Socioeconomic Status and Adaptive Function in Autistic Children: Results from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT)

S. Eberle, J.M. Wolf, A. Naples, C. Carrow, K. Chawarska, G. Dawson, S. Jeste, J. Dziura, S. Webb, S. Faja, N. Kleinhans, C. Sugar, F. Shic, J. McPartland

McPartland Lab
Yale Child Study Center

Autism Biomarkers Consortium for Clinical Trials

Background

- Many children with autism spectrum disorder (ASD) have significant weaknesses in adaptive functioning that impact their self-sufficiency and quality of life.[1]
- While lower cognitive ability and greater autism severity have been associated with lower adaptive functioning, other factors, such as socioeconomic status (SES), may also impact adaptive functioning.[2,3]
- SES could impact accessibility to healthcare, timeliness of diagnosis, and access to intervention for ASD, all of which may relate to variability in adaptive functioning.[1,4]

Objectives

1. Investigate whether socioeconomic factors explain variability in adaptive functioning in a large and geographically diverse sample of autistic children.
2. Identify the adaptive functioning domains that may be most impacted by socioeconomic factors and which socioeconomic factors have the greatest influence.

Methods

Participants

- As part of their participation in a multisite longitudinal biomarker study, caregivers of school-aged (N=280) autistic children reported their adaptive functioning over a period of 6 months. Parents also reported a range of demographic information, including race/ethnicity, caregiver education, and household income **(Table 1).**
- Caregiver-reported adaptive functioning skills were assessed by the Vineland Adaptive Behavior Scales-3rd Edition (Vineland-3).[5]
- ASD diagnoses were confirmed with the Autism Diagnostic Observation Schedule-2nd Edition, Autism Diagnostic Interview-Revised, and clinician endorsement of DSM-5 criteria for ASD.[6,7]

Table 1.

	N = 271 (207 male)
Age (Years)	
Mean (SD) [Range]	8.53 (1.64) [6.01, 11.5]
Vineland-III Scores	
Composite	73.55 (11.23) [31, 113]
Daily Living Skills	77.75 (11.73) [31, 108]
Socialization	69.77 (16.28) [27, 106]
Communication	76.44 (15.11) [28, 124]
Race	
American Indian / Alaskan Native	2 (0.73%)
Asian	21 (7.75%)
Black or African American	13 (4.79%)
White	185 (68.26%)
Mixed Race	44 (16.24%)
Other	6 (2.21%)
Ethnicity	
Hispanic or Latino	52 (19.19%)
Highest level of caregiver education	
Less than high school	2 (0.76%)
High school degree	12 (4.58%)
Some college	51 (19.46%)
Bachelor's degree	62 (22.66%)
Some graduate work	82 (31.30%)
Graduate degree	53 (31.23%)
Annual family income	
$25,001 – 35,000	4 (1.47%)
$10,001 - 15,000	5 (1.84%)
$35,001 – 50,000	10 (3.69%)
$50,001 – 75,000	18 (6.64%)
$75,001 – 100,000	22 (8.11%)
$100,001 – 150,000	71 (26.20%)
>$150,000	141 (52.03%)

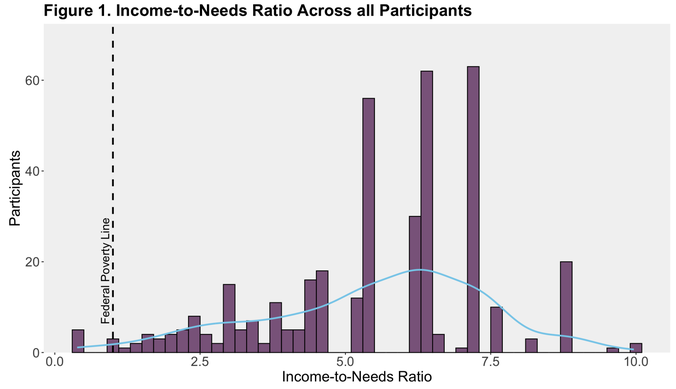
- Only autistic participants who had demographic information and Vineland-3 scores across the study timepoints were included (N= 271).
- Study sites included Yale University, University of California, Los Angeles, Duke University, University of Washington, and Boston Children's Hospital.

Analysis

- **Household-level socioeconomic status:** Household-level socioeconomic status was estimated using the income-to-needs ratio by dividing an individual's household income by the U.S. Census Bureau–based poverty threshold that accounts for family size.
- **Caregiver education:** Caregiver education was self-reported by the child's caregiver as the highest grade level that caregivers each completed.
- **Predicting adaptive functioning**: Multiple regression models were used to predict Vineland-3 scores by income-to-need ratios, study site, and caregiver education.

Results

Figure 1. Income-to-Needs Ratio Across all Participants



- Distribution of income-to-needs ratio scores across all participants (*M* = 5.26, *SD* = 1.99) **(Figure 1).**
- An income-to-needs ratio of ≤ 1.0 indicates living at or below the federal poverty line.

- Vineland-3 Standard Scores categorized by domain (communication, daily living, and socialization), stratified by income-to-needs ratio scores. Vineland standard scores have a mean of 100 and standard deviation of 15 **(Figure 2).**

- Participants with income-to-needs ratio scores of 5 and above (*M* = 85.2, *SD* = 16.6), 4 to 5 (*M* = 75.7, *SD* = 10.8), 3 to 4 (*M* = 80.7, *SD* = 22.1), and 2 to 3 (*M* = 75.6, *SD* = 20) had stronger adaptive composite scores compared to those with scores of 1 to 2 (*M* = 68.8, *SD* = 8.7) and below the poverty line (*M* = 71.8, *SD* = 16.8).
- There was a significant difference in adaptive composite scores across income groups, $F(5, 34.01) = 10.15$, $p < .01$.

Figure 2. Vineland-3 Standard Scores by Domain and Income-to-Needs Ratio

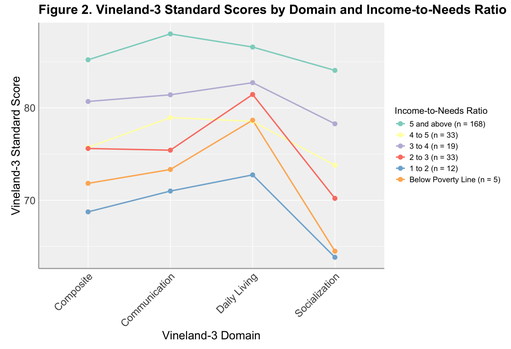
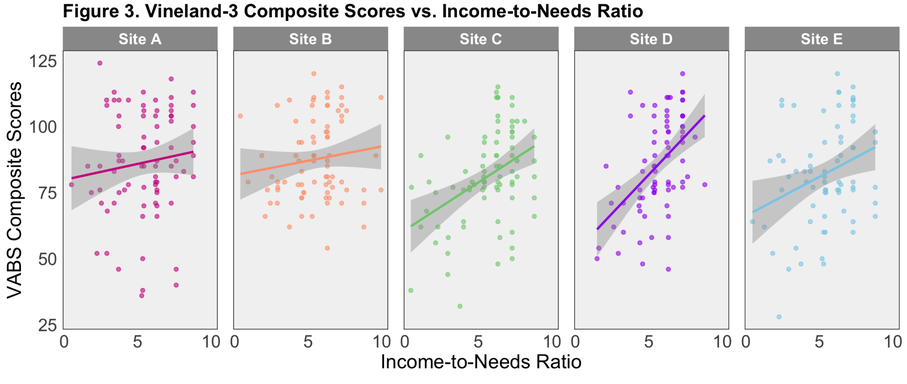


Figure 3. Vineland-3 Composite Scores vs. Income-to-Needs Ratio



- Sites were separated to account for differences in average income and living costs by location.
- Income-to-needs ratio scores significantly predicted Vineland-3 composite scores for Site C ($\beta = 1.96$, $p < .01$), Site D ($\beta = 3.41$, $p < .01$), and Site E ($\beta = 1.42$, $p < .05$) **(Figure 3).**
- Income-to-needs ratio scores did not significantly predict Vineland-3 composite scores for Site A ($\beta = .58$, $p > .05$) and Site B ($\beta = .49$, $p > .05$).

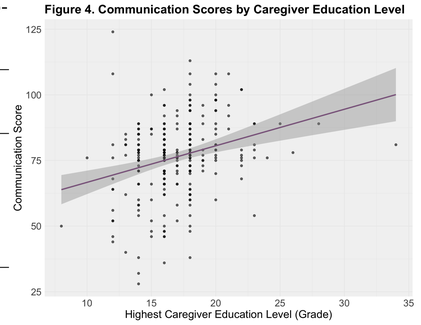
Results

Table 2. Multiple Regression Predicting Vineland-3 Domain Scores from Income-to-Needs Ratio and Caregiver Education

Domain	Income-to-Needs	Mother's Education	Father's Education
Composite	**1.52 (.002)**	0.37 (.21)	0.18 (.46)
Communication	**1.60 (.004)**	**0.85 (.02)**	**0.75 (.03)**
Daily Living	**1.09 (.02)**	0.29 (.38)	0.18 (.50)
Socialization	**2.51 (.001)**	0.12 (.81)	0.2 (.56)

Note. β(*p*-value) reported. Bolded values indicate $p < .05$.

Figure 4. Communication Scores by Caregiver Education Level



- Multiple regression analysis was used to evaluate whether income-to-needs ratio and caregiver education levels (mother's and father's) predicted Vineland-3 domain scores **(Table 2).**
- Income-to-needs scores were significant predictors across all Vineland-3 domains.
- Mother's education level and father's education level emerged as significant predictors of communication scores with all sites combined.
- Highest caregiver education level was moderately correlated with communication scores ($r = .28$, $p < .05$) **(Figure 4).**

Conclusions

- These results suggest that individual and contextual socioeconomic factors have a significant role in predicting adaptive behavior and communication skills in autistic children.
- Specifically, family income relative to need and caregiver education were significant predictors.
- These findings emphasize the importance of addressing socioeconomic disparities, particularly in access to educational resources and intervention services, to better support families of autistic children from lower socioeconomic backgrounds.[8,9]

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McPartland Lab
mcp-lab.org
mcp.lab@yale.edu
mcpartland.lab on Instagram

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