

THE RELATIONSHIP BETWEEN INTELLIGENCE AND CAREGIVER RATINGS OF SOCIAL SKILLS FOR CHILDREN WITH AUTISM

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ABSTRACT

Social skills are pivotal skills in children with autism that impact learning and outcomes. Early intervention research has focused mainly on IQ, rather than social skills, as a primary target outcome. Given that social skills, not level of IQ, is a primary feature of autism, more information is needed on the influence of IQ on social skills. IQ scores were analyzed against caregiver ratings of social skills of 61 children with autism ($M_{age} = 5.08$ years old, $SD = 1.52$). Results showed a significant correlation between intelligence and social skills ($r = .294, p = .021$); however, only 8.6% of the variance in social skills was explained by IQ scores.

INTRODUCTION

Although cognitive functioning is not part of the diagnostic criteria for autism, it is often a target for early intervention planning and outcome evaluation.

- For treatment planning, this may be problematic because educators may develop intervention goals or make educational placement decisions based on perceived abilities based on standardized test scores, rather than actual skills, of the child.
- For outcome evaluation, improvements in IQ scores (Smith, 2001), may not result in improvements in the core features of autism (i.e., social and communication impairments; Anderson, 2001).
- Behavioral interventions that impact IQ scores may be misleading because of an indirect effect of promoting test-taking strategies and encouraging behavior associated with better test performance (Lord & Schopler, 1989), rather than a true improvement on underlying cognitive functioning.
- Despite these challenges, what remains unknown is the relationship between social behaviors and intellectual functioning.

Although researchers have repeatedly documented the difficulties with social skills demonstrated by individuals with autism, few have assessed whether cognitive functioning is associated with social skills.

- This information will help increase understanding of the multiple and complex influences on social development.

OBJECTIVES

The purpose of this study is to describe the relationship between cognitive functioning and parent ratings of social skills for young children with autism. One primary research question and two secondary questions include:

- What is the relationship between cognitive functioning as measured by the *Differential Abilities Scale* (DAS; Elliott, 1990) and caregiver ratings of social skills on the *Early Childhood Social Skills Survey* (ECSSS; Ruble & Dalrymple, 2005) and how much variance is accounted for in social skills by IQ?
- What is the internal consistency of the caregiver ratings on the ECSSS?

- What is the relationship between the ECSSS and established measures of social functioning—the *Vineland Adaptive Behavior Scales* (VABS; Sparrow, Balla, Cicchetti, 1984) and the *Autism Diagnostic Observation Schedule* (ADOS; Lord, Rutter, DiLavore, & Risi, 1999)?

METHODS

The DAS was administered to 61 children with autism ($M_{age} = 5.08$ years old, $SD = 1.52$). 34.5% were boys. The ECSSS is a criterion-based questionnaire that assesses perceptions that caregivers have regarding their child's abilities to initiate, maintain, and respond to other adults and children. The questionnaire contains 29 items and used a Likert scale (1 "not at all" to 4 "very much"). The total score obtained on the ECSSS was used in the analyses.

The reliability of the ECSSS was examined by calculating the internal consistency using Cronbach's alpha, which measures reliability across items in a single test.

Validity of the ECSSS was established by calculating the relationship between items on the ECSSS, items from the Socialization domain on the VABS, and items from the Social Interaction domain on the ADOS.

Simple linear regression analysis was used to determine the relationship between and variance accounted by the General Cognitive Ability (GCA) scores obtained on the DAS with caregiver ratings of social skills from the ECSSS.

RESULTS

Table 1.

Summary of Descriptive Statistics

Measure	Mean	Standard Deviation
ECSSS	2.03	0.493
ADOS Social Interaction	7.54	4.89
VABS Socialization	63.05	14.49
DAS GCA	51.09	22.49

Reliability Estimates

- Internal consistency indicated an alpha of .91.

Validity Estimates

- A bivariate correlation was conducted to determine the relationship between items on the ECSSS and items from the Socialization domain on the VABS. A non-significant correlation ($r = .172, p = .101$) between the two measures was obtained.
- A bivariate correlation was also performed to determine the relationship between items on the ECSSS and items from the Social Interaction domain on the ADOS. A significant negative correlation ($r = -.214, p = .048$) was found between the two measures.

Simple Linear Regression Analysis

- A bivariate correlation and regression analysis was conducted using GCAs obtained on the DAS as a predictor of caregiver ratings of early social skills on the ECSSS. The model revealed that GCAs account for 8.6% of the variance (based on R-squared) in caregiver ratings of early social skills with a Pearson $r = .294, F(1,59) = 5.587, p = .021$.

- Listwise deletion was used in the regression analysis, causing any participant with missing data to be dropped entirely from the analysis.

DISCUSSION

Results obtained from the regression model indicated that although cognitive functioning, as measured by the DAS, correlates with early social skills, it accounted for little of the variance in social skills as rated by parents.

- Despite varying levels of cognitive functioning, children with autism display remarked impairment in development of early social skills as rated by caregivers.
- Based on the variance accounted for by the model (8.6%), it may be argued that using gains in cognitive functioning as an outcome measure for social skills interventions may be misleading because other residual variables may better predict and account for social skills development.
- These results are supported by conclusions drawn from previous researchers who have examined different measures of cognitive functioning (i.e., WISC-IV and Stanford Binet) and social functioning (i.e., VABS and ADOS) as part of their model and found similar findings of a weak and non-predictive relationship between cognitive functioning and social skills ratings (Bölte & Poustka, 2002; Freeman, Del'Homme, Guthrie, & Zhang, 1999; Joseph, Tager-Flusberg, & Lord, 2002; Liss et al., 2001).

The ECSSS has excellent reliability for assessing caregiver ratings of early social skills in children with autism.

- Although the ECSSS was not found to be correlated with the VABS, it can be argued that the ECSSS measures early social skills on a more discrete and precise level for children with autism.
- The ECSSS takes into consideration the skills that children with autism have the most difficulty in obtaining, such as initiating and maintaining interactions; whereas, the VABS accounts for more global skills (Sparrow et al., 1984).
- The ECSSS was indirectly correlated with the Social Interaction domain from the ADOS, indicating that items on the ECSSS tap into similar social skills as measured by the ADOS.

While the results obtained lend support to the existing literature, the study is not without limitations from sample size as well as analysis techniques used to account for missing data.

REFERENCES

- Anderson, M. (2001). Annotation: Conceptions of intelligence. *Journal of Child Psychology and Psychiatry*, 42, 267-268.
- Bölte, S., & Poustka, F. (2002). The relationship between general cognitive level and adaptive behavior domains in individuals with autism with and without co-morbid mental retardation. *Child Psychology and Human Development*, 33(2), 165-172.
- Elliott, C.D. (1990). *Differential Abilities Scale*. San Antonio, TX: Pearson Corporation.
- Freeman, B.J., Del'Homme, M., Guthrie, D., & Zhang, F. (1999). Vineland Adaptive Behavior Scale scores as a function of age and initial IQ in 210 autistic children. *Journal of Autism and Developmental Disorders*, 29(6), 379-384.
- Joseph, R.M., Tager-Flusberg, H., & Lord, C. (2002). Cognitive profiles and social-communicative functioning in children with autism spectrum disorder. *Journal of Child Psychology and Psychiatry*, 43(6), 807-821.
- Liss, M., Harel, B., Fein, D., Allen, D., Dunn, M., Feinstein, C., Morris et al. (2001). Predictors and correlates of adaptive functioning in children with developmental disorders. *Journal of Autism and Developmental Disorders*, 31(2), 219-230.
- Lord, C., Rutter, M., DiLavore, P.C., & Risi, S. (1999). *Autism Diagnostic Observation Schedule*. Los Angeles, CA: Western Psychological Services.
- Lord, C., & Schopler, E. (1989). The role of age at assessment, developmental level, and test in the stability of intelligence scores in young autistic children. *Journal of Autism and Developmental Disorders*, 19(4), 483-499.
- Ruble, L., & Dalrymple, N. (2005). *Early Childhood Social Skills Survey*. (Available from L. Ruble, 237 Dickey Hall, Lexington, Kentucky, 40508).
- Smith, T. (2001). Discrete trial training in the treatment of autism. *Focus on Autism and Other Developmental Disabilities*, 16, 86-92.
- Sparrow, S.S., Balla, D., & Cicchetti, D. (1984). *Vineland Adaptive Behavior Scales*. Circle Pines, MN: American Guidance Service.

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