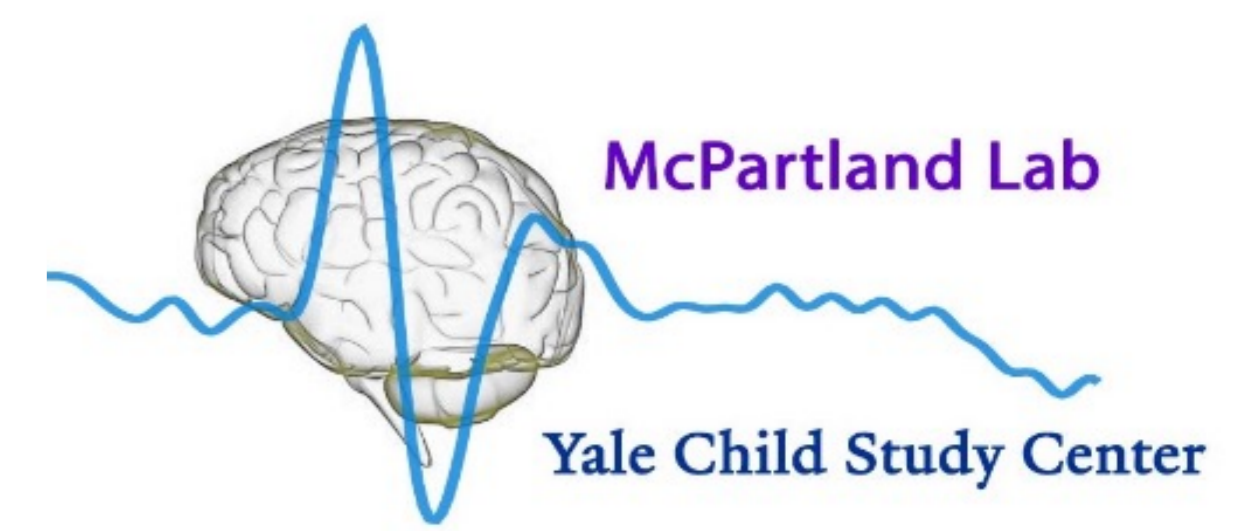


The Role of Neurotypical Siblings in the Clinical and Behavioral Development of Autistic Children: Results from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT)



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Background

- Siblings provide valuable learning opportunities that support the development of social, emotional, and adaptive skills.¹
- These opportunities may be particularly beneficial for autistic children who commonly experience challenges with social communication and adaptive functioning across the lifespan.^{2,3,4,5}
- However, the benefits associated with sibling relationships may vary depending on siblings' relative ages (i.e., relative to the autistic sibling).^{3,5,6}
- Understanding of the benefits of sibling relationships for autistic children remains limited, due in part to the predominance of cross-sectional designs and small sample sizes.⁶

Objectives

- Identify whether the presence of one or more siblings (vs. no siblings) is associated with stronger clinical and behavioral functioning of autistic children.
- Explore whether differences vary depending on siblings' relative age.

Methods

Participants

- N=164 autistic children ages 6-11 that participated in the Autism Biomarkers Consortium for Clinical Trials (ABC-CT).
- 109 participants had at least one non-autistic (NT) sibling; 55 had no siblings.
 - 62 had only younger siblings and 31 had only older siblings.
 - 16 participants with both younger and older siblings were excluded in relative age models.
- All siblings included in analyses had no neurodevelopmental diagnoses.

Measures

- Social-communication skills were assessed via caregiver report by the Autism Impact Measure (AIM) and the Social Responsiveness Scale-2nd Edition (SRS-2).
 - 4 AIM domains were used for analyses: Communication, Social Reciprocity, Peer Interaction, and Atypical Behavior.
 - 2 composites from the SRS-2 were used for analyses: Overall and Social Communication Index (SCI) T-Scores.
- Adaptive functioning was assessed by the Vineland Adaptive Behavior Scales-3rd Edition (VABS-3) Adaptive Behavior Composite (ABC).

Data Analysis

- Independent-samples t-tests were used to explore how participant demographics and clinical features differed by sibling status (**Table 1**).
- Linear regression models were used to investigate relationships between clinical and behavioral features, sibling presence, and the sibling's relative age (i.e., younger or older), while covarying for participant age, full-scale IQ (FSIQ), and hours of intervention per week in each model (**Table 2**).

Table 1. Participant Demographics

	No Sibling	Has Sibling	p
n (Female)	55 (14)	109 (22)	
Age (Years)	8.45 (1.52)	8.38 (1.62)	.801
Hours of Intervention (Weekly)	6.10 (9.43)	5.64 (8.61)	.753
FSIQ	93.42 (17.77)	97.23 (17.79)	.197
AIM Communication	26.91 (8.95)	24.10 (6.65)	.025
AIM Social Reciprocity	32.49 (5.41)	34.31 (4.86)	.031
AIM Peer Interaction	22.84 (3.77)	24.09 (4.61)	.083
AIM Atypical Behavior	28.49 (9.87)	29.28 (9.33)	.615
SRS-2 Overall T-Score (n=163)	71.20 (12.06)	72.49 (11.42)	.509
SRS-2 SCI T-Score (n=163)	70.33 (11.77)	71.65 (11.34)	.491
VABS-3 ABC	73.42 (11.19)	74.72 (11.65)	.496

Note. M (SD) reported. FSIQ was assessed by the Developmental Abilities Scale-II (DAS-II).

Results

Table 2. Multiple Linear Regressions Predicting AIM Domain Scores from NT Sibling Presence and Relative Age

Predictor	Communication	Social Reciprocity	Peer Interaction	Atypical Behavior
Has Sibling vs. No Sibling	-2.27 (.057)	1.92 (.025)	1.62 (.023)	1.41 (.401)
Younger Sibling vs. No Sibling	-2.41 (.065)	1.95 (.037)	2.15 (.006)	2.42 (.187)
Older Sibling vs. No Sibling	-1.99 (.202)	1.84 (.101)	0.61 (.507)	-0.52 (.813)
Older Sibling vs. Younger Sibling	0.92 (.496)	-0.40 (.708)	-1.67 (.087)	-2.63 (.230)

Note. β (p-value) reported. Bolded values indicate $p < .05$. Reference group=No Sibling; for Older Sibling vs. Younger Sibling comparison, reference group=Younger Sibling.

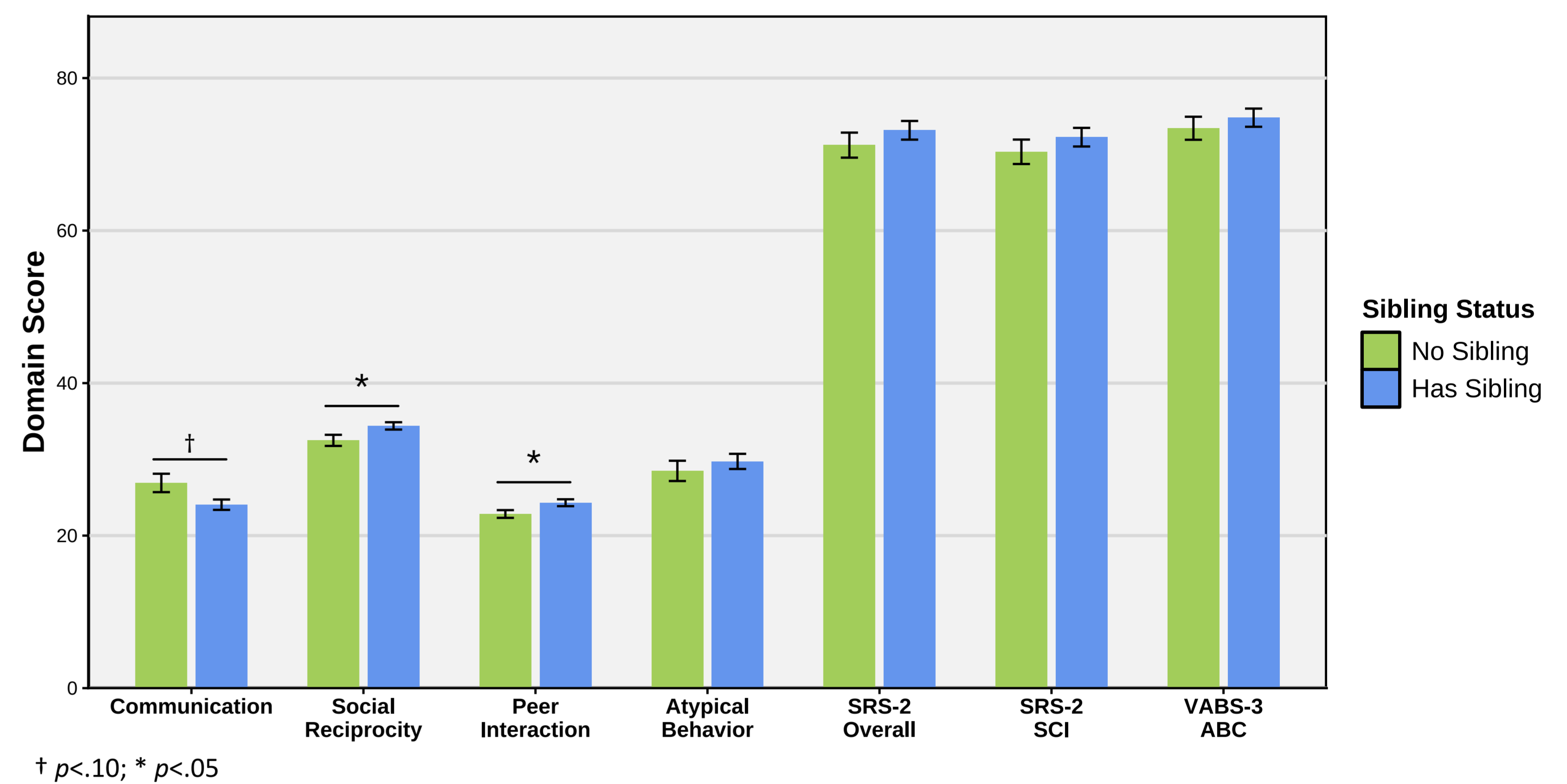
- No significant associations were observed between sibling status or relative sibling age and SRS-2 or VABS-3 outcomes.

Results

Presence of One or More NT Siblings

- Compared to autistic children without siblings, those with at least one NT sibling showed *more challenges* in social reciprocity ($\beta=1.92, p=.025$) and peer interaction ($\beta=1.62, p=.023$) and marginally *fewer challenges* in communication ($\beta=-2.27, p=.057$) on the AIM (**Figure 1**).
- No significant associations were observed for the AIM atypical behavior domain ($\beta=0.88, p=.580$), SRS-2 (overall: $\beta=1.73, p=.371$; SCI: $\beta=1.78, p=.350$), or VABS-3 ($\beta=0.10, p=.953$) outcomes (**Figure 1**).

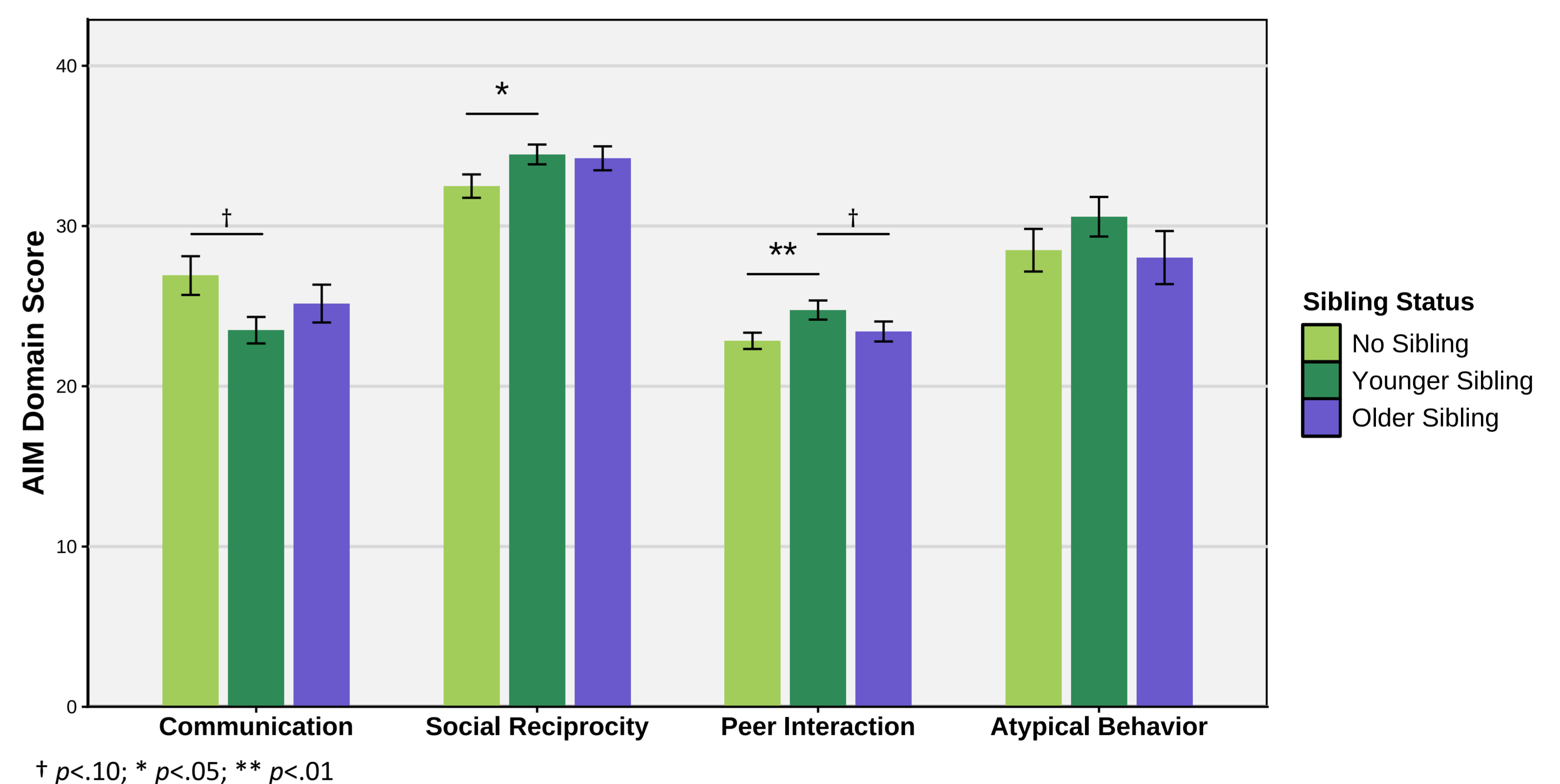
Figure 1. Differences in Clinical and Behavioral Domain Scores by NT Sibling Presence



Differential Effects of Relative NT Sibling Age

- Compared to autistic children without siblings, those with younger siblings demonstrated *more challenges* on the AIM in social reciprocity ($\beta=1.95, p=.037$) and peer interaction ($\beta=2.15, p=.006$), and marginally *fewer challenges* in communication ($\beta=-2.41, p=.065$) (**Figure 2**).
 - There were no differences in atypical behavior between children with younger siblings and those without siblings ($\beta=2.42, p=.187$), nor were there differences on any AIM domain between children with older siblings and those without siblings (**Figure 2**).
- Among autistic children with siblings, those with older siblings exhibited marginally *fewer challenges* on the AIM in peer interaction ($\beta=-1.67, p=.087$) compared to those with younger siblings (**Figure 2**).

Figure 2. Differences in AIM Domain Scores by Relative NT Sibling Age



Conclusions

- Compared to autistic children without siblings, autistic children with younger siblings exhibited greater challenges in social reciprocity and peer interactions.
- Patterns may reflect increased caregiver awareness of social challenges exhibited by their autistic child relative to NT siblings.
 - This may shape how caregivers anchor their ratings of social behavior, potentially leading to more conservative estimates of the autistic child's abilities, particularly in the presence of a younger sibling.
- Future research should examine how siblings shape the longitudinal developmental trajectories of autistic children and the effect of other sibling characteristics (i.e., sex, number of siblings, benefits of an autistic sibling) on caregiver- and clinician-rated social functioning to clarify the mechanisms through which sibling dynamics influence socio-behavioral outcomes in autistic children.

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