

Supplement 1. Description of the replication sample

The replication sample ($N=2,503$) comprised four studies conducted in diverse geographic regions and clinical settings: (1) referrals to a psychology clinic within a large hospital in Chicago ($n=1,537$)¹, (2) a randomized controlled trial (RCT) for children (ages 6-12) with attention deficit hyperactivity disorder (ADHD) and co-occurring severe aggression recruited from four university-affiliated sites (The Ohio State University, Case Western Reserve University, the University of Pittsburgh, and Stony Brook University), the Treatment of Severe Child Aggression (TOSCA)² ($n=168$); (3) youth (ages 6–12) attending outpatient mental health clinics in four university-affiliated sites (Case Western Reserve University, Cincinnati Children's Medical Center, the Ohio State University, and the University of Pittsburgh Medical Center/Western Psychiatric Institute and Clinic) recruited for participation in the Longitudinal Assessment of Manic Symptoms (LAMS) study³ ($n=462$); and (4) consecutive referrals to a psychological testing service within a pediatric hospital in the Midwest^{4,5} ($n=336$).

Studies	(1)	(2)	(3)	(4)	Total
<i>N</i>	1,537	168	462	336	2,503
% Male	69.6	76.8	66.9	61.9	68.5
Mean age (SD)	8.83 (1.90)	8.89 (2.01)	9.26 (1.86)	9.88 (2.70)	9.06 (2.06)

Supplemental Tables

Table S1. The List of Child And Adolescent Symptom Inventory-4R Autism Spectrum

Disorder Items

Item numbers	Items
1	Relates to others in an unusual way
2	Difficulty playing with and relating to other children
3	Lack of interest in making friends
4	Lacks interest in or awareness of other people's feelings
5	Language difficulties
6	Difficulty engaging in socially appropriate conversation
7	Speaks in an odd way
8	Difficulty engaging in make-believe play
9	Is preoccupied with certain topics
10	Distressed by small changes in routine or environment
11	Engages in odd repetitive movements
12	Has intense interest in parts of objects

Note: Specific item content is abridged to comply with limitations on publication of copyrighted measures.

Table S2. Factor Loadings for the Three-Factor Exploratory Factor Analysis

Items	Factors loadings		
	SI	COM	RRB
Peculiar way of relating to others	.708*	.017	.119
Does not play well with others	.952*	-.055	.016
Not interested in making friends	.869*	.030	-.093
Unaware of other people's feelings	.803*	-.080	-.001
Significant problem with language	.007	1.136*	-.312*
Difficulty making socially appropriate conversation	.406*	.548*	.003
Talks in a strange way	-.063	.761*	.204*
Unable to pretend when playing	.180*	.511*	.188*
Excessive preoccupation with one topic	.173*	-.001	.678*
Upset over small changes in routine	.196*	.000	.506*
Makes strange repetitive movements	.084	.161	.577*
Strange fascination for parts of objects	-.001	.163	.706*

Note. Exploratory factor analysis was conducted with robust maximum likelihood estimation and oblique Geomin rotation. COM = communication; RRB = restricted repetitive behavior; SI = social interaction;

*Significant at $p < .05$.

Table S3a. Model Fit Information for the Top Five Models From the Original and Replication Analyses

Model	<i>k</i>	<i>LL</i>	AIC	BIC	Description
Original analysis					
3-Factor CFA ^a	28	-16884.960	33825.919	33999.954	Best-fitting overall
3-Factor EFA	45	-16825.551	33741.103	34020.803	
4-Factor EFA	54	-16798.631	33705.262	34040.902	
3-Factor CFA ^b	27	-16916.496	33886.991	34054.811	
5-Factor EFA	62	-16782.744	33689.488	34074.852	
Replication analysis					
3-Factor EFA	45	-10001.098	20092.196	20354.332	Best-fitting overall
4-Factor EFA	54	-9982.584	20073.169	20387.732	
3-Factor CFA ^a	28	-10085.544	20227.088	20390.195	
5-Factor EFA	62	-9964.762	20053.524	20414.689	
3-Factor CFA ^b	27	-10122.402	20298.804	20456.085	

Note. AIC = Akaike information criteria; BIC = Bayesian information criteria; CFA = confirmatory factor analysis; EFA = exploratory factor analysis; *k* = number of parameters; *LL* = log-likelihood.

Model subscripts:

^aCFA with cross-loading of item “difficulty engaging in socially appropriate conversation”

^bCFA with no cross-loading

Table S3b. The Best-Fitting Models of Each Approach From the Original and Replication**Analyses**

Approach	Original analysis					Replication analysis				
	Model	<i>k</i>	<i>LL</i>	AIC	BIC	Model	<i>k</i>	<i>LL</i>	AIC	BIC
Best-fitting EFA	3-factor	45	-16825.55	33741.10	34020.80	3-factor	45	-10001.10	20092.20	20354.33
Best-fitting CFA	3-factor ₁	28	-16884.96	33825.92	33999.95	3-factor ₁	28	-10085.54	20227.09	20390.20
Best-fitting LCA	6-class	77	-16841.50	33837.01	34315.60	5-class	64	-10045.99	20219.98	20592.80
Best-fitting EFMA	2-factor	71	-16754.96	33651.93	34093.23	2-factor	71	-9956.80	20055.60	20469.19
	/2-class					/2-class				
Best-fitting LCFA	3-factor	45	-16914.32	33918.64	34198.34	3-factor	45	-10105.78	20301.56	20563.69
	/6-class					/6-class				

Note: AIC = Akaike information criteria; BIC = Bayesian information criteria; CFA = confirmatory factor analysis; EFA = exploratory factor analysis; EFMA = exploratory factor mixture analysis; *k* = number of parameters; LCA = latent class analysis; LCFA = latent class factor analysis; *LL* = log-likelihood.

Model subscripts:

^a3-factor CFA with cross-loading of item “difficulty engaging in socially appropriate conversation

Supplemental Figures

Animated 3-dimensional interactive figures of the distribution of autism spectrum disorder symptoms. For download: <http://psychology.psy.sunysb.edu/asd/>

Figure S1. For the Distribution of Symptoms of the Total Sample.

http://psychology.psy.sunysb.edu/asd/ASD_Smooth_All_colored_total_symptoms_CFA.html

Figure S2. For the Distribution of Symptoms of Individuals Whose Autism Spectrum Disorder Diagnostic Status was Known:

http://psychology.psy.sunysb.edu/asd/Smooth_ASD_Diag_new%20smoothing.html

Note. These figures can be zoomed in/out and oriented by the viewer using their mouse.

Supplemental References

1. Lavigne JV, Cromley T, Sprafkin J, Gadow KD. The Child and Adolescent Symptom Inventory-Progress Monitor: a brief Diagnostic and Statistical Manual of Mental Disorders, -referenced parent-report scale for children and adolescents. *Journal of child and adolescent psychopharmacology*. 2009;19(3):241-252.
2. Gadow KD, Arnold LE, Molina BS, et al. Risperidone added to parent training and stimulant medication: effects on attention-deficit/hyperactivity disorder, oppositional defiant disorder, conduct disorder, and peer aggression. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2014;53(9):948-959. e941.
3. Findling RL, Youngstrom EA, Fristad MA, et al. Characteristics of children with elevated symptoms of mania: the Longitudinal Assessment of Manic Symptoms (LAMS) study. *The Journal of clinical psychiatry*. 2010;71(12):1664.
4. Castellanos I, Kronenberger WG, Pisoni DB. Questionnaire-based assessment of executive functioning: Psychometrics. *Applied Neuropsychology: Child*. 2018;7(2):93-109.
5. Levy JD, Kronenberger WG, Dunn DW. Development of a very brief measure of ADHD: The CHAOS scale. *Journal of attention disorders*. 2017;21(7):575-586.