SUPPLEMENTARY MATERIAL

METHOD

Measures

Wechsler Intelligence Scales for Children, Third Edition (WISC-III). [1] Responses were prorated following procedures described by Sattler.[2]

Data analyses

To account for the inclusion of cluster-correlated data (twin pairs) we employed robust variance estimators[3] using the "cluster" option in STATA, which specifies that observations are independent across families but not necessarily within families.[4]

We used negative binomial regression (NBREG) models to assess the unique contribution of each ADHD symptom dimension or extreme group membership in predicting the number of times participants selected smaller-immediate rewards under each condition of the MIDA task. The dependent measure is a count type variable following a Poisson distribution. NBREG models are specifically designed for analyses of count variables yielding more consistent and accurate estimates relative to linear regression models. All NBREG models tested here showed evidence for over-dispersion (a was significantly different from zero), justifying their use over the Poisson regression model. Given that some participants did not respond in all trials, we used the option "exposure" in STATA to adjust for total number of attempted trials. No participant responded in less than 17 trials, while 91.5% of them responded in all 20 trials in each condition. NBREG models use the incident rate ratio (IRR), which is defined as the exponential of the b coefficient and expresses the factor by which the expected number of smaller-immediate reward choices changes for a change of one standard deviation in the predictor (or with membership in one of the extreme groups).[4] Discrete change was calculated using the "prchange" command in STATA.

In linear regression models testing the delay aversion specific hypothesis using IDA scores, we used percentages of smaller-immediate reward choices under each condition as our dependent measure. The use of percentages controls for participant differences in the

number of completed trials. No evidence for multicollinearity was found in any NBREG or linear regression model.

RESULTS

Subgroup characteristics

No significant differences existed between participants with missing data in the MIDA task (n=99) and the rest of the sample in the remaining variables of interest (age: $F_{(1, 667)}=1.96$, p=.16; IQ: $F_{(1, 667)}=0$, p=.95; inattention: $F_{(1, 610)}=0$, p=.96; hyperactivity-impulsivity: $F_{(1, 610)}=0.06$, p=.81). Participants with missing teacher ratings on the Conner's subscales (n=151) were slightly older from the rest of the sample (M=9.12, SD=0.72; $F_{(1, 667)}=17.9$, p<.001, R^2=.02) and showed slightly higher parent inattention ratings (M=7.18, SD=5.82; rest of sample: M=6.02, SD=5.41; $F_{(1, 666)}=4.96$, p=.026, R^2=.004) but did not differ in the remaining variables (IQ: $F_{(1, 667)}=3.55$, p=.06; parent hyperactivity-impulsivity ratings: $F_{(1, 666)}=3.53$, p=.06; smaller-immediate reward choices in the no post-reward and post-reward delay conditions: $F_{(1, 627)}=0.68$, p=.41 and $F_{(1, 626)}=0$, p=.99, respectively).

Regarding gender effects in the predictor variables, boys (n = 542) and girls (n = 520) did not differ in age (boys: M=8.82, SD = 0.65; girls: M=8.78, SD=0.67; $t_{(1060)}=0.78$, p=.44) or IQ (boys: M=110.56, SD=15.51; girls: M=108.88, SD=14.31; $t_{(1060)}=1.82$, p=.068). Boys received higher inattention (boys: M=13.56, SD=10.43; girls: M=8.54, SD=7.38; $t_{(1060)}=9.03$, p < .001) and hyperactivity-impulsivity ratings (boys: M=11.16, SD=9.20; girls: M=7.12, SD=6.32; $t_{(1060)}=8.31$, p<.001).

TABLE

Table A. Testing for mean differences in age and IQ between each extreme group and the corresponding control sample (male participants only).

		Extreme group (top 5%, males only)		Control sample (bottom 95%, males only)		
	N	Age (SD)	N	Age (SD)	$F_{(1,371)}$[4]	p
ADHD-IN[1]	32	8.64 (0.56)	510	8.83 (0.65)	3.38	.07
ADHD-H/I[2]	25	8.75 (0.71)	517	8.82 (0.65)	0.19	.66
ADHD-CT[3]	19	8.74 (0.61)	523	8.82 (0.65)	0.27	.61
		IQ (SD)		IQ (SD)		
ADHD-IN[1]	32	109.13 (13.57)	510	110.65 (15.63)	0.37	.54
ADHD-H/I[2]	25	112.24 (11.79)	517	110.48 (15.67)	0.48	.49
ADHD-CT[3]	19	108.68 (17.63)	523	110.63 (15.44)	0.23	.63

Note: [1]Scoring in the top 5% on inattention ratings, but below the top 5% on hyperactivity-impulsivity ratings; [2]Scoring in the top 5% on hyperactivity-impulsivity ratings but below the top 5% on inattention ratings; [3]Scoring in the top 5% on both inattention and hyperactivity-impulsivity ratings; [4]Tested using the general linear model, with age/IQ as the DV and group as the predictor, so as to control for cluster-correlated data using the "cluster" option in STATA (see Data analyses).

REFERENCES

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1.	Wechsler D. *Wechsler Intelligence Scale for Children*. 3rd ed. London: The Psychological Corporation; 1991.

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4.	Long JS, Freese J. *Regression Models for Categorical Dependent variables Using Stata*. 2nd ed. College Station, Texas: STATA Press; 2006.