*Interviewer training*

The interviewers consisted of psychiatrists and research assistants with a bachelor’s degree in psychology. All the interviewers were requested to watch training DVDs, observe interviews performed by the corresponding author, rate several subjects under supervision, and complete practice interviews. All interviewers had received intensive clinical and research training of child psychiatry for more than two years and were asked to be familiar with DSM-5 criteria for ADHD and DSM-IV criteria for other psychiatric disorders assessed in this study. All of them practiced interviews until their interview ratings reached over 90% agreement on all the symptom items of ADHD and other psychiatric disorders and four areas of functional impairments against the ratings by the corresponding author for at least two subjects. Then the inter-rater reliability study was performed among the seven interviewers, who completed 14 interview assessments. There was a high agreement of the modified adult ADHD supplement (ranging from 84.1 to 97.7% with a mean agreement proportion of 91.6 ± 4.59%) against the rating of each item rated by the corresponding author before study implementation. The kappa statistics among the eight interviewers, including the corresponding author, for all the symptom and impairment items, showed moderate to the excellent agreement, from 0.60 to 1.00 (95% confidence intervals, 0.31-0.83). The discrepancies among raters were discussed in regular meetings hosted- by the corresponding author, who would make the final decision of symptom rating according to the detailed behavior descriptions by the raters.

**Table S1. Comparison of demographic data between subjects with ADHD and control subjects followed and not followed in this study**

|  |  |  |  |
| --- | --- | --- | --- |
| Mean (SD) | ADHD(n = 95) | Controls(n = 107) | Not followed vs Followed*F*  *Statistics* |
| Not followed(n = 42) | Followed(n = 53) | Not followed(n = 57) | Followed(n = 50) | ADHD | Controls |
| Male, n (%) | 33 (78.57) | 42 (79.25) | 47 (82.46) | 35 (70.00) | *χ*2(1)= 0.006 | *χ*2(1)=2.31 |
| Age, years | 12.36 (1.73) | 12.77 (1.60) | 13.09 (1.71) | 12.80 (1.60) | 1.47 | 0.83 |
| (age range) | (8-17) | (10-17) | (11-16) | (10-16) |  |  |
| ADHD symptom count (self-report) |  |  |  |  |  |  |
| Inattention  | 5.70 (2.70) | 5.90 (2.46) | 0.37 (0.71) | 0.27 (0.69) | 0.09 | 0.28 |
| Hyperactivity/Impulsivity | 4.10 (2.77) | 4.66 (2.56) | 0.26 (0.71) | 0.25 (0.64) | 0.65 | 0.01 |
| Intelligent quotient (IQ) |  |  |  |  |  |  |
|  Full IQ | 104.05 (11.97) | 103.82 (11.44) | 111.28 (9.00) | 112.90 (9.10) | 0.01 | 0.85 |
|  Verbal IQ  | 104.54 (10.77) | 103.43 (12.10) | 111.37 (9.33) | 113.42 (8.59) | 0.21 | 1.39 |
|  Performance IQ | 103.37 (13.42) | 104.41 (11.95) | 109.79 (11.55) | 110.60 (11.90) | 0.16 | 0.13 |
| ADHD medication History |  |  |  |  |  |  |
| Ever use, n (%) | 33 (78.57) | 45 (84.91) | - | - | *χ*2(1)= 0.0015 | - |
| Current use, n (%) | 29 (69.04) | 23 (43.40) | - | - | *χ*2(1)= 6.22a  | - |
|  Duration, months | 26.06 (23.81) | 18.79 (21.94) | - | - | 1.69 | - |
| Current any psychiatric comorbidity | 24 (64.29) | 41 (77.36) | 10 (17.54) | 10 (20.00) | *χ*2(1)= 4.43a | *χ*2(1)= 0.11 |
| Paternal age | 45.76 (3.70) | 46.02 (5.67) | 46.39 (4.66) | 46.78 (4.10) | 0.05 | 0.21 |
| Maternal age | 42.97 (3.61) | 42.86 (4.42) | 43.72 (3.85) | 44.45 (3.81) | 0.01 | 0.95 |
| Parental Education |  |  |  |  |  |  |
|  College and above | 27 (64.29) | 34 (66.67) | 50 (87.72) | 41 (83.67) | Fisher’s test *p* = 0.0575 | Fisher’s test*p* = 0.0679 |
|  Senior high school | 12 (28.57) | 14 (27.45) | 5 (8.77) | 7 (14.29) |
|  Junior high school and below | 3 (7.14) | 3 (5.88) | 2 (3.51) | 1 (2.04) |
| Parental occupation  |  |  |  |  |  |  |
|  Professional  | 10 (24.39) | 8 (16) | 11 (19.64) | 9 (18.75) | Fisher’s test *p* = 0.046 | Fisher’s test*p* = 0.019 |
|  Technical  | 30 (73.17) | 40 (80) | 45 (80.36) | 36 (75) |
|  Others | 1 (2.44) | 2 (4) | 0 (0.00) | 3 (6.25) |

Note: SD: standard deviation; a 0.01 < p < 0.05

**Table S2. Comparison of neuropsychological functioning between participants with ADHD and control subjects followed and not followed in this study.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | ADHD (n = 95) | Control (n = 107) | Not followed vs Followed |
| Mean (SD) | Not followed(n = 42) | Followed(n = 53) | Not followed(n = 57) | Followed(n = 50) | ADHD | Control |
| Cohen *d* | *F*  | Cohen *d* | *F*  |
| **Reaction Time** |  |  |  |  |  |  |  |  |
| Simple | 364.70 (123.97) | 336.98 (51.53) | 309.92 (61.67) | 315.11 (66.99) | -0.29 | 2.18 | 0.08 | 0.17 |
| 5-choice | 382.25 (117.62) | 364.10 (93.36) | 329.32 (58.45) | 338.95 (50.55) | -0.17 | 0.70 | 0.18 | 0.82 |
| **Rapid Visual Information Processing** |  |  |  |  |  |  |  |
| Probability of hit | 0.51 (0.18) | 0.52 (0.18) | 0.63 (0.20) | 0.63 (0.16) | 0.06 | 0.16 | 0.00 | 0.02 |
| A' (Signal detectability) | 0.85 (0.06) | 0.87 (0.05) | 0.90 (0.05) | 0.90 (0.05) | 0.36 | 3.32 | 0.00 | 0.09 |
| **Spatial Span** |  |  |  |  |  |  |  |  |
| Span length | 6.64 (1.51) | 7.00 (1.29) | 7.96 (1.18) | 7.66 (1.21) | -0.26 | 1.55 | -0.25 | 1.74 |
| **Spatial Working Memory** |  |  |  |  |  |  |  |  |
| Strategy utilization | 35.12 (4.46) | 34.42 (4.00) | 31.42 (5.06) | 31.26 (5.25) | -0.17 | 0.65 | -0.03 | 0.03 |
| Between Errors | 32.40 (17.71) | 28.40 (15.19) | 16.49 (13.09) | 15.2 (12.7) | -0.24 | 1.41 | -0.10 | 0.27 |
| **Intradimension/ Extradimension Shift** |  |  |  |  |  |  |  |
| Completed stages | 8.12 (0.97) | 8.47 (0.82) | 8.61 (1.08) | 8.58 (0.78) | 0.39 | 3.68 | -0.03 | 0.03 |
| Extra-dimensional shift errors | 14.86 (11.72) | 10.66 (10.55) | 8.72 (8.46) | 9.08 (9.94) | -0.38 | 3.36 | 0.04 | 0.04 |
| **Stocking of Cambridge** |  |  |  |  |  |  |  |  |
| Problems solved in minimum moves | 7.52 (1.71) | 7.53 (2.37) | 9.35 (2.04) | 8.54 (1.91) | 0.00 | 0.00 | -0.41 | **4.47a** |
| Mean moves (5 move problem) | 7.42 (1.47) | 7.16 (1.53) | 5.97 (1.06) | 6.34 (1.28) | -0.17 | 0.66 | 0.31 | 2.64 |

Note: SD: standard deviation. a 0.01 < p < 0.05

**Table S3. Comparison of the magnitude of the slopes of executive functions changes between the ADHD and the control groups**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ADHD |  | Control |  | Main effects | Interaction |
| *β* (95% CI) |  | *β* (95% CI) |  | Group | Time | Group\* Time |
| F (p) |
| **Reaction Time** |  |  |  |  |  |  |  |
| Simple | 3.26 (-21.72, 28.23) |  | -10.84 (-36.55,14.87) |  | 0.07 (0.79) | 0.18 (0.68) | 0.61 (0.44) |
| 5-choice | -18.01 (-72.42, 33.91) |  | -23.90 (-47.98, 0.19) |  | 0.52 (0.47) | 6.13 (0.01) | 0.12 (0.73) |
| **Rapid Visual Information Processing** |  |  |  |  |  |  |  |
|  Probability of hit | 0.10 (0.12, 0.22) |  | 0.17 (0.13, 0.22) |  | 2.94 (0.09) | 97.54 (<.0001) | 0.03 (0.87) |
| A' (Signal detectability) | 0.05 (0.04, 0.06) |  | 0.05 (0.04, 0.06) |  | 3.22 (0.08) | 104.25 (<.0001) | 0.00 (0.98) |
| **Spatial Span** |  |  |  |  |  |  |  |
| Span length | 0.66 (0.29, 1.03) |  | 0.66 (0.28, 1.04) |  | 2.19 (0.14) | 24.21 (<.0001) | 0.00 (1.00) |
| **Spatial Working Memory** |  |  |  |  |  |  |  |
| Strategy utilization | -4.55 (-5.86, -3.23) |  | -2.48 (-3.83, -1.13) |  | **9.74 (0.002)** | 54.71 (<.0001) | **4.73 (0.03)** |
| Between errors | -14.06 (-17.32, -10.79) |  | -7.64 (-11.00, -4.28) |  | **22.28 (<.0001)** | 84.31 (<.0001) | **7.37 (0.008)** |
| **Intradimension/ Extradimension Shift** |  |  |  |  |  |  |  |
| Completed stages | 0.32 (0.08, 0.57) |  | 0.38 (0.13, 0.63) |  | 0.03 (0.86) | 15.69 (<.0001) | 0.11 (0.74) |
| Extra-dimensional shift errors | -4.70 (-7.65, -1.75) |  | -5.80 (-8.34, -2.76) |  | 0.02 (0.89) | 24.15 (<.0001) | 0.27 (0.61) |
| **Stocking of Cambridge** |  |  |  |  |  |  |  |
| Problems solved in minimum moves | 1.83 (1.22, 2.44) |  | 1.28 (0.65, 1.91) |  | 4.49 (0.04) | 29.14 (<.0001) | 1.54 (0.22) |
| Mean moves (5 move problem) | -0.52 (-1.03, -0.01) |  | -0.49 (-1.01, 0.03) |  | 2.16 (0.14) | 7.62 (0.007) | 0.01 (0.093) |

Note: CANTAB = Cambridge Neuropsychological Testing Automated Battery; SWM = spatial working memory; IED = intra-dimension/extra-dimension shift; SOC = stocking of Cambridge; CI = confidence interval; ADHD = attention-deficit/hyperactivity disorder

**Table S3-1. Comparison of the magnitude of changes of executive functions between the ADHD and control groups (adjusting for the current psychiatric comorbidity)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ADHD |  | Control |  | Main effects |  | Interaction |  |  |
| *β* (95% CI) |  | *β* (95% CI) |  | Group | Time |  | Group\* Time |  | Comorbidity |
| F (p) |  |  |  |  |
| **Reaction Time** |  |  |  |  |  |  |  |  |  |  |
| Simple | 4.78 (-21.07, 30.62) |  | -9.67 (-35.81, 16.47) |  | 0.00 (0.95) | 0.07 (0.79) |  | 0.62 (0.43) |  | 0.65 (0.42) |
| 5-choice | -21.79 (-45.69, 2.10) |  | -25.07 (-49.26, -0.87) |  | 0.99 (0.32) | 7.39 (0.008) |  | 0.04 (0.85) |  | 0.82 (0.37) |
| **Rapid Visual Information Processing** |  |  |  |  |  |  |  |  |  |  |
|  Probability of hit | 0.16 (0.11, 0.21) |  |  0.17 (0.12, 0.22) |  | 1.86 (0.18) | 84.18 (<.0001) |  | 0.14 (0.71) |  | 0.40 (0.53) |
| A' (Signal detectability) | 0.05 (0.03, 0.06) |  | 0.05 (0.03, 0.06) |  | 2.19 (0.14) | 90.64 (<.0001) |  | 0.05 (0.83) |  | 0.27 (0.61) |
| **Spatial Span** |  |  |  |  |  |  |  |  |  |  |
| Span length | 0.59 (0.21, 0.98) |  | 0.62 (0.24, 1.02) |  | 1.06 (0.31) | 19.29 (<.0001) |  | 0.02 (0.90) |  | 1.62 (0.21) |
| **Spatial Working Memory** |  |  |  |  |  |  |  |  |  |  |
| Strategy utilization | -4.08 (-5.42, -2.75) |  | -2.44 (-3.78, -1.10) |  | **7.29 (0.008)** | 46.14 (<.0001) |  | 3.04 (0.08) |  | 0.21 (0.65) |
| Between errors | -13.30 (-16.65, -9.95) |  | -7.47 (-10.83, -4.10) |  | **18.06 (<.0001)** | 74.15 (<.0001) |  | **6.06 (0.02)** |  | 0.61 (0.44) |
| **Intradimension/ Extradimension Shift** |  |  |  |  |  |  |  |  |  |  |
| Completed stages | 0.29 (0.04, 0.55) |  | 0.37 (0.11, 0.62) |  | 0.01 (0.92) | 13.03 (0.001) |  | 0.16 (0.69) |  | 1.03 (0.31) |
| Extra-dimensional shift errors | -4.16 (-7.20-1.11) |  | -5.48 (-8.57, -2.40) |  | 0.13 (0.72) | 19.19 (<.0001) |  | 0.37 (0.54) |  | 3.37 (0.07) |
| **Stocking of Cambridge** |  |  |  |  |  |  |  |  |  |  |
| Problems solved in minimum moves | 1.67 (1.04, 2.30) |  | 1.24 (0.60, 1.88) |  | 2.69 (0.10) | 40.90 (<.0001) |  | 0.93 (0.34) |  | 1.08 (0.30) |
| Mean moves (5 move problem) | -0.39 (-0.90, 0.13) |  | -0.45 (-0.98, 0.66) |  | 0.98 (0.33) | 5.13 (0.03) |  | 0.03 (0.86) |  | 1.55 (0.22) |

Note: SWM = spatial working memory; IED = intra-dimension/extra-dimension shift; SOC = stocking of Cambridge; CI = confidence interval; ADHD = attention deficit/hyperactivity disorder; FIQ = full-scaled intelligent quotient

**Table S3-2. Comparison of the magnitude of changes of executive functions between the ADHD and the control groups (adjusting for Time 1 FIQ)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ADHD |  | Control |  | Main effects |  | Interaction |  |  |
| *β* (95% CI) |  | *β* (95% CI) |  | Group | Time |  | Group\* Time |  | FIQ |
| F (p) |  | F (p) |  | F (p) |
| **Reaction Time** |  |  |  |  |  |  |  |  |  |  |
| Simple | 3.50 (-22.20, 29.20) |  | -10.84 (-36.79, 15.11) |  | 0.00 (0.97) | 0.16 (0.69) |  | 0.61 (0.44) |  | 3.77 (0.05) |
| 5-choice | -18.50 (-42.58, 5.58) |  | -23.90 (-48.22, 0.42) |  | 0.68 (0.41) | 6.04 (0.02) |  | 0.10 (0.76) |  | 0.38 (0.54) |
| **Rapid Visual Information Processing** |  |  |  |  |  |  |  |  |  |  |
|  Probability of hit | 0.17 (0.12, 0.22) |  | 0.17 (0.12, 0.22) |  | 1.41 (0.24) | 92.40 (<.0001) |  | 0.07 (0.80) |  | 3.70 (0.06) |
| A' (Signal detectability) | 0.05 (0.03, 0.06) |  | 0.05 (0.04, 0.06) |  | 1.65 (0.20) | 98.71 (<.0001) |  | 0.02 (0.89) |  | 3.20 (0.08) |
| **Spatial Span** |  |  |  |  |  |  |  |  |  |  |
| Span length | 0.68 (0.31, 1.07) |  | 0.66 (0.28, 1.04) |  | 1.79 (0.18) | 24.59 (<.0001) |  | 0.01 (0.92) |  | 1.08 (0.30) |
| **Spatial Working Memory** |  |  |  |  |  |  |  |  |  |  |
| Strategy utilization | -4.76 (-6.09, -3.44) |  | -2.48 (-3.82, -1.14) |  | **6.98 (0.01)** | 57.95 (<.0001) |  | **5.76 (0.02)** |  | 4.50 (0.04) |
| Between errors | -14.33 (-17.68, -10.98) |  | -7.64 (-11.02, -4.26) |  | **17.48 (<.0001)** | 83.88 (<.0001) |  | **7.78 (0.006)** |  | 2.51 (0.12) |
| **Intradimension/ Extradimension Shift** |  |  |  |  |  |  |  |  |  |  |
| Completed stages | 0.33 (0.08, 0.58) |  | 0.38 (0.13, 0.63) |  | 0.02 (0.88) | 16.08 (0.0001) |  | 0.07 (0.79) |  | 6.58 (0.01) |
| Extra-dimensional shift errors | -4.98 (-8.00, -1.96) |  | -5.80 (-8.85, -2.75) |  | 0.05 (0.82) | 24.77 (<.0001) |  | 0.14 (0.71) |  | 11.96 (0.0008) |
| **Stocking of Cambridge** |  |  |  |  |  |  |  |  |  |  |
| Problems solved in minimum moves | 1.69 (1.08, 2.29) |  | 0.31 (0.67, 1.89) |  | 1.44 (0.23) | 46.69 (<.0001) |  | 0.88 (0.35) |  | 8.80 (0.004) |
| Mean moves (5 move problem) | -0.43 (-0.94, 0.09) |  | -0.49 (-0.03, 0.005) |  | 0.86 (0.36) | 6.27 (0.02) |  | 0.003(0.87) |  | 2.03 (0.16) |

Note: FIQ = full-scale intelligent quotient; SWM = spatial working memory; IED = intra-dimension/extra-dimension shift; SOC = stocking of Cambridge; CI = confidence interval; ADHD = attention deficit/hyperactivity disorder.

**Table S4. Correlation matrix of all continuous variables between Time 1 and Time 2.**

|  |  |
| --- | --- |
|  | Pearson Partial Correlation Coefficients,r (p-value) |
| Time 1Time 2 | inattention | HI | FIQ | Psych Com | RT1 | RT5 | RVPh | RVPA | Spatial span | SWMS | SWMbE | IEDcs | IEDedE | SOCps | SOCmm5 |
| inattention | **0.75****(<.0001)** | **0.62****<.0001** | **-0.36****(0.0002)** | **0.29****(0.0002)** | 0.17(0.09) | 0.15(0.15) | **-0.27****(0.006)** | **-0.26****(0.009)** | -0.09(0.35) | **0.29****(0.004)** | **0.38****(0.0001)** | **-0.26****(0.008)** | **0.21****(0.008)** | -0.16(0.11) | 0.17(0.10) |
| HI | **0.51****(<.0001)** | **0.54****<.0001** | **-0.29****(0.0035)** | **0.25****(0.012)** | 0.03(9.75) | 0.08(0.45) | **-0.20****(0.04)** | -0.20(0.05) | -0.11(0.30) | **0.24****(0.02)** | **0.37****(0.0002)** | **-0.31****(0.001)** | **0.28****(0.005)** | **-0.25****(0.01)** | **0.28****(0.005)** |
| Psych Com | **0.58****(<.0001)** | **0.61****(<.0001)** | **-0.26****(0.01)** | **0.20****(0.04)** | 0.08(0.43) | 0.18(0.07) | -0.15(0.13) | -0.15(0.13) | -0.09(0.38) | **0.27****(0.015)** | **0.32****(0.001)** | -0.11(0.26) | 0.11(0.28) | **-0.31****(0.002)** | 0.19(0.06) |
| RT1 | 0.18(0.07) | 0.220.03 | **-0.29****(0.0028)** | 0.14(0.15) | 0.15(0.12) | 0.04(0.70) | -0.16(0.12) | -0.17(0.09) | 0.03(0.79) | 0.18(0.07) | 0.14(0.16) | -0.18(0.08) | 0.15(0.14) | **-0.28****(0.005)** | **0.28****(0.004)** |
| RT5 | **0.25****(0.01)** | **0.32****0.001** | **-0.29****(0.0038)** | **0.09****(0.39)** | **0.27****(0.006)** | 0.07(0.45) | -0.16(0.10) | -0.17(0.08) | -0.03(0.79) | **0.34****(0.004)** | 0.16(0.10) | -0.03(0.75) | -0.01(0.92) | -0.18(0.07) | **0.24****(0.01)** |
| RVPh | **-0.38****(0.0001)** | **-0.26****0.008** | **0.36****(0.0002)** | -0.16(0.11) | -0.15(0.12) | -0.17(0.08) | **0.49****(<.0001)** | **0.46****(<.0001)** | **0.20****(0.04)** | **-0.39****(<.0001)** | **-0.38****(<.0001)** | 0.18(0.06) | -0.20(0.04) | **0.25****(0.01)** | **-0.29****(0.003)** |
| RVPA | **-0.37****(0.0001)** | **-0.26****0.008** | **0.37****(0.0007)** | -0.16(0.10) | -0.15(0.12) | -0.17(0.09) | **0.49****(<.0001)** | **0.46****(<.0001)** | **0.20****(0.04)** | **-0.40****(<0.0001)** | **-0.40****(<.0001)** | 0.19(0.05) | **-0.21****(0.04)** | **0.25****(0.01)** | **-0.30****(0.002)** |
| Spatial span | -**0.26****(0.01)** | -0.100.33 | **0.33****(0.007)** | -0.18(0.06) | -0.11(0.27) | -0.06(0.52) | **0.30****(0.002)** | **0.31****(0.002** | **0.39****(<.0001)** | **-0.25****(0.01)** | **-0.39****(<.0001)** | 0.12(0.25) | -0.11(0.27) | **0.27****(0.006)** | **-0.26****(0.01)** |
| SWMS | 0.15(0.14) | 0.07(0.51) | **-0.28****(0.005)** | 0.05(0.59) | 0.09(0.34) | 0.03(0.72) | **-0.25****(0.01)** | **-0.25****(0.01)** | -0.12(0.23) | **0.55****(<.0001)** | **0.46****(<.0001)** | -0.19(0.05) | 0.18(0.07) | **-0.28****(0.004)** | **0.25****(0.01)** |
| SWMbE | **0.25****(0.01)** | 0.17(0.10) | **-0.27****(0.006)** | 0.06(0.56) | 0.08(0.43) | 0.06(0.57) | **-0.24****(0.02)** | **-0.26****(0.01)** | -0.17(0.09) | **0.42****(<.0001)** | **0.61****(<.0001)** | -0.14(0.15) | 0.18(0.07) | **-0.26****(0.009)** | **0.27****(0.006)** |
| IEDcs | -0.16(0.12) | -0.16(0.12) | 0.15(0.13) | -0.02(0.82) | -0.04(0.71) | 0.10(0.34) | 0.12(0.22) | 0.10(0.33) | 0.03(0.73) | -0.18(0.07) | **0.21****(0.03)** | 0.10(0.33) | -0.07(0.49) | **0.28****(0.004)** | -0.14(0.17) |
| IEDedE | 0.19(0.06) | **0.20****(0.04)** | **-0.34****(0.0005)** | 0.004(0.97) | 0.08(0.44) | -0.03(0.73) | -0.14(0.16) | -0.13(0.20) | -0.08(0.42) | **0.24****(0.02)** | **0.31****(0.002)** | -0.20(0.05) | -0.19(0.06) | **-0.34****(0.0005)** | **0.21****(0.04)** |
| SOCps | -0.05(0.53) | -0.04(0.10) | **0.31****(0.002)** | 0.02(0.85) | -0.24(0.02) | -0.05(0.59) | 0.18(0.07) | 0.18(0.06) | 0.20(0.04) | **-0.31****(0.001)** | **-0.28****(0.004)** | 0.05(0.65) | -0.05(0.61) | **-0.37****(0.0001)** | **-0.25****(0.01)** |
| SOCmm5 | 0.18(0.07) | 0.18(0.07) | **-0.27****(0.0068)** | 0.03(0.73) | 0.13(0.18) | 0.07(0.48) | -0.17(0.08) | -0.18(0.07) | -0.22(0.03) | **0.28****(0.004)** | **0.28****(0.004)** | -0.03(0.76) | -0.003(0.98) | -0.20(0.05) | 0.13(0.19) |

Note: HI = hyperactivity/impulsivity; FIQ = full-scale IQ; Psych Com = psychiatric comorbidity; RT1 = reaction time, simple task; RT5 = reaction time, 5-choice task; RVPh = rapid visual information processing, hit probability; RVPA = rapid visual information processing, signal detectability; SWMS = spatial working memory, strategy utilization; SWMbE = spatial working memory, between errors; IEDcs = Intradimension/extradimension shift, completed stages; IEDedE = Intradimension/extradimension shift, extra-dimensional shift errors; SOCps = Stocking of Cambridge, problem solved in minimal moves; SOCmm5 = mean moves of the 5-move problem.

**Table S5. Group comparison of neuropsychological functions between the ADHD and the control groups**

|  |  |  |
| --- | --- | --- |
| Group comparisons |  | *F*statistics |
|  |  | Model 1 |  | Model 2 |  | Model 3 |  | Model 4 |
|  | Time 1 | Time 2 |  | Time 1 | Time 2 |  | Time 1 | Time 2 |  | Time 1 | Time 2 |
|  |  | F | Adjusted P | F | Adjusted P |  | F | Adjusted P | F | Adjusted P |  | F | Adjusted P | F | Adjusted P |  | F | Adjusted P | F | Adjusted P |
| **Reaction Time** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Simple |  | 3.86 | 0.06 | **5.71a** | **0.026** |  | 3.25 | 0.12 | **5.26a** | 0.33 |  | 2.38 | 0.32 | 1.77 | 0.29 |  | 1.30 | 0.35 | 0.15 | 0.85 |
| 5-choice |  | 3.53 | 0.12 | **13.55c** | **0.002** |  | **6.19a** | **0.03** | **11.50b** | **0.007** |  | 3.10 | 0.13 | **7.53b** | 0.07 |  | **7.11b** | 0.05 | 2.26 | 0.38 |
| **Rapid Visual Information Processing** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Probability of hit |  | **12.24c** | **0.005** | **12.43c** | **0.002** |  | **5.64a** | **0.04** | **8.71b** | **0.02** |  | **4.65a** | 0.10 | **5.56a** | 0.07 |  | 1.66 | 0.35 | **4.64a** | 0.21 |
| A' (Signal detectability) |  | **11.65c** | **0.005** | **12.80c** | **0.002** |  | **6.67a** | **0.03** | **8.52b** | **0.02** |  | **4.47a** | 0.10 | **5.64a** | 0.07 |  | 2.11 | 0.35 | **4.39a** | 0.21 |
| **Spatial Span** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Span length |  | **7.62b** | **0.01** | **9.27b** | **0.006** |  | 2.66 | 0.15 | **6.09a** | 0.06 |  | 3.65 | 0.10 | 3.38 | 0.14 |  | 1.37 | 0.35 | 2.51 | 0.37 |
| **Spatial Working Memory** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Strategy utilization |  | **9.60b** | **0.005** | 1.02 | 0.31 |  | **9.04b** | **0.018** | 0.15 | 0.15 |  | 2.93 | 0.10 | 0.19 | 0.74 |  | 3.25 | 0.27 | 0.30 | 0.82 |
| Between errors |  | **20.64c** | **0.001** | **9.82b** | **0.005** |  | **20.45c** | **0.001** | 2.79 | 0.15 |  | **8.52b** | **0.03** | 3.74 | 0.11 |  | **9.06­b** | 0.04 | 1.00 | 0.56 |
| **Intradimension/ Extradimension Shift** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Completed stages |  | 0.44 | 0.62 | 3.49 | 0.08 |  | 0.05 | 0.88 | 1.06 | 0.37 |  | 0.50 | 0.60 | 1.34 | 0.33 |  | 0.94 | 0.41 | 0.40 | 0.82 |
| Extra-dimensional shift errors |  | 0.66 | 0.59 | **5.71a** | **0.03** |  | 0.02 | 0.88 | 0.70 | 0.45 |  | 0.17 | 0.60 | 1.22 | 0.33 |  | 0.67 | 0.46 | 0.00 | 0.95 |
| **Stocking of Cambridge** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Problems solved in minimum moves |  | **5.25a** | **0.03** | 2.20 | 0.15 |  | 2.02 | 0.19 | 0.40 | 0.53 |  | 0.34 | 0.60 | 0.50 | 0.80 |  | 0.41 | 0.52 | 0.01 | 0.95 |
| Mean moves (5 move problem) |  | **8.52b** | **0.007** | **9.92b** | **0.005** |  | **6.25a** | **0.03** | 2.88 | 0.15 |  | 3.76 | 0.33 | **5.23a** | 0.07 |  | 1.37 | 0.35 | 1.42 | 0.95 |

 Note: Model 1: controlling for age sex; model 2: controlling for age, sex, any psychiatric comorbidity; model 3: controlling for age, sex, FIQ; model 4: controlling for age, sex, FIQ, any psychiatric comorbidity. FIQ = Full-scale intelligence quotient. a raw p < 0.05; b raw p < 0.01; c raw p < 0.001. Adjusted p value is the value adjusted for the false discovery rate (maximum = 0.05) from the raw p value.

**Table S6. Association between changes of neuropsychological functions (NF) and Time 1/Time 2 neuropsychological functions in all subjects**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Time 1 NF** |  | **Time 2 NF** |
| **Change of NF** | r ( p-value) |  | r ( p-value) |
| **Reaction Time** |  |  |  |
| Simple | 0.51 (< 0.0001) |  | -0.76 (< 0.0001) |
| 5-choice | 0.85 (< 0.0001) |  | -0.46 (< 0.0001) |
| **Rapid Visual Information Processing** |  |  |  |
| Probability of hit | -0.56 (< 0.0001) |  | 0.47 (< 0.0001) |
| A' (Signal detectability) | -0.60 (< 0.0001) |  | 0.43 (< 0.0001) |
| **Spatial Span** |  |  |  |
| Span length | -0.57 (< 0.0001) |  | 0.53 (< 0.0001) |
| **Spatial Working Memory** |  |  |  |
| Strategy utilization | -0.38 (< 0.0001) |  | 0.59 (< 0.0001) |
| Between errors | 0.67 (< 0.0001) |  | -0.21 (0.04) |
| **Intradimension/ Extradimension Shift** |  |  |  |
| Completed stages | -0.47 (< 0.0001) |  | 0.44 (< 0.0001) |
| Extra-dimensional shift errors | 0.86 (< 0.0001) |  | -0.35 (0.0003) |
| **Stocking of Cambridge** |  |  |  |
| Problems solved in minimum moves | -0.68 (< 0.0001) |  | 0.47 (< 0.0001) |
| Mean moves (5 move problem) | 0.70 (< 0.0001) |  | -0.64 (< 0.0001) |

This correlation matrix controlled for age, sex, and duration of follow-up.

ADHD = attention deficit/hyperactivity disorder

**Table S6-1. Association between changes of neuropsychological functions (NF) and Time 1/Time 2 neuropsychological functions in all subjects (adjusting for FIQ)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Time 1 NF** |  | **Time 2 NF** |
| **Change of NF** | r ( p-value) |  | r ( p-value) |
| **Reaction Time** |  |  |  |
| Simple | 0.53 (< 0.0001) |  | -0.76 (< 0.0001) |
| 5-choice | 0.85 (< 0.0001) |  | -0.43 (< 0.0001) |
| **Rapid Visual Information Processing** |  |  |  |
| Probability of hit | -0.57 (< 0.0001) |  | 0.49 (< 0.0001) |
| A' (Signal detectability) | -0.62 (< 0.0001) |  | 0.46 (< 0.0001) |
| **Spatial Span** |  |  |  |
| Span length | -0.61 (< 0.0001) |  | 0.49 (< 0.0001) |
| **Spatial Working Memory** |  |  |  |
| Strategy utilization | -0.39 (< 0.0001) |  | -0.60 (< 0.0001) |
| Between errors | 0.65 (< 0.0001) |  | -0.18 (0.008) |
| **Intradimension/ Extradimension Shift** |  |  |  |
| Completed stages | -0.49 (< 0.0001) |  | 0.44 (< 0.0001) |
| Extra-dimensional shift errors | 0.86 (< 0.0001) |  | -0.40 (< 0.0001) |
| **Stocking of Cambridge** |  |  |  |
| Problems solved in minimum moves | -0.68 (< 0.0001) |  | 0.53 (< 0.0001) |
| Mean moves (5 move problem) | 0.73 (< 0.0001) |  | -0.69 (< 0.0001) |

This correlation matrix controlled for Time 1 age, sex, duration of follow-up and full-scale IQ. FIQ had no significant influences on the results. Psychiatric comorbidities did not affect the results, either. FIQ=full-scale intelligent quotient

**Table S7. Association between changes of neuropsychological functions (NF) and Time 1/Time 2 neuropsychological functions in ADHD**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Time 1 NF** |  | **Time 2 NF** |
| **Change of NF** | r ( p-value) |  | r ( p-value) |
| **Reaction Time** |  |  |  |
| Simple | 0.46 (0.001) |  | -0.90 (< 0.0001) |
| 5-choice | 0.91 (< 0.0001) |  | -0.53 (0.0002) |
| **Rapid Visual Information Processing** |  |  |  |
| Probability of hit | -0.57 (< 0.0001) |  | 0.37 (0.01) |
| A' (Signal detectability) | -0.58 (< 0.0001) |  | 0.35 (0.02) |
| **Spatial Span** |  |  |  |
| Span length | -0.48 ( 0.0003) |  | 0.65 (< 0.0001) |
| **Spatial Working Memory** |  |  |  |
| Strategy utilization | 0.15 (0.32) |  | -0.70 (< 0.0001) |
| Between errors | 0.55 (< 0.0001) |  | -0.31 (0.03) |
| **Intradimension/ Extradimension Shift** |  |  |  |
| Completed stages | -0.85 (< 0.0001) |  | 0.51 (0.003) |
| Extra-dimensional shift errors | 0.83 (< 0.0001) |  | -0.45 (0.002) |
| **Stocking of Cambridge** |  |  |  |
| Problems solved in minimum moves | -0.67 (< 0.0001) |  | 0.47 ( 0.001) |
| Mean moves (5 move problem) | 0.69 (< 0.0001) |  | -0.65(< 0.0001) |

This correlation matrix controlled for Time 1 age, sex and duration of follow-up.

**Table S7-1. Association between changes of neuropsychological functions (NF) and Time 1/Time 2 neuropsychological functions in ADHD (adjusting for FIQ)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Time 1 NF** |  | **Time 2 NF** |
| **Change of NF** | r ( p-value) |  | r ( p-value) |
| **Reaction Time** |  |  |  |
| Simple | 0.45 (0.002) |  | -0.89 (< 0.0001) |
| 5-choice | 0.90 (< 0.0001) |  | -0.64 (< 0.0001) |
| **Rapid Visual Information Processing** |  |  |  |
| Probability of hit | -0.54 (< 0.0001) |  | 0.40 (0.006) |
| A' (Signal detectability) | -0.57 (< 0.0001) |  | 0.38 (0.009) |
| **Spatial Span** |  |  |  |
| Span length | -0.50 ( 0.0005) |  | 0.55 (< 0.0001) |
| **Spatial Working Memory** |  |  |  |
| Strategy utilization | 0.23 (0.13) |  | -0.71 (< 0.0001) |
| Between errors | 0.53 (<0.0002) |  | -0.37 (0.01) |
| **Intradimension/ Extradimension Shift** |  |  |  |
| Completed stages | -0.39 ( 0.007) |  | 0.53 (0.0002) |
| Extra-dimensional shift errors | 0.81 (< 0.0001) |  | -0.50 (0.0005) |
| **Stocking of Cambridge** |  |  |  |
| Problems solved in minimum moves | -0.67 (< 0.0001) |  | 0.56 ( <0.0001) |
| Mean moves (5 move problem) | 0.72 (< 0.0001) |  | -0.73 (< 0.0001) |

This correlation matrix controlled for Time 1 age, sex, duration of follow-up and FIQ. FIQ had no significant influences on the results. Psychiatric comorbidities did not affect the results, either. ADHD = attention-deficit/hyperactivity disorder

**Table S8. Association between changes of neuropsychological functions and changes of ADHD symptom count in all subjects**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | ADHD symptoms |  | Inattention  |  | Hyperactivity/Impulsivity |
| Estimate (SE) | F value |  | Estimate (SE) | F value |  | Estimate (SE) | F value |
| **Reaction Time** |  |  |  |  |  |  |  |  |
| Simple | 0.004 (0.005) | 0.62 |  | 0.003 (0.003) | 1.82 |  | 0.0002(0.003) | 0.01 |
| 5-choice | 0.003 (0.005) | 0.45 |  | -0.001 (0.003) | 0.10 |  | 0.004 (0.003) | 2.14 |
| **Rapid Visual Information Processing** |  |  |  |  |  |  |  |  |
| Probability of hit | 0.42 (2.49) | 0.03 |  | 1.64 (1.36) | 1.47 |  | -1.22 (1.43) | 0.72 |
| A' (Signal detectability) | 5.33 (9.21) | 0.33 |  | 7.98 (5.00) | 2.55 |  | -2.64 (5.33) | 0.25 |
| **Spatial Span** |  |  |  |  |  |  |  |  |
| Span length | 0.02 (0.32) | 0.07 |  | -0.01 (0.18) | 0.01 |  | 0.03 (0.19) | 0.03 |
| **Spatial Working Memory** |  |  |  |  |  |  |  |  |
| Strategy utilization | -0.03 (0.09) | 0.13 |  | -0.02 (0.05) | 0.09 |  | -0.02 (0.05) | 0.12 |
| Between errors | -0.03 (0.04) | 0.50 |  | -0.03 (0.02) | 2.17 |  | 0.004 (0.02) | 0.03 |
| **Intradimension/ Extradimension Shift** |  |  |  |  |  |  |  |  |
| Completed stages | -0.09 (0.48) | 0.03 |  | 0.05 (0.26) | 0.04 |  | -0.14 (0.27) | 0.26 |
| Extra-dimensional shift errors | -0.01 (0.04) | 0.08 |  | -0.02 (0.02) | 0.70 |  | 0.01 (0.02) | 0.10 |
| **Stocking of Cambridge** |  |  |  |  |  |  |  |  |
| Problems solved in minimum moves | 0.33 (0.19) | 2.91 |  | 0.26 (0.10) | 6.44a |  | 0.07 (0.11) | 0.33 |
| Mean moves (5 move problem) | -0.06 (0.23) | 0.07 |  | -0.13 (0.13) | 1.13 |  | 0.07 (0.13) | 0.29 |

Note: Adjusting for Time 1 age, sex and duration of follow-up. a p < 0.05. ADHD = attention deficit/hyperactivity disorder

**Table S8-1. Association between changes of neuropsychological functions and changes of ADHD symptom count in all subjects (adjusting for Time 1 FIQ)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | ADHD symptoms |  | Inattention  |  | Hyperactivity/Impulsivity |
| Estimate (SE) | F value |  | Estimate (SE) | F value |  | Estimate (SE) | F value |
| **Reaction Time** |  |  |  |  |  |  |  |  |
| Simple | 0.004 (0.005) | 0.83 |  | 0.004 (0.002) | 2.73 |  | 0.0001 (0.003) | 0.00 |
| 5-choice | 0.005 (0.005) | 0.79 |  | 0.0001 (0.003) | 0.07 |  | 0.004 (0.003) | 1.75 |
| **Rapid Visual Information Processing** |  |  |  |  |  |  |  |  |
| Probability of hit | 0.44 (2.47) | 0.03 |  | 1.15 (1.33) | 0.74 |  | -0.70 (1.40) | 0.25 |
| A' (Signal detectability) | 3.54 (9.12) | 0.15 |  | 5.32 (4.92) | 1.17 |  | -1.79 (5.19) | 0.12 |
| **Spatial Span** |  |  |  |  |  |  |  |  |
| Span length | -0.15 (0.33) | 0.22 |  | -0.10 (0.18) | 0.34 |  | -0.05 (0.19) | 0.07 |
| **Spatial Working Memory** |  |  |  |  |  |  |  |  |
| Strategy utilization | -0.13 (0.09) | 1.98 |  | -0.06 (0.05) | 1.70 |  | -0.06 (0.05) | 1.48 |
| Between errors | -0.01 (0.04) | 0.05 |  | -0.02 (0.02) | 0.91 |  | 0.01 (0.02) | 0.28 |
| **Intradimension/ Extradimension Shift** |  |  |  |  |  |  |  |  |
| Completed stages | -0.43 (0.48) | 0.80 |  | -0.13 (0.26) | 0.24 |  | -0.11 (0.27) | 1.24 |
| Extra-dimensional shift errors | 0.01 (0.04) | 0.09 |  | 0.003 (0.02) | 0.02 |  | 0.01 (0.02) | 0.17 |
| **Stocking of Cambridge** |  |  |  |  |  |  |  |  |
| Problems solved in minimum moves | -0.02 (0.19) | 0.01 |  | -0.06 (0.05) | 1.70 |  | -0.07 (0.11) | 0.45 |
| Mean moves (5 move problem) | 0.19 (0.23) | 0.71 |  | -0.19 (0.02) | 0.91 |  | 0.19 (0.13) | 2.20 |

Note: Adjusting for Time 1 age, sex, duration of follow-up and full-scale IQ. FIQ had no significant influences on the results. Psychiatric comorbidities did not affect the results, either. ADHD = attention-deficit/hyperactivity disorder

**Table S9. Association between changes of neuropsychological functions and changes of ADHD symptom counts in the ADHD group**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | ADHD symptoms |  | Inattention  |  | Hyperactivity/Impulsivity |
| Estimate (SE) | F value |  | Estimate (SE) | F value |  | Estimate (SE) | F value |
| **Reaction Time** |  |  |  |  |  |  |  |  |
| Simple | 0.001 (0.007) | 0.04 |  | 0.003 (0.004) | 0.68 |  | -0.002 (0.004) | 0.21 |
| 5-choice | -0.001 (0.007) | 0.03 |  | -0.002 (0.005) | 0.11 |  | 0.0002 (0.005) | 0.00 |
| **Rapid Visual Information Processing** |  |  |  |  |  |  |  |  |
| Probability of hit |  |  |  |  |  |  |  |  |
| A' (Signal detectability) | 9.50 (17.49) | 0.29 |  | 12.78 (9.93) | 1.66 |  | -3.27 (10.29) | 0.10 |
| **Spatial Span** |  |  |  |  |  |  |  |  |
| Span length | 0.002 (0.52) | 0.00 |  | -0.14 (0.30) | 0.23 |  | 0.14 (0.30) | 0.23 |
| **Spatial Working Memory** |  |  |  |  |  |  |  |  |
| Strategy utilization | 0.10 (0.18) | 0.30 |  | 0.09 (0.10) | 0.82 |  | 0.006 (0.11) | 0.00 |
| Between errors | 0.05 (0.06) | 0.54 |  | 0.01 (0.04) | 0.12 |  | 0.04 (0.04) | 0.83 |
| **Intradimension/ Extradimension Shift** |  |  |  |  |  |  |  |  |
| Completed stages | -0.44 (0.78) | 0.31 |  | -0.07 (0.45) | 0.02 |  | -0.37 (0.46) | 0.64 |
| Extra-dimensional shift errors | 0.02 (0.06) | 0.12 |  | -0.005 (0.04) | 0.02 |  | 0.03 (0.04) | 0.55 |
| **Stocking of Cambridge** |  |  |  |  |  |  |  |  |
| Problems solved in minimum moves | 0.32 (0.30) | 1.08 |  | 0.24 (0.17) | 1.84 |  | 8.20 (8.20) | 1.20 |
| Mean moves (5 move problem) | -1.22 (0.37) | 0.11 |  | -0.12 (0.21) | 0.35 |  | 0.002 (0.13) | 0.00 |

Note: Adjusting for Time 1 age, sex and duration of follow-up. ADHD = attention deficit/hyperactivity disorder

**Table S9-1. Association between changes of neuropsychological functions and changes of ADHD symptom count in ADHD (adjusting for Time 1 FIQ)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | ADHD symptoms |  | Inattention  |  | Hyperactivity/Impulsivity |
| Estimate (SE) | F value |  | Estimate (SE) | F value |  | Estimate (SE) | F value |
| **Reaction Time** |  |  |  |  |  |  |  |  |
| Simple | 0.002 (0.005) | 0.15 |  | 0.003 (0.004) | 0.99 |  | -0.001 (0.003) | 0.07 |
| 5-choice | 0.002 (0.005) | 0.19 |  | -0.001 (0.003) | 0.29 |  | 0.004 (0.003) | 1.57 |
| **Rapid Visual Information Processing** |  |  |  |  |  |  |  |  |
| Probability of hit | 0.40 (2.44) | 0.03 |  | 1.67 (1.32) | 1.59 |  | -1.26 (1.42) | 0.79 |
| A' (Signal detectability) | 4.45 (9.02) | 0.24 |  | 7.65 (4.86) | 2.48 |  | -3.20 ( 5.27) | 0.37 |
| **Spatial Span** |  |  |  |  |  |  |  |  |
| Span length | 0.01 (0.33) | 0.13 |  | -0.005 (0.18) | 0.00 |  | 0.12 (0.19) | 0.42 |
| **Spatial Working Memory** |  |  |  |  |  |  |  |  |
| Strategy utilization | -0.08 (0.09) | 0.73 |  | -0.03 (0.05) | 0.39 |  | -0.05 (0.05) | 0.77 |
| Between errors | -0.02 (0.04) | 0.42 |  | -0.03 (0.02) | 1.96 |  | 0.004 (0.02) | 0.03 |
| **Intradimension/ Extradimension Shift** |  |  |  |  |  |  |  |  |
| Completed stages | -0.02 (0.48) | 0.24 |  | 0.02 (0.26) | 0.00 |  | -0.25 (0.28) | 0.83 |
| Extra-dimensional shift errors | -0.01 (0.04) | 0.04 |  | -0.002 (0.02) | 0.60 |  | 0.01 (0.02) | 0.15 |
| **Stocking of Cambridge** |  |  |  |  |  |  |  |  |
| Problems solved in minimum moves | 0.18 (0.20) | 0.78 |  | 0.18 (0.11) | 2.64 |  | 0.001 (0.12) | 0.01 |
| Mean moves (5 move problem) | 0.01 (0.23) | 0.00 |  | -0.10 (0.12) | 0.66 |  | 0.11 (0.13) | 0.67 |

Note: Adjusting for Time 1 age, sex, duration of follow-up and full-scale IQ. FIQ has no significant effect on changes of ADHD symptoms. Psychiatric comorbidities did not affect the results, either. ADHD = attention-deficit/hyperactivity disorder.

**Table S10. Effect of Time 1 neuropsychological functions on Time 2 ADHD symptom count in the ADHD group**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Overall ADHD symptoms |  | Inattention  |  | Hyperactivity/Impulsivity |
| Estimate (SE) | F value | Adjusted P |  | Estimate (SE) | F value | Adjusted P |  | Estimate (SE) | F value | Adjusted P |
| **Reaction Time** |  |  |  |  |  |  |  |  |  |  |  |
| Simple | 0.02 (0.01) | 2.36 | 0.23 |  | 0.02 (0.01) | 5.34a | 0.13 |  | 0.002 (0.007)  | 0.05 | 0.91 |
| 5-choice | 0.006 (0.006) | 0.85 | 0.40 |  | 0.003 (0.004) | 0.48 | 0.68 |  | 0.003 (0.004) | 0.58 | 0.55 |
| **Rapid Visual Information Processing** |  |  |  |  |  |  |  |  |  |  |  |
| Probability of hit | -3.82 (3.40) | 1.26 | 0.33 |  | -2.00 (2.14) | 0.88 | 0.46 |  | -1.65 (1.88) | 0.77 | 0.53 |
| A' (Signal detectability) | -14.53 (12.69) | 1.31 | 0.33 |  | -7.35 (8.01) | 0.84 | 0.46 |  | -6.56 (7.01) | 0.88 | 0.53 |
| **Spatial Span** |  |  |  |  |  |  |  |  |  |  |  |
| Span length | 0.12 (0.52) | 0.06 | 0.81 |  | 0.15 (0.31) | 0.23 | 0.72 |  | -0.001 (0.29) | 0.00 | 1.00. |
| **Spatial Working Memory** |  |  |  |  |  |  |  |  |  |  |  |
| Strategy utilization | 0.26 (0.15) | 2.84 | 0.23 |  | 0.14 (0.09) | 2.43 | 0.27 |  | 0.11 (0.08) | 1.85 | 0.33 |
| Between Errors | **0.10 (0.04)** | **6.16a** | 0.06 |  | 0.05 (0.02) | 3.74 | 0.25 |  | **0.05 (0.02)** | **5.10a** | 0.09 |
| **Intradimension/ Extradimension Shift** |  |  |  |  |  |  |  |  |  |  |  |
| Completed stages | **-2.35 (0.71)** | **11.08b** | **0.020** |  | **-1.04 (0.44)** | **5.50a** | 0.13 |  | **-1.29 (0.39)** | **11.23b** | **0.02** |
| Extra-dimensional shift errors | **0.15 (0.06)** | **6.75a** | 0.06 |  | 0.06 (0.04) | 2.49 | 0.27 |  | **0.09 (0.03)** | **8.65a** | **0.03** |
| **Stocking of Cambridge** |  |  |  |  |  |  |  |  |  |  |  |
| Problems solved in minimum moves | -0.39 (0.26) | 2.17 | 0.23 |  | -0.10 (0.16) | 0.37 | 0.68 |  | **-0.29 (0.14)** | **4.38a** | 0.09 |
| Mean moves (5 move problem) | 0.63 (0.40) | 2.46 | 0.23 |  | 0.17 (0.24) | 0.47 | 0.68 |  | **0.48 (0.21)** | **4.98a** | 0.09 |

 **Note:** \*This analysis adjusted for Time 1 age, sex, Time1 symptom count and duration of follow-up. SE = standard error.

araw p < 0.05; braw p < 0.01.

Adjusted p-value is the value adjusted for the false discovery rate (maximum = 0.05) from the raw p-value.

**Table S10-1. Effect of Time 1 Neuropsychological Functions on Time 2 ADHD Symptom count in ADHD (adjusting for Time 1 current psychiatric comorbidity)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Overall ADHD symptoms |  | Inattention  |  | Hyperactivity/Impulsivity |
| Estimate (SE) | F value | Adjusted P |  | Estimate (SE) | F value | Adjusted P |  | Estimate (SE) | F value | Adjusted P |
| **Reaction Time** |  |  |  |  |  |  |  |  |  |  |  |
| Simple | 0.02 (0.01) | 2.57 | 0.25 |  | 0.02 (0.007) | 5.53a | 0.13 |  | 0.002 (0.007)  | 0.07 | 0.77 |
| 5-choice | 0.005 (0.007) | 0.52 | 0.52 |  | 0.002 (0.004) | 0.22 | 0.84 |  | 0.002 (0.004) | 0.38 | 0.66 |
| **Rapid Visual Information Processing** |  |  |  |  |  |  |  |  |  |  |  |
| Probability of hit | -4.55 (3.47) | 1.72 | 0.25 |  | -2.32 (2.17) | 1.15 | 0.49 |  | -2.05 (1.95) | 1.11 | 0.41 |
| A' (Signal detectability) | -16.63 (12.85) | 1.67 | 0.25 |  | -8.22 (8.09) | 1.03 | 0.49 |  | -7.76 (7.18) | 1.17 | 0.41 |
| **Spatial Span** |  |  |  |  |  |  |  |  |  |  |  |
| Span length | 0.05 (0.53) | 0.01 | 0.93 |  | 0.11 (0.31) | 0.66 | 0.58 |  | -0.04 (0.29) | 0.02 | 0.90 |
| **Spatial Working Memory** |  |  |  |  |  |  |  |  |  |  |  |
| Strategy utilization | 0.25 (0.15) | 2.76 | 0.25 |  | 0.14 (0.09) | 2.37 | 0.29 |  | 0.11 (0.08) | 1.75 | 0.35 |
| Between Errors | **0.09 (0.04)** | **5.58a** | 0.08 |  | 0.04 (0.02) | 3.28 | 0.24 |  | **0.05 (0.02)** | **4.68a** | 0.11 |
| **Intradimension/ Extradimension Shift** |  |  |  |  |  |  |  |  |  |  |  |
| Completed stages | **-2.47 (0.70)** | **-12.28b** | **0.01** |  | **-1.11 (0.45)** | **6.11a** | 0.13 |  | **-1.18 (0.39)** | **12.24b** | **0.01** |
| Extra-dimensional shift errors | **0.16 (0.06)** | **8.05b** | **0.04** |  | 0.06 (0.04) | 3.04 | 0.24 |  | **0.10 (0.03)** | **10.01b** | **0.02** |
| **Stocking of Cambridge** |  |  |  |  |  |  |  |  |  |  |  |
| Problems solved in minimum moves | -0.37 (0.27) | 1.88 | 0.25 |  | -0.08 (0.16) | 0.27 | 0.72 |  | **-0.29 (0.14)** | **4.04a** | 0.11 |
| Mean moves (5 move problem) | 0.57 (0.42) | 1.85 | 0.25 |  | 0.11 (0.25) | 0.21 | 0.72 |  | **0.48 (0.23)** | **4.48a** | 0.11 |

Note: This analysis adjusted for Time 1 age, sex, Time 1 ADHD symptoms, duration of follow-up and Time 1 any psychiatric comorbidity. a rawp < 0.05; b raw p < 0.01. ADHD = attention-deficit/hyperactivity disorder.

Adjusted p-value is the value adjusted for the false discovery rate (maximum = 0.05) from the raw p-value.

**Table S10-2. Effect of Time 1 Neuropsychological Functions on Time 2 ADHD Symptom count in ADHD (adjusting for Time 1 FIQ)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Overall ADHD symptoms |  | Inattention  |  | Hyperactivity/Impulsivity |
| Estimate (SE) | F value | Adjusted P |  | Estimate (SE) | F value | Adjusted P |  | Estimate (SE) | F value | Adjusted P |
| **Reaction Time** |  |  |  |  |  |  |  |  |  |  |  |
| Simple | 0.02 (0.01) | 2.15 | 0.24 |  | 0.02 (0.01) | 5.10a | 0.14 |  | 0.002 (0.007)  | 0.04 | 0.86 |
| 5-choice | 0.006 (0.007) | 0.86 | 0.40 |  | 0.003 (0.004) | 0.38 | 0.60 |  | 0.004 (0.004) | 0.86 | 0.51 |
| **Rapid Visual Information Processing** |  |  |  |  |  |  |  |  |  |  |  |
| Probability of hit | -3.83 (3.68) | 1.08 | 0.37 |  | -2.15 (2.29) | 0.88 | 0.59 |  | -1.64 (2.01) | 0.66 | 0.51 |
| A' (Signal detectability) | -14.69 (13.87) | 1.12 | 0.37 |  | -7.79 (8.69) | 0.80 | 0.59 |  | -6.73 (7.52) | 0.80 | 0.51 |
| **Spatial Span** |  |  |  |  |  |  |  |  |  |  |  |
| Span length | 0.11 (0.55) | 0.04 | 0.84 |  | 0.08 (0.32) | 0.06 | 0.80 |  | 0.05 (0.30) | 0.03 | 0.86 |
| **Spatial Working Memory** |  |  |  |  |  |  |  |  |  |  |  |
| Strategy utilization | 0.34 (0.18) | 3.36 | 0.20 |  | 0.22 (0.11) | **4.14a** | 0.13 |  | 0.12 (0.10) | 1.36 | 0.46 |
| Between Errors | **0.11 (0.04)** | **6.63a** | 0.06 |  | 0.05 (0.03) | **4.53a** | 0.13 |  | **0.05 (0.02)** | **5.26a** | 0.07 |
| **Intradimension/ Extradimension Shift** |  |  |  |  |  |  |  |  |  |  |  |
| Completed stages | **-2.44 (0.76)** | **10.35b** | **0.03** |  | **-1.03 (0.47)** | **4.80a** | 0.13 |  | **-1.40 (0.40)** | **12.05b** | **0.01** |
| Extra-dimensional shift errors | **0.15 (0.06)** | **6.29a** | 0.06 |  | 0.06 (0.04) | 2.39 | 0.29 |  | **0.09 (0.03)** | **8.52b** | **0.03** |
| **Stocking of Cambridge** |  |  |  |  |  |  |  |  |  |  |  |
| Problems solved in minimum moves | -0.46 (0.30) | 2.32 | 0.24 |  | -0.12 (0.18) | 0.44 | 0.60 |  | **-0.35 (0.16)** | **4.72a** | 0.08 |
| Mean moves (5 move problem) | 0.76 (0.45) | 2.85 | 0.22 |  | 0.17 (0.27) | 0.40 | 0.60 |  | **0.61 (0.23)** | **6.73a** | **0.05** |

Note: This analysis adjusted for Time 1 age, sex, Time 1 ADHD symptoms, duration of follow-up and Time 1 FIQ. araw p < 0.05; b raw p < 0.01. ADHD = attention-deficit/hyperactivity disorder. FIQ = full-scale IQ. Adjusted p-value is the value adjusted for the false discovery rate (maximum = 0.05) from the raw p-value.