0.04	0.08	0.03	0.08	
		PLC	0.09	0.01	0.06	0.11	0.06	0.11	
		MPH	0.08	0.02	0.06	0.11	0.05	0.11	
20,5	Difference	PLC-CON	0.03	0.01	0.01	0.06	0.01	0.06	**1.00**
		PLC-MPH	0.01	0.01	-0.01	0.03	-0.02	0.04	0.77
	Estimated	CON	-0.09	0.01	-0.11	-0.07	-0.12	-0.07	
		PLC	-0.06	0.01	-0.08	-0.03	-0.09	-0.03	
		MPH	-0.05	0.02	-0.07	-0.02	-0.08	-0.02	
7,2	Difference	PLC-CON	0.03	0.01	0.01	0.05	0.00	0.05	**0.98**

	Estimated	PLC-MPH	0.02	0.01	-0.01	0.04	-0.01	0.04	0.88
		CON	-0.05	0.01	-0.07	-0.03	-0.07	-0.02	
		PLC	-0.02	0.01	-0.04	0.00	-0.05	0.01	
		MPH	-0.01	0.02	-0.03	0.02	-0.04	0.02	
8,6	Difference	PLC-CON	-0.04	0.01	-0.06	-0.02	-0.07	-0.01	**0.00**
		PLC-MPH	-0.01	0.01	-0.03	0.01	-0.04	0.02	0.23
	Estimated	CON	0.04	0.01	0.02	0.06	0.02	0.07	
		PLC	0.00	0.01	-0.02	0.03	-0.03	0.03	
		MPH	-0.01	0.02	-0.03	0.02	-0.04	0.02	
9,4	Difference	PLC-CON	-0.04	0.01	-0.06	-0.01	-0.06	-0.01	**0.00**
		PLC-MPH	0.01	0.01	-0.01	0.03	-0.02	0.04	0.77
	Estimated	CON	0.31	0.01	0.29	0.33	0.29	0.34	
		PLC	0.28	0.01	0.25	0.30	0.25	0.30	
		MPH	0.29	0.02	0.26	0.31	0.26	0.32	

TABLE S1. 11-1 POSTERIOR DISTRIBUTIONS OF CREDIBLE EDGE DIFFERENCES BETWEEN GROUPS. Table summarises the posterior distributions by providing the mean and standard deviations of the distributions, as well as the 90% and 95% highest density intervals of the distributions. The difference distributions additionally have the proportion of the distribution that is above zero, and credible differences are highlighted in bold. The leftmost column indicated which two nodes the edge connects. CON = control, PLC = placebo, MPH = methylphenidate.

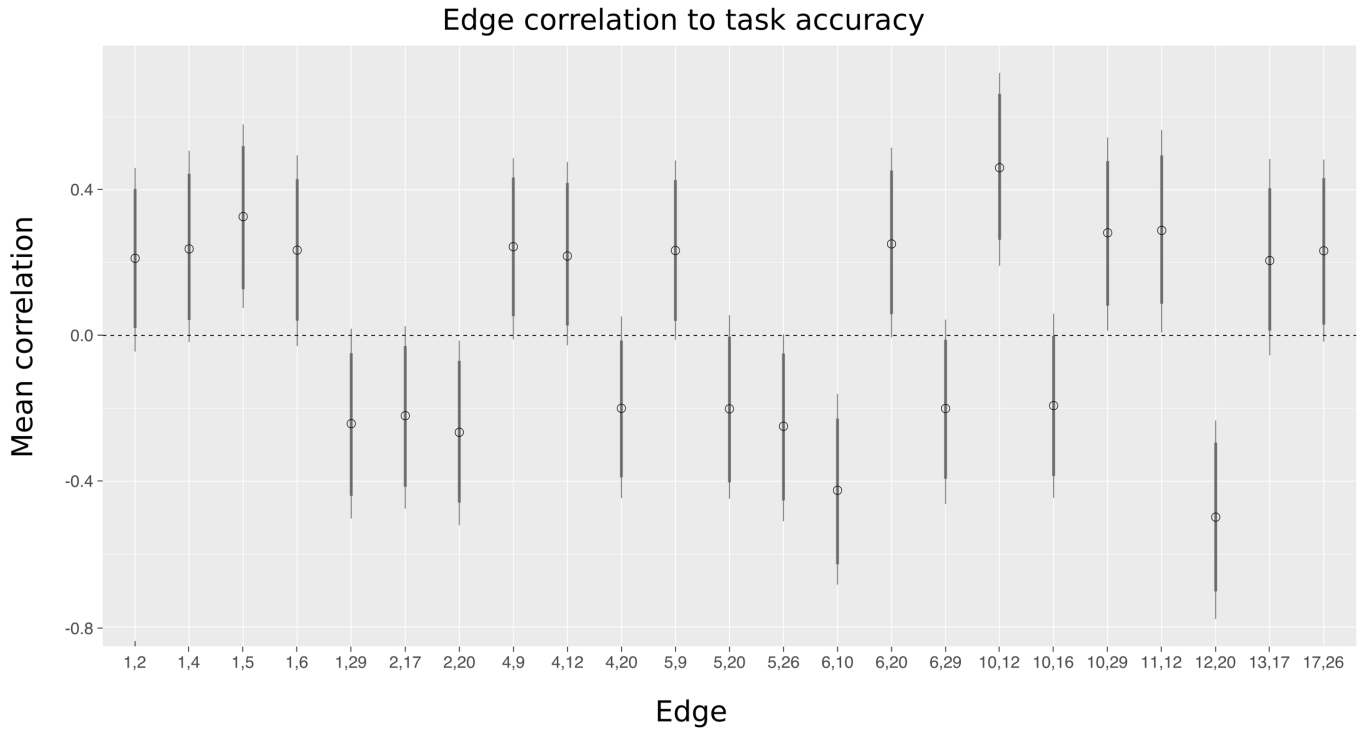


FIGURE S1. 11-1 EDGES RELATED TO OVERALL TASK ACCURACY. Edges showing credible association with overall task accuracy. Circles are the mean of the distribution, Thin lines are the 99% highest density interval (HDI), thick lines are the 95% HDI. X-axis denoted the two nodes that are connected by the edge.

S1.12 WITHIN NETWORK CONNECTIVITY

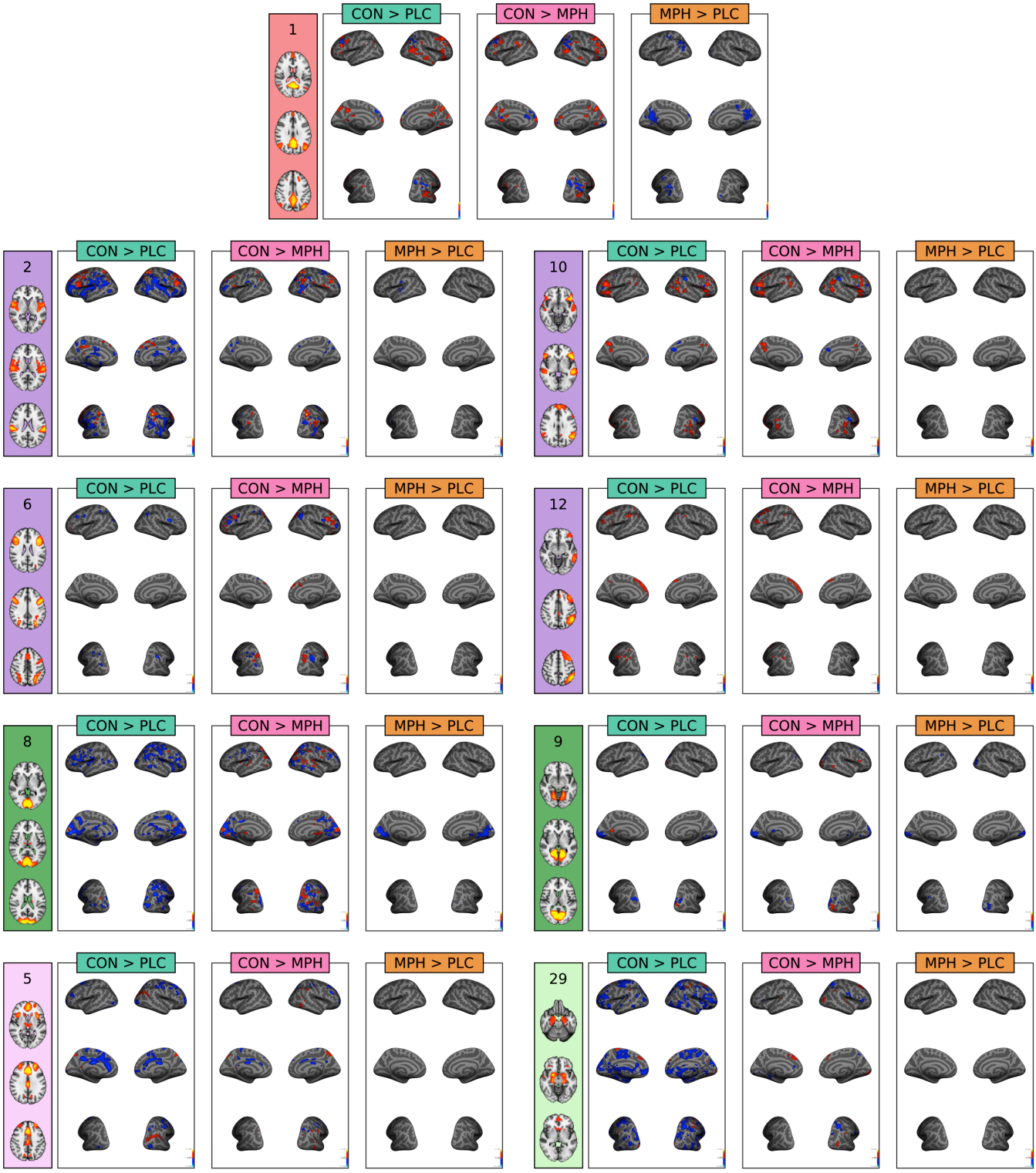


FIGURE S1. 12-1 WITHIN NETWORK CONNECITIVITY DIFFERENCES. Results from within network analyses on the eleven nodes whose time series were correlated with task decision-phase and that showed differences between groups. The leftmost columns depict the node whose connectivity is changed, coloured by the functional network group this node belongs to. There are three columns for each node for comparisons of controls to placebo, controls to methylphenidate, and methylphenidate to placebo. Please note, the possible difference between control and placebo, and control and methylphenidate is not interpretable unless there is also an effect when comparison placebo to methylphenidate. Hot colours indicate increased connectivity; cool colours indicate reduced connectivity.

S1.13 REFERENCES; SUPPLEMENTAL MATERIALS 1

American Psychiatric Association, [APA]. (1994). *Diagnostic and Statistical Manual of Mental Disorders DSM-IV*.

Birn, R. M. (2012). The role of physiological noise in resting-state functional connectivity. *NeuroImage*, *62*(2), 864–870. http://doi.org/10.1016/j.neuroimage.2012.01.016

Griffanti, L., Salimi-Khorshidi, G., Beckmann, C. F., Auerbach, E. J., Douaud, G., Sexton, C. E., … Smith, S. M. (2014). ICA-based artefact removal and accelerated fMRI acquisition for improved resting state network imaging. *NeuroImage*, *95*, 232–247. http://doi.org/10.1016/j.neuroimage.2014.03.034

Kooij, J. J. S., & Francken, M. H. (2010). *Diagnostic Interview for ADHD (DIVA) 2.0. DIVA foundation*. Retrieved from http://www.psyq.nl/files/1263005/DIVA_2_EN.pdf

Salimi-Khorshidi, G., Douaud, G., Beckmann, C. F., Glasser, M. F., Griffanti, L., & Smith, S. M. (2014). Automatic denoising of functional MRI data: combining independent component analysis and hierarchical fusion of classifiers. *NeuroImage*, *90*(0), 449–68. http://doi.org/10.1016/j.neuroimage.2013.11.046

Sheehan, D., Lecrubier, Y., Harnett Sheehan, K., Janavs, J., Weiller, E., Keskiner, A., … Dunbar, G. (1997). The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability. *European Psychiatry*, *12*(5), 232–241. http://doi.org/10.1016/S0924-9338(97)83297-X