

Correlates and Turning Points of Adaptive Functioning Trajectories & Longitudinal Associations with Autism Symptoms from Early Childhood to Adolescence

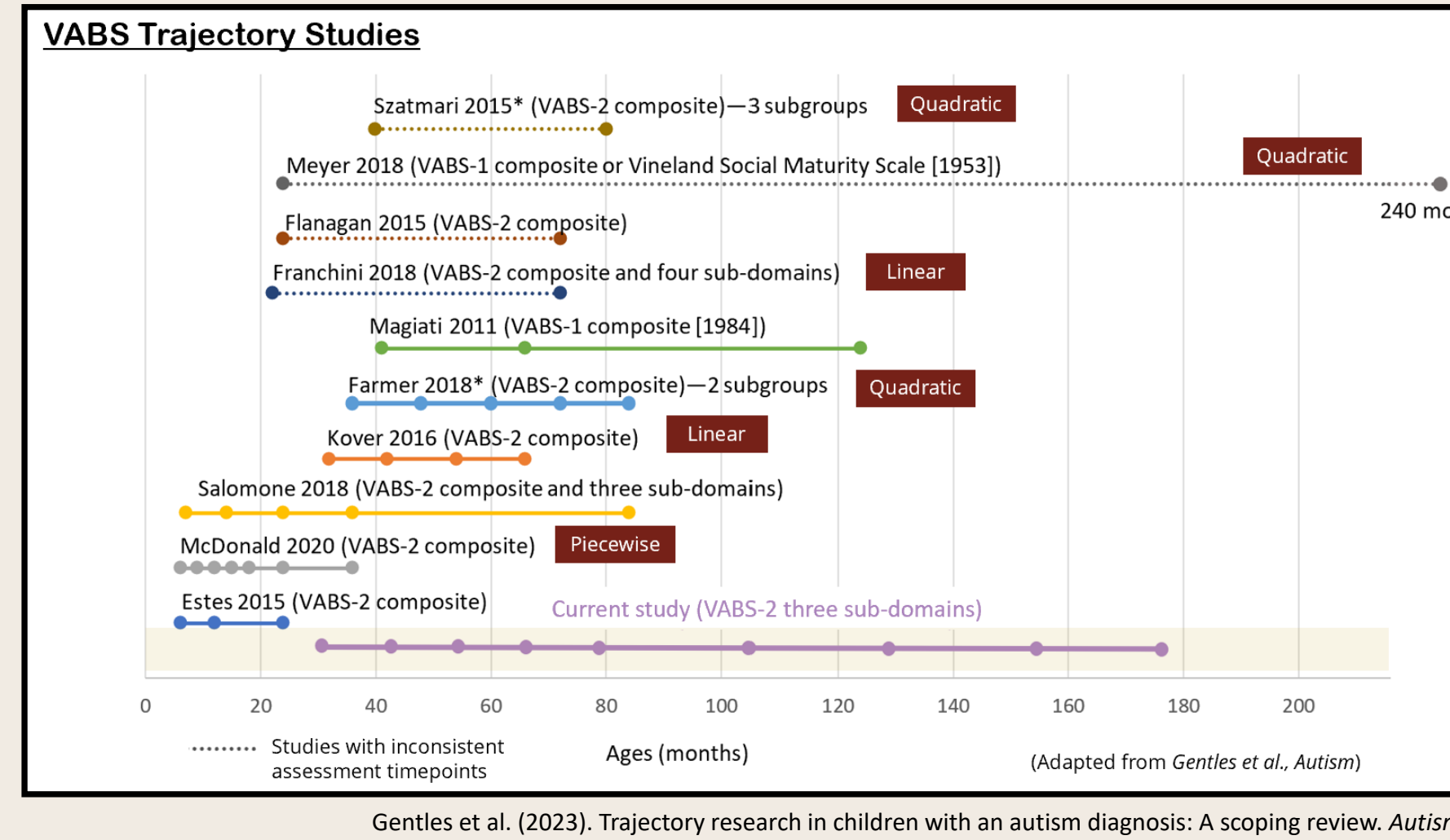
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Background

Heterogenous adaptive outcomes in autism have been observed in previous longitudinal studies.



Evidence Gaps

Associated characteristics beyond baseline (e.g., autism symptoms)

Turning points of adaptive functioning trajectories to inform opportunities for change

Family characteristics as covariates of trajectories (e.g., SES, immigrant status)

Global vs. Domain Score as unit of analysis
Domain-level sources of variance were often ignored.

Data Wave vs. Chronological Age as time metrics
Between-person age differences and within-person change were often conflated.

Research Questions

- What is the **best-fitting shape** of the latent trajectories of VABS subdomains? Are there **turning points** at certain ages?
- How many **VABS trajectory subgroups** can be identified? Is the subgroup membership associated with **child and family characteristics**?
- Do these VABS trajectory subgroups differ by **the changes of autism symptoms** from early to late childhood?

Methods



406 children diagnosed with autism at ages 2-5
>15 years of follow-up
(with ≥ 1 timepoint of VABS data available) (Y2005-current)

Participants



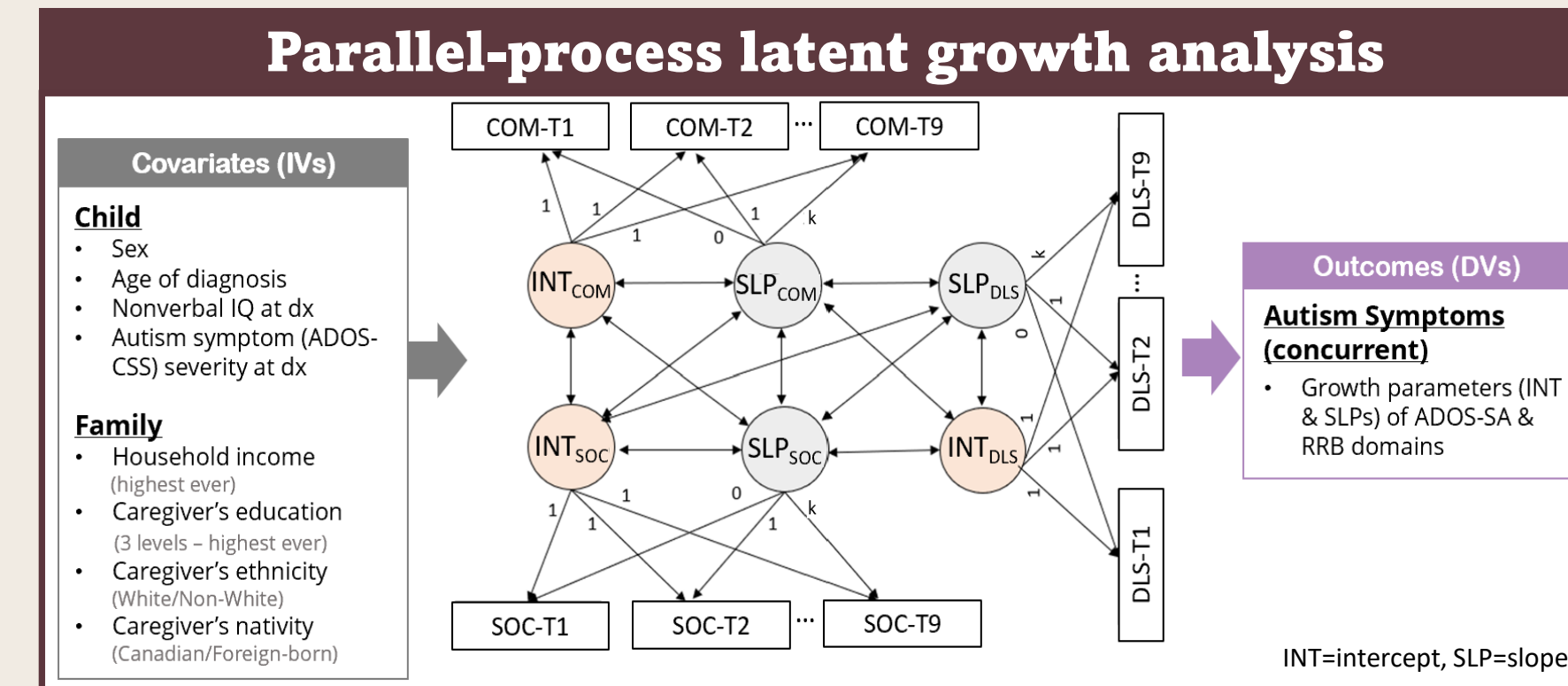
Measures & Timeline

10 waves of data collection

Outcome Measures VABS-II ADOS
Domain-Level Standard Scores

Study Entry	Sequential Design	1	2	3	4	5	6	7	8	9	10
Age (yrs)	Dx	6mos	12mos								
2-5	2.5-5.5	3-6	5.5-7.5	7.5-8	8-9.5	9.5-10	10-12	12-14	14-17		
VABS	X	X	X	X		X		X		X (12-17)	
ADOS	X	X		X			X				
FBIQ (family background)	X	X	X		X	X	X	X		X	

Analysis



*Repeated data were restructured by age (age intervals: 12-24 months) → 9 timepoints

Latent growth curve modeling

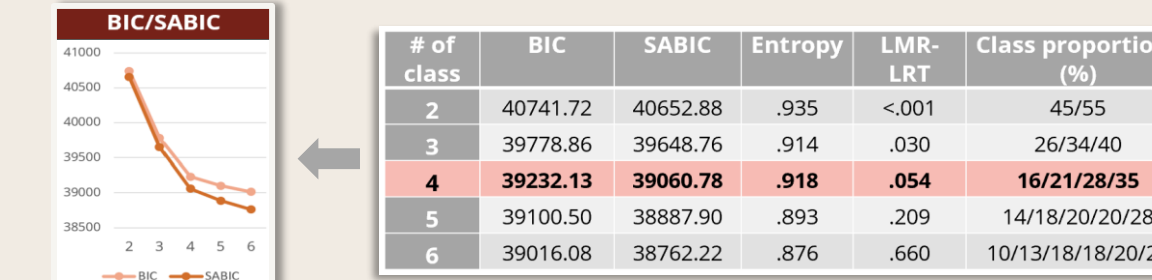
Determine best-fitting functional form (linear, quadric, or piecewise)

(VABS, ADOS)

Latent class growth analysis

Identify trajectory subgroups

(VABS)



Key Findings

4 VABS trajectory subgroups with varying levels & change rates of functioning were parsed among 406 autistic children from ages 2 to 15.



Class 1 (n=87, 21%)	Class 2 (n=113, 28%)	Class 3 (n=140, 35%)	Class 4 (n=66, 16%)
<ul style="list-style-type: none"> Overall low functioning Early decrease + late catch-up after entering school age Lower NVIQ at dx More elevated autism symptoms at dx Lower family SES 	<ul style="list-style-type: none"> Between low and adequate range Overall stable trajectories & autism symptoms until 2nd turning point Family SES similar to C1 	<ul style="list-style-type: none"> Nearly adequate range of functioning Early improvement across domains Later diagnosed Autism symptoms at dx & family SES didn't differ from C4 	<ul style="list-style-type: none"> Above adequate level & early improvement More adaptive social outcomes in adolescence Higher NVIQ at dx (*1/3 with IQ<70) Higher family SES

VABS change patterns



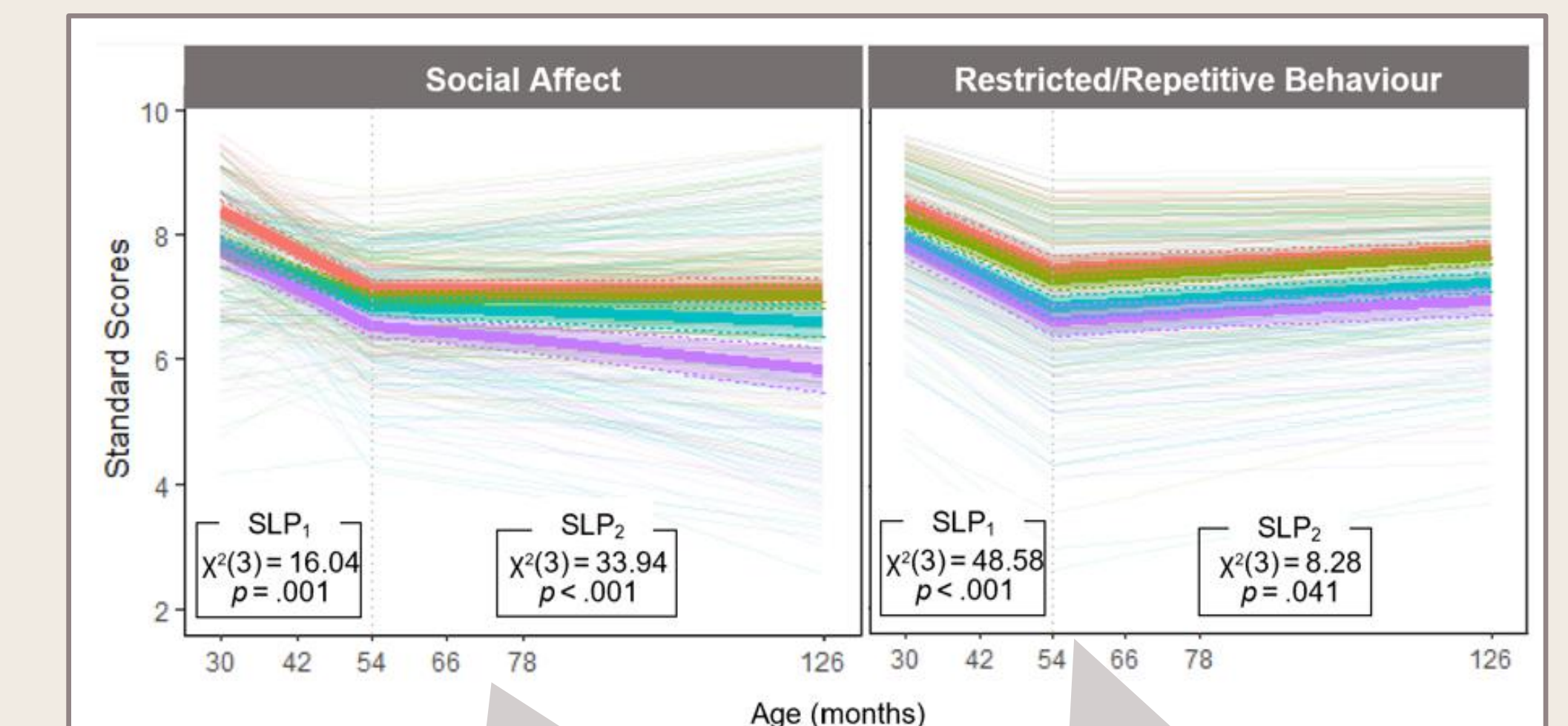
2 turning points at ages 5-6 and 9-10
(Transitions into school age and early adolescence).

NVIQ at diagnosis & household income are key correlates of VABS trajectories.

Covariates	C1 (n=87)	C2 (n=113)	C3 (n=140)	C4 (n=66)	Multinomial Logistic Regression
Child Characteristics at Diagnosis					
Male	75 (86%)	92 (81%)	120 (86%)	55 (83%)	No sig. group difference
Age of diagnosis (m)	36.01 (8.69)	37.96 (7.84)	39.89 (9.20)	38.92 (8.67)	C3>C1, C4>C2, C3>C4
NVIQ (Merrill-Palmer-R cog.)	34.85 (15.20)	52.36 (16.84)	65.49 (20.65)	82.54 (25.78)	C2>C1, C3>C1, C4>C1, C3>C2, C4>C2, C4>C3
ADOS-total CSS	8.49 (1.51)	7.30 (1.67)	7.38 (1.67)	7.21 (1.70)	C1>C2, C1>C3, C1>C4
Family Characteristics					
Household Income	8.45 (2.72)	8.56 (2.78)	9.44 (2.41)	10.49 (1.27)	C3>C1, C4>C1, C3>C2, C4>C2, C4>C3
Caregiver's Education (Bachelor's Degree+)	30 (34%)	42 (37%)	75 (54%)	38 (58%)	C3>C1, C4>C1, C3>C2, C4>C2
Caregiver's Race (White)	51 (59%)	68 (60%)	111 (79%)	51 (77%)	C3>C1, C3>C2, C4>C2
Caregiver's Nativity (Canada-born)	48 (55%)	69 (61%)	108 (77%)	50 (76%)	C3>C1, C4>C1, C3>C2, C4>C2

Significant effects ($p < .05$) in the adjusted model were bolded.

Differential associations with ADOS domains were observed across time.



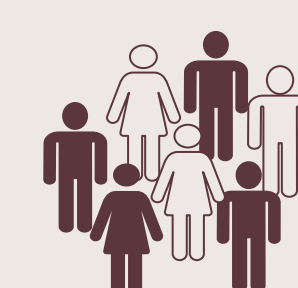
Group differences in SA slopes **increase** over time.

Group differences in RRB slopes **decrease** over time.

Intervention targets may vary across developmental stages for better supporting autistic children's functional needs.

Implications

Who



~21% were in the low-functioning range and more likely from a **low-SES** family.

Support for **early access to services**

"Doing Well"

~16% of our autistic participants showed good social adaptive outcomes by adolescence.

When

Entering school age is associated with **challenge or opportunities** for improvement in functioning.

Various responses to transitions

Overall **decreasing trends** in adaptive functioning were observed in **adolescence** despite stable or decreasing ADOS-SA scores.

Environmental supportiveness