

Social Adaptive Functioning and Autism Symptoms in Minimally Verbal Children with Autism Spectrum Disorder

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Introduction

- Previous research examining the relationship between ASD symptoms and adaptive functioning reports different results, using various measures of autism symptoms^{1,2,3,4}.
- Some studies suggest that pro-social development of skills is not related to qualitatively different or impaired social behaviors^{2,3}.
- Individuals with ASD demonstrate a range of adaptive functioning, though research shows that standard scores of adaptive behavior tend to decrease as age increases within childhood, meaning that individuals with autism do not develop adaptive skills at a rate commensurate to that of their typically developing peers².
- Existing research examining this relationship has focused on more cognitively able and verbal populations, and as such, investigating adaptive behavior in a relatively homogeneous group of minimally verbal children with ASD is an important extension of this body of research.
- Previous studies report that adaptive skills are significantly related to IQ^{1,2,4}. It is important to determine whether ASD symptoms, in a sample of minimally verbal children, are related to adaptive functioning, above and beyond what can be accounted for by IQ.
- The ADOS-2 modules control for an individual's language abilities, so comparisons of the ADOS-2 and Vineland-II are complicated, particularly in a sample with little variability in communication skills.

Objective

Elucidate the relationship between communication and socialization skills and deficits in a sample of minimally verbal children with ASD.

Hypotheses

We predict that there will be:

- An inverse relationship between the Vineland-II Socialization domain age equivalents and ADOS-2 Social Affect raw algorithm totals, as neither measure controls for age.
- An inverse relationship between Vineland-II Socialization standard scores and ADOS-2 Social Affect calibrated severity scores (CSS), as age is controlled for by both measures.
- No relationship between Vineland-II Communication domain (age equivalents and standard scores) and ADOS-2 Social Affect domain (raw algorithm totals and CSSs), as there is a lack of variability in communication abilities in our sample.

Results

Stepwise Multiple Regression Analysis:

- Age and IQ entered at step 1, ADOS SA CSS entered at step 2. Age was dropped from the model.
- IQ contributed 12.5% of the variance in Vineland Socialization standard scores and an additional 8.3% was accounted for by ADOS SA severity.

Partial Correlation: Controlling for Mental Age (Leiter)			
	Vineland Age Equivalents		
	Communication	Socialization	
ADOS SA Raw	-.10	-.33**	
ADOS RRB Raw	-.07	.18	
ADOS Overall Raw	-.13	-.20	

Partial Correlation: Controlling for IQ (Leiter)			
	Vineland Standard Scores		
	Communication	Socialization	ABC
ADOS SA CSS	.04	-.32*	-.23
ADOS RRB CSS	-.10	.12	-.07
ADOS Overall CSS	-.03	-.14	-.23

- The Vineland-II Socialization domain and ADOS-2 Social Affect (SA) subscale were related when comparing age equivalents to raw scores, as well as standard scores to calibrated severity scores (CSS).
- The ADOS-2 SA subscale was not related to the Vineland-II Communication domain.
- No relationships were found between the ADOS-2 Restricted and Repetitive Behaviors (RRB) subscale or ADOS-2 overall total and either Vineland-II domain.

- IQ was positively related to Vineland-II Socialization, Communication, and Adaptive Behavior Composite (ABC) standard scores.
- The PLS-5 was positively related to the Vineland-II Communication domain and ABC.
- Receptive language skills correlated negatively with the ADOS-2 RRB subscale.
- Chronological age was inversely related to the Vineland-II Socialization domain.

	Pearson Correlations					
	ADOS CSS			Vineland Standard Scores		
	SA	RRB	Overall	Socialization	Communication	ABC
Chronological Age	-.10	-.05	-.22	-.29*	-.14	-.24
Leiter Brief IQ	.09	-.02	.06	.35**	.55**	.66**
PLS-5 Auditory Age Equivalent	-.04	-.29*	-.24	.22	.59**	.42**
PLS-5 Expressive Age Equivalent	.04	-.07	-.05	.13	.59**	.45**

N=64, except 1 individual was missing the Leiter Brief IQ and 7 individuals did not have a Vineland ABC.

* p<.05 ** p<.01

Method

Participants

- Sixty-four children who participated in an ongoing, multiple-site clinical intervention trial (Adaptive Interventions for Minimally Verbal Children with Autism Spectrum Disorder in the Community; AIM).
- Children were eligible for AIM if they:
 - Had a community diagnosis of ASD
 - Were between age 4.5 and 8.5 years old
 - Achieved a nonverbal mental age of at least 18 months
 - Were confirmed to be minimally verbal (used fewer than 20 words in a 20-minute standardized language sample)

N=64 (53 male)	M	SD	range
Age (months)	72	14.7	49 - 102
ADOS CSS	7.2	1.2	6 - 10
Nonverbal IQ (Leiter-R)	60.2	15.3	36 - 98
Expressive Language Age Equivalent (PLS-5; months)	18.8	6.6	5 - 33

Measures

*Autism Diagnostic Observation Schedule, 2nd Edition, Module 1 (ADOS-2)*⁵. The ADOS-2 was administered to confirm diagnosis and serve as a measure of symptom severity⁶.

*Vineland Adaptive Behavior Scales, 2nd Edition – Survey Form (Vineland-II)*⁷. The Vineland-II is a semi-structured parent interview, which provides information about a child's adaptive functioning in various domains. The measure yields age equivalents for each subdomain, as well as standard scores for each domain. Domain age equivalents were calculated based on the average of subdomain age equivalents. Prorated domain standard scores were calculated for children whose data could not be scored in one out of three subdomains, taking the remaining two into account⁷.

*Leiter International Performance Scale—Revised*⁸. Used to determine nonverbal intelligence.

*Preschool Language Scales—Fifth Edition (PLS-5)*⁹. Used to quantify expressive and receptive language level.

Conclusions

- There is variability in social deficits and social adaptation beyond what is accounted for by IQ, even in minimally verbal children.
- For research purposes, it is useful to consider the SA and RRB subscales of the ADOS-2 independently, as this may reveal relationships between ASD symptomatology and other areas of functioning.
- Our results suggest that clinicians' observations of skills and/or deficits in social affect during evaluations are related to the social skills demonstrated in everyday life, therefore confirming the usefulness of these types of assessments in intervention planning.

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Acknowledgments

We would like to thank the principal investigators (Kasari, C., Lord, C., Kaiser, A., Smith, T., & Almirall, D.) and the research staff at the University of California, Los Angeles, University of Rochester, Vanderbilt University, and Weill Cornell Medical College. We are grateful to New York Presbyterian Hospital and the Center for Autism and the Developing Brain, where our research team is housed and conducts assessments. Above all, we would like to express our gratitude to all of the families who participated in the AIM-ASD Study. This project was supported by 5 R01 HD073975-03 to Connie Kasari.