Supplementary Information

Genetic and phenotypic evidence of the predictive validity of preschool parent reports of hyperactivity/impulsivity and inattention

**Appendix M1. Supplementary Methods**

|  |  |  |  |  |  |  |  |  |  |  |  |
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| **Table M1.** Fisher Z tests of the comparison between the correlations for hyperactivity/impulsivity and inattention at adjacent time-points. | | | | | | | | | | | |
| Age | 1.5 | 2.5 | 4 | 5 | 6 | 7 | 9 | 10 | 12 | 14 | 15 |
| 2.5 | **4.36\*\*\*** |  |  |  |  |  |  |  |  |  |  |
| 4 | **3.93\*\*\*** | **4.16\*\*\*** |  |  |  |  |  |  |  |  |  |
| 5 | **4.53\*\*\*** | **5.24\*\*\*** | **4.00\*\*\*** |  |  |  |  |  |  |  |  |
| 6 | 1.00 | **2.06\*** | **2.43\*** | 0.49 |  |  |  |  |  |  |  |
| 7 | 1.71 | 1.83 | 1.45 | 1.55 | **2.11\*** |  |  |  |  |  |  |
| 9 | **2.76\*\*** | 1.92 | 1.33 | 0.50 | **2.47\*\*** | 1.14 |  |  |  |  |  |
| 10 | 0.85 | 0.66 | 0.14 | -0.78 | 0.30 | 0.97 | 0.56 |  |  |  |  |
| 12 | 1.33 | **2.77\*\*** | 1.27 | 0.70 | -0.07 | -0.02 | -0.52 | 0.97 |  |  |  |
| 14 | **2.99\*\*** | **2.55\*\*** | 1.73 | 0.57 | -0.58 | -1.37 | -0.58 | -0.39 | **-2.90\*\*** |  |  |
| 15 | **2.36\*** | **2.82\*\*** | 0.90 | 0.33 | -0.26 | -0.35 | 0.65 | 0 | -0.60 | -1.10 |  |
| 17 | 1.18 | -0.06 | 0.47 | -1.56 | -0.91 | -1.00 | 0.33 | -0.46 | -0.62 | -0.10 | -0.10 |

*Note***.** \* = *p* < .05; \*\* p < .01; \*\*\* *p* < .001.

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| **Appendix S2. Supplementary Results**  **Table S1.** *T*-tests of mean differences and Levene tests of variance equality for sex and zygosity. | | | | | | | | | | | | |
|  | Hyperactivity/Impulsivity | | | | | | Inattention | | | | | |
| Age | Sex | | | Zygosity | | | Sex | | | Zygosity | | |
|  | *t* | *df* | *F* | *t* | *df* | *F* | *t* | *df* | *F* | *t* | *df* | *F* |
| 1.5 | 3.58\*\*\* | 1129 | 2.37 | .93 | 1053.08 | 13.32\*\*\* | 1.59 | 1112 | 2.30 | 0.79 | 1104 | 2.29 |
| 2.5 | 4.77\*\*\* | 1059 | 1.21 | .04 | 986.81 | 7.22\*\* | 4.04\*\*\* | 1043 | 0.23 | 0.02 | 1039 | 0.12 |
| 4 | 4.73\*\*\* | 909 | 0.07 | .42 | 856.54 | 8.26\*\* | 3.07\*\* | 910 | 0.63 | 1.59 | 906 | 3.77 |
| 5 | 4.86\*\*\* | 935 | 0.03 | 1.21 | 929 | 0.99 | 5.31\*\*\* | 935 | 0.04 | 1.28 | 887.26 | 6.38\* |
| 6 | 7.52\*\*\* | 724.15 | 45.60\*\*\* | -2.31\* | 783 | 3.78 | 6.51\*\*\* | 764.70 | 8.28\*\* | -1.44 | 782 | 0 |
| 7 | 7.49\*\*\* | 786.81 | 41.54\*\*\* | -3.03\*\*\* | 803.16 | 8.97\*\* | 6.42\*\*\* | 836 | 2.09 | -2.15 | 836 | 1.07 |
| 9 | 8.36\*\*\* | 674.69 | 70.12\*\*\* | -1.42 | 752 | 0.23 | 6.51\*\*\* | 731.61 | 10.89\*\* | -0.92 | 752 | 0.25 |
| 10 | 8.37\*\*\* | 713.89 | 59.02\*\*\* | -2.59 | 771 | 3.18 | 6.80\*\*\* | 766.07 | 7.37\*\* | 0.16 | 771 | 1.11 |
| 12 | 6.63\*\*\* | 537.66 | 47.72\*\*\* | -1.42 | 622 | 1.21 | 5.61\*\*\* | 589.47 | 4.40\* | -0.49 | 621 | 2.37 |
| 14 | 6.66\*\*\* | 785.61 | 19.64\*\*\* | -.30 | 796 | 0.48 | 8.06\*\*\* | 815 | 0.36 | -0.22 | 796 | 0.04 |
| 15 | 2.97\*\*\* | 736.10 | 4.52\* | -.91 | 690.08 | 5.15\* | 5.61\*\*\* | 741.93 | 9.27\*\* | -0.25 | 761 | 1.04 |
| 17 | 2.85\*\*\* | 767.17 | 12.37\*\*\* | -2.17\* | 763.39 | 13.43\*\*\* | 5.21\*\*\* | 785.76 | 12.25\*\*\* | -3.74\*\*\* | 769.61 | 20.45\*\*\* |

*Note***.**

\* = *p* < .05; \*\* p < .01; \*\*\* *p* < .001.

**Table S2.** Trajectory analyses parameters for hyperactivity/impulsivity (left panel) and inattention (right panel).

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Hyperactivity/impulsivity** | | | | | | **Inattention** | | | | | |
| **N** | **πj** | ***Pj*** | **AvePP** | **OCC** | **|π-P|** | **N** | **πj** | ***Pj*** | **AvePP** | **OCC** | **|π-P|** |
| **2-Trajs** | | | | | | | | | | | | |
| **AIC** | -4948.93 | | | | | | -6240.32 | | | | | |
| **BIC** | -4968.35 | | | | | | -6259.76 | | | | | |
| **Group1** | 607 | .64 | .63 | .95 | 11.30 | .0 | 500 | .53 | .52 | .95 | 15.05 | .01 |
| **Group2** | 350 | .36 | .37 | .91 | 17.53 | .0 | 454 | .47 | .48 | .92 | 13.31 | .01 |
| **3-Trajs** | | | | | | | | | | | | |
| **AIC** | -4793.7 | | | | | | -6101.88 | | | | | |
| **BIC** | -4827.74 | | | | | | -6135.91 | | | | | |
| **Group1** | 492 | .51 | .51 | .92 | 11.48 | .01 | 357 | .38 | .37 | .90 | 14.43 | .0 |
| **Group2** | 377 | .39 | .39 | .87 | 10.01 | 0 | 439 | .45 | .46 | .85 | 7.02 | .01 |
| **Group3** | 88 | .10 | .09 | .90 | 75.52 | .01 | 158 | .17 | .17 | .88 | 33.63 | .01 |
| **4-Trajs** | | | | | | | | | | | | |
| **AIC** | -4740.17 | | | | | | -6081.69 | | | | | |
| **BIC** | -4786.38 | | | | | | -6120.58 | | | | | |
| **Group1** | 156 | .13 | .16 | .78 | 22.45 | .03 | 120 | .13 | .13 | .77 | 22.20 | .01 |
| **Group2** | 420 | .47 | .44 | .90 | 10.44 | .03 | 353 | .36 | .37 | .78 | 6.27 | .01 |
| **Group3** | 310 | .32 | .32 | .85 | 11.80 | .01 | 347 | .36 | .36 | .81 | 7.70 | 0 |
| **Group4** | 71 | .12 | .07 | .91 | 74.20 | .04 | 134 | .15 | .14 | .86 | 35.50 | .01 |
| **5-trajs** | | | | | | | | | | | | |
| **AIC** | -4726.38 | | | | | | -6061.72 | | | | | |
| **BIC** | -4782.32 | | | | | | -6110.33 | | | | | |
| **Group1** | 157 | .14 | .16 | .78 | 22.14 | .03 | 105 | .12 | .11 | .78 | 25.19 | .01 |
| **Group2** | 153 | .20 | .16 | .71 | 9.84 | .04 | 349 | .33 | .37 | .75 | 6.10 | .03 |
| **Group3** | 289 | .30 | .30 | .70 | 5.46 | 0 | 278 | .28 | .29 | .76 | 7.75 | .01 |
| **Group4** | 287 | .29 | .30 | .82 | 11.27 | .01 | 78 | .10 | .08 | .68 | 17.77 | .03 |
| **Group5** | 71 | .08 | .07 | .90 | 107.59 | .01 | 144 | .15 | .15 | .86 | 34.18 | 0 |
| **6-Trajs** | | | | | | | | | | | | |
| **AIC** | -4700.28 | | | | | | -6045.95 | | | | | |
| **BIC** | -4765.94 | | | | | | -6101.84 | | | | | |
| **Group1** | 158 | .14 | .17 | .77 | 21.26 | .03 | 105 | .12 | .110 | .78 | 25.07 | .01 |
| **Group2** | 313 | .34 | .33 | .81 | 8.64 | .01 | 103 | .14 | .108 | .70 | 13.87 | .03 |
| **Group3** | 101 | .13 | .11 | .67 | 14.26 | .02 | 345 | .32 | .362 | .74 | 5.94 | .04 |
| **Group4** | 208 | .22 | .27 | .71 | 8.62 | 0 | 230 | .23 | .241 | .71 | 7.97 | .01 |
| **Group5** | 149 | .15 | .16 | .79 | 21.54 | .01 | 75 | .08 | .079 | .71 | 28.28 | 0 |
| **Group6** | 28 | .03 | .03 | .91 | 270.78 | .01 | 96 | .10 | .10 | .79 | 33.48 | 0 |

*Note*. πj=Population size of trajectory group j estimated by the model; Pj=Actual proportion of individuals   
assigned to group j; AvePP=Average Posterior Probability; OCC=Odds of Correct Classification;   
|π-P|=Difference between π and P.

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| **Table S3.** Standardized parameter estimates of additive genetic (A) and nonshared environment (E) factors from the full Cholesky decomposition for HI (top) and IN (bottom) from ages 6 to 17 years. Significant parameters are highlighted in bold. | | | | | | | | | |
| A parameter for Hyperactivity, Impulsivity | | | | | | | | | |
| Age | 6 | 7 | 9 | 10 | 12 | 14 | 15 | 17 | Total A |
| 6 | **.53 [.44, .63]** |  |  |  |  |  |  |  | .70 |
| 7 | **.37 [.25, .49]** | **.13 [.02, .24]** |  |  |  |  |  |  | .65 |
| 9 | **.25 [.16, .35]** | **.23 [.03, .42]** | .13 [-.05, .31] |  |  |  |  |  | .70 |
| 10 | **.16 [.07, .26]** | .11 [-.04, .26] | .04 [-.07, .14] | **.20 [.11, .29]** |  |  |  |  | .57 |
| 12 | **.22 [.10, .34]** | .01 [-.05, .07] | .08 [-.12, .28] | .04 [-.06, .14] | .08 [-.13, .30] |  |  |  | .51 |
| 14 | **.07 [.01, .13]** | .01 [-.03, .04] | .10 [-.12, .33] | .01 [-.03, .05] | .01 [-.11, .13] | .31 [.00, .62] |  |  | .66 |
| 15 | .03 [-.01, .07] | .08 [-.06, .21] | .06 [-.10, .21] | .00 [-.01, .02] | .01 [-.06, .07] | .18 [-.07, .44] | .16 [-.11, .42] |  | .67 |
| 17 | .03 [-.02, .07] | .13 [-.07, .34] | .02 [-.10, .14] | .01 [-.03, .04] | .00 [-.01, .01] | .17 [-.11, .45] | .06 [-.18, .30] | **.24 [.11, .36]** | .79 |
| E parameter for hyperactivity, impulsivity | | | | | | | | | |
| Age | 6 | 7 | 9 | 10 | 12 | 14 | 15 | 17 | Total E |
| 6 | .27 [.21, .33] |  |  |  |  |  |  |  | .30 |
| 7 | .00 [.00, .00] | **.30 [.23, .36]** |  |  |  |  |  |  | .35 |
| 9 | .00 [-.01, .02] | .00 [.00, .00] | **.26 [.20, .32]** |  |  |  |  |  | .30 |
| 10 | .00 [-.01, .02] | .02 [-.01, .04] | .01 [-.01, .04] | **.37 [.29, .44]** |  |  |  |  | .43 |
| 12 | .01 [-.01, .03] | .00 [-.01, .01] | .00 [.00, .01] | .04 [-.01, .09] | **.38 [.28, .48]** |  |  |  | .50 |
| 14 | .00 [.00, .00] | .00 [-.01, .01] | .00 [.00, .00] | .01 [-.01, .03] | .00 [-.01, .01] | **.25 [.18, .31]** |  |  | .35 |
| 15 | .00 [-.01, .01] | .00 [.00, .00] | .00 [.00, .00] | .01 [-.01, .03] | .02 [-.01, .06] | .02 [-.01, .05] | **.24 [.18, .30]** |  | .33 |
| 17 | .00 [-.01, .01] | .00 [-.01, .01] | .00 [-.01, .01] | .01 [-.01, .02] | .02 [-.01, .04] | .01 [-.01, .03] | .01 [-.01, .03] | **.16 [.11, .20]** | .22 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A parameter for inattention | | | | | | | | | |
| Age | 6 | 7 | 9 | 10 | 12 | 14 | 15 | 17 | Total A |
| 6 | **.47 [.38, .56]** |  |  |  |  |  |  |  | .53 |
| 7 | **.31 [.19, .43]** | **.21 [.08, .34]** |  |  |  |  |  |  | .64 |
| 9 | **.13 [.04, .23]** | **.24 [.06, .42]** | .10 [-.05, .24] |  |  |  |  |  | .61 |
| 10 | **.11 [.03, .20]** | .11 [-.02, .24] | .02 [-.06, .10] | **.14 [.05, .23]** |  |  |  |  | .50 |
| 12 | **.19 [.08, .30]** | .02 [-.04, .08] | .15 [-.09, .39] | .12 [-.09, .32] | **.03 [-.17, .23]** |  |  |  | .62 |
| 14 | .02 [-.02, .06] | .13 [-.03, .29] | .00 [-.02, .03] | .03 [-.06, .12] | .07 [-.58, .72] | .11 [-.60, .81] |  |  | .44 |
| 15 | .01 [-.02, .03] | .01 [-.03, .05] | .02 [-.07, .11] | .07 [-.05, .19] | .00 [-.05, .05] | .12 [-.88, 1] | .05 [-.98, 1] |  | .44 |
| 17 | .01 [-.02, .03] | .06 [-.05, .16] | .00 [-.04, .04] | .02 [-.05, .09] | .08 [-.45, .61] | .19 [-1, 1] | .10 [-1, 1] | .00 [.00, .00] | .62 |
| E parameter for inattention | | | | | | | | | |
| Age | 6 | 7 | 9 | 10 | 12 | 14 | 15 | 17 | Total E |
| 6 | .44 [.35, .52] |  |  |  |  |  |  |  | .48 |
| 7 | .00 [-.01, .01] | **.33 [.27, .40]** |  |  |  |  |  |  | .36 |
| 9 | .01 [-.01, .03] | .00 [.00, .00] | **.36 [.28, .44]** |  |  |  |  |  | .39 |
| 10 | .01 [-.01, .03] | .00 [-.01, .01] | .04 [.00, .08] | **.41 [.32, .50]** |  |  |  |  | .49 |
| 12 | .00 [-.01, .01] | .01 [-.01, .03] | .01 [-.01, .03] | .00 [-.01, .01] | **.37 [.19, .45]** |  |  |  | .40 |
| 14 | **.05 [.01, .10]** | .01 [-.01, .04] | .02 [-.01, .06] | .00 [-.01, .01] | .03 [-.01, .07] | **.38 [.29, .47]** |  |  | .56 |
| 15 | .03 [-.01, .07] | .03 [-.01, .06] | .02 [-.01, .05] | .00 [.00, .00] | .00 [-.01, .01] | **.11 [.04, .17]** | **.35 [.28, .42]** |  | .57 |
| 17 | .01 [-.01, .04] | .00 [-.01, .02] | .00 [-.01, .02] | .01 [-.01, .02] | **.04 [.01, .08]** | .04 [.00, .08] | .02 [.00, .04] | .21 [.16, .27] | .37 |
| *Note*. A = additive genetic factors; E = nonshared environment factors. | | | | | | | | | |