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Table S1. Spearman correlations between Vineland Adaptive Behavior Scales, Second Edition standard scores and scores from other selected instruments in children with autism spectrum disorder, Study to Explore Early Development phases one (birth years 2003-2006) and two (birth years 2008-2011); correlation coefficient (95% confidence interval)

Variable	VABS-II Score				
	Composite	Communication	Daily Living Skills	Socialization	Motor Skills
Age at assessment (years)	-0.09 (-0.14, -0.04)	-0.12 (-0.17, -0.07)*	-0.11 (-0.16, -0.06)*	-0.08 (-0.13, -0.03)	-0.04 (-0.09, 0.01)
Early Learning Composite	0.74 (0.71, 0.76)*	0.79 (0.77, 0.81)*	0.63 (0.60, 0.66)*	0.60 (0.57, 0.63)*	0.56 (0.53, 0.60)*
Composite Raw Score	0.72 (0.70, 0.75)*	0.75 (0.73, 0.77)*	0.62 (0.58, 0.65)*	0.61 (0.57, 0.64)*	0.57 (0.53, 0.60)*
Visual Reception T-score	0.66 (0.63, 0.69)*	0.71 (0.68, 0.73)*	0.56 (0.53, 0.60)*	0.55 (0.51, 0.58)*	0.51 (0.47, 0.54)*
Visual Reception Raw Score	0.67 (0.64, 0.70)*	0.70 (0.67, 0.72)*	0.57 (0.53, 0.60)*	0.57 (0.53, 0.60)*	0.53 (0.49, 0.57)*
Fine Motor T-score	0.66 (0.63, 0.68)*	0.65 (0.62, 0.68)*	0.56 (0.52, 0.59)*	0.50 (0.46, 0.54)*	0.59 (0.56, 0.63)*
Fine Motor Raw Score	0.67 (0.64, 0.70)*	0.65 (0.62, 0.68)*	0.58 (0.54, 0.61)*	0.54 (0.50, 0.57)*	0.60 (0.57, 0.63)*
Receptive Language T-score	0.66 (0.63, 0.69)*	0.74 (0.71, 0.76)*	0.56 (0.52, 0.59)*	0.53 (0.49, 0.56)*	0.48 (0.44, 0.52)*
Receptive Language Raw Score	0.70 (0.67, 0.72)*	0.75 (0.72, 0.77)*	0.59 (0.56, 0.62)*	0.59 (0.55, 0.62)*	0.53 (0.49, 0.56)*
Expressive Language T-score	0.65 (0.62, 0.68)*	0.72 (0.69, 0.74)*	0.56 (0.53, 0.60)*	0.54 (0.51, 0.58)*	0.44 (0.40, 0.458)*
Expressive Language Raw Score	0.70 (0.67, 0.73)*	0.75 (0.73, 0.77)*	0.60 (0.57, 0.63)*	0.61 (0.58, 0.64)*	0.50 (0.46, 0.54)*
Overall Developmental Quotient	0.77 (0.75, 0.79)*	0.82 (0.81, 0.84)*	0.67 (0.64, 0.70)*	0.64 (0.61, 0.67)*	0.60 (0.56, 0.63)*
Visual Reception Developmental Quotient	0.71 (0.69, 0.74)*	0.76 (0.74, 0.78)*	0.61 (0.58, 0.64)*	0.60 (0.56, 0.63)*	0.55 (0.52, 0.59)*
ADOS Calibrated Severity Score	-0.27 (-0.32, -0.22)*	-0.20 (-0.25, -0.15)*	-0.28 (-0.33, -0.24)*	-0.29 (-0.34, -0.25)*	-0.19 (-0.24, -0.14)*
Total T-Score	-0.27 (-0.32, -0.22)*	-0.24 (-0.29, -0.19)*	-0.25 (-0.30, -0.20)*	-0.28 (-0.33, -0.23)*	-0.19 (-0.24, -0.14)*
Externalizing T-Score	-0.21 (-0.25, -0.15)*	-0.19 (-0.24, -0.14)*	-0.19 (-0.24, -0.14)*	-0.21 (-0.26, -0.16)*	-0.13 (-0.18, -0.08)*

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Variable	VABS-II Score				
	Composite	Communication	Daily Living Skills	Socialization	Motor Skills
Internalizing T-Score	-0.22 (-0.27, -0.17)*	-0.18 (-0.23, -0.13)*	-0.20 (-0.25, -0.15)*	-0.26 (-0.31, -0.21)*	-0.16 (-0.21, -0.11)*

*p-value <0.0001

VABS-II: Vineland Adaptive Behavior Scales, Second Edition; MSEL: Mullen Scales of Early Learning; ADOS: Autism Diagnostic Observation Schedule; CBCL: Childhood Behavior Checklist

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Table S2. Results of linear regression modeling Vineland Adaptive Behavior Scales, Second Edition (VABS-II) scores in children with autism spectrum disorder, Study to Explore Early Development phases one (birth years 2003-2006) and two (birth years 2008-2011); cognitive ability was measured using the Mullen Scales of Early Learning Visual Reception raw score

			VABS-II Score									
			Composite		Communication		Daily Living Skills		Socialization		Motor Skills	
Model	Variables Added		R ² (%)	ΔR ² (%)	R ² (%)	ΔR ² (%)	R ² (%)	ΔR ² (%)	R ² (%)	ΔR ² (%)	R ² (%)	ΔR ² (%)
			n	1286	1300	1300	1300	1300	1300	1300	1300	1300
Overall	1a	Demographics ^a	13.0	NA	17.1	NA	14.0	NA	10.3	NA	5.9	NA
	2a	+ Visual Reception Raw Score ^b	57.2	44.2***	65.9	48.8***	48.7	34.7***	39.0	28.7***	34.4	28.5***
	3a	+ ADOS Calibrated Severity Score	57.7	0.5**	65.9	0.0	49.4	0.7**	40.0	1.0***	34.6	0.2
	4a	+ Interaction ^c	57.9	0.2	65.9	0.0	49.4	0.1	40.0	0.0	35.4	0.8**
	5a	+ CBCL Total T-Score	60.7	2.8***	67.1	1.2***	51.7	2.3***	44.8	4.8***	36.3	1.0***
			n	619	624	624	624	624	624	624	624	624
Visual Reception T-score ≤30	1b	Demographics ^a	13.5	NA	14.2	NA	17.2	NA	12.3	NA	7.9	NA
	2b	+ Visual Reception Raw Score ^b	53.9	40.4***	54.3	40.1***	48.9	31.7***	39.3	27.0***	30.6	22.7***
	3b	+ ADOS Calibrated Severity Score	53.9	0.0	54.3	0.0	49.0	0.1	40.3	1.0**	31.5	0.9*
	4b	+ Interaction ^c	54.0	0.1	54.6	0.2	49.2	0.1	40.5	0.2	31.5	0.0
	5b	+ CBCL Total T-Score	56.7	2.7***	55.8	1.3***	52.0	2.9***	44.8	4.3***	32.4	0.9*
			n	667	676	676	676	676	676	676	676	676
Visual Reception T-score >30	1c	Demographics ^a	13.0	NA	22.3	NA	12.1	NA	9.5	NA	6.8	NA
	2c	+ Visual Reception Raw Score ^b	19.0	6.0***	33.0	10.7***	14.8	2.7***	11.6	2.1**	9.7	3.0***
	3c	+ ADOS Calibrated Severity Score	21.1	2.0**	33.2	0.2	16.8	2.0**	12.8	1.2**	11.7	2.0**
	4c	+ Interaction ^c	21.6	0.6	33.3	0.1	17.2	0.4	13.8	1.0*	12.5	0.7*
	5c	+ CBCL Total T-Score	26.8	5.2***	35.9	2.6***	19.8	2.6***	21.0	7.2***	13.8	1.3**

*p-value <0.05, **p-value <0.01, ***p-value <0.0001

VABS-II: Vineland Adaptive Behavior Scales, Second Edition; MSEL: Mullen Scales of Early Learning; ADOS: Autism Diagnostic Observation Schedule, Second Edition; CBCL: Childhood Behavior Checklist; NA: not applicable.

^aDemographic variables: child's sex, child's race/ and ethnicity, child's age at administration of MSEL, child's birth order, household income, primary language spoken in the home, maternal age at enrollment (and the quadratic term), maternal education, mother's place of birth, and study site.

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^bIncludes Visual Reception Raw Score + Visual Reception Raw Score²

^cInteraction between Visual Reception variables and ADOS CSS

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Table S3. Results of linear regression modeling Vineland Adaptive Behavior Scales, Second Edition scores in children with autism spectrum disorder, Study to Explore Early Development phases one (birth years 2003-2006) and two (birth years 2008-2011); cognitive ability was measured using the Mullen Scales of Early Learning overall developmental quotient

			VABS-II Score									
			Composite		Communication		Daily Living Skills		Socialization		Motor Skills	
Model	Variables Added		R ² (%)	ΔR ² (%)	R ² (%)	ΔR ² (%)	R ² (%)	ΔR ² (%)	R ² (%)	ΔR ² (%)	R ² (%)	ΔR ² (%)
			n		1278		1291		1291		1291	
Overall	1a	Demographics ^a	13.2	NA	17.2	NA	14.1	NA	10.5	NA	6.0	NA
	2a	+ Overall Developmental Quotient ^b	64.1	51.0***	75.3	58.2***	54.9	40.8***	42.8	32.4***	37.6	31.6***
	3a	+ ADOS Calibrated Severity Score	64.2	0.1	75.5	0.1*	55.1	0.2*	43.3	0.4**	37.6	0.0
	4a	+ Interaction ^c	64.3	0.1	75.5	0.0	55.2	0.1	43.5	0.2	38.0	0.4**
	5a	+ CBCL Total T-Score	67.1	2.8***	76.7	1.2***	57.5	2.3***	48.3	4.9***	39.1	1.0***
			n		667		672		672		672	
Overall Developmental Quotient ≤70	1b	Demographics ^a	12.6	NA	11.8	NA	17.4	NA	10.9	NA	9.2	NA
	2b	+ Overall Developmental Quotient ^b	62.1	49.6***	69.8	58.0***	55.1	37.7***	43.7	32.8***	32.0	22.8***
	3b	+ ADOS Calibrated Severity Score	62.2	0.0	70.0	0.2*	55.1	0.0	44.1	0.4*	32.6	0.6*
	4b	+ Interaction ^c	62.3	0.1	70.0	0.0	55.3	0.2	44.3	0.2	32.9	0.2
	5b	+ CBCL Total T-Score	64.9	2.6***	70.9	0.8***	57.8	2.5***	48.6	4.4***	33.9	1.0**
			n		611		619		619		619	
Overall Developmental Quotient >70	1c	Demographics ^a	12.4	NA	19.6	NA	11.8	NA	10.4	NA	8.2	NA
	2c	+ Overall Developmental Quotient ^b	23.4	11.0***	36.5	16.9***	17.2	5.4***	13.2	2.8**	14.3	6.1***
	3c	+ ADOS Calibrated Severity Score	24.1	0.7*	36.6	0.1	18.5	1.2**	13.9	0.7*	15.0	0.8*
	4c	+ Interaction ^c	24.5	0.4	37.2	0.5	18.7	0.3	14.5	0.6	16.2	1.2*
	5c	+ CBCL Total T-Score	30.4	5.9***	41.2	4.0***	21.9	3.2***	21.6	7.1***	17.5	1.3**

*p-value <0.05, **p-value <0.01, ***p-value <0.0001

VABS-II: Vineland Adaptive Behavior Scales, Second Edition; MSEL: Mullen Scales of Early Learning; ADOS: Autism Diagnostic Observation Schedule, Second Edition; CBCL: Childhood Behavior Checklist; NA: not applicable.

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^aDemographic variables: child's sex, child's race/ and ethnicity, child's age at administration of MSEL, child's birth order, household income, primary language spoken in the home, maternal age at enrollment (and the quadratic term), maternal education, mother's place of birth, and study site.

^bIncludes MSEL Overall Developmental Quotient + MSEL Overall Developmental Quotient²

^cInteraction between MSEL variables and ADOS CSS

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Table S4. Results of linear regression modeling Vineland Adaptive Behavior Scales, Second Edition scores in children with autism spectrum disorder, Study to Explore Early Development phases one (birth years 2003-2006) and two (birth years 2008-2011); cognitive ability was measured using the Mullen Scales of Early Learning Visual Reception developmental quotient

			VABS-II Score									
			Composite		Communication		Daily Living Skills		Socialization		Motor Skills	
Model	Variables Added		R ² (%)	ΔR ² (%)	R ² (%)	ΔR ² (%)	R ² (%)	ΔR ² (%)	R ² (%)	ΔR ² (%)	R ² (%)	ΔR ² (%)
			n		1286		1300		1300		1300	
Overall	1a	Demographics ^a	13.0	NA	17.1	NA	14.0	NA	10.3	NA	5.9	NA
	2a	+ Visual Reception Developmental Quotient ^b	57.8	44.8***	66.2	49.1***	49.7	35.8***	39.1	28.8***	35.0	29.1***
	3a	+ ADOS Calibrated Severity Score	58.2	0.4**	66.2	0.0	50.2	0.5**	40.0	0.9***	35.1	0.1
	4a	+ Interaction ^c	58.3	0.1	66.2	0.0	50.3	0.1	40.0	0.0	35.7	0.5**
	5a	+ CBCL Total T-Score	61.0	2.7***	67.4	1.2***	52.6	2.3***	44.7	4.7***	36.6	1.0***
			n		552		557		557		557	
Visual Reception Developmental Quotient ≤70	1b	Demographics ^a	15.0	NA	14.3	NA	18.8	NA	15.0	NA	9.1	NA
	2b	+ Visual Reception Developmental Quotient ^b	50.9	35.9***	49.4	35.1***	47.6	28.8***	36.7	21.7***	29.6	20.5***
	3b	+ ADOS Calibrated Severity Score	50.9	0.0	49.4	0.0	47.7	0.1	38.0	1.3**	30.8	1.2**
	4b	+ Interaction ^c	51.5	0.6	49.8	0.3	48.5	0.7*	38.5	0.5	31.3	0.4
	5b	+ CBCL Total T-Score	54.4	2.8***	51.3	1.6***	51.1	2.7***	43.2	4.7***	32.2	0.9*
			n		734		743		743		743	
Visual Reception Developmental Quotient >70	1c	Demographics ^a	13.7	NA	23.9	NA	12.4	NA	8.9	NA	6.8	NA
	2c	+ Visual Reception Developmental Quotient ^b	21.1	7.4***	35.5	11.6***	16.1	3.7***	11.2	2.3***	10.9	4.1***
	3c	+ ADOS Calibrated Severity Score	22.7	1.7**	35.6	0.1	17.7	1.6**	12.2	1.1**	12.7	1.8**
	4c	+ Interaction ^c	22.8	0.1	35.6	0.0	17.9	0.2	12.6	0.3	12.8	0.1
	5c	+ CBCL Total T-Score	27.7	4.9***	38.0	2.4***	20.8	2.8***	19.2	6.6***	14.0	1.2**

*p-value <0.05, **p-value <0.01, ***p-value <0.0001

VABS-II: Vineland Adaptive Behavior Scales, Second Edition; MSEL: Mullen Scales of Early Learning; ADOS: Autism Diagnostic Observation Schedule, Second Edition; CBCL: Childhood Behavior Checklist; NA: not applicable.

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^aDemographic variables: child's sex, child's race/ and ethnicity, child's age at administration of MSEL, child's birth order, household income, primary language spoken in the home, maternal age at enrollment (and the quadratic term), maternal education, mother's place of birth, and study site.

^bIncludes MSEL Visual Reception Developmental Quotient + MSEL Visual Reception Developmental Quotient ²

^cInteraction between MSEL variables and ADOS CSS

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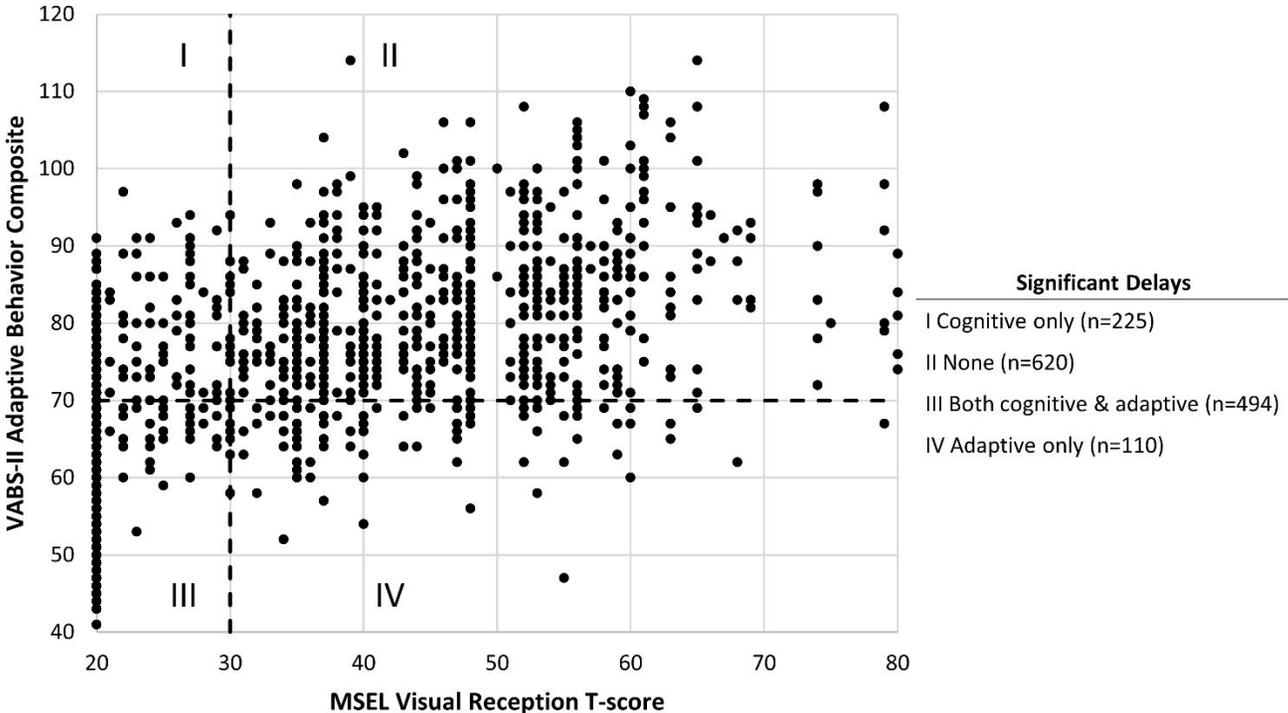
Table S5. Comparison of the frequencies and percentages of children with autism spectrum disorder who would be classified as: (a) having significant delays based on having both MSEL and Vineland Adaptive Behavior Scale, Second Edition (VABS-II) scores two or more standard deviations below the mean; (b) based on MSEL only; (c) based on VABS-II score only; and (d) having no significant delays based on either MSEL nor VABS-II score among children with autism spectrum disorder, Study to Explore Early Development phases one (birth years 2003 through 2006) and two (birth years 2008 through 2011)

Score ≥ 2 Standard Deviations Below the Mean; n (%)		VABS-II Score				
		Composite	Communication	Daily Living Skills	Socialization	Motor Skills
MSEL Early Learning Composite	Total n	1439	1455	1455	1453	1453
	(a) Both	553 (38.4)	421 (28.9)	485 (33.3)	589 (40.5)	361 (24.9)
	(b) MSEL score only	364 (25.3)	506 (34.8)	442 (30.4)	336 (23.1)	565 (38.9)
	(c) VABS-II score only	47 (3.3)	11 (0.8)	52 (3.6)	117 (8.1)	40 (2.8)
	(d) Neither	475 (33.0)	517 (35.5)	476 (32.7)	411 (28.3)	487 (33.5)
MSEL Visual Reception T-score	Total n	1449	1466	1466	1464	1464
	(a) Both	494 (34.1)	397 (27.1)	427 (29.1)	509 (34.8)	314 (21.5)
	(b) MSEL score only	225 (15.5)	329 (22.4)	299 (20.4)	216 (14.8)	410 (28.0)
	(c) VABS-II score only	110 (7.6)	38 (2.6)	113 (7.7)	201 (13.7)	89 (6.1)
	(d) Neither	620 (42.8)	702 (47.9)	627 (42.8)	538 (36.8)	651 (44.5)

VABS-II: Vineland Scales of Early Learning, Second Edition. Frequencies and percentage calculations are limited to those children with autism spectrum disorder with both an MSEL and a VABS-II score recorded

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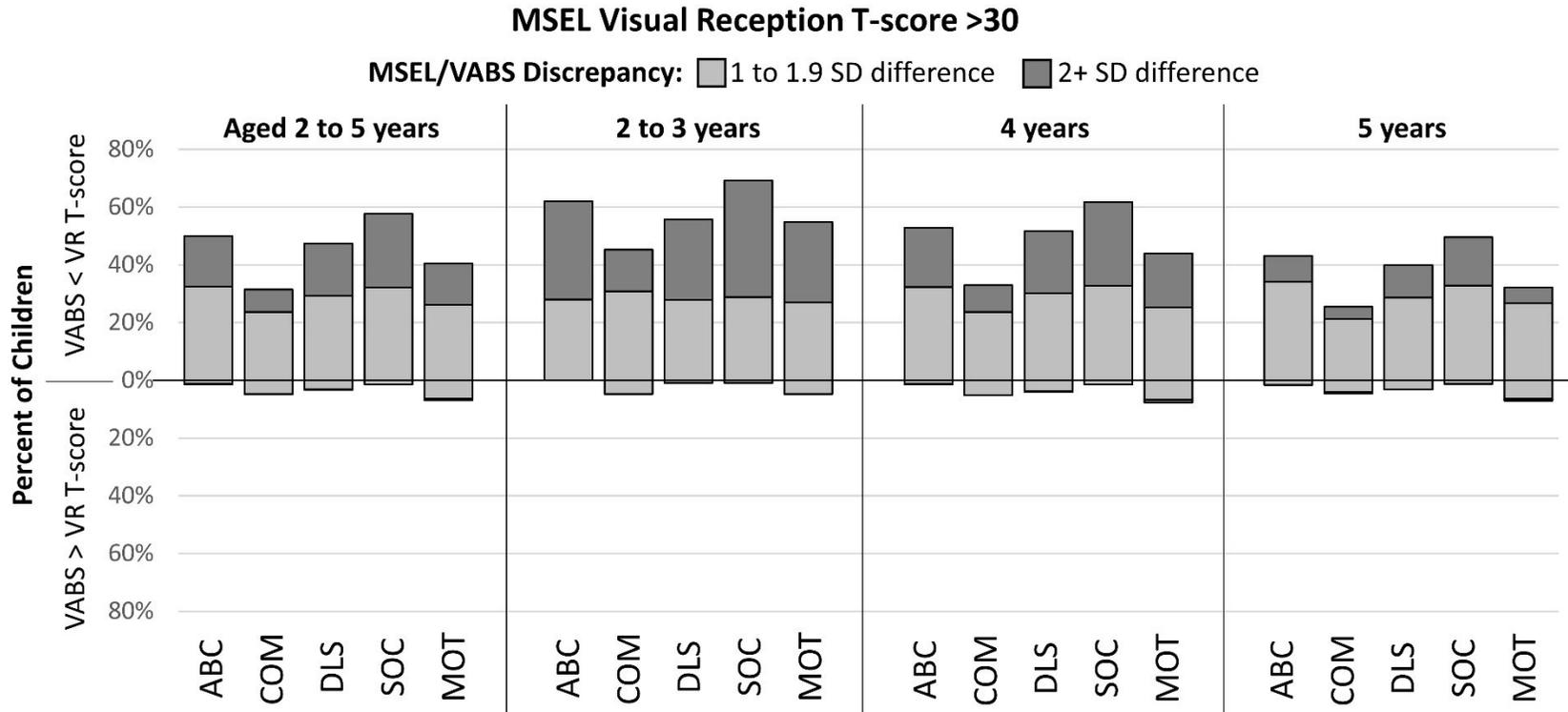
Figure S1. Discrepant (I, IV) and concordant (II, III) categorizations of functioning based on cognitive development as measured by the Mullen Scales of Early Learning (MSEL) Visual Reception T-score and/or adaptive behavior scores as measured by the Vineland Adaptive Behavior Scales, Second Edition (VABS-II) Composite in children with autism spectrum disorder, Study to Explore Early Development phases one (birth years 2003-2006) and two (birth years 2008-2011). Dashed lines indicate two standard deviations below the mean on the VABS-II (horizontal line) and MSEL (vertical line), the cutoff typically used to indicate significant impairment or delay.



VABS-II: Vineland Adaptive Behavior Scales, Second Edition; MSEL: Mullen Scales of Early Learning.

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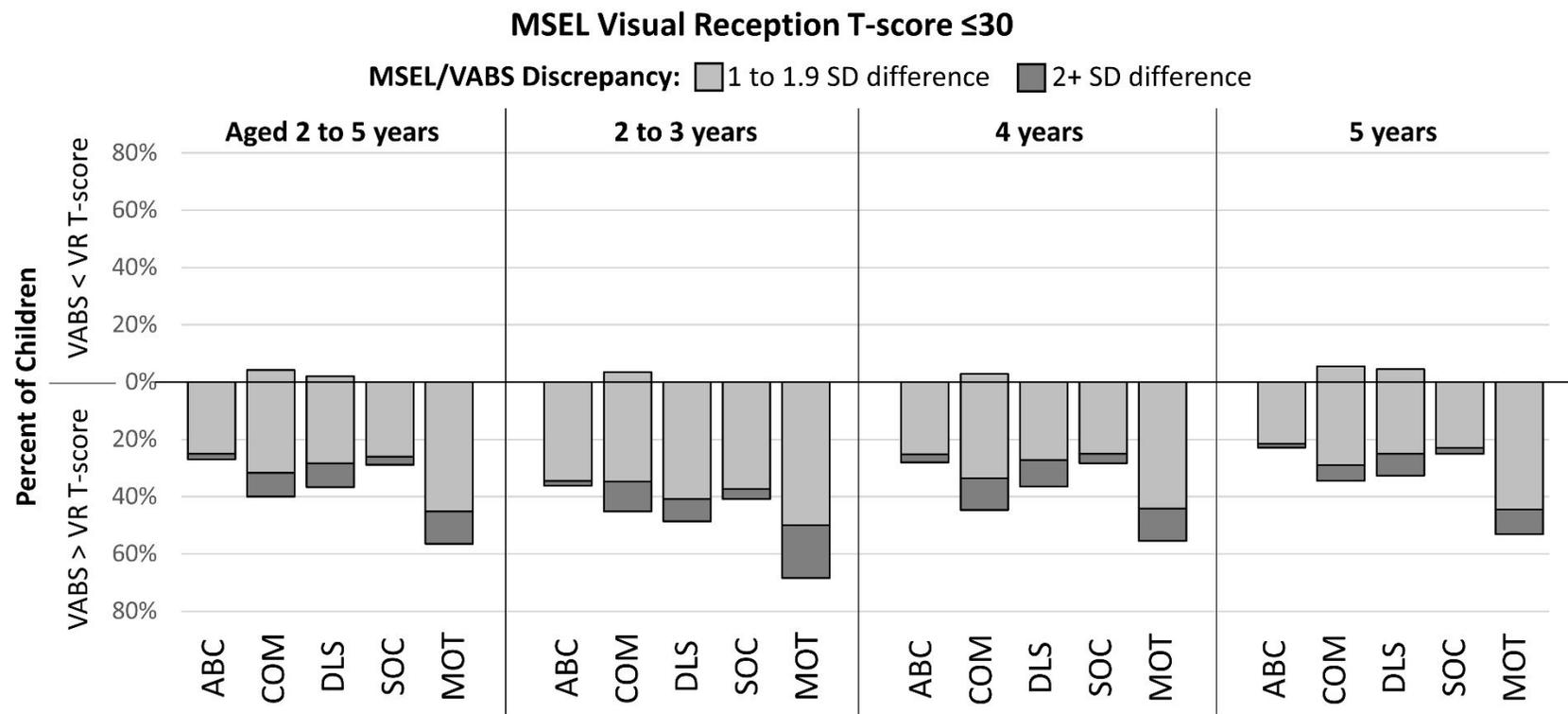
Figure S2. Discrepancies of one or more standard deviations (SD) between cognitive development as measured by the Mullen Scales of Early Learning Visual Reception (VR) T-score and Vineland Adaptive Behavior Scales, Second Edition Composite (ABC), Communication (COM), Daily Living Skills (DLS), Socialization (SOC), and Motor Skills (MOT) scores among children with autism spectrum disorder and MSEL VR T-score >30, Study to Explore Early Development phases one (birth years 2003-2006) and two (birth years 2008-2011)



VABS: Vineland Adaptive Behavior Scales, Second Edition; MSEL: Mullen Scales of Early Learning; VR: Visual Reception T-score; SD: standard deviation; ABC: Adaptive Behavior Composite; COM: Communication; DLS: Daily Living Skills; SOC: Socialization; MOT: Motor Skills.

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Figure S3. Discrepancies of one or more standard deviations (SD) between cognitive development as measured by the Mullen Scales of Early Learning Visual Reception (VR) T-score and Vineland Adaptive Behavior Scales, Second Edition Composite (ABC), Communication (COM), Daily Living Skills (DLS), Socialization (SOC), and Motor Skills (MOT) scores among children with autism spectrum disorder and MSEL VR T-score ≤30, Study to Explore Early Development phases one (birth years 2003-2006) and two (birth years 2008-2011)



VABS: Vineland Adaptive Behavior Scales, Second Edition; MSEL: Mullen Scales of Early Learning; VR: Visual Reception T-score; SD: standard deviation; ABC: Adaptive Behavior Composite; COM: Communication; DLS: Daily Living Skills; SOC: Socialization; MOT: Motor Skills.