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Are Non-intellectually Disabled Black Youth with ASD Less Impaired on Parent Report than Their White Peers?

Allison B. Ratto¹, Bruno J. Anthony², Lauren Kenworthy¹, Anna Chelsea Armour¹, Katerina Dudley¹, and Laura Gutermuth Anthony¹

Allison B. Ratto: aratto@childrensnational.org

¹Center for Autism Spectrum Disorders, Center for Neuroscience Research, Children's Research Institute, Children's National Health System, George Washington University School of Medicine, 15245 Shady Grove Rd., Suite 350, Rockville, MD 20850, USA

²Center for Child and Human Development, Georgetown University, Box 571485, Washington, DC 20057-1485, USA

Abstract

There is a lack of research examining differences in functioning in autism spectrum disorder (ASD) across ethnicity, particularly among those without intellectual disability (ID). This study investigated ethnic differences in parent-reported impairment in executive function, adaptive behavior, and social-emotional functioning. White and Black youth ($n = 64$; ages 6–17) with ASD without ID were compared on each of these domains. Black youth had significantly lower levels of impairment on all three domains. Findings may reflect better daily functioning among Black youth with ASD and/or cultural differences in parent response to questionnaires. Regardless, these findings raise concern about the sensitivity of commonly used measures for Black children with ASD and the impact of culture on daily functioning and symptom manifestation.

Keywords

Race/ethnicity; Black/African-American; ASD; Executive function; Adaptive behavior; Social-emotional functioning

Introduction

As the diagnosis of autism spectrum disorder (ASD) has increased over the past several decades (CDC 2014), research into this disorder has grown exponentially. Despite considerable advancements in the understanding of ASD, relatively little is known about the impact of race and ethnicity on the screening, diagnosis, manifestation, and treatment of this disorder (Wallis and Pinto-Martin 2008). Racial/ethnic minority families are also

Correspondence to: Allison B. Ratto, aratto@childrensnational.org.

Author contributions

AR collected the data, ran the analyses, and wrote the paper. BA assisted in designing the analyses and wrote the paper. LK served as co-principal investigator for the project, collected the data, provided feedback on analyses, and wrote the paper. ACA and KD collected the data, managed the database, and edited the paper. LA served as co-principal investigator for the project, collected the data, assisted in designing the analyses, and wrote the paper.

significantly underrepresented in ASD research, limiting the generalizability of findings to these populations. Several ways in which ethnic differences may emerge have been identified, including differential functioning of assessment measures (particularly parent-report scales), differential responses to the standardized testing environment, differences in cultural expectations for socially appropriate behavior, differences in parental knowledge and beliefs regarding development and mental health, and clinician and referral bias (Norbury and Sparks 2013; Wallis and Pinto-Martin 2008). Soto et al. (2014) have also noted that significant adaptations are necessary for use of ASD screening tools across ethnic and cultural groups, given the complexity of these symptoms and the inherent impact of culture in defining appropriate social behavior.

Despite clear theoretical relevance of cultural factors to ASD diagnosis and symptom manifestation, there has been limited research into cross-cultural differences in ASD. From this limited research, prior studies have consistently demonstrated that ethnic minority children have reduced access to services for the diagnosis and treatment of ASD (Begeer et al. 2009; Liptak et al. 2008), as well as delays in diagnosis and higher rates of misdiagnosis, including in samples restricted to low socioeconomic status (SES) families (Mandell et al. 2002; Mandell et al. 2007; Valicenti-McDermoot et al. 2012). At least one study also found higher rates of language delay and gross motor delay in young children with ASD from ethnic minority backgrounds among a sample of middle to upper SES families (Tek and Landa 2012). However, study of non-White children as a group in comparison to White children is relatively meaningless, given the substantial cultural and psychosocial differences between children of different ethnic minority backgrounds. This study focuses specifically on Black youth, as a population at particular risk of under-representation in clinical and research samples. Black children have significantly higher rates of unmet mental health needs than White children (NSCH 2011/2012) and a well-documented history of reduced access to mental health services (Flores and Tomany-Korman 2008; Montes and Halterman 2011). Moreover, these disparities persist even after controlling for the effects of confounding variables, including SES (Garland et al. 2005). As a group, Blacks are also less likely to identify mental health treatment as a preferred method of dealing with behavioral and psychological issues (Schnittker et al. 2000; Slade 2004). For example, Black children are less likely to receive stimulant medication for treatment of ADHD, despite similar rates of parent-reported ADHD symptoms (Cuffe et al. 2005; Pastor and Reuben 2005). Thus, they are at particular risk for being under-diagnosed and under-treated for ASD, as it requires access to specialized mental health services, often driven by parents actively seeking referrals.

Examination of actual ASD prevalence rates among Black children supports the idea that these children are at risk for under-diagnosis. In the most recent report of a multisite U.S. study underway by the Centers for Disease Control and Prevention (CDC) using medical and educational record data, Black children were diagnosed with ASD at significantly lower rates than White children (CDC 2014). Consistent with CDC findings, independent studies have also found that Black children are less likely to be diagnosed with ASD, even after controlling for variables such as SES and IQ (Jarquin et al. 2011; Mandell et al. 2009). Black children with ASD are also more likely to initially be misdiagnosed, most often with adjustment disorder or conduct disorder (Mandell et al. 2007, 2009). One recent study also

reported lower diagnosis rates after age 5 of mild/moderate (as opposed to severe) ASD in Black children as compared to White children, suggesting that non-intellectually disabled Black youth are at particular risk of under-diagnosis of ASD (Jo et al. 2015). Although clinician bias and reduced access to specialist care likely contribute significantly to these disparities, the role of ethnic differences in symptom manifestation and clinical presentation cannot be ruled out. Differences in the manifestation of core ASD symptoms and daily functioning could contribute to diagnostic disparities by affecting the validity of screening and diagnostic tools, and/or clinician perceptions (Norbury and Sparks 2013; Wallis and Pinto-Martin 2008).

Shedding light on the potential effect of differences in symptom profiles on diagnostic rates, a limited number of studies have examined differences in symptom profiles in Black youth with ASD relative to other ethnic groups, with mixed findings. Studies of children with ASD have not found any differences between Black and White youth in social communication symptoms on parent report or in medical record data (Cuccaro et al. 2007; Sell et al. 2012). One study also reported no differences in restricted/repetitive behavior symptoms on parent report (Cuccaro et al. 2007), while another using medical record data reported decreased rates of some restricted/repetitive behaviors symptoms in Black children with ASD relative to their White peers (Sell et al. 2012). Conversely, Jang et al. (2013) reported that parents of Black children endorsed higher rates of repetitive behaviors on a caregiver questionnaire.

Findings regarding behavior problems are also mixed, but have generally reported greater impairment among Black children with ASD relative to their White peers. Several studies have reported higher rates of externalizing behavior, inattention, and impulsivity among Black children with ASD relative to White children (Horovitz et al. 2011; Jang et al. 2013). However, Sell et al. (2012) found no significant differences between these groups in externalizing behaviors in medical record data. Available data have consistently indicated that Black children with ASD have higher rates of developmental delay than their White peers, including higher rates of language delays (Cuccaro et al. 2007) and intellectual disability (Jarquin et al. 2011; Mandell et al. 2009). Overall then, the extent to which ASD may present differently in Black children is unclear. General findings of higher rates of developmental delay and behavioral problems among Black children with ASD suggest that only the most impaired of these children are recognized and accurately diagnosed with ASD. However, studies of Black children with ASD to date have examined samples that include children both with and without intellectual disability (ID). Given the higher rates of ID and developmental delays in Black children with ASD, it is unclear to what extent prior findings regarding comorbid symptoms in particular may be driven by differences in rates of ID. Thus, additional research is needed to evaluate ethnic differences in clinical presentation outside the context of ID.

The aim of the present study was to examine parent-reported impairment in daily functioning among youth with ASD and without ID, identified by their parents as “Black or African American,” as compared to White youth (U.S. Department of Health and Human Services, Office of Minority Health 2011).¹ Given the elevated rates of ID in Black youth with ASD, as well as the strong correlation between ID and impairments in daily functioning, this study aimed to focus specifically on youth without ID to explore patterns of

impairment that are not better accounted for by cognitive disabilities. Prior studies of ethnic differences in ASD have focused primarily on core symptoms, rather than daily functioning. The present study chose to undertake analysis of indicators of daily functioning in order to address this gap in the literature and evaluate whether ethnic differences exist in overall impairment in ASD. The domains of executive function, adaptive behavior, and social–emotional functioning were chosen as specific indicators of daily functioning, as all have been previously shown to be significantly impaired in children with ASD (Biederman et al. 2010; Gilotty et al. 2002) and are often better indicators of overall functioning than severity of ASD symptoms or presence of ID (Kuhlthau et al. 2010). Although findings from prior studies have been mixed, the general trend has been for increased rates of behavioral problems in Black youth with ASD relative to their White peers, as well as higher rates of developmental delay, indicating an overall pattern of greater impairment in Black children relative to White children with ASD. Based on the trend for greater impairment in Black children with ASD relative to their White peers, it was hypothesized that Black youth with ASD would have greater impairments than their White peers in executive function, adaptive behavior, and social–emotional functioning, and that ethnicity would significantly predict lower functioning in these domains after controlling for confounding variables.

Methods

Participants

All participants were youth with a confirmed diagnosis of ASD, ages 6–17 years with an IQ > 70. Participants were recruited through an autism specialty clinic providing diagnostic and neuropsychological evaluations, seen between 2002 and 2014, and as part of a larger research program examining cognitive phenotypes of children with ASD and without intellectual disability. Participants with ID (defined as full-scale IQ < 70) were excluded from analyses. All participants were diagnosed with an ASD by a trained, reliable clinician based on DSM-IV-TR (APA 2000) and DSM-5 (APA 2013) diagnostic criteria and met criteria for an ASD based on the Autism Diagnostic Observation Schedule (ADOS; Lord et al. 2000) or its recent revision, the ADOS-2 (Lord et al. 2012), and/or the Autism Diagnostic Interview-Revised (ADI-R; Rutter et al. 2003). Participants with genetic or neurological diagnoses (e.g., Fragile X, tuberous sclerosis) were excluded from the present study. English language proficiency was required for participation in the study, for both children and parents. From the initial sample of 966 participants, a final sample of 64 children ($n = 32$ self-identified “White”, $n = 32$ self-identified “Black or African American”) was created. Participants were matched on gender and full-scale IQ (within 5 points) using the case–control matching feature (“fuzzy” command) in SPSS 22. All Black participants in the sample were successfully matched with White participants. Groups did not differ significantly based on age ($t = 1.37$, $p < .14$) or highest level of parental education, a proxy for socioeconomic status (Table 1); rates of college education were equivalent across

¹Race/ethnicity were identified by parent selection from among the following categories: American Indian/Alaska Native; Asian American; Black or African American; Native Hawaiian/Pacific Islander; White; Other. Families then identified as Hispanic or Latino versus Not Hispanic or Latino. Self-report is the widely preferred approach to obtaining race and ethnicity data and is considered to be the “gold standard” (Higgins and Taylor 2009; Wei et al. 2006). We acknowledge that these categories may be not sufficiently descriptive to distinguish among locally relevant ethnic populations.

samples. As noted, groups were matched on full-scale IQ; there were no significant differences in verbal or nonverbal IQ. Rates of comorbid ADHD diagnoses ($X^2 = 3.47, p < .11$) and use of stimulant medication ($X^2 = .678, p < .43$) did not differ across samples. White participants were significantly more likely to have participated through the specialty clinic than through the research trial ($X^2 = 15.15, p < .0001$).

Measures

Cognitive Ability—Cognitive ability was assessed using the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler 1999) for all participants recruited through the larger research study. Additional participant data was collected from a clinical database, in which cognitive ability was assessed using the WASI, the Wechsler Intelligence Scale for Children-Fourth Edition (WISC-IV; Wechsler 2003), the Wechsler Adult Intelligence Scale-Third Edition (WAIS-III; Wechsler 1997), or the Differential Ability Scales-Second Edition (DAS-II; Elliott 2007). The full scale IQ score (reported as a standard score) was utilized as a cutoff for inclusion in the sample, as well as in hierarchical multiple linear regression analyses.

Executive Function—The parent form of the Behavior Rating Inventory of Executive Function (BRIEF; Gioia et al. 2000) was used to assess executive function (EF) abilities. The BRIEF is an informant-report questionnaire that was developed to identify everyday EF abilities in children ages 5–18 and divides EF skills into two broad Indices: the Behavioral Regulation Index (the ability to inhibit, shift and modulate behaviors and emotions appropriately) and the Metacognition Index (the ability to cognitively plan, organize, and manage information and tasks and monitor performance); and a Global Executive Composite (GEC) score. T-scores are generated for each index score and the GEC.

Adaptive Behavior—Adaptive behavior was assessed using the Vineland Adaptive Behavior Scales, Second Edition (Vineland-II; Sparrow et al. 2005). The Vineland-II assesses adaptive behavior skills in individuals from birth to age 90 and divides adaptive behavior into three broad domains: communication skills, daily living skills, and social skills, as well as motor skills in children under age 5 (thus, not included in the present analyses). Standard scores are generated for each domain, as well as for the Adaptive Behavior Composite (ABC). The Survey Interview format was used for the present study.

Social–Emotional Functioning—The Child Behavior Checklist (CBCL; Achenbach and Rescorla 2001) was used to assess emotional and behavioral problems. The CBCL is a parent-report questionnaire normed for children ages 6–18. It identifies psychological symptoms in two broad domains: internalizing and externalizing. Within these domains, symptoms are further broken down in 8 syndrome scales. The CBCL also categorizes symptoms in 6 DSM-oriented scales, although these scales were not utilized in the present study. T-scores are generated for each scale. Scales of interest in the present study included: Internalizing Problems, Externalizing Problems, Withdrawn/Depressed, Social Problems, and Thought Problems.

Data Analysis

Study data were managed using REDCap electronic data capture tools hosted at Children's National Medical Center.¹ REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing (1) an intuitive interface for validated data entry; (2) audit trails for tracking data manipulation and export procedures; (3) automated export procedures for seamless data downloads to common statistical packages; and (4) procedures for importing data from external sources.

A series of one-way ANOVAs was used to analyze differences between ethnic groups in mean scores on the BRIEF, Vineland-II, and selected subscales of the CBCL (see Table 2).

Follow-up analyses using hierarchical multiple linear regression were then conducted to determine if ethnicity was a significant predictor, after controlling for full-scale IQ (entered in Block 1) and SES (entered in Block 2). The False Discovery Rate procedure (Benjamini and Hochberg 1995) was used to control for Type I error rate in all analyses. Groups were compared on the GEC and index scores of the BRIEF, the total and subdomain scores of the Vineland-II, and three subscales of the CBCL with relevance to ASD: Withdrawn/Depressed, Social Problems, and Thought Problems (Biederman et al. 2010; Hurtig et al. 2009), as well as the more general CBCL indices of Internalizing and Externalizing Problems. Regression analyses were run separately for each subscale.

Results

Across all three measures, Black participants were less impaired than their White peers, with Black participants' average scores falling in the non-clinical range on all scales, while White participants' mean scores fell in the borderline to clinically-impaired range on all scales, with the exception of Externalizing Behavior on the CBCL. Analyses showed that Black participants had significantly lower scores on all indices of the BRIEF, as well as the GEC, indicating less reported impairment in executive function. Parents also reported significantly lower scores for Black youth on the CBCL, endorsing less impairment in social-emotional functioning. Additionally, Black youth had significantly higher scores on the Vineland-II, with parents reporting better adaptive functioning.

Summary statistics from hierarchical regression analyses are reported in Table 3.

Analyses indicated that after controlling for both full-scale IQ and SES, neither of which significantly predicted scores on the BRIEF, ethnicity significantly predicted overall executive functioning, behavioral regulation, and metacognition, such that being Black was associated with fewer problems with executive function, with medium effect sizes. Ethnicity also remained a significant predictor of scores on all the selected subscales of the CBCL after controlling for IQ and SES, with Black ethnicity predicting fewer problems with social-emotional functioning. Medium effect sizes were found for all selected subscales of the CBCL. As found on the BRIEF, IQ and SES generally were not significant predictors of CBCL subscale scores. However, IQ significantly predicted Withdrawn/Depressed scores ($F = 4.42, p < .04$), such that higher full-scale IQ scores were associated with slight increases in withdrawn/depressed symptoms ($\beta = .15$). Additionally, SES significantly predicted

externalizing problems after controlling for IQ (F -change = 5.70, $p < .006$), such that increases in parents' education were associated with significantly decreased behavioral problems ($\beta = -13.2$). Ethnicity also remained a significant predictor of scores on the Vineland-II for overall adaptive behavior, communication skills, daily living skills, and socialization, after controlling for both IQ and SES. A medium effect size was found for communication skills, and small effect sizes were found for overall adaptive behavior, daily living skills, and socialization. Again, the direction of effects was such that Black youth were reported to have better adaptive functioning. Both IQ ($F = 5.42$, $p < .023$) and SES (F -change = 4.39, $p < .017$) significantly predicted communication skills, such that increases in IQ ($\beta = .21$) and parents' education ($\beta = 11.30$) were associated with improved communication. Neither SES nor IQ significantly predicted daily living skills, socialization, or overall adaptive behavior on the Vineland-II.

Although rates of ADHD did not differ significantly across ethnic groups, the difference approached statistical significance ($\chi^2 = 3.47$, $p < .11$). Thus, all analyses were re-run with participants with a comorbid diagnosis of ADHD excluded (Black $n = 7$, White $n = 14$). Although the smaller groups (Black $n = 25$, White $n = 18$) were no longer matched, there were no significant differences in full-scale IQ ($t = .16$, $p < .88$), age ($t = 1.37$, $p < .18$), or gender distribution ($\chi^2 = .08$, $p < .99$). Findings persisted when analyses were run on this smaller sample of participants without comorbid ADHD.

Discussion

Despite significant advancements in the understanding, assessment, and treatment of ASD, there continue to be significant and unexplained ethnic disparities in diagnostic rates (CDC 2014). Although a limited number of studies have previously investigated differences in symptom profiles between Black and other children with ASD, this is the first study to focus specifically on indicators of daily functioning, as well as to focus specifically on ethnic differences among youth with ASD without intellectual disability. Counter to our hypotheses, Black youth had significantly lower rates of parent-reported problems with daily functioning in adaptive behavior, executive function, and social-emotional functioning relative to White youth. These findings are striking, given that groups were matched on gender and IQ, and differences persisted even after controlling for parent education and intellectual ability. Although the present study did not focus primarily on the relative contributions of SES and IQ to daily functioning, it is worth noting that findings were consistent with prior research that low SES is a risk factor for externalizing behavior problems (Bradley and Corwyn 2002) and that IQ is not significantly associated with adaptive behavior among youth with ASD without ID (Gilotty et al. 2002; Pugliese et al. 2014).

It is also notable that findings were consistent across both checklist and interview measures, such that Black children with ASD were less impaired both on direct parent ratings, as well as clinician ratings of parent-reported behaviors. Findings in prior studies have been mixed, but have generally reported higher rates of externalizing and other impairing behaviors in Black relative to White children with ASD. However, prior studies have included children with a wide range of cognitive ability, while our study focused solely on children without

ID, which may account for the difference in findings. It is also particularly notable that on average, Black children's scores fell in the non-clinical range across all three measures, all of which have been previously demonstrated to show clinically significant impairment in samples of predominantly White children (Biederman et al. 2010; Gilotty et al. 2002). This was an unexpected finding that raises important questions as to why parents of Black youth with ASD in our sample do not report clinical impairment on measures of daily functioning, particularly given that parents did report clinically significant impairment in ASD symptoms on the ADI-R. Thus, these findings seem to reflect a specific ethnic difference in daily functioning, rather than a broad tendency for parents of Black children with ASD to minimize symptoms.

Further studies are needed to replicate present results and determine what factors may contribute to better parent-reported daily functioning among Black children with ASD. One possible explanation is the emphasis on individual responsibility and autonomy among Black parents (Julian et al. 1994; Suizzo et al. 2008), which may foster the development of independence and improved daily functioning among these children. Due to these cultural values, Black parents may place higher expectations on their children with ASD than White parents, giving these children the opportunity to develop improved adaptive and executive control behaviors, consequently leading to improved social-emotional functioning. Alternatively, our current findings may be driven by ethnically based differences in how Black parents respond to parent-report measures, rather than true differences in child functioning. These questionnaires may be less culturally relevant for Black parents, who may observe these behaviors, but perhaps not see them as problematic. Indeed, prior studies of Black parents' responses to the CBCL have noted ethnic differences in applicability of the CBCL items to Black parents' concerns about their children's behavior (Lambert et al. 2002), as well as poor construct validity (Mano et al. 2009; Tyson et al. 2011). To our knowledge, no studies have yet been conducted on ethnic differences in parent reporting on the BRIEF or the Vineland-II, outside of the standardization samples. However, some studies have also noted that Black mothers report lower perceived negative impact of having a child with ASD (Bishop et al. 2007; Carr and Lord 2013). If parents do not experience symptoms of executive dysfunction, internalizing and externalizing behaviors, and adaptive deficits as problematic, they may be less likely to report their observation of these symptoms. This may be particularly true for the BRIEF, which asks parents to rate how often a behavior is "a problem" for their child, rather than simply rating its frequency.

It is also possible that observed differences in daily functioning are due to a selection bias in the study composition, as all children in our analyses received a clinical diagnosis in our specialty clinic or had a prior clinical diagnosis of ASD. Prior studies have reported that Black children are under-represented in ASD diagnosis rates, with Black youth without intellectual disabilities at even greater risk of being under-diagnosed and misdiagnosed (Jo et al. 2015), as their impairments may be less obvious or may be conceptualized as behavioral problems. Reduced access to specialty mental health services, clinician bias, and other factors may lead to more impaired Black children with ASD without intellectual disability receiving alternate diagnoses (e.g., conduct disorder, ADHD) and/or never being referred to ASD specialist services. This may then result in a biased sample of only the highest functioning of non-intellectually disabled Black children being correctly diagnosed

with ASD. Our sample was also unique in that a majority of parents had at least a college education. These parents may have a greater ability to access specialist services for their children and obtain an ASD diagnosis. However, it should be noted that there were no significant differences between White and Black parents in education, although White participants were significantly more likely to be recruited from the clinical than the research sample. Furthermore, at least one prior study that reported underdiagnosis of Black children without ID found no relationship between diagnosis rates and parental education (Jo et al. 2015).

There are several limitations to the generalizability of study findings that should be taken into account. The final matched sample utilized in this study was relatively small. This study also used a secondary data analysis of a sample drawn from a clinic and research program sample, rather than a population sample, and therefore should not be used to estimate population rates or norms. Although there were no significant differences between groups in SES, the majority of parents in both samples had at least a college education. Thus, these findings are unlikely to be representative of families with lower educational levels. Additionally, SES was represented solely through parent education. Important differences may still exist in income or other SES-related factors that were not available for analysis in the present study.

Given our reliance on parent-report data in the present study, it will be important in future studies to evaluate differences in these domains on clinician judgment, standardized measures, and observer report (e.g., teachers). Agreement between parent and teacher report (Dirks et al. 2012), as well as between parent report and standardized assessment are generally poor (Silver 2012), independent from ethnic or other differences. Nonetheless, it is important to determine whether these findings extend to other approaches to assessment of functioning in these domains. This study highlights the need to consider the role of cultural and ethnic factors in the assessment of ASD and manifestation of symptoms and opens the domain of ethnic differences in the overall ASD profile for further study. Our findings raise concern that the impairments in daily functioning and treatment needs of Black children with ASD may be underestimated by commonly used parent-report measures in the field of autism. It is possible that these underestimations contribute to the racial disparities in diagnosis and treatment-seeking. Our findings may also indicate that currently used measures do not capture the areas of functioning that are of greatest concern to parents of Black children with ASD, given that many of these children were recruited from a treatment-seeking sample but did not show impairment in areas commonly targeted in ASD treatment. It will be crucial for future research that confirms this study's findings to explore the reasons for the discrepancies, and to evaluate the impact of these discrepancies.

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Table 1

Demographic characteristics by ethnicity

	White mean (SD)	Black mean (SD)
N	32	32
Gender (male <i>N</i>)	24	24
Parent education (college degree or more <i>N</i>)	27	27
Child age (years)	10.74 (3.21)	9.71 (2.79)
Full scale IQ	97.81 (16.09)	99.12 (15.17)
Verbal IQ	102.34 (16.72)	101.77 (19.06)
Nonverbal IQ	100.22 (11.75)	100.39 (14.93)
ADI-R: Reciprocal social interaction	14.87 (4.85)	17.35 (6.35)
ADI-R: Communication (verbal)	12.40 (3.78)	14.74 (5.40)
ADI-R: Restricted/repetitive behaviors	4.74 (2.87)	4.17 (2.39)
ADOS: Social–communication total	14.06 (4.48)	13.51 (4.83)
Comorbid ADHD diagnosis (<i>N</i>)	14	7
Prescribed stimulant medication (<i>N</i>)	12	8

Table 2

Results of one-way ANOVAs comparing White and Black youth

	White mean (SD)	Black mean (SD)	F (<i>p</i>)
BRIEF ^a (T-scores)			
Global executive composite	74.00 (9.44)	61.66 (14.28)	16.63 (<i>p</i> < .0005)
Behavioral regulation index	71.25 (13.02)	60.56 (14.64)	9.51 (<i>p</i> < .003)
Metacognition index	72.87 (8.18)	60.81 (13.66)	18.37 (<i>p</i> < .0005)
CBCL ^a (T-scores)			
Internalizing	65.44 (9.65)	56.03 (11.82)	12.17 (<i>p</i> < .001)
Externalizing	62.19 (10.91)	53.84 (10.43)	9.78 (<i>p</i> < .003)
Withdrawn/depressed	66.06 (7.98)	58.81 (8.29)	12.71 (<i>p</i> < .001)
Social problems	69.16 (9.66)	61.72 (7.23)	12.16 (<i>p</i> < .001)
Thought problems	70.09 (8.84)	61.62 (8.92)	14.55 (<i>p</i> < .0005)
Vineland-II ^b (standard scores)			
Adaptive behavior composite	73.97 (9.29)	81.16 (11.01)	7.88 (<i>p</i> < .007)
Communication	79.25 (9.53)	86.26 (11.91)	6.67 (<i>p</i> < .012)
Daily living skills	76.12 (13.49)	86.13 (15.04)	7.74 (<i>p</i> < .007)
Socialization	72.69 (10.01)	80.48 (11.76)	8.05 (<i>p</i> < .006)

^aHigher scores denote more problems^bHigher scores denote fewer problems

Table 3

Results of hierarchical regression analyses predicting functioning from ethnicity, after controlling for full scale IQ and SES

	β : ethnicity	Model F: full model	R ² : full model	F change: ethnicity	Cohen's f^2 : ethnicity
BRIEF^a					
Behavioral regulation index	-.9.79	2.98 ($p < .026$)	.176	7.24 ($p < .009$)	.13
Metacognition index	-.11.79	5.50 ($p < .001$)	.282	15.52 ($p < .0001$)	.28
Global executive composite	-.11.81	5.09 ($p < .001$)	.267	13.66 ($p < .001$)	.24
CBCL^a					
Externalizing problems	-.7.47	5.21 ($p < .001$)	.271	8.02 ($p < .006$)	.14
Internalizing problems	-.9.62	4.93 ($p < .002$)	.260	12.43 ($p < .001$)	.22
Withdrawn/depressed	-.7.06	5.22 ($p < .001$)	.271	11.87 ($p < .001$)	.21
Social problems	-.7.75	4.52 ($p < .003$)	.244	12.05 ($p < .001$)	.22
Thought problems	-.8.65	5.04 ($p < .002$)	.265	13.69 ($p < .0001$)	.24
Vineland-II^b					
Communication	7.26	6.15 ($p < .0001$)	.309	7.93 ($p < .007$)	.14
Daily living skills	8.52	2.19 ($p < .082$)	.137	4.82 ($p < .032$)	.09
Socialization	6.84	3.32 ($p < .017$)	.195	5.69 ($p < .020$)	.10
Adaptive behavior composite	6.59	2.86 ($p < .032$)	.172	5.81 ($p < .019$)	.17

^aHigher scores denote more problems

^bHigher scores denote fewer problems