

**Table S1.** Cognitive and clinical measures (means ± standard deviations) in participants groups.

	ADH D (n = 24)	Controls (n = 21)	Value	<i>p</i>		ADHD (n = 24)	Controls (n = 21)	Value	<i>p</i>
<b>ANT – Baseline speed</b>					<b>ANT – Sustained attention date</b>				
RT (ms)	328.54 ± 64.93	317.38 ± 45.57	250.00 0 <sup>b</sup>	.964	<i>SD</i>	3.39 ± 1.46	2.41 ± 1.20	-2.406 <sup>a</sup>	<b>.020</b>
<i>SD</i> of RT	118.71 ± 83.83	87.05 ± 22.84	192.50 0 <sup>b</sup>	.176	Misses	29.88 ± 20.14	19.57 ± 18.75	-1.768 <sup>a</sup>	.084
<b>ANT – Focused attention 4 letters</b>					False alarms	17.04 ± 9.36	19.52 ± 18.65	233.000 <sup>b</sup>	.665
RT correct responses (ms)	926.66 ± 275.60	963.52 ± 355.97	.391 <sup>a</sup>	.698	Coefficient of variation	.22 ± .07	.17 ± .05	-3.073 <sup>a</sup>	<b>.004</b>
<i>SD</i> of correct responses RT	324.65 ± 181.63	337.94 ± 189.53	231.00 0 <sup>b</sup>	.633	<b>ADHD rating scale</b>				
Misses	2.63 ± 2.37	2.14 ± 2.13	-.713 <sup>a</sup>	.480	Hyperactivity –Impulsivity scale	14.79 ± 1.93	1.86 ± 5.90	-10.141 <sup>a</sup>	<b>&lt;.001</b>

False alarms relevant non-target	.58 ± .83	.52 ± .75	-.251 <sup>a</sup>	.803	Inattention scale	15.67 ± 6.23	2.52 ± 2.98	-9.201 <sup>a</sup>	<.001
False alarms irrelevant target	1.87 ± 3.78	.86 ± 1.28	190.00 0 <sup>b</sup>	.137	Total	30.46 ± 10.75	4.38 ± 4.46	-10.862 <sup>a</sup>	<.001
<b>ANT – Visual set-shifting</b>					<b>Conners' parents rating scales</b>				
RT inhibition (ms)	296.50 ± 206.76	409.76 ± 286.15	191.00 0 <sup>b</sup>	.165	ADHD index	72.79 ± 11.16	42.52 ± 5.95	-11.546 <sup>a</sup>	<.001
RT flexibility (ms)	644.71 ± 298.09	792.83 ± 374.11	202.00 0 <sup>b</sup>	.255	CGI: restless-impulsive	69.29 ± 11.80	41.95 ± 6.80	-9.661 <sup>a</sup>	<.001
Number of errors inhibition	8.21 ± 7.80	3.52 ± 4.32	- 2.533 <sup>a</sup>	<b>.016</b>	CGI: emotional lability	60.88 ± 15.64	43.81 ± 15.64	-5.076 <sup>a</sup>	<.001
Number of errors flexibility	18.04 ± 11.97	14.90 ± 14.60	184.50 0 <sup>b</sup>	.124	CGI: total	66.79 ± 16.29	41.57 ± 6.21	-7.024 <sup>a</sup>	<.001
<i>Note.</i> ADHD = Children with ADHD; Controls = Typically developing children; RT = Mean reaction time; <i>SD</i> = Standard deviation; ANT = Amsterdam Neuropsychological Task. Contrast in bold is significant at alpha = .05. <sup>a</sup> Student's <i>t</i> test value. <sup>b</sup> Mann-Whitney test value.					DSM-IV: inattentive	69.00 ± 17.02	44.05 ± 6.99	-6.577 <sup>a</sup>	<.001
					DSM-IV: hyperactive-impulsive	68.04 ± 16.01	40.95 ± 3.63	-8.054 <sup>a</sup>	<.001
					DSM-IV: total	71.30 ± 15.01	41.71 ± 5.20	-8.887 <sup>a</sup>	<.001

**Table S2.** N-back task performance (means  $\pm$  standard deviations).

	ADHD	Controls	Value	<i>p</i>
<b>0 Back condition</b>				
Mean RT	4691.18 $\pm$ 898.17	4038.57 $\pm$ 731.50	-2.605 <sup>a</sup>	<b>.013</b>
<i>SD</i>	1345.64 $\pm$ 538.40	1069.48 $\pm$ 485.80	-1.763 <sup>a</sup>	.085
Number of errors	.50 $\pm$ .74	.19 $\pm$ .40	-1.714 <sup>a</sup>	.096
Misses	.23 $\pm$ .43	.14 $\pm$ .48	203.00 <sup>b</sup>	.288
<b>1 Back condition</b>				
Mean RT	5901.27 $\pm$ 1226.84	5432.48 $\pm$ 1446.34	-1.148 <sup>a</sup>	.258
<i>SD</i>	2206.86 $\pm$ 888.57	1828.24 $\pm$ 910.97	-1.38 <sup>a</sup>	.175
Number of errors	1.95 $\pm$ 1.29	1.76 $\pm$ .94	-.557 <sup>a</sup>	.581
Misses	1.68 $\pm$ 2.42	.86 $\pm$ 1.77	184.50 <sup>b</sup>	.206
<b>2 Back condition</b>				
Mean RT	6149.41 $\pm$ 1471.20	5417.24 $\pm$ 1780.17	-1.473 <sup>a</sup>	.148
<i>SD</i>	2830.23 $\pm$ 1315.95	2550.05 $\pm$ 1316.20	-.698 <sup>a</sup>	.489
Number of errors	2.05 $\pm$ 3.55	.57 $\pm$ .75	169.50 <sup>b</sup>	.108
Misses	7.50 $\pm$ 4.32	5.24 $\pm$ 3.92	-1.795 <sup>a</sup>	.080
<b>Total</b>				
Mean RT	5580.64 $\pm$ 980.49	4962.71 $\pm$ 1182.77	-1.869 <sup>a</sup>	.069
<i>SD</i>	2127.59 $\pm$ 438.55	1815.90 $\pm$ 718.59	-1.707 <sup>a</sup>	.097
Number of errors	4.50 $\pm$ 4.60	2.52 $\pm$ 1.60	167.50 <sup>b</sup>	.115
Misses	9.41 $\pm$ 5.80	6.24 $\pm$ 4.55	-1.989 <sup>a</sup>	.053

Note. ADHD = Children with ADHD; Controls = Typically developing children; RT = Reaction time; *SD* = Standard deviation. Contrast in bold is significant at alpha = .05. <sup>a</sup>Student's *t* test value. <sup>b</sup>Mann-Whitney test value.

**Table S3a.** HbO (a.u.) mean activations in each ROI and task condition in both groups.

	ADHD (N = 22)	TD (N = 21)	<i>p</i>		ADHD (N = 22)	TD (N = 21)	<i>p</i>
<b>Left prefrontal</b>				<b>Right prefrontal</b>			
0 Back	.16 ± 0.82	1.78 ± 4.73	0.14 <sup>a</sup>	0 Back	-.04 ± 1.12	.60 ± 4.25	.512 <sup>a</sup>
1 Back	-.13 ± 1.43	.36 ± 7.00	.811 <sup>b</sup>	1 Back	-.14 ± 1.83	4.02 ± 7.13	<b>.039</b>
2 Back	.52 ± 1.21	2.33 ± 4.15	.066 <sup>a</sup>	2 Back	.64 ± 1.61	3.70 ± 4.15	<b>.004<sup>a</sup></b>
All task	.18 ± 0.83	1.49 ± 4.23	.178 <sup>a</sup>	All task	.15 ± 1.08	2.77 ± 4.11	<b>.010<sup>a</sup></b>
<b>Left frontoparietal</b>				<b>Right frontoparietal</b>			
0 Back	-.03 ± 0.73	1.41 ± 4.37	.154 <sup>b</sup>	0 Back	-.11 ± 0.80	.59 ± 3.56	.636 <sup>b</sup>
1 Back	-.15 ± 1.14	1.07 ± 5.98	.437 <sup>b</sup>	1 Back	-.11 ± 1.03	.49 ± 6.27	.140 <sup>b</sup>
2 Back	.59 ± 1.01	3.03 ± 4.37	<b>.001<sup>b</sup></b>	2 Back	.41 ± 1.05	3.03 ± 4.87	<b>.003<sup>b</sup></b>
All task	.14 ± 0.61	1.84 ± 3.75	<b>.010<sup>b</sup></b>	All task	.07 ± 0.53	1.37 ± 3.95	.076 <sup>b</sup>

**Table S3b.** HbR (a.u.) mean activations in each ROI and task condition in both groups.

	ADHD (N = 22)	TD (N = 21)	<i>p</i>		ADHD (N = 22)	TD (N = 21)	<i>p</i>
<b>Left prefrontal</b>				<b>Right prefrontal</b>			
0 Back	.10 ± 1.64	-1.48 ± 4.16	.099 <sup>b</sup>	0 Back	.34 ± 1.32	-1.87 ± 5.78	.132 <sup>b</sup>
1 Back	.83 ± 1.94	-4.65 ± 7.58	<b>.004<sup>a</sup></b>	1 Back	.68 ± 1.80	-7.20 ± 8.53	<b>&lt;.001<sup>a</sup></b>
2 Back	.23 ± 1.42	-1.99 ± 2.98	<b>.005<sup>a</sup></b>	2 Back	-.11 ± 1.19	-2.94 ± 4.63	<b>.013<sup>a</sup></b>
All task	.39 ± 1.21	-2.71 ± 3.93	<b>.002<sup>a</sup></b>	All task	.30 ± 0.95	-4.00 ± 5.05	<b>&lt;.001<sup>b</sup></b>
<b>Left frontoparietal</b>				<b>Right frontoparietal</b>			
0 Back	.10 ± 0.49	.04 ± 3.17	.941 <sup>b</sup>	0 Back	.28 ± 0.83	-.24 ± 2.37	.616 <sup>b</sup>
1 Back	.24 ± 0.97	-1.94 ± 6.25	<b>.023<sup>b</sup></b>	1 Back	.08 ± 0.95	-.42 ± 5.91	.379 <sup>b</sup>
2 Back	-.32 ± 0.91	-1.48 ± 5.74	<b>.029<sup>b</sup></b>	2 Back	-.36 ± 0.72	-1.27 ± 3.39	.240 <sup>a</sup>
All task	.01 ± 0.56	-1.13 ± 4.05	<b>.018<sup>b</sup></b>	All task	-.001 ± 0.53	-.64 ± 2.95	.379 <sup>b</sup>

Note. 0B = 0 back task condition; 1B = 1 back task condition; 2B = 2 back task condition. All task = sum of all task conditions activations. ADHD = Children with ADHD; HbO = oxyhemoglobin; HbR = deoxyhemoglobin; TD = Typically developing children. Contrast in bold is significant at alpha = .05. aStudent's t test. b Mann-Whitney U test.

**Table S4a.** Spearman's rho values for correlations between HbO and blood fatty acid measures in the whole sample.

	LA	AA	EPA	DHA		LA	AA	EPA	DHA
<b>Left prefrontal</b>					<b>Right prefrontal</b>				
0 Back	-.191 [-.50; .188]	-.082 [-.425; .264]	-.029 [-.379; .275]	-.025 [-.352; .306]	0 Back	-.197 [-.511; .162]	-.046 [-.442; .325]	-.192 [-.497; .148]	.030 [-.305; .363]
1 Back	.033 [-.270; .352]	.211 [-.148; .547]	-.265 [-.536; .048]	.081 [-.291; .395]	1 Back	.133 [-.213; .425]	.272 [-.102; .550]	-.255 [-.569; .092]	.175 [-.203; .509]
2 Back	-.025 [-.385; .365]	.112 [-.260; .477]	-.078 [-.356; .223]	.116 [-.225; .431]	2 Back	-.138 [-.464; .200]	.220 [-.115; .533]	.239 [-.063; .479]	-.020 [-.339; .298]
All task	-.064 [-.386; .298]	.112 [-.240; .453]	-.221 [-.495; .095]	.037 [-.288; .361]	All task	.015 [-.326; .315]	.198 [-.181; .518]	-.179 [-.481; .166]	.161 [-.177; .480]
<b>Left frontoparietal</b>					<b>Right frontoparietal</b>				
0 Back	-.269 [-.533; .065]	-.131 [-.465; .228]	<b>-.506 **</b> [-.710; <b>.208]</b>	-.023 [-.337; .320]	0 Back	-.332 * [-.626; .040]	<b>-.352 *</b> [-.625; <b>-.011]</b>	<b>-.462 **</b> [-.706; <b>-.157]</b>	-.051 [-.386; .306]
1 Back	-.214 [-.515; .123]	.160 [-.205; .515]	-.326 [-.573; -.013]	.12 [-.221; .442]	1 Back	-.286 [-.565; .020]	-.055 [-.391; .298]	-.243 [-.554; .090]	.081 [-.251; .380]
2 Back	-.079 [-.408; .289]	.208 [-.130; .544]	-.071 [-.383; .268]	-.065 [-.369; .268]	2 Back	-.035 [-.385; .336]	.03 [-.283; .365]	-.012 [-.335; .354]	-.134 [-.424; .184]
All task	-.206 [-.507; .153]	.160 [-.176; .474]	<b>-.356 *</b> [-.594; <b>-.053]</b>	.021 [-.299; .372]	All task	-.212 [-.516; .126]	-.054 [-.379; .275]	-.295 [-.602; .045]	-.023 [-.363; .286]

Note. HbO = Oxyhemoglobin; HbR = Deoxyhemoglobin; 0 Back = 0 back task condition; 1 Back = 1 back task condition; 2 Back = 2 back task condition. All task = sum of all task conditions activations. \* $p < .05$ ; \*\* $p < .01$ . Values in bold are significant according to  $p$  value and bootstrap confidence intervals. Lower and upper limits of 95% confidence intervals from bootstrapping methodology with 1.000 resamples iteration are reported in square brackets.

**Table S4b.** Spearman coefficients values for correlations between HbR and blood fatty acid measures in the whole sample.

	LA	AA	EPA	DHA		LA	AA	EPA	DHA
	<b>Left prefrontal</b>					<b>Right prefrontal</b>			
0 Back	.146 [-.212; .477]	.093 [-.252; .413]	-.041 [-.318; .278]	-.014 [-.341; .318]	0 Back	.038 [-.306; .345]	-.137 [-.431; .195]	-.001 [-.333; .311]	-.038 [-.395; .299]
1 Back	.001 [-.328; .335]	-.280 [-.594; .091]	.254 [-.066; .546]	<b>-.390 *</b> <b>[-.668;</b> <b>-.050]</b>	1 Back	-.007 [-.352; .345]	-.221 [-.526; .120]	.129 [-.208; .443]	-.202 [-.493; .119]
2 Back	.012 [-.335; .336]	.095 [-.246; .414]	-.104 [-.436; .227]	-.187 [-.492; .180]	2 Back	.301 [-.035; .583]	-.119 [-.451; .214]	-.173 [-.426; .114]	-.157 [-.474; .214]
All task	.099 [-.247; .443]	-.095 [-.467; .251]	.081 [-.289; .388]	-.268 [-.580; .093]	All task	.105 [-.234; .408]	-.219 [-.550; .129]	-.022 [-.366; .302]	-.222 [-.520; .111]
	<b>Left frontoparietal</b>					<b>Right frontoparietal</b>			
0 Back	.036 [-.356; .376]	.089 [-.222; .374]	.214 [-.107; .525]	.035 [-.292; .339]	0 Back	-.083 [-.398; .252]	-.066 [-.382; .240]	<b>.353 *</b> <b>[.046;</b> <b>.622]</b>	.125 [-.235; .442]
1 Back	.033 [-.285; .360]	-.098 [-.420; .271]	-.003 [-.317; .320]	-.212 [-.532; .170]	1 Back	.314 [.019; .571]	.119 [-.223; .428]	.071 [-.269; .400]	<b>-.377 *</b> <b>[-.660;</b> <b>-.013]</b>
2 Back	.006 [-.310; .334]	.101 [-.218; .426]	-.165 [-.442; .135]	-.242 [-.544; .117]	2 Back	.284 [-.049; .567]	<b>.421 **</b> <b>[.115;</b> <b>.633]</b>	.027 [-.293; .323]	-.042 [-.378; .294]
All task	-.006 [-.343; .298]	-.002 [-.329; .333]	.030 [-.264; .347]	-.126 [-.464; .231]	All task	.304 [-.017; .567]	.290 [-.012; .541]	.119 [-.206; .431]	-.295 [-.612; .062]

Note. HbO = Oxyhemoglobin; HbR = Deoxyhemoglobin; 0 Back = 0 back task condition; 1 Back = 1 back task condition; 2 Back = 2 back task condition. All task = sum of all task conditions activations. \* $p < .05$ ; \*\* $p < .01$ . Values in bold are significant according to  $p$  value and bootstrap confidence intervals. Lower and upper limits of 95% confidence intervals from bootstrapping methodology with 1.000 resamples iteration are reported in square brackets.