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Brief Communication

Unequal neighborhoods, unequal skills: Adaptive functioning and access to community resources

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Abstract

Objective: To examine the relationship between children's adaptive functioning and neighborhood resources – such as school quality, access to healthy food, green spaces, and housing quality – using a large, diverse clinical outpatient sample. **Method**: Pediatric outpatients (N = 6,942; age M = 10.44 years; 67.0% male; 50.3% White; 33.9% Medicaid), aged 1-18, who underwent neuropsychological or psychological evaluation were included if their caregiver completed the Adaptive Behavior Assessment System, 3rd Edition (ABAS-3) and had a nationally normed Child Opportunity Index (COI) score, a composite measure of 29 geo-coded neighborhood characteristics. **Results**: Children from higher-opportunity neighborhoods demonstrated significantly stronger adaptive functioning across conceptual, social, and practical domains. Those in the top 40% of neighborhood advantage exhibited stronger adaptive skills than those in the bottom 60%. Neighborhood resources and family financial resources were associated with greater adaptive skills beyond child age, sex, and racial/ethnic background. **Conclusion**: Neighborhood resources are linked to children's adaptive functioning, possibly due to increased opportunities to practice these skills in safer, more supportive environments. These findings emphasize the importance of considering environmental factors in assessing adaptive skills and highlight the need for public health investments and legislation related to community resources.

Keywords: Behavior; adaptive; neighborhood characteristics; neurodevelopmental disorders; neuropsychological tests; child development; socioeconomic factors

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Statement of Research Significance

Research Topic:

- This study explores the link between children's adaptive functioning and neighborhood resources using a large, diverse clinical sample. By examining neighborhood opportunity levels that incorporate features such as school quality, access to healthy foods, green spaces, and housing quality, this work highlights how these environmental elements are connected to children's day-to-day skills.

Main Findings:

- The findings indicate that children from higher-opportunity neighborhoods exhibit stronger adaptive skills across conceptual, social, and practical domains, perhaps due to increased opportunities to practice these skills in safer, more supportive environments.

Study Contributions:

- This study demonstrates that structural neighborhood factors are linked to children's day-to-day functional skills in a clinical sample. Thus, clinicians should consider a child's neighborhood context in assessment interpretation and policymakers can look to infrastructure investments, including access to healthcare, housing and employment, and school funding, as potential avenues to support children's adaptive development.

Introduction

Social determinants of health (SDOH) are the conditions in which people are born, grow, live, work, and age. Despite increasing attention to SDOH in neuropsychological assessment, the role of community and local resources in shaping children's adaptive functioning remains underexplored. For instance, access to healthy

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foods, green spaces, walkable and safe neighborhoods, high-quality educational instruction, and environments free from toxic exposures may influence the development of daily living skills. Most current literature connecting adaptive functioning to SDOH has focused on specific populations, including pediatric brain tumor survivors, children with autism spectrum disorder (ASD), and those with sickle cell disease (Hodge et al., 2021; Nielsen et al., 2023; Nolan et al., 2024; Trpchevska et al., 2022). However, the potential links between neighborhood resources and adaptive functioning across a large, diverse clinical population has not yet been investigated. This is an important area to explore given that adaptive functioning, which comprises the day-to-day independent living skills required to navigate social, practical, and conceptual demands, is particularly important for child outcomes (American Psychiatric Association, 2022). Prior work has found links in adaptive development to cognitive skills, language, and behavioral dysregulation, and concerns can be observed across the lifespan, with greater challenges in adaptive functioning connected to greater challenges in other domains (e.g., educational attainment; De Bildt et al., 2005; Liss et al., 2001; Matson et al., 2009; Papazoglou et al., 2013; Ventola et al., 2014).

Prior work has found that more family- and community-based resources positively contribute to children's overall health, such as cognitive and academic functioning (Hicks et al., 2018; Kalb et al., 2023; Leventhal & Dupéré, 2019; Schraegle et al., 2023; Xiao et al., 2023). Additionally, lower socioeconomic status and neighborhood disadvantage has been associated with neuroanatomical implications including lower cortical and subcortical gray matter volumes (Barch et al., 2022) and reduced cortical thickness (Rakesh et al., 2022), which are associated with poorer executive functioning, lower IQ scores, and challenges in learning and memory, impacting overall cognitive performance. Within specific clinical populations (e.g., pediatric patients with history of brain tumor, ASD, and sickle cell), studies have found associations between lower adaptive functioning scores and fewer family- and community-based resources, operationalized as caregiver education, occupation, household income, or aggregated neighborhood advantages (Ibrahim et al., 2020; Nolan et al., 2024; Raghubar et al., 2019; Trpchevska et al., 2022).

This study adds to this growing body of literature by examining connections between adaptive functioning and neighborhood resources using a large, diverse clinical sample evaluated at a neuropsychological and psychological assessment center. To measure neighborhood opportunity, we utilized the Child Opportunity Index (COI), a unique tool that assesses geo-coded, census-tract-level indicators relevant to children, such as access to quality schools, early education centers, green spaces, and walkability (Acevedo-Garcia et al., 2014, 2020). The primary aim of this study was to investigate how a child's environment, as measured by the COI, is linked to the development of day-to-day life skills, or adaptive functioning, using a well-validated, age-normed caregiver-reported measure collected as part of clinical evaluations. We also explored the relationships between specific subdomains of adaptive functioning (conceptual, practical, and social skills) and neighborhood advantage. We hypothesized that children from resource-advantaged neighborhoods would demonstrate stronger adaptive skills, theorizing that children would benefit from greater opportunities to practice and foster these skills in safer, more supportive environments. Additionally, we investigated how the combination of neighborhood resources and family financial resources, proxied by insurance type, contributed to adaptive skill development, as we anticipated both micro- and macro-level resources are important to skill development. We hypothesized that neighborhood resources would be significantly associated with the development of adaptive functioning above and beyond other demographic variables (i.e., child sex, age, insurance type, and race/ethnicity).

Method

Participants and procedure

The sample included pediatric patients (N = 6,942) who underwent an outpatient neuropsychological or psychological assessment at a large, urban academic medical center in the eastern mid-Atlantic region of the United States. In this clinical sample, families presented for an evaluation due to concerns with a child's functioning. Inclusion criteria included: patients age 18 years or younger at the time of their appointment; a caregiver completed Adaptive Behavior Assessment System, 3rd Edition (ABAS-3; (Harrison & Oakland, 2015) as part of routine clinical care; and a calculable Childhood Opportunity Index 2.0 (COI; (Noelke et al., 2020) based on the patient's address in the medical record. For patients with multiple assessment points, the most recent evaluation was used. The sample included children aged 1–18 years (M = 10.44, SD = 3.71), of which 67.0% were male. Approximately 50.3% of children were White, 28.8% Black, 12.3% multiracial, 4.0% Asian, 0.2% American Indian/Alaskan Native, 1.2% other race, and 3.1% unknown. With regard to ethnicity, 5.8% were Hispanic/Latino. Interpreters were requested for 1.7% (n = 120) of patients. Insurance type was split between Medicaid/government-sponsored medical assistance (33.9%) and commercial insurance (66.1%); within the United States, with limited exceptions, families who fall below certain income requirements are eligible to receive Medicaid.

For a subset of patients (n = 4,182; 60.2%), diagnostic information was available. Of these, 60.9% had a diagnosis of attention-deficit/hyperactivity disorder; 36.3% had an anxiety or depression diagnosis; 27.2% had a receptive, expressive, or mixed receptive-expressive language disorder; 24.4% had a specific learning disorder; 23.9% had ASD; and 13.6% had intellectual developmental disorder/intellectual disability. For those without diagnostic information, this information was missing, rather than suggestive of an absence of diagnosis in this clinical sample. This study received Johns Hopkins Medicine Institutional Review Board approval under a waiver of consent, and in accordance with the Helsinki Declaration. All data were extracted from the electronic medical records.

Measures

Sociodemographic and diagnostic characteristics

Demographic data, including age at visit, insurance type (Medicaid vs. commercial), race, ethnicity, and legal sex were extracted from medical records. Legal sex was used due to inconsistent gender identity data entered in the medical record, limiting accurate identification of trans or gender diverse patients.

Adaptive functioning

Adaptive functioning was measured using the ABAS-3 (Harrison & Oakland, 2015) via the age 0–5 or age 5–21 rating forms. The ABAS-3 was developed to be consistent with models of adaptive

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Table 1. Descriptive statistics, ANOVAs, and hierarchical linear regression results of adaptive functioning standard scores by level of neighborhood opportunity

	N	ABAS-3 General Ability Composite	ABAS-3 Conceptual Index	ABAS-3 Social Index	ABAS-3 Practical Index
Overall *M* (SD)	6873	79.19 (14.01)	79.43 (13.74)	82.83 (14.63)	81.54 (14.51)
COI Level					
Very Low *M* (SD)	809	77.31 (14.06)	76.19 (13.46)	80.04 (14.14)	80.77 (15.07)
Low *M* (SD)	847	77.36 (13.95)	77.20 (13.69)	80.80 (14.52)	80.18 (14.36)
Moderate *M* (SD)	1140	77.75 (13.50)	77.93 (13.23)	81.25 (14.01)	80.26 (13.93)
High *M* (SD)	1585	80.02 (14.02)	80.07 (13.71)	83.64 (14.52)	82.08 (14.53)
Very High *M* (SD)	2492	81.02 (13.99)	81.55 (13.71)	84.65 (14.87)	82.52 (14.53)
ANOVA *F*		22.41***	35.94***	25.50***	7.94***
η^2		.013	.021	.015	.005
Regression analysis					
Outcome: ABAS-3 GAC (N = 6871)		*B*	*SE B*	*β*	*t*
Intercept		79.40	0.71	–	112.15***
Child sex		−2.30	0.36	−0.08	−6.45***
Child age		−0.14	0.05	−0.04	−3.00**
Hispanic/Latino		−3.10	0.88	−0.05	−3.54***
Race (Black)		0.61	0.43	0.02	1.43
Race (Asian)		−4.47	0.87	−0.06	−5.15***
Race (Native American/Alaskan)		−3.89	3.85	−0.01	−01.01
Race (multiracial)		−0.04	0.64	−0.00	−.07
Race (other)		−3.27	1.56	−0.03	−2.10*
Race (missing)		−0.95	0.97	−0.01	−0.97
National COI		1.23	0.13	0.12	9.27***

Note: *$p < .05$, **$p < .01$, ***$p < .001$. COI = Childhood Opportunity Index. ABAS-3 = Adaptive Behavior Assessment System, 3rd Edition. Child sex: 0 = female, 1 = male; insurance type: 0 = Medicaid, 1 = commercial insurance. Child race was coded categorically into White (reference group), Black, Asian, Native American/Alaskan, multiracial, other race, or missing. Child ethnicity was Hispanic/Latino was binary (0 = Non-Hispanic/Latino, 1 = Hispanic/Latino).

behaviors put forth by the American Psychiatric Association (2013) as well as the American Association on Intellectual and Developmental Disabilities (2010). It has good test-retest reliability and internal consistency (Harrison & Oakland, 2015, 2018). Caregivers rated how independently a child could perform various skills on scales ranging from 0 (cannot perform) to 3 (almost always performs independently). An overall General Adaptive Composite (GAC) score was calculated, as well as three subdomains: conceptual (e.g., communication, academics, self-direction), social (e.g., leisure, social), and practical (e.g., community use, health, self-care). Scores on the ABAS-3 were age-normed standard scores (SS; mean of 100, standard deviation of 15) to provide information on how a child's adaptive skills are developing relative to same-aged children. Continuous standard scores were used in all analyses.

Neighborhood resource level

Neighborhood resource levels were measured using the national Childhood Opportunity Index 2.0 (Acevedo-Garcia et al., 2014; Noelke et al., 2020), a geo-coded measure based on 29 weighted indicators of educational, social, economic, health, and environmental quality within a child's census tract. Examples of factors incorporated include neighborhood-level adult educational attainment, third grade reading and math proficiency, teacher experience, housing vacancy, health insurance coverage, access to healthy food, access to green space, toxic exposures such as presence of hazardous waste dump sites and industrial pollutants, homeownership rate, and median household income. The COI has been validated against other neighborhood-level measures, and it has been found to have robust links to children's health outcomes (e.g., Aris et al., 2023; Krager & Bettenhausen, 2025; Zewdie et al., 2021). The COI categorizes neighborhoods into quintiles of advantage, each representing 20% of the U.S. child population, labeled Very Low, Low, Moderate, High, and Very High (with corresponding interval values of 0–4). Our sample distribution was as follows: Very Low (n = 821; 11.8%), Low (n = 857; 12.3%), Moderate (n = 1151; 16.6%), High (n = 1607; 23.1%), and Very High (n = 2506; 36.1%).

Statistical analysis plan

All analyses were conducted using SPSS Version 29. Following examination of descriptive statistics, one-way ANOVAs were performed to assess significant differences in adaptive functioning across different levels of neighborhood advantage. Significant omnibus ANOVAs were followed by Bonferroni post hoc tests to adjust for the multiple comparison error rate. Next, a sensitivity analysis was conducted via hierarchical linear regression to determine whether the relationship between neighborhood advantage and adaptive functioning persisted after accounting for family financial resources as indicated by insurance type (Medicaid vs. commercial). Finally, the full model included sociodemographic factors such as continuous child age, binary child sex, binary ethnicity (Hispanic/Latino vs. non-Hispanic/Latino), and categorical race. All model assumptions were met.

Results

Average adaptive skills by level of neighborhood advantage

Significant differences in overall adaptive functioning were observed across levels of neighborhood advantage using one-way ANOVAs (see Table 1). Post hoc Bonferroni tests revealed that children living in neighborhoods within the top 40% of opportunity (High or Very High COI) had significantly better-developed adaptive skills than those in the bottom 60% (Very Low, Low, or Moderate COI; all comparisons $p < .001$). Descriptively, for children falling into the Very Low COI range, 29.4% had Exceptionally Low (SS<70) overall adaptive functioning scores, whereas for children falling into the Very

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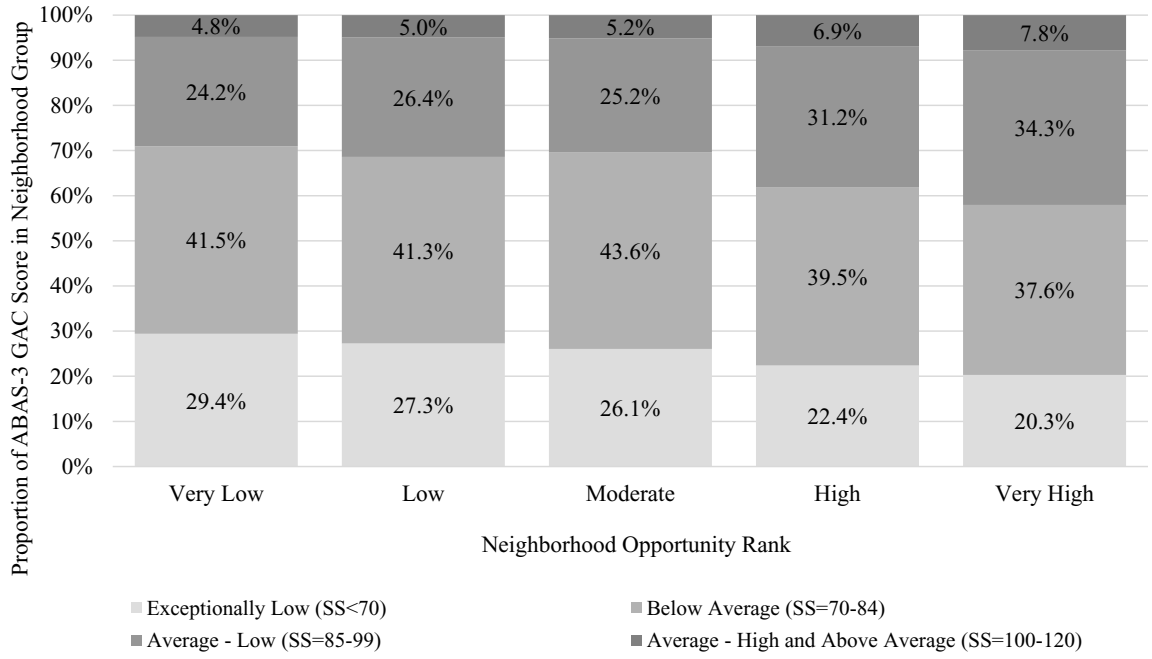

Figure 1. ABAS-3 GAC scores by neighborhood opportunity rank.

High COI range, 20.3% had Exceptionally Low overall adaptive scores; see Figure 1.

Differences were also found within the subdomains of conceptual, social, and practical skills, although the effects were smaller compared to overall adaptive functioning. For both conceptual and social skills, children in the top 40% of neighborhood opportunity scored significantly higher than those in the bottom 60% (all $p < .001$). Additionally, for conceptual skills, children in Very High opportunity neighborhoods scored significantly higher than those in High opportunity neighborhoods ($p < .01$). For practical skills, children in Very High COI neighborhoods had significantly better skills than those in Very Low ($p < .05$), Low ($p < .001$), and Moderate ($p < .001$) neighborhoods, and children in High COI neighborhoods scored higher than those in Low and Moderate neighborhoods (both $p < .05$).

Adaptive skills and neighborhood advantage, accounting for sociodemographic characteristics

Sociodemographic variables (age, sex, race, and ethnicity) were examined with COI. Neighborhood opportunity remained a significant correlate of adaptive functioning (see Table 1), $F(10,6860) = 18.69$, $p < .001$, adjusted $R^2 = .025$. The same pattern of results emerged when examining the conceptual, social, and practical subdomains of adaptive functioning individually. In each case, greater neighborhood advantage significantly and independently predicted more positive skill development, above and beyond child age, sex, race, and ethnicity.

Given that both insurance type and COI are markers of economic resources, a sensitivity analysis was conducted to examine if the relationship between neighborhood opportunity and adaptive functioning persisted when including family financial resources (using insurance type as a proxy) in the model. Insurance type and COI were moderately positively correlated, $r = .43$, $p < .001$. More advantaged neighborhood opportunity ($\beta = .07$, $p < .001$) and insurance type ($\beta = .15$, $p < .001$) were both significantly associated with stronger adaptive functioning skills, model $F(11,6859) = 28.20$, $p < .001$, adjusted $R^2 = .042$. This same pattern of results was found across the conceptual, social, and practical subdomains. Of note, the average difference of adaptive scores between insurance types was similar to the difference between Very Low and Very High COI (i.e., ABAS-3 GAC SS = 76 for patients with Medicaid, SS = 80 for patients with commercial insurance), $t(6871) = -13.60$, $p < .001$.

Discussion

This study contributes to the growing body of literature on SDOH, specifically neighborhood resources, in relation to children's adaptive functioning in a clinical sample. Our findings provide evidence that children residing in resource-rich neighborhoods, as measured by the COI, exhibited stronger overall adaptive skills, independent of other sociodemographic characteristics including family financial resources. The difference of average adaptive skills scores between binary insurance type as well as the lowest and highest levels of COI were both about 5 standard score points, or a third of a standard deviation, suggesting a relatively small but consistent contribution of SDOH to children's skills. This underscores the importance of considering both macro-level factors, such as neighborhood opportunity, and micro-level factors, such as family economic resources, in understanding children's development. These results align with previous research linking socioeconomic factors to adaptive functioning in specific clinical populations (Hodge et al., 2021; Nielsen et al., 2023; Nolan et al., 2024; Trpchevska et al., 2022), expanding this connection to a large, clinically diverse sample of pediatric patients.

The implications of this study are relevant for both clinical practice and public policy. Clinicians should consider the broader environmental context when assessing children's adaptive functioning, particularly in urban settings where neighborhood resources can vary widely. Clinicians should also consider recommending community-level supports, such as afterschool

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programs or neighborhood safety initiatives, alongside individual or family-based treatments. At the policy level, our findings underscore the importance of investing in neighborhood infrastructure and services to support child development. Policymakers should prioritize efforts to reduce disparities in neighborhood opportunities, recognizing the potential long-term benefits for children's adaptive functioning.

Despite its strengths, including a large, diverse clinical sample and the use of well-validated measures of neighborhood opportunity and adaptive functioning, this study has several limitations. Most notably, the cross-sectional design precludes causal conclusions about the relationship between neighborhood resources and adaptive functioning. Neighborhood advantage was also not equally distributed, suggesting sample bias exists with regard to which children receive evaluations; while our center is diverse overall in terms of insurance type, racial/ethnic backgrounds, ages, and presenting concerns, more than half of our sample fell into the High or Very High COI range. Furthermore, as clinicians select their evaluation batteries independently, there is likely sample bias as to who receives an ABAS-3 (e.g., based on referral questions, child's functioning, clinician preference). Co-occurring neurodevelopmental or psychiatric conditions and aspects of functioning, such as cognitive or executive functioning skills, likely also impact acquisition and independent application of adaptive skills. While comprehensive examination of these issues was beyond the scope of the current study, we did perform sensitivity analyses using subsamples of youth for whom cognitive functioning measures and diagnoses were available. These analyses continued to demonstrate that COI was significantly related to adaptive functioning; see Table 1 in the supplemental materials. However, those results are not included in the main body of this study due to issues related to data missingness (sample reduced by 68%), multicollinearity, and potentially biased estimates (e.g., Dennis et al., 2009; Richiardi et al., 2013). Additionally, while our analyses controlled for key sociodemographic factors, unmeasured variables such as parental education and family environment may also influence adaptive skill development. The COI is based on the most current address within the medical record, and this may obscure the potential impact of household moves. However, most households report relatively low rates of relocation within the past year, with research indicating that families typically move within the same county and into economically similar neighborhoods (e.g., DeLuca & Jang-Trettien, 2020; Frost, 2020; National Institute on Minority Health and Health Disparities, 2025). Longitudinal studies are needed to assess whether neighborhood resources directly contribute to changes in adaptive functioning over time.

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