

Reported Perception and Clinical Diagnosis of Autism Among
White and Non-White Groups

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Abstract

Objective: Lessen racial disparity by advancing awareness and promoting culturally competent practice related to Autism Spectrum Disorder (ASD) among racial groups to safeguard that children regardless of race, receive timely, accurate diagnosis and intervention. Evidence has been inconclusive regarding disparities in identifying and diagnosing ASD with some reports of higher incidents of delayed and missed diagnoses of ASD among underserved ethnic and racial minority groups. Thus, this study examined the relationship between the child's race and reported perception of ASD and clinical diagnosis of ASD among White and Non-White children. **Method:** The sample ($N=48$) consisted of preschool children (between the ages 2 to 5) referred by the Child Find Project to the Psychological and School Services of Eastern Carolina (PSSEC), who completed the Pediatric Autism intakes and diagnostic forms. The MANOVA statistical analysis was used to examine whether differences existed between reported perceptions of ASD in White and Non-White groups compared to clinician's diagnosis of ASD in White and Non-White groups based on the child's race. **Results:** The results revealed an overall higher rate of diagnosis of ASD among the White group compared to the Non-White group. However, teachers' reported perception of ASD was higher for the Non-White group, while parents reported perception of ASD was lower for the Non-White group. **Conclusions:** These findings revealed differences in the way ASD symptoms were perceived, which can explain the previously reported higher delayed and missed diagnoses of ASD among underserved ethnic and racial minorities.

Keywords: Autism Spectrum Disorder; race; ethnicity; minority; perception

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The pervasiveness of ASD has increased significantly in the United States over the past 2 decades with about 1 in 68 children currently being diagnosed with ASD (CDC, 2014). Autism is deemed a major disability due to its severe lifelong impact on individuals and families. Symptoms include delays in the development of socialization and communication along with restricted, repetitive interests and behaviors presenting in early childhood (American Psychiatric Association, 2013). Reports have documented that autism spectrum disorders are evident across all racial and ethnic groups (CDC, 2014), and early intervention (evidence-based treatment) is recommended as the most effective approach to ASD care (Durkin et al., 2010). However, before intervention can be initiated, it is crucial that symptoms delay be competently identified and examined to achieve a correct diagnosis among all racial and cultural groups (Ennis-Cole et al., 2013). For example, minority parents may fail to report subtle cues associated with autism, believing that delays in social skills and language may be a phase that will be outgrown (Ennis-Cole, Durodoye, & Harris, 2013). Researchers have also reported that White Americans children were diagnosed with ASD about 1.5 years earlier than Non-White American children (Morrier, Hess & Heflin, 2008).

While there is a large body of evidence identifying racial and ethnic disparities in the diagnosis and treatment of numerous health conditions (Institute of Medicine, 2002), evidence has been inconclusive regarding disparities in identifying and diagnosing ASD (Mandell et al., 2009). As a result, several researchers in the field of ASD have highlighted the need for further investigations among diverse racial populations (Becerra et al., 2014; Blacher, Cohen & Azad,

2014; Tek & Landa, 2012; Valicenti-McDermott, Hottinger, Seijo, & Shulman, 2012). Further, in 2013, there were 17.4 million children living with at least one immigrant parent (Zong & Batalova, 2015). All of these factors present urgency for researchers to consider the influence of race and culture on the diagnosis of ASD (Khowaja, Hazzard, & Robins 2014). Therefore, this study seeks to examine perceptions of ASD diagnosis among diverse racial populations and potentially contribute to more culturally sensitive ASD screening and assessment measures for providers, clinicians, educators, and parents.

Complex Representation of ASD

A meta-analysis by Chaste and Leboyer (2012) of several significant findings of epidemiological and genetic studies demonstrated that ASD is an extremely multifaceted disorder influenced by both genetic and environmental influences. Further, Chaste and Leboyer indicated that developments and growth on the genetic roots, such as certain alleles that may play a role in autism have provided valuable pieces that may help solve the ASD puzzle. Chaste and Leboyer's (2012) meta-analysis demonstrated that there are still several pieces of the ASD puzzle to be added, such as the role that environmental and cultural factors may have on autism.

Erba (2000) addressed the intricacy representative in dealing with autism. For example, she identified that several theories linked to child development; cognitive, social, behavioral, affective, and neurobiological, have all been utilized in an endeavor to better understand the impairment and capabilities of individual s with autism. However, Rogers (1996) showed that receiving early intervention was beneficial to the level of functionality in children with ASD. Erba (2000) also found that children before the age of 5 years responded better to ASD interventions compared to children after the age of 5 years.

Race, Ethnicity, and Sociodemographic Factors

A population-based study conducted by Becerra et al. (2014) looked at children born from 1998 to 2009 who had a diagnosis of ASD. The study examined the effects of the mother's ethnicity or race on pediatric ASD among Hispanics, Asians, and African Americans in the United States. They found a higher risk of ASD among children born to "black, Central/South American, Filipino, and Vietnamese, as well as among US-born Hispanic and African American/black mothers, compared with US-born whites" (p. e63). Also, African American, Hispanic, and South or Central American mothers born in the United States had offspring that were at a greater risk of limited language and higher emotional dysregulation compared to native-born White mothers. They concluded that maternal race and ethnicity were linked to the child's diagnosis of ASD.

Blacher et al. (2014) assessed children suspected of ASD and found that Hispanic mothers reported fewer ASD symptoms compared to the Anglo mothers. However, Hispanic children diagnosed with ASD received greater Autism severity scores compared to Anglo children. Mandell et al. (2009) examined the ethnic disparities in recognizing ASD among mental health professionals from any further assessment of developmental delay among minority groups. Some of the influences linked to the disparity were identified as a mixture of the families' and mental health professionals' knowledge, behaviors, and beliefs. Further studies were recommended to find ways to aid with the timely identification of pediatric ASD. They also suggested further studies to promote awareness and professional education and public awareness related to the heterogeneous presentation of ASD (Mandell et al., 2009).

Perception of Signs and Symptoms of ASD

Early detection of ASD, as timely as 14 months of age, has been documented as being vital in obtaining diagnosis, intervention, and services (Blacher et al., 2014; Landa, Holman, & Garrett-Mayer, 2007; Mandell et al., 2009; Tek & Landa, 2012). However, studies have reported that minority children, namely those of Asian, Hispanic, and African American descent, were less likely to receive early ASD diagnosis compared to Caucasian children (Blacher et al., 2014; Mandell et al., 2002; Tek & Landa, 2012). However, evidence exploring the reasons for the considerable delay in diagnosis of ASD among minority children remains inconclusive (Burkett, Morris, Manning-Courtney, Anthony, & Shambley-Ebron, 2015; Palmer et al., 2010; Tek & Landa, 2012).

Tek and Landa (2012) compared Caucasian and minority parents with child dyads and found that children from lower SES backgrounds were at risk for delayed intervention services, and early detection compared to highly educated families possibly due to better accessibilities to resources. It was postulated that parental cultural difference in perception of what is considered typical and atypical developmental in their children could be an influencing factor, but more specific research was suggested (Mandell & Novak, 2005). Tek and Landa (2012) proposed that minority parents may ignore early symptoms of ASD. For example, delayed milestones or unusual behaviors may be perceived within cultural context as normal or inconsequential.

Parent and caregiver interpretation of ASD symptoms may be based on cultural beliefs and values (Zhang, Wheeler, & Richey, 2006). They found that behaviors such as modeling parental behaviors, making direct eye contact, and pointing to show shared interest were deemed disrespectful in Asian culture. Likewise, in Hispanic/Latino culture researchers have found that

parents reported characteristically different understanding of developmental milestones and when skillsets should be accomplished (Blacher et al., 2014; Gannotti, Handwerke, Groce, & Cruz, 2001). Garcia, Perez, and Ortiz (2000) conducted a qualitative study to examine Mexican American mothers' beliefs about disabilities. They found that mothers expected their child's milestone for language acquisition or their understanding of language to not be until 3-years-old, delaying recognition of communication disorders in their children.

Burkett et al. (2015) suggested that caregivers and service providers may vary in their perception of ASD symptoms which may influence the diagnosis of ASD in children from minority and non-minority groups. Likewise, Reijneveld, Harland, Brugman, Verhulst, and Verloove-Vanhorick (2005) found that communication deficiencies connected with ASD could be more likely perceived as a deficiency in English as a first language groups. Also, social deficits related to ASD could be perceived as challenges linked to the process of acculturating into the American culture and norms in minority groups (Reijneveld et al., 2005).

Diagnostic Procedure of ASD

The recommended diagnostic approach of ASD based on the American Psychological Association and the American Academy of Pediatrics is comprised of steps that may at times require repeated surveillance (Filipek et al., 2000). The approach should begin with the initial pediatric appointment, and a formal screen should be conducted if issues are identified during surveillance evaluation (Filipek et al., 2000; Huerta & Lord, 2012). A formal diagnostic assessment should be conducted if additional caregivers' concerns are identified (Filipek et al., 2000; Huerta & Lord, 2012). Nevertheless, Braiden, Bothwell, and Duffy (2010) indicated that

the educational programs appeared to be the first identifier of ASD symptoms, and the study reported that the likelihood of minority children being underdiagnosed was significant.

According to Huerta and Lord (2012), best practice diagnostic method should incorporate a multidisciplinary approach with an emphasis on numerous domains of functioning being assessed during a diagnostic evaluation. A comprehensive evaluation should include information collected from multiple sources. Also, parent interviews can be used to collect valuable information of the child's current functioning. Information collected from caregivers offered a broader context to aid in understanding the child's daily behavior in a broad array of situations, family's values, child's history, and contextual influences.

Literature relating to ASD suggests that there are copious amounts of diagnostic instruments used in the evaluation process, which could make selecting the best instruments challenging (Huerta & Lord, 2012; Stone, Coonrod, & Ousley, 2000). According to the CDC (2015), when making a diagnosis of ASD more than one sources of information is recommended along with one or more diagnostic instruments. Examples of screening instruments include Communication and Symbolic Behavior Scales (CSBS), Ages and Stages Questionnaire (ASQ), and Parents' Evaluation of Developmental Status (PEDS). Some of the most frequently used instruments to diagnosis ASD in research studies have been identified as the Autism Diagnostic Observation Schedule (ADOS) (CDC, 2015; Lord et al., 2012; Lord, Rutter, DiLavore, & Risi, 1999). The ADOS-2 is a play-based tool that integrates a semi-structured interaction between the child and examiner to evaluate the child's ASD symptomology such as play, restrictive and repetitive behaviors, social interaction and communication (Lord et al., 2012).

Additional diagnostic tools include the Childhood Autism Rating Scale (CARS-2) which is a questionnaire used to identify behavioral symptoms of ASD among children ages 2 and older (CDC, 2015; Perry, Condillac, Freeman, Dunn-Geier, & Belair, 2005). Several researchers have concurred that both the CARS and CARS-2 have demonstrated reliability and validity (Breibord & Croudace, 2013; Magyar & Pandolfi, 2007; Reszka, Boyd, McBee, Hume, & Odom, 2014) along with diagnostic accuracy (Falkmer, Anderson, Falkmer, & Horlin, 2013).

Another instrument to diagnosis ASD is the Psychoeducational Profile-Third Edition (PEP-3) (Schopler, Lansing, Reichler, & Marcus, 2004). Fu, Chen, Tseng, Chiang, and Hsieh (2012) reported sufficient internal consistency and validated the PEP-3 as a reliable and valid instrument to evaluate ASD symptoms and adaptive functioning.

Method

Participants

The target population was preschool children in Duplin County, North Carolina (NC). Specifically, this study's target population consisted of preschool children referred by the Child Find Project in NC to the Psychological and School Services of Eastern Carolina (PSSEC) between 2008 and 2016. A stratified random sampling procedure was used whereby the population was separated by strata and then samples were randomly chosen from each stratum (race). The sampling frame consisted of children referred to the PSSEC between ages 2 to 5 and who fully consented and completed both the Pediatric Autism intakes and diagnostic forms. All races and ethnicities of children were included for the study examining both White and Non-White groups. The sample consisted of a total of 48 children, 18 in the White group and 18 in the Nonwhite group. See Table 1 with statistical description of sample.

Insert Table 1 About Here

Instrumentation

Childhood Autism Rating Scale-Second Edition (CARS-2). The CARS-2 is a standardized instrument developed by Schopler, Van Bourgondien, Wellman, and Love (2010) to identify behavioral symptoms of ASD among children ages 2 and older. The CARS-2 is also used to differentiate children with ASD symptoms from those with developmental disabilities. It has been determined to be a reliable and valid instrument (Breidbord & Croudace, 2013; Magyar & Pandolfi, 2007; Reszka et al., 2014) and accuracy (Falkmer et al., 2013)

Psychoeducational Profile-Third Edition (PEP-3). The PEP-3 was developed by Schopler et al. (2004) as a revision to the over 20-year-old instrument used to evaluate behaviors and skills of children (6 months to 7 years) with ASD and communication deficits. It has been determined to be both reliable and valid (Fu et al., 2012). The PEP-3 can be used in educational settings to assess children (3 to 5 years-old) with disabilities as well as yielding valuable data for Individualized Education Programs (IEPs) for older students.

Adaptive Behavior Assessment System (ABAS-II). The ABAS-II (Harrison & Oakland, 2003) is a norm-based measure of adaptive behavior skills in individuals (birth to age 89 years). It is used to determine individuals' level of independent functioning and social interactions within their community and cultural environment. The ABAS-II's includes an Infant/Preschool form that offer conceptual, social, and practical domain scores. There are five ABAS-II forms distinctively assigned for different age ranges and raters. Two forms are

designated for teachers/daycare providers use (ages 2 to 5 and 5 to 21), two forms for parents/primary caregiver (ages 0 to 5 and 5 to 21), and one form for adults (ages 19 to 89). Studies conducted as part of the standardization process indicated sufficient reliability and validity of the ABAS-II (Rust & Wallace, 2004).

Child Behavior Checklist for Ages 1.5-5 (CBCL/1.5-5) and Caregiver-Teacher Report Form for Ages 1.5-5 (C-TRF). Achenbach and Rescorla (2001), under the overall Achenbach System of Empirically Based Assessment (ASEBA), developed the preschool forms CBCL/1.5-5 and C-TRF/1.5-5 to gather information on specific emotional and behavioral difficulties among preschoolers (ages 1½ to 5 years). Empirically based syndromes scored from both the CBCL/1½-5 and C-TRF produces patterns of difficulties. These ASEBA forms have shown to have well-documented reliability and validity which was standardized and validated in various countries (Rescorla, 2005).

Results

The purpose of this study was to investigate the relationship between child's race and reported perception of ASD, and clinical diagnosis of ASD among White and Non-White groups. Race was the independent variable, and the reported perception of ASD and clinician's diagnosis of ASD were the dependent variables.

MANOVA, using Pillai's trace, indicated there was a significant effect of race on reported perception of ASD and diagnosis of ASD, $V = 0.59$, $F(14, 33) = 3.36$, $p = .002$. Specifically, the reported perceptions of ASD measured by the *ABAS-II* Parent-General Adaptive Composite score for those in the White group ($M = 6.30$, $SD = 14.00$) was higher than the *ABAS-II* Parent-General Adaptive Composite score for those in the Non-White group ($M = 3.76$,

$SD = 9.63$). This difference indicated that parents in the White group reported more ASD adaptive symptoms in their children compared to parents in the Non-White group. However, the ABAS-II Teacher-General Adaptive Composite score for those in the White group ($M = 2.11$, $SD = 3.74$) was slightly lower than the ABAS-II Teacher-General Adaptive Composite score for those in the Non-White group ($M = 3.74$, $SD = 6.31$). This difference indicated that teachers reported slightly more adaptive ASD symptoms for children in the Non-White group compared to the children in the White group.

The ABAS-II Parent-General Conceptual Composite score for those in the White group ($M = 9.83$, $SD = 15.57$) was higher than the ABAS-II Parent-General Conceptual Composite score for those in the Non-White group ($M = 2.78$, $SD = 5.01$). This difference indicated that parents in the White group reported more ASD conceptual symptoms in their children compared to parents in the Non-White group. However, the ABAS-II Teacher-General Conceptual Composite score for those in the White group ($M = 3.23$, $SD = 7.24$) was slightly lower than the ABAS-II Teacher-General Conceptual Composite score for those in the Non-White group ($M = 3.74$, $SD = 5.62$). This difference indicated that teachers reported slightly more conceptual ASD symptoms for children in the Non-White group compared to the children in the White group.

The ABAS-II Parent-General Social Composite score for those in the White group ($M = 8.85$, $SD = 16.46$) was higher than the ABAS-II Parent-General Social Composite score for those in the Non-White group ($M = 6.11$, $SD = 11.44$). This difference indicated that parents in the White group reported more ASD social symptoms in their children compared to parents in the Non-White group. However, the ABAS-II Teacher-General Social Composite score for those in the White group ($M = 2.08$, $SD = 3.31$) was lower than the ABAS-II Teacher-General Social

Composite score for those in the Non-White group ($M = 3.48, SD = 6.84$). This difference indicated that teachers reported more social ASD symptoms for children in the Non-White group compared to the children in the White group.

Continuing the pattern, the ABAS-II Parent-General Practical Composite score for those in the White group ($M = 5.13, SD = 12.75$) was higher than the ABAS-II Parent-General Practical Composite score for those in the Non-White group ($M = 3.53, SD = 8.82$). This difference indicated that parents in the White group reported more ASD practical symptoms in their children compared to parents in the Non-White group. However, the ABAS-II Teacher-General Practical Composite score for those in the White group ($M = 3.96, SD = 12.73$) was lower than the ABAS-II Teacher-General Practical Composite score for those in the Non-White group ($M = 6.17, SD = 14.74$). This difference indicated that teachers reported more practical ASD symptoms for children in the Non-White group compared to the children in the White group.

The CBCL-Total Problems score for those in the White group ($M = 67.44, SD = 38.05$) was higher than those in the Non-White group ($M = 62.40, SD = 38.40$). This difference indicated that parents in the White group reported more behavioral ASD symptoms in their children compared to parents in the Non-White group. However, the C-TRF-Total Problems score for those in the White group was ($M = 21.78, SD = 40.03$) was higher than those in the Non-White group ($M = 35.33, SD = 43.41$). This difference indicated that teachers reported more behavioral ASD symptoms for children in the Non-White group compared to the children in the White group.

In looking at the diagnosis of ASD measured by the PEP-3, the Composite Score-in Communication for those in the White group ($M = 64.78$, $SD = 27.23$) was higher than the score in the Non-White group ($M = 45.40$, $SD = 23.61$). This difference between groups indicated that in the domain of communication skills, more children in the White group met criteria for ASD compared to children in the Non-White group.

The PEP-3 Composite Score-Motor for those in the White group ($M = 59.33$, $SD = 26.93$) slightly higher than those in the Non-White group was ($M = 51.33$, $SD = 29.36$). This difference between groups indicated that in the domain of motor skills, slightly more children in the White group met criteria for ASD compared to children in the Non-White group.

The PEP-3 Composite Score-Maladaptive for those in the White group ($M = 57.38$, $SD = 32.54$) was higher than those in the Non-White group ($M = 35.90$, $SD = 33.36$). This difference between groups indicated that in the domain of maladaptive behaviors, more children in the White group met criteria for ASD compared to children in the Non-White group.

On the other hand, the CARS-2-Overall Severity Group score for those in the White group ($M = 28.80$, $SD = 8.89$) was lower than those in the Non-White group was ($M = 33.33$, $SD = 9.35$). This difference between groups indicated that more children in the Non-White group met symptoms severity criteria for ASD compared to children in the White group.

The study's findings indicated that reported perceptions of ASD in White and Non-White groups did indicate significant differences from clinician's diagnosis of ASD in White and Non-White groups based on child's race. The main difference was the overall higher clinically diagnosed of ASD among the White group ($M = 52.88$) as compared to the Non-White group ($M = 41.49$). This was in contrast to the teachers' higher reported perception of ASD among

children from the Non-White group compared to children from the White group.

When examining the diagnostic measures independently, the results of the PEP-3 indicated that more children in the White group were clinically diagnosed with ASD compared to children in the Non-White group. This was in contrast to the higher teachers' reported perception of ASD symptoms among Non-White groups measured by the ABAS-II, and the C-TRF. However, based on the CARS-2 measure, more children in the Non-White group were clinically diagnosed with ASD compared to children in the White group. This was in contrast to the higher parental reported perception of ASD symptoms among the White group measured by the ABAS-II, and the CBCL.

The study's findings revealed that the parents' reported perceptions of ASD measured by the ABAS-II, and the CBCL indicated that parents within the White group reported more ASD symptoms in their children over parents in the Non-White group. Conversely, teachers' reported perceptions of ASD measured by the ABAS-II, and the C-TRF indicated that teachers reported more ASD symptoms for children in the Non-White group over children in the White group.

Discussion

The statistical analysis indicated that there was a significant effect of race on reported perception of ASD and diagnosis of ASD. This finding found differences between the reported perceptions of ASD as measured by ABAS-II, CBCL, and C-TRF in White and Non-White groups compared to the clinician's diagnosis of ASD measured by PEP-3 and CARS-2 in White and Non-White groups based on child's race. The key identified difference was the overall higher clinical diagnosis of ASD (measured by the PEP-3 and CARS-2) among the White group ($M = 52.88$) as compared to the Non-White group ($M = 41.49$). This contrasted with the

teachers' higher reported perception of ASD (measured by the ABAS-II and the C-TRF) among children from the Non-White group compared to children from the White group.

In examining the diagnostic measures independently based on the PEP-3, more children in the White group were clinically diagnosed with ASD compared to children in the Non-White group. This was in contrast to the higher teachers' reported perception of ASD symptoms among Non-White groups measured by the ABAS-II and the C-TRF. However, based on the CARS-2, more children in the Non-White group were clinically diagnosed with ASD compared to children in the White group. This was in contrast to the higher parental reported perception of ASD symptoms among the White group measured by the ABAS-II and the CBCL. Hence, the ABAS-II and CBCL measures indicated that parents within the White group reported more ASD symptoms in their children over parents in the Non-White group. Conversely, the ABAS-II and C-TRF indicated that teachers reported more ASD symptoms for children in the Non-White group over children in the White group.

The ABAS-II Parent-General Adaptive Composite score for those in the White group was higher than the score for those in the Non-White group. The ABAS-II Parent-General Conceptual Composite score for those in the White group was higher than the score for those in the Non-White group. The ABAS-II Parent-General Social Composite score for those in the White group was higher than the score for those in the Non-White group. The ABAS-II Parent-General Practical Composite score for those in the White group was higher than the score for those in the Non-White group. Finally, the CBCL-Total Problems score for those in the White was higher than those in the Non-White group.

In contrast, the ABAS-II Teacher-General Adaptive Composite score for those in the White group was slightly lower than the score for those in the Non-White group. The ABAS-II Teacher-General Conceptual Composite score for those in the White group was slightly lower than the score for those in the Non-White group. The ABAS-II Teacher-General Social Composite score for those in the White group was lower than the score for those in the Non-White group. The ABAS-II Teacher-General Practical Composite score for those in the White group was lower than the score for those in the Non-White group. Finally, the C-TRF-Total Problems score for those in the White group was lower than those in the Non-White group.

Interpretation of the Findings

Results indicated a significant effect of race on the reported perception of ASD and diagnosis of ASD, which validated the acceptance of the study's hypothesis. The findings specifically indicated an overall higher clinical rate of diagnosis of ASD (measured by the PEP-3 and CARS-2) among the White group ($M = 52.88$) as compared to the Non-White group ($M = 41.49$). This differed from the teachers' higher reported perception of ASD (measured by the ABAS-II and the C-TRF) among children from the Non-White group compared to children from the White group. Therefore, diagnostically more behaviors, skills, and communication deficits were identified in children from the White group. However, teachers reported children in the Non-White group as having more deficits in emotional and behavioral functioning, independent functioning, and social interactions within their community and cultural environment. This finding extended knowledge in the discipline based on what has been found in the peer-reviewed literature. For instance, several researchers in the field of ASD have highlighted the need for further investigations among diverse racial populations (Becerra et al., 2014; Blacher et al.,

2014; Tek & Landa, 2012; Valicenti-McDermott et al., 2012). The reason for this need was based on researchers' summation that little was known about the nuances of ASD symptoms and perception among different groups along with the impact this may have on early detection rates. Additionally, several studies have supported the view that the clinical phenotype of ASD does not vary by race. However, this study's findings disconfirmed that view and added to the empirical evidence to support that the occurrence varied across racial groups (Grinker, Yeargin-Allsopp, & Boyle, 2011; Mandell et al., 2009; Valicenti-McDermott et al., 2012; Yeargin-Allsopp et al., 2003).

A further comparison of this study's findings, with similar studies revealed a confirmation of previous empirical literature. For example, this study's findings revealed that parents within the White group reported more ASD symptoms in their children than parents in the Non-White group, and there was a higher clinical rate of diagnosis of ASD among the White group as compared to the Non-White group. However, teachers reported more ASD symptoms for children in the Non-White group than children in the White group. This finding aligned with previous studies that reported minority children, namely those of Asian, Hispanic, and African American descent, were less likely to receive early ASD diagnosis compared to Caucasian children (Blacher et al., 2014; Mandell et al., 2002; Tek & Landa, 2012). Nevertheless, this study's finding corroborated previous studies' (Burkett et al., 2015; Palmer, Walker, Mandell, Bayles, & Miller, 2010; Tek & Landa, 2012) indication that the reasons for the delay in the diagnosis of ASD among minority children remain inconclusive.

Furthermore, results revealed a higher reported perception of ASD among parents from the White group over the Non-White group, along with lower reported perception of ASD among

teachers related to the White group over the Non-White group. This pattern of difference in relation to the reported perception of ASD between parents and teachers of children from White and Non-White groups confirmed and highlighted gradations of ASD symptoms and perceptions among different groups identified in previous empirical literature (Becerra et al., 2014; Blacher, et al., 2014; Valicenti-McDermott et al., 2012). Hence, Blacher et al.'s (2014) study called for further research to unveil a deeper understanding of ASD in Latino children, whereby “actual symptoms of ASD may be in the eye of the beholder” (p. 1655).

Tek and Landa (2012) proposed that minority parents may ignore early symptoms of ASD, whereby delayed milestones or unusual behaviors were perceived within their racial or cultural context as normal or inconsequential. Subsequently, parent and caregiver interpretations of ASD symptoms were based on racial or cultural beliefs and values as seen in a study by Zhang et al. (2006). Likewise, this study corroborated that variation of interpretation of ASD symptoms exists among White and Non-White groups.

The pattern of differences between parents' perception of ASD symptoms among White and Non-White groups echoed the empirical literature, which suggest higher rates of delayed and missed diagnoses of ASD among underserved ethnic and racial minorities (Jarquin, Wiggins, Schieve, & Van Naarden-Braun, 2011; Thomas, Zahorodny, Peng, & Kim, 2012). Likewise, among the Hispanic/Latino culture, researchers have found that parents reported characteristically different understandings of developmental milestones and the timing of when skillsets should be accomplished (Blacher et al., 2014; Gannotti et al., 2001).

Conclusion

Empirical data has confirmed the existence of ASD among all racial groups and

emphasized the significance of early intervention. Therefore, this study was driven by the scholarly findings which indicated delayed identification and diagnosis of ASD among minority children, the increased immigrants in American and insufficient literature related to ASD among different racial groups. This finding was consistent with Blacher et al. (2014) conclusion that “actual symptoms of ASD may be in the eye of the beholder” (p. 1655). Hence, this empirical validation advanced the need for future studies to examine other factors that may contribute to the disparity in the recognition of ASD among different racial groups. Also, this finding added to the scholarly consensus which has recognized the need for ASD research in diverse racial populations to better inform clinical practice and increase public awareness (Becerra et al., 2014; Blacher et al., 2014).

Further, the study’s findings indicated that parents within the White group report more ASD symptoms in their children in comparison to parents in the Non-White group, while teachers report more ASD symptoms for children in the Non-White group over children in the White group. These findings also revealed the differences in the way ASD symptoms were perceived and were consistent with the reported higher delayed and missed diagnoses of ASD among underserved ethnic and racial minorities (Jarquin et al., 2011; Thomas et al., 2012). Further, Tek and Landa’s (2012) suggested that minority parents may overlook certain signs of ASD based on their cultural background. Therefore, this study underscores the need for further studies to examine the perception and diagnosis of ASD among different groups, along with the impact this may have on early detection rates and intervention.

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Table 1

Descriptive Statistics for Diagnosis and Reported Perception of ASD

Measures	Group	Mean	Std. Deviation	<i>n</i>
PEP-3-Communication	White	64.78	27.234	18
	Non-White	45.40	23.617	30
	Total	52.67	26.501	48
PEP-3-Motor	White	59.333	26.9313	18
	Non-White	51.330	29.3663	30
	Total	54.331	28.4566	48
PEP-3-Maladaptive	White	57.83	32.547	18
	Non-White	35.90	33.363	30
	Total	44.13	34.425	48
CARS-2	White	28.806	8.8901	18
	Non-White	33.337	9.3575	30
	Total	31.638	9.3557	48
ABAS-II Parent-Adaptive	White	6.3044	14.00571	18
	Non-White	3.7686	9.63356	30
	Total	4.7196	11.39095	48
ABAS-II Parent-Conceptual	White	9.8383	15.75989	18
	Non-White	2.7833	5.01345	30
	Total	5.4289	10.82866	48
ABAS-II Parent-Social	White	8.8539	16.46335	18
	Non-White	6.1126	11.44899	30
	Total	7.1406	13.44299	48
ABAS-II Parent-Practical	White	5.1322	12.75369	18
	Non-White	3.5360	8.82690	30
	Total	4.1346	10.36908	48
ABAS-II Teacher-Adaptive	White	2.1166	4.72171	18
	Non-White	3.7429	6.31298	30
	Total	3.1331	5.76955	48
ABAS-II Teacher-Conceptual	White	3.233	7.2490	18
	Non-White	3.740	5.6276	30
	Total	3.550	6.2136	48
ABAS-II Teacher-Social	White	2.083	3.3108	18
	Non-White	3.480	6.8451	30
	Total	2.956	5.7743	48
ABAS-II Teacher-Practical	White	3.9610	12.73871	18
	Non-White	6.1763	14.74453	30
	Total	5.3456	13.92878	48

Table continues

Measures	Group	Mean	Std. Deviation	<i>n</i>
CBCL-Total Problems	White	67.44	38.055	18
	Non-White	62.40	39.138	30
	Total	64.29	38.406	48
C-TRF-Total Problems	White	21.78	40.036	18
	Non-White	35.33	43.416	30
	Total	30.25	42.270	48
