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Cultural Differences Between Parent and Teacher Report of ADHD Symptoms: Implications for Disparities in Diagnosis

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Philadelphia College of Osteopathic Medicine

Department of Psychology

CULTURAL DIFFERENCES BETWEEN PARENT AND TEACHER REPORT OF
ADHD SYMPTOMS: IMPLICATIONS FOR DISPARITIES IN DIAGNOSIS

By Elisabeth Troffo

Submitted in Partial Fulfillment of the Requirements of the Degree of

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DEPARTMENT OF PSYCHOLOGY**

Dissertation Approval

This is to certify that the thesis presented to us by Elisabeth Truffo
on the 25th day of April, 2013, in partial fulfillment of the
requirements for the degree of Doctor of Psychology, has been examined and is
acceptable in both scholarship and literary quality.

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Abstract

Despite lack of empirical support for differing incidence of ADHD, African American children are diagnosed with ADHD at significantly lower rates than Caucasian children. Research suggests that parents of African American children report ADHD symptoms less frequently than parents of Caucasian children; however, teachers are more likely to report more symptoms and more behavioral problems for African American children than for Caucasian children. The present study attempted to discern what some of these differences can be attributed to by controlling for the variables of age, gender, IQ score, diagnosis, and socioeconomic factors. The present study did not find differences in parent report of ADHD symptoms by ethnicity, but did find that both teachers and parents reported significantly more behavioral symptoms for African American children.

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PARENT AND TEACHER REPORT OF ADHD SYMPTOMS

Introduction

Statement of the Problem

Attention-Deficit/Hyperactivity Disorder (ADHD) is classified as a disorder of early childhood. The symptoms of ADHD affect millions of children and adolescents (Bussing, Schoenberg, & Perwien, 1998). Early diagnosis and treatment are keys in assisting people with ADHD to achieve reduction of their symptoms and attain optimal achievement across all areas of their lives (Bussing et al., 1998). Since there is no definitive test of ADHD, in order for a child to be identified as having ADHD, the symptoms must be detected and reported (Hervey-Jumper, Douyon, & Franco, 2006). The individuals who see the child most frequently, usually his or her parents or caregivers and teachers, are often the ones who report symptoms to the clinician (de Nijs et al., 2004). The clinician must then reconcile these reports to determine whether the child meets the criteria for diagnosis (Power, Costigan, Leff, Eiraldi, & Landau, 2001).

There are, however, documented disparities between parent and teacher reports of ADHD symptoms (Bailey & Owens, 2005; Gomez, 2007). This lack of agreement between parents and teachers makes it difficult for a clinician to determine whether a child meets criteria for ADHD. Parents, in general, tend to underreport symptom severity, and this difference is especially notable for minorities, specifically African Americans (Stevens, Harman, & Kelleher, 2005; Wolraich et al., 2004). It is possible that the lower level of reporting by parents is due to the fact that they do not see the same types of behaviors at home (Gomez, 2007; Wolraich et al., 2004). This difference in reporting could be due to differences in the demands of attention called for in the school versus the home environment (Gomez, 2007; Wolraich et al., 2004). The issue of lower

parental reporting of ADHD symptoms may be particularly important for treatment outcomes, as access to treatment and services may be lower for children from minority backgrounds (Bussing et al., 1998; Stevens et al., 2005). The concern and potential implication is that if parents are not recognizing symptoms in their child as problematic and do not communicate with or agree with the teacher about their child's symptoms, the child may never receive diagnosis and treatment. As a result, teachers may be instrumental in early identification of ADHD for African American children (Stevens et al., 2005). Teachers often are the first to notice a problem and refer children from minority backgrounds for assessment and diagnosis (Stevens et al., 2005).

Relying on teacher reporting may be problematic, however. Teachers may misperceive or misattribute the symptoms of ADHD in minority children, overreporting behavioral symptoms in African American children (Wolraich et al., 2004). Children who have a history of grade failure or academic problems may not only have ADHD, but may display problem behaviors due to an underlying learning disability (Bailey & Owens, 2005; Mayes & Calhoun, 2007; Mayes, Calhoun, & Crowell, 2000) or the sequelae of adverse childhood experiences. Teachers may perceive symptoms of ADHD or learning disability as merely behavior problems and may not recognize that the child has an underlying diagnosis that is impacting his or her behavior. As a result, minority children may be grouped into special education for grade failure or emotional support due to lack of correct diagnosis and treatment. Many studies have found African American students to be significantly more likely to receive special education than Caucasian students, leading some children to be undiagnosed and untreated for symptoms of ADHD (Bailey & Owens, 2005; Hervey-Jumper et al., 2006; Nolan, Gadow, & Sprafkin, 2001;

Reid, 1995). It is important to accurately distinguish these differences in symptoms to ensure that all children have equitable access to the services they need.

Literature Review

Clinical criteria for diagnosis. The Diagnostic and Statistical Manual of Mental Disorders delineates three subtypes of ADHD: 1) combined type, 2) predominantly inattentive type, and 3) predominantly hyperactive/impulsive type (4th ed., text rev.; *DSM—IV—TR*; American Psychiatric Association, 2000). For a diagnosis of ADHD, Predominantly Inattentive type, a child must have at least six symptoms of impairment in the category for inattention (e.g., “often does not seem to listen when spoken to directly”) (American Psychiatric Association [APA], 2000). For a diagnosis of ADHD, predominantly hyperactive/impulsive type, a child must have at least six symptoms of impairment in the category for hyperactivity/impulsivity (e.g., “often fidgets with hands or feet or squirms in seat”) (APA, 2000). An individual who has at least six symptoms each from both categories would receive a diagnosis of ADHD, combined type (APA, 2000). For all three of these diagnoses, impairment must be present in at least two areas of the child’s life, such as in school and at home, and have been present prior to age 7 (APA, 2000).

Demographic distribution. Current estimates of the prevalence of ADHD among school-age children in the United States range between 7.8% and 9.5% of the population (Visser, Bitsko, Danielson, Perou, & Blumberg, 2010). ADHD is more prevalent in boys than in girls, with ratios ranging from 2:1 to 9:1 (APA, 2000). The disparity between diagnoses by gender is greater for ADHD hyperactive/impulsive type than for ADHD inattentive type (APA, 2000).

Comorbidity with other disorders. ADHD can exist in the presence of other disorders. Some disorders often found to be comorbid with ADHD include oppositional defiant disorder, conduct disorder, tic disorders, depression, anxiety, substance abuse disorders, and learning disorders (Al-Yagon, 2009; Bailey & Owens, 2005; Eiraldi, Mazzuca, Clarke, & Power 2006; Hervey-Jumper et al., 2006; Mayes & Calhoun, 2007, Nolan et al., 2001). It is difficult to distinguish between the symptoms for each of these disorders, as symptoms of ADHD often co-occur with other disruptive behavior problems, such as defiance, anger, aggression, and tantrums (Miller, Nigg, & Miller, 2009; Nolan et al., 2001). These externalizing symptoms are found to occur most often with the combined type of ADHD (Nolan et al., 2001). If a child is having behavior problems, it may be difficult for parents and teachers to recognize and attribute the child's behavior to ADHD. For example, the symptoms of ADHD relating to inattention, such that a child does not complete his or her work or chores and does not seem to listen when being spoken to, may be similar to behaviors of more active noncompliance seen in oppositional defiant disorder (APA, 2000). Some of the ADHD symptoms of hyperactivity and impulsivity may also overlap with symptoms of deliberately annoying others in oppositional defiant disorder, or even fighting and bullying seen in conduct disorder (APA, 2000).

One disorder that ADHD co-occurs with for many children is a learning disability. It is estimated that 25% to 50% of children with ADHD have a comorbid learning disability (Barkley, 1994). A learning disability (LD) diagnosis is assigned when a child scores significantly lower in specific subject areas on tests measuring academic achievement than would be expected given his or her IQ scores (Mayes &

Calhoun, 2007). A study of 119 children between ages 8 and 16 seen in an outpatient clinic found that children with ADHD were significantly more likely to have one or more learning disabilities than children without ADHD (Mayes & Calhoun, 2007).

Learning and attention problems have been found to be more severe for children coping with comorbid LD and ADHD diagnoses as well (Mayes et al., 2000; Willcutt et al., 2007). The Mayes study also found that attention problems were more severe for children with the ADHD and LD diagnoses than for children with only ADHD (Mayes & Calhoun, 2007). This study also found that children with ADHD and LD performed most poorly on tests of academic achievement; however, children with only ADHD were found to perform somewhat better than children with only LD (Mayes et al., 2000).

Logically, a child experiencing the effects of both ADHD and LD might present as having more behavior problems in the classroom. They would have difficulty both paying attention and focusing on the task, as well as trouble understanding and learning the material. A study of public school children between the ages of 8 and 12 found that children with comorbid ADHD and LD demonstrate more socioemotional and behavioral problems when compared to typical peers (Al-Yagon, 2009). The effects of having both diagnoses are longer lasting than having either diagnosis alone. A longitudinal twin study of 306 children found that those children with ADHD and comorbid reading disorder were more likely to still meet criteria for those diagnoses and experience poorer academic performance 5 years later when compared to children who were diagnosed with ADHD or reading disorder alone (Willcutt et al., 2007).

African American children and ADHD. The likelihood of an ethnic bias in diagnosis of ADHD is strongly indicated from a review of the prevalence statistics. There is no

empirical reason to believe that African American children would experience ADHD at a lower rate than the general population. Therefore, African American children are estimated to have a diagnosis of ADHD at the same rate as the general population, with Caucasian children estimated at a prevalence of 7.5% to 8.6%, and African American children estimated at a prevalence of 7.7% to 8.2% (Hillemeier, Foster, Heinrichs, Heier, & The Conduct Problems Prevention Research Group, 2007). African American children, however, are actually diagnosed with ADHD at a much lower rate than the larger population (Bailey & Owens, 2005; Eiraldi, Mazzuca, Clarke, & Power 2006; Miller et al., 2009; Stevens et al., 2005). It is not clear why this discrepancy exists, as there is a scarcity of research examining ADHD in African American children (Miller et al., 2009).

A recently conducted meta-analysis yielded only five studies including African American children that examined diagnoses of ADHD by ethnicity (Miller et al., 2009). The results of the meta-analysis found that Caucasian children received a diagnosis of ADHD one and a half times more often than African American children (Miller et al., 2009). Another study of a sample of 266 elementary school students considered to be at high risk for ADHD found that 82% of Caucasian children received a diagnosis of ADHD, while only 28% of African American children were diagnosed (Bussing, Gary, Mills, & Garvan, 2003). Another study of children in grades two through five in two different school districts found that the percentage of Caucasian students receiving medication to treat ADHD was nearly double the percentage of African American students receiving medication for ADHD (LeFever, Dawson, & Morrow, 1998).

In fact, African American children are 33% less likely to have a diagnosis of ADHD, despite being reported to have more ADHD symptoms than Caucasian children (Miller et al., 2009; Nolan et al., 2001). Teachers are also more likely to report oppositional behaviors, conduct problems, and classroom behavior problems in African American children than in Caucasian children (Miller et al., 2009; Nolan et al., 2001). If symptoms are being reported, why are African American students not being diagnosed? A study of over 3,000 children found that African American children were more likely to be receiving special education services (Nolan et al., 2001). It is possible that African American children are not being diagnosed with ADHD because they are being labeled with a learning disability instead.

The high rate of comorbidity of ADHD with other disorders also makes reporting symptoms more difficult, as it is harder to distinguish the symptoms of ADHD for accurate diagnosis (Bailey & Owens, 2005; Mayes & Calhoun, 2007). Are children making mistakes on schoolwork because they are having trouble sustaining attention, or do they have a reading disability? Are children out of their seats because they're hyperactive, or are they avoiding a writing task they can't complete? This highlights the importance of and need for better identification of ADHD in African American children to gain access to appropriate educational supports and treatment. It is possible that African American children are either being misdiagnosed and receiving special education for impairment better explained by ADHD than LD or that they have not received treatment for existing ADHD and are experiencing continued impairment in the classroom setting, leading to educational deficits.

African American parental awareness of ADHD. Teacher reports alone are not sufficient to diagnose of ADHD. There are many issues that may contribute to the lower rate of diagnosis among African American children. One issue that may be contributing to the lower rate of diagnosis is that there may be a lower level of parental attention to or awareness of the disorder (Bailey & Owens, 2005; Miller et al., 2009). A study of over 4,000 children between ages 11 and 17 found that Caucasian parents were almost two times as likely to report that their child had an emotional, behavioral, or drug/alcohol problem than minority parents (Roberts, Alegria, Roberts, & Chen, 2005). Controlling for age, gender, education level of caregiver, and child-reported diagnoses and impairments did not change the parental reporting pattern, suggesting that minority parents may not be recognizing an issue (Roberts et al., 2005).

A survey of 486 African American and Caucasian parents of children at high risk for ADHD indicated that 69% of African American parents reported having heard of ADHD, compared with 95% of Caucasian parents (Bussing et al., 1998). It should be noted that during this time ADHD was still emerging as a recognizable mainstream disorder. When examining what parents thought might be the cause of ADHD, ethnic differences emerged, as well (Bussing et al., 1998). When socioeconomic status (SES), gender, and treatment status were controlled for, African American parents were over four times as likely as Caucasian parents to attribute their child's ADHD symptoms to excess sugar consumption (Bussing et al., 1998). African American parents were also three times less likely to identify a genetic cause for ADHD, four times less likely to use a medical label for their child's ADHD symptoms, and four times more likely to label their child bad than Caucasian parents (Bussing et al., 1998). African American parents

were less likely to connect ADHD problems to school or be concerned about academic problems, more likely to say that they didn't know what kind of treatment their child should receive, and less likely to ask for medication or school-based interventions (Bussing et al., 2003).

Potential barriers to diagnosis and treatment. Aside from parental differences in beliefs about ADHD, African American children face several potential barriers to diagnosis and treatment when compared with their Caucasian counterparts. Issues of access to care due to lack of health insurance, lack of transportation, and cost of medication are more likely to affect minority populations of low socioeconomic status (Eiraldi et al., 2006; Stevens et al., 2005). Cultural factors may act as a barrier, as well, including negative attitudes towards medication and concerns about stigma associated with the label of a diagnosis (Eiraldi et al., 2006; dosReis et al., 2006).

One of the barriers to treatment is insurance status. Lack of healthcare coverage may lead to less access to treatment. A study of 1,061 children found that children with insurance were twice as likely to receive a diagnosis of ADHD as those without insurance, and those without insurance were also less likely to follow up with treatment (Stevens et al., 2005). Children who did not have insurance were significantly less likely to receive a prescription for ADHD medication and had fewer therapy visits for ADHD than children with either public or private insurance (Stevens et al., 2005). Less access to and less use of services by African Americans leads to lower rates of diagnosis and treatment and higher rates of problem behaviors left untreated (Miller et al., 2009). The Stevens and coworkers study only identified service utilization by insurance status and

did not did not categorize insurance status by ethnicity; therefore the interaction of ethnicity with insurance status was not reported (2005).

Even with access to services, African Americans may feel ambivalent about seeking treatment. African American families may be mistrustful of treatment for ADHD (dosReis et al., 2006; Jones & Herndon, 1992). A study of 48 African American families whose children were receiving medication to treat ADHD symptoms found that 71% stated they were initially hesitant to use medication, 46% preferred medication to counseling, but 69% had never received counseling before (dosReis et al., 2006). Ninety percent of African American parents stated that they believed medication was safe if a doctor prescribed it, but approximately 20% of respondents endorsed concerns about ADHD medication leading to drug abuse, having negative side effects, and being overprescribed (dosReis et al., 2006). African American parents seem generally more reluctant to use medication to treat their children for ADHD and prefer behavioral treatment (dosReis et al., 2006; Stevens et al., 2005).

Reports of ADHD symptoms. Above all, the first step in getting treatment is receiving a diagnosis. Since there is no simple diagnostic test that can be administered to diagnose ADHD, it is necessary to obtain information about the child from several settings (Bailey & Owens, 2005; Power et al., 1998). Generally, the diagnostic requirement for symptoms of ADHD to cause impairment in two settings is satisfied through a report of behavior in the home and at school (Gomez, 2007). It is unlikely that the parent can provide a full picture of the child in the school setting or that a teacher can accurately report on the child's behavior in the home setting; therefore multiple informants are often used to report on the child's behavior in each setting (de Nijs et al.,

2004; Gomez, 2007; Power et al., 1998; Wolraich et al., 2004). Given that many questionnaires have been standardized and demonstrated good reliability and validity, they are a convenient way of obtaining reports from multiple sources on the degree of ADHD symptoms a child is exhibiting in different settings (Bohnstedt et al., 2005).

It is important to note that many of the questionnaires, while assessing the symptoms listed in the *DSM—IV—TR*, do so in a Likert scale fashion that may affect their utility in accurately predicting diagnoses (Power et al., 2001). The Likert method of scoring typically uses never, sometimes, often and very often categories and counts the items that were scored as often or very often. An analysis of each item's actual ability to predict diagnosis found that some items were only predictive at the very often level while other items were found to be predictive of ADHD even at the sometimes rating (Power et al., 2001). It is recommended that assessment of symptoms include clinical interviews so that some degree of clinical expertise is used without relying solely on reporting via rating scales (Power et al., 2001). Unfortunately, it is often not possible to interview a child's teacher in the same way that a clinician can interview a parent, but asking parents about any discrepancies between their report and the teacher's ratings may uncover important information that can impact the decision to diagnose (Wender, 2004).

Parent report vs. teacher report. Parents and teachers often report symptoms differently and frequently demonstrate low levels of agreement on the symptoms reported both across settings and within the same setting (Bailey & Owens, 2005; de Nijs et al., 2004; Gomez, 2007; Lau et al., 2004; Wender, 2004; Wolraich et al., 2004). A study of 30 children diagnosed with ADHD found that parents' and teachers' reports of a child's behavior in the same setting had only slight to moderate levels of agreement (de Nijs et

al., 2004). In addition, parents' reports of behaviors at home had low correlation with teachers' reports of behaviors at school (de Nijs et al., 2004). A study of 243 children either diagnosed with or at risk for ADHD found low interrater agreement between parent and teacher report of symptoms using the Vanderbilt ADHD rating scales (Wolraich et al., 2004). A study of 213 children between the ages of 6 and 11 also found that parents and teachers had low levels of agreement of ADHD symptoms assessed using the Disruptive Behavior Rating Scale (Gomez, 2007).

Teachers and parents simply may not see the same behaviors due to situational specificity in the kinds of tasks that are likely to bring out symptoms of ADHD (Gomez, 2007; Wolraich et al., 2004). For example, children with ADHD are often able to attend to tasks that they enjoy, but have a short attention span for activities that are not of interest to them (APA, 2000). Support for this is demonstrated by the Gomez study (2007), which found the teacher and parent rating scales to be psychometrically equivalent, and scores for the same child should conceivably be directly comparable regardless of the informant. Therefore, if teachers and parents are rating a child differently on rating scales that are psychometrically equivalent, this may be due to differences in observed behaviors based on setting.

Another possible source of differences in ratings between parents and teachers may be different judgments about the child's behavior and not recognizing changes in the child's behavior in the same way (de Nijs et al., 2004). For example, in a study of 16 children between the ages of 8 and 11 from a clinical outpatient sample, teachers were not as sensitive to changes in a child's behavior once he or she had begun receiving treatment over a shorter time span, while parents were more sensitive to the changes

(Bohnstedt et al., 2005). A study of 147 children between the ages of 5 and 14 found that, while both parent and teacher reports contributed significantly to a diagnosis of ADHD, parent ratings were found to be more accurate and better able to differentiate between subtypes of ADHD (Power et al., 1998). Perhaps parents are more likely to make conservative reports of their child's behavior, which may lead them to be more accurate but underestimate true impairment, while teachers are more likely to endorse elevations on a greater number of symptoms, leading to overreporting. This tendency for teachers to report significantly more behavioral problems and ADHD symptoms is even more pronounced for African American children (Epstein, March, Conners, & Jackson, 1998; Lau et al., 2004; Miller et al., 2009).

Report measures of ADHD in African American children. Researchers have questioned whether behavioral rating scales normed on English-speaking Caucasian populations are valid and reliable for African American children due to confounds of cross-cultural assessment and homogeneous norm groups (Bailey & Owens, 2005; de Ramirez & Shapiro, 2005; Reid, 1995). A review of 11 different rating scales found that more than half did not even mention inclusion of culturally different individuals in their norm groups (Reid, 1995). Factors other than actual behavior, such as cultural differences in behavior norms, interaction of culture of rater with culture of student, and halo effects may affect the results of behavior rating scales for African American children (Reid et al., 1998). These stated possible cultural differences are additional reasons why African American parents may not report behaviors that can be easily diagnosed as ADHD.

A study of 218 Hispanic and White teachers found significant differences in ratings of a standardized video of a White and a Hispanic child's classroom behavior based on ethnicity, using the ADHD Rating Scale IV (de Ramirez & Shapiro, 2005). There were no significant differences in how the White teachers rated either child; however, the Hispanic teachers rated the Hispanic child's behavior as more severe than they rated the behavior of the White child (de Ramirez & Shapiro, 2005). One possible explanation for this could be that teachers were holding the children who belonged to their own ethnic group to a higher standard than students from other groups. Another potential explanation that was examined was the level of acculturation of the teacher to White American norms (de Ramirez & Shapiro, 2005). When the level of acculturation of the Hispanic teachers was accounted for, the differences in their ratings were no longer significant, implying that differences in cultural values could be one of many factors that affect teacher perception of child behavior (de Ramirez & Shapiro, 2005).

This concept of acculturation has not been applied to the African American population, perhaps because of the historical tendency to view this group as a race, rather than an ethnicity (Landrine & Klonoff, 1994). Race refers to a group that is defined by physical differences, while ethnicity refers to a group that is socially constructed based on differences in culture (Landrine & Klonoff, 1994). While African Americans do belong to a group that is different based on racial definitions, there are also cultural differences that exist for African Americans that may not exist for other individuals of an African racial background. A study comparing 123 African American individuals to 60 individuals from other ethnic groups found significant differences independent of SES, gender, or education in level of African American acculturation on eight subscales,

including family values, health beliefs, and socialization (Landrine & Klonoff, 1994).

Thus, differences in level of acculturation of either the parent or teacher who is rating that child could significantly influence ratings of that child's behavior, as was seen in the de Ramirez and Shapiro study (2005).

Teacher reports of ADHD symptoms in African American children. Several studies have been conducted that examine differences in teacher reports of behavior problems and ADHD symptoms for African American students as compared to Caucasian students using established rating scales. One study used the Connors Teacher Rating Scale and found significant differences in how teachers rated African American and Caucasian students (Epstein, et al., 1998). Teachers were asked to rate over 1,000 students in grades 5 through 8, and their responses revealed differences by race when gender was accounted for (Epstein et al., 1998). Teachers rated African American males significantly higher than Caucasian males for externalizing symptoms, such as conduct problems and hyperactivity, in addition to endorsing antisocial symptoms, such as lying and stealing, in African American males that they did not endorse for Caucasian males (Epstein et al., 1998). Teachers rated African American females significantly higher than Caucasian females on symptoms of conduct problems and anxiety, and did not significantly rate African American females as having symptoms of inattention, whereas Caucasian females were rated as having these symptoms (Epstein et al., 1998).

Another study of over 3,000 students between the ages of 5 and 18 found that teachers rated African American boys as the most severe on ADHD symptoms, followed by African American girls and Caucasian boys as the next most severe, with Caucasian females rated as least severe using the ADHD Rating Scale—IV (Reid et al., 2000).

When gender differences were examined, teachers were found to rate ADHD behaviors of African American students consistently regardless of gender, but teachers' ratings of boys and girls varied significantly for Caucasian students, with female Caucasian students reported to have the fewest externalizing symptoms (Reid et al., 2000).

A different study examined the Achenbach behavior rating scales for 600 children between the ages of 11 and 17 and found that teachers reported significantly more externalizing symptoms than parents for African American children when compared with teacher and parent reports for other ethnicities (Lau et al., 2004). A study of over 3,000 children ages 3 to 18 found that teachers reported symptoms of ADHD in African American children at a rate more than double that for their Caucasian counterparts, independent of SES of the child (Nolan et al., 2001). A study of over 1,700 male students between the ages of 5 and 18 found that teachers rated the African American boys as meeting criteria for ADHD nearly twice as often as Caucasian boys using the ADHD Rating Scale—IV (Reid et al., 1998). Specific statistical analyses conducted in this study further suggested the presence of differences in teacher perception of behavior between ethnicities (Reid et al., 1998).

The above-cited studies found that teachers rated African American children as having more externalizing symptoms and behavioral problems than Caucasian children. Additionally, a meta-analysis of studies examining report of ADHD symptoms in African American children found that teachers reported more behavioral problems for African American children than for Caucasian children (Miller et al., 2009). These studies all relied on teacher ratings alone and did not compare ratings to direct observation. One study did compare teacher ratings of minority students, including African American

students, with direct observations of student behavior (Hosterman, DuPaul, & Jitendra, 2008). It was found that while teachers did rate minority students significantly higher on hyperactive and impulsive behaviors, these ratings were consistent with objective ratings of student behavior completed by trained graduate students (Hosterman et al., 2008). The fact that the rating scales were consistent with the objective observer ratings may indicate that teachers do accurately perceive the behavior of African American students. The accuracy of teacher reporting is especially important, given that African American children are most often not diagnosed based solely on parent report of symptoms (Stevens et al., 2005). One study found that the school was the most common referral source for African American parents whose children were receiving treatment for ADHD (dosReis et al., 2006). African American children experiencing emotional, behavioral, or academic problems in the classroom are most often referred to the school's mental health services (Jones & Herndon, 1992). It is the decision of the parents, however, to take their child for assessment and treatment for ADHD.

Parent reports of ADHD symptoms in African American children. Schools rarely diagnose children. Instead they notify parents of concerns and recommend that parents have their children evaluated. These are some additional reasons why some African American caregivers may not accept an ADHD label for their children. As mentioned previously, African American families may not recognize the symptoms their child exhibits as problematic behaviors (Eiraldi et al., 2006). African American parents have a more negative attitude towards pharmacological treatment and are less likely to report symptoms of ADHD than Caucasian parents, making them less likely to initiate diagnosis and treatment (Stevens et al., 2005). African American parents are less likely

to be aware of any problems in school caused by ADHD symptoms (Bailey & Owens, 2005). They may also resist following up with assessment due to a perception that the school is unfairly targeting their child for diagnosis (Bailey & Owens, 2005; Jones & Herndon, 1992).

There are some differences in how African American families perceive the symptoms of ADHD in their children (Hillemeier et al., 2007). African American parents are more likely to misperceive the ADHD symptoms as something their children will outgrow with time (Bailey & Owens, 2005). African American parents are also more likely to endorse identification of external factors such as diet, stress, and parenting as causing the ADHD symptoms (Bailey & Owens, 2005; Bussing et al., 1998; Hillemeier et al., 2007).

When parents of African American children do report symptoms of ADHD, they tend to report more concrete, observable symptoms. A study of over 1,000 third graders using the Diagnostic Interview Schedule for Children revealed that the kinds of ADHD symptoms reported by parents differed for African American children and Caucasian children (Hillemeier et al., 2007). Parents of African American children were significantly more likely to endorse items assessing symptoms of hyperactivity, impulsivity, and poor concentration than parents of Caucasian children (Hillemeier et al., 2007). Parents of Caucasian children were more likely to endorse items assessing poor organizational skills at home (Hillemeier et al., 2007). When SES was controlled for, the differences between parental ratings by race were reduced, but still significant (Hillemeier et al., 2007). The fact that the differences remained suggests cultural differences in the way parents perceive and report symptoms of ADHD in their children.

As a result of these complications with parent reports, teacher reports are often needed to provide more information about a child's behavior. A study of 129 students between ages 5 and 12 found that teacher reported symptoms predicted final diagnosis of ADHD more often than parent report (Power et al., 2001). Clinicians prefer to use multiple informants to reach a diagnosis; however, if parents are not endorsing clinically significant numbers of symptoms in the home setting, clinicians may be forced to overrely on the teacher report (Power et al., 2001). This makes it difficult to arrive at a diagnosis, as impairment in at least two settings is part of the diagnostic criteria for ADHD (APA, 2000).

Summary. ADHD affects millions of children and adolescents and requires early diagnosis and treatment to achieve optimal outcomes (Bussing et al., 1998). African American children receive diagnoses of ADHD at remarkably lower rates than Caucasian children (Miller et al., 2009; Nolan et al., 2001). This is important because lower rates of diagnosis mean less access to treatment and poorer outcomes for African American children, an ethnic group that already experiences decreased access to services (Eiraldi et al., 2006; Stevens et al., 2005).

Diagnosis of ADHD often relies on parent and teacher reports of a child's behavior (de Nijs et al., 2004; Gomez, 2007; Power et al., 1998; Wolraich et al., 2004). Reports of ADHD symptoms vary significantly, however, between parents and teachers (Bailey & Owens, 2005; de Nijs et al., 2004; Gomez, 2007; Lau et al., 2004; Wender, 2004; Wolraich et al., 2004). Parents underreport ADHD symptom severity for African American children (Stevens et al., 2005; Wolraich et al., 2004). Teacher reports of ADHD symptoms for African American children are also significantly more severe than

their reports for Caucasian children (Epstein et al., 1998; Lau et al., 2004; Miller et al., 2009; Nolan et al., 2001; Reid et al., 1998, 2000).

If teachers are reporting significantly more symptoms of ADHD for African American children, then why aren't the children receiving the diagnosis and receiving treatment? Perhaps African American parents are less likely to seek assessment and diagnosis of ADHD due to cultural differences in perception of the disorder or disagreement with teacher reports (Bailey & Owens, 2005; Bussing et al., 1998, 2003; Miller et al., 2009). Another possible reason is that ethnicity affects teachers' perceptions of African American children and results in higher ratings of all behavioral problems without discernment (Epstein et al., 1998; Reid et al., 1998, 2000). Perhaps SES, IQ, and comorbid disorders are confounding factors that inflate ethnic differences between reports of ADHD symptoms (Al-Yagon, 2009; Harris & Llorente, 2005; Jones & Herndon, 1992). Another possibility is that African American children are being overidentified for special education services and are receiving special education assistance for a learning disability instead of receiving ADHD supports (Reid & Katsiyannis, 1995).

All of the above-mentioned issues are factors that have been thought to contribute to discrepancies in symptom reporting and diagnosis of ADHD in African American children. Very little research exists that studies African American children and ADHD, and no current research exists that attempts to look at these factors while controlling for multiple significant sources of variance.

As a result, the present study further examined differences in parent and teacher reports of ADHD symptoms while controlling for SES, IQ, academic achievement, and

diagnosis. Additionally, the present study sought evidence of other possible explanations for differences, such as inflated behavioral problem reporting and special education categorization, while controlling for sources of variance.

Purpose of the Study

The purpose of the present study was to investigate whether there are significant differences in reports of ADHD symptoms between African American and Caucasian children. The variables of gender, age, IQ score, diagnosis, and socioeconomic status (SES) were controlled for to reduce possible variance in reporting due to those factors (Al-Yagon, 2009; Harris & Llorente, 2005; Hillemeier, et al., 2007; Jones & Herndon, 1992; Nolan et al., 2001). Many studies have controlled for some of these factors, such as SES or diagnosis, but no existing research has combined all of these concerns while examining teacher and parent reports of ADHD symptoms in African American children compared to Caucasian children. The present study examined levels of teacher and parent reports of ADHD symptoms, behavioral problems, and learning difficulties for African American and Caucasian children. Special education identification and grade failure were also reviewed to determine whether ethnicity is a predictor of frequency of identification of learning disability.

Hypotheses

1. When age, gender, IQ scores, diagnosis, and socioeconomic factors were controlled for:
 - a. It was hypothesized that parent report of child ADHD symptoms would be less severe for African American children than Caucasian children. Studies have found that parents of African American children do not report as much knowledge about ADHD or report symptoms of ADHD in the same way as parents of Caucasian children (Bailey & Owens, 2005; Bussing et al., 1998; Hillemeier et al., 2007; Miller et al., 2009; Roberts et al., 2005; Stevens et al., 2005).
 - b. It was hypothesized that parent report of homework problem behaviors would not be significantly different for African American children and Caucasian children. African American parents do not appear to be as aware of behaviors from the school setting, but do report concrete behaviors observed in the home setting (Bailey & Owens, 2005; Hillemeier et al., 2007).
2. When age, gender, IQ scores, diagnosis, and socioeconomic factors were controlled for, it was hypothesized that teacher reports of student ADHD symptoms would be more severe for African American children than Caucasian children. Multiple studies have found that teachers report more symptoms of ADHD for African American children than Caucasian children (Epstein et al., 1998; Lau et al., 2004; Miller et al., 2009; Nolan et al., 2001; Reid et al., 1998, 2000).

3. When age, gender, IQ scores, diagnosis, and socioeconomic factors were controlled for:
 - a. It was hypothesized that frequency of teachers' reports of behavioral problems would be greater than parents' report of behavioral problems for African American students than Caucasian students. Studies found that teachers identify externalizing behaviors, such as conduct problems and behavioral problems, more frequently among African American students than Caucasian students (Epstein et al., 1998; Lau et al., 2004; Miller et al., 2009).
 - b. It was hypothesized that parents' reports of behavioral problems would not be significantly different for African American children and Caucasian children. While African American parents do not report as much knowledge of ADHD as Caucasian parents, they do report concrete behavioral issues; therefore, no difference was expected in reports of behavioral problems (Bailey & Owens, 2005; Bussing et al., 1998; Hillemeier et al., 2007).
4. When age, gender, IQ scores, diagnosis, and socioeconomic factors were controlled for, it was hypothesized that frequency of teachers' reports of behavioral problems would be greater for African American students than Caucasian students, while there would be no differences in the report of learning problems by ethnicity. Studies have demonstrated that teachers report externalizing problems more frequently than learning problems for African American children than Caucasian children and that it is difficult to distinguish

between symptoms of learning disabilities and of ADHD (Al-Yagon, 2009; Epstein et al., 1998; Lau et al., 2004; Miller et al., 2009).

5. When age, gender, IQ scores, diagnosis, and socioeconomic factors were controlled for, an exploratory analysis was conducted to examine the likelihood that African American children were receiving special education services or had a history of grade failure at a higher rate than Caucasian children. Due to the paucity of information on the difference in receipt of special education services or grade failure by ethnicity in children with ADHD and the fact that the data was available, an exploratory analysis was performed to obtain additional information.

Method

Overview

The goal of the present study was to use archival data to investigate whether there were significant differences in reports of ADHD symptoms between African American and Caucasian children while controlling for gender, age, IQ score, diagnosis, and socioeconomic factors to reduce possible variance in reporting.

Design and Design Justification

This study examined teacher and parent scores on measures of behavioral and learning symptoms for African American and Caucasian children. The study design was a matched, between-subjects correlational design.

Participants

The data on subjects in this study were obtained from an archival data set maintained by a large children's hospital in the Philadelphia area. Participants were 36 African American children and 36 Caucasian children between the ages of 6 and 12. There were 58 males and 14 females.

Inclusion and exclusion criteria. African American and Caucasian subjects were selected for inclusion in this study. Participants were selected for inclusion based on matched scores on gender, age, IQ, diagnosis, and socioeconomic status and separated into two groups based on ethnicity. Participants who had a comorbid mood or anxiety disorder were excluded from this study, as the symptoms of these disorders may act as a confounding variable in teacher and parent reports of ADHD symptoms. Participants were already screened and diagnosed with these disorders as part of the information that was initially entered into the dataset.

Recruitment. The current study utilized an archival dataset maintained for research purposes by the hospital. Participants were recruited to submit their children's information into the aggregate dataset by the hospital at the time they were receiving treatment. They provided informed consent/assent at that time to have their information used in hospital-supervised research projects.

Measures

The measures from the dataset that this study used are as follows:

Academic Performance Questionnaire. This questionnaire is designed to be completed by teachers, and assesses the child's performance in reading, mathematics, writing, and homework (Mercugliano, Power, & Blum, 1999). It consists of 10 items on a 4-point (well above average to well below average) or 5-point (90%-100% to 0%-59%) ordinal scale. Test-retest reliability was found to be acceptable, with a kappa of .74 (Bennett, Power, Eiraldi, Leff, & Blum, 2009). The present study used this measure to assess whether a child was receiving special education services through pull-out instruction, and had a history of grade failure.

ADHD Rating Scale IV. This questionnaire is designed to assess symptoms that would indicate a diagnosis of ADHD (DuPaul, Power, Anastopoulos, & Reid, 2000). There are two versions, one for the home and one for the school. It consists of 18 items rated on a 4-point Likert scale (never or rarely to very often). Nine of the items assess symptoms of inattention and nine assess symptoms of hyperactivity/impulsivity. The items are presented in alternating order by inattention and hyperactivity/impulsivity. The present study used this measure to assess parent and teacher reported symptoms of ADHD.

Test-retest reliability for the school version was $r = .90$ for the total score, $r = .89$ for the inattention items, and $r = .88$ for the hyperactivity/impulsivity items (Jenkins, 2003). Test-retest reliability for the home version was $r = .85$ for the total score, $r = .78$ for the inattention items, and $r = .86$ for the hyperactivity/impulsivity items (Jenkins, 2003). Internal consistency alpha coefficients were found to be acceptable for total (home version = .92, school version = .94), inattention (home version = .86, school version = .96), and hyperactivity-impulsivity (home version = .88, school version = .88) scores (Jenkins, 2003; Lindskog, 2003).

This measure was analyzed for criterion validity by comparing it with another well-established measure, and found to be significant for the school version ($r = .73$ for the inattention score, $r = .79$ for the hyperactivity-impulsivity score, and $r = .86$ for total score) (Jenkins, 2003). Criterion validity was also found to be significant for the home version ($r = .61$ for the inattention score, $r = .81$ for the hyperactivity-impulsivity score, and $r = .80$ for total score) (Jenkins, 2003).

Behavior Assessment System for Children, Second Edition Parent and Teacher Rating Scales. This questionnaire is designed to assess emotional and behavioral functioning in children (Reynolds & Kamphaus, 2004). There are two versions, one for the home and one for the school. It consists of 100 to 160 items, depending on the form used, that are rated on a 4-point scale (never to almost always). The items assess composite areas of adaptive skills, externalizing problems, internalizing problems, and the teacher rating scale also includes the composite area of school problems. The present study used the Parent and Teacher Rating Scales. The aggression and conduct problems scales were used to assess for parent and teacher reported

behavioral problems, and the hyperactivity and attention problems scales were used to assess for parent and teacher reported symptoms of ADHD. The learning problems scale on the Teacher Rating Scale was also used to assess for teacher report of learning problems.

Extensive research on the psychometric properties of these scales has been conducted (Reynolds & Kamphaus, 2004). Reliability alpha coefficients for the composite areas were found to be above .80 for both the Parent and Teacher Rating Scales (Reynolds & Kamphaus, 2004). Test-retest reliability scores were found to be above .80 for the Teacher Rating Scale and .78 and above for the Parent Rating Scale (Reynolds & Kamphaus, 2004). Both Parent and Teacher Rating Scales were found to have acceptable criterion validity when compared with another well-established measure (Reynolds & Kamphaus, 2004). Correlations were moderate to high, ranging from .65 to .83 on both composite scores and scale scores (Reynolds & Kamphaus, 2004).

Diagnostic Interview for Children and Adolescents—IV (DICA—IV). This measure is a structured interview designed to assess for DSM—IV—TR diagnostic criteria for child psychopathology in 30 different diagnoses (Reich, Welner, Herjanic, & Multi-Health Systems Staff, 1999). The interview consists of 358 stem questions which if answered affirmatively, can lead to just under 3,000 total questions. Questions generally assess presence of a symptom and the time period it has been present. Responses are scored as yes or no, with some responses allowing an answer of sometimes or somewhat. Responses are computer scored to integrate parent and child responses to yield a total symptom count for each disorder, leading to a positive or negative diagnosis based on DSM—IV—TR criteria. The present study used this measure to exclude

participants with comorbid mood or anxiety disorder diagnoses and to control for the diagnosis of type of ADHD between participants.

Test-retest reliability for diagnosis in a clinical sample ranged from kappa = .42 to .92 for children, kappa = .43 to .96 for parents, and kappa = .51 to .86 when parent and child reports are combined (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000).

Test-retest reliability for diagnosis in a community sample ranged from kappa = .10 to .64 for children, kappa = .45 to .68 for parents, and kappa = .44 to .66 when parent and child reports are combined (Shaffer et al., 2000). Test-retest reliability in the community sample when considering only the scale reliability of symptom and criterion counts ranged from kappa = .11 to .92 for children, kappa = .43 to .93 for parents, and kappa = .12 to .91 when parent and child reports are combined (Shaffer et al., 2000).

Validity testing of the DICA—IV is not currently available; however, past versions of the DICA have demonstrated acceptable criterion validity of responses in the community sample, ranging from kappa = .23 to .79 for children, kappa = .29 to .74 for parents, and kappa = .40 to .80 when parent and child reports are combined (Shaffer et al., 2000).

Hollingshead Four Factor Index of Social Status. This measure assesses SES using four factors: occupation, education, marital status, and gender (Hollingshead, 1975). Occupation is scored on a 9-point scale, education is scored on a 7-point scale, marital status determines a weighted value used to compute social status, and gender is not assigned a value in computing the social status score. The present study used this measure to control for socioeconomic factors between participants.

Data obtained using scores from the 1970 U.S. Census demonstrated a high degree of reliability and validity (Gottfried, 1985). This measure was analyzed for criterion validity by comparing it with two other well-established measures (Gottfried, 1985). Validity scores range from .73 to .93 for the overall index as well as the scale scores (Gottfried, 1985).

Homework Problems Checklist. This parental report questionnaire assesses a range of problems typically encountered by students in completing homework (Anesko, Schoiock, Ramirez, & Levine, 1987). It consists of 20 items scored on a 4-point Likert scale (never to very often). Internal consistency was found to be high ($\alpha = .90$ to $.92$) (Anesko et al., 1987). Concurrent validity was established by comparing parent ratings of academic functioning with scores on the questionnaire, and a moderate negative correlation was found (Anesko et al., 1987). The present study used this measure to assess parent report of homework problem behaviors.

Wechsler Abbreviated Scale of Intelligence. This screen of intelligence consists of four subtests (vocabulary, matrix reasoning, similarities, and block design) loading on two indices of verbal and performance, yielding a full scale IQ score (Wechsler, 1999). All four subtests may be administered, or a shorter administration of only two subtests may be given. This test is normed for use with children and adults between the ages of 6 and 89. The present study utilized the full scale IQ score to control for IQ within one standard deviation (plus or minus 15 points).

The vocabulary subtest requires the examinee to name pictures and define words presented verbally. The block design subtest requires the examinee to use red and white blocks to build a design demonstrated by the examiner or shown in a picture. The

similarities subtest requires the examinee to choose a picture that is most similar to a group of other pictures and verbally explain how two words or concepts are alike. The matrix reasoning subtest requires the examinee to choose a picture to complete a pattern in which one picture is missing. Stop and start points for administration of the subtests depends on the examinee's age.

Split-half reliability was acceptable ($r = .81$ to $.98$ for the subtests, and $r = .92$ to $.98$ for IQ scores) (Lindskog & Smith 2001). Test-retest reliability was acceptable ($r = .79$ to $.90$ for the subtests, and $r = .85$ to $.93$ for IQ scores) (Lindskog & Smith 2001). This measure was analyzed for criterion validity by comparing it with the full Wechsler measures, and found to be significant ($r = .66$ to $.88$ for subtests, and $r = .76$ to $.92$ for IQs) (Lindskog & Smith 2001).

Wechsler Intelligence Scale for Children—IV. This test of intelligence consists of 10 core subtests (similarities, vocabulary, comprehension, block design, picture concepts, matrix reasoning, digit span, letter-number sequencing, coding, and symbol search) loading on four indices (verbal comprehension index, perceptual reasoning index, working memory index, and processing speed index) yielding a full scale IQ score (Wechsler, 2003). There are also five supplemental subtests (information, word reasoning, picture completion, arithmetic, and cancellation) that may be substituted for core subtests. This test is normed for use with children between the ages of 6 years 0 months to 16 years 11 months. The present study utilized the full scale IQ score to control for IQ within one standard deviation (plus or minus 15 points).

Internal consistency reliability was acceptable ($r = .79$ to $.90$ for core subtests, $r = .79$ to $.88$ for supplemental subtests, $r = .90$ or above for the indices, and $r = .96$ or above for IQ) (Maller, 2005). Test-retest reliability was acceptable ($r = .70$ to $.80$ for subtests, $r = .84$ to $.95$ for the indices, and $r = .91$ or above for IQ) (Maller, 2005). Correlation was calculated between this measure and past versions as well as with other Wechsler measures and found to be moderate to high (Maller, 2005).

Procedure

The data was analyzed using the Statistical Package for the Social Sciences (SPSS), Version 17.0 (SPSS Inc., 2008). The eligible participants and the necessary variables were extracted from the larger dataset and placed into a smaller dataset for the purposes of this study.

First, African American participants were identified and matched with a Caucasian participant based on their gender, age, IQ, diagnosis, and demographic measures. If an African American participant had more than one Caucasian participant who qualified as a match, a match was randomly selected for final inclusion using a statistical function.

Variables were created to reflect separate composite scores for ADHD symptoms as reported by parents and teachers on the ADHD Rating Scale—IV and the BASC—II and behavioral problems as reported on the BASC—II. Variables were created to reflect scores for learning problems as reported on the BASC—II, homework problem behaviors as reported on the Homework Problems Checklist, and enrollment in special education and history of grade failure as reported on the Academic Performance Questionnaire.

Results

Descriptive analyses were conducted on the data for the 72 participants to obtain the means and standard deviations for the continuous variables used in the study. These values are reported in Table 1. Pearson's correlations were then calculated to ensure that the independent variables were correlated for each hypothesis.

Table 1

Descriptive Statistics for the Study Sample

Variable	Mean	SD	Minimum	Maximum
Age in months	101.63	17.92	74	152
SES score	41.72	10.39	20	66
WASI Full Scale IQ – 2 Subtests	99.26	12.66	75	123
WASI Full Scale IQ – 4 Subtests	91.38	6.19	87	106
WISC III Full Scale IQ	96.60	15.49	81	124
Homework Problems Checklist	6.79	5.26	0	18
Parent ADHD Rating Scale—IV total score	85.15	15.38	31	99
Teacher ADHD Rating Scale—IV total score	81.83	14.85	42	99
Parent BASC—II ADHD score	127.13	17.16	86	166
Teacher BASC—II ADHD score	125.31	18.24	95	173

(continued)

Table 1

Descriptive Statistics for the Study Sample (continued)

Variable	Mean	SD	Minimum	Maximum
Parent BASC—II aggression scale score	54.50	13.12	34	104
Teacher BASC—II aggression scale score	58.15	14.23	39	92
Parent BASC—II conduct problems scale score	57.10	15.78	36	109
Teacher BASC—II conduct problems scale score	53.99	10.58	36	83
Teacher BASC learning problems scale score	59.76	10.79	39	87

The mean characteristics of the sample group were a mean age of 8.5 years, of an average SES background (scores between 33.9 and 57.3), with an average IQ (full scale scores between 85 and 115). Parents reported an average level of homework problems (scores between 2.47 and 18.53) and an at risk level of ADHD symptoms (scores of 85 and above), and teachers did not report an elevated level of ADHD symptoms.

A MANOVA was conducted to test the hypothesis that parent report of child ADHD symptoms would be less severe for African American children than Caucasian children. There were no significant main effects of ethnicity on parent reports of ADHD symptoms or homework problems, $F(3, 68) = 1.22, p = .31$. These results do not support

the hypothesis. Further, this MANOVA tested the hypothesis that parent report of homework problem behaviors would not be significantly different for African American children. There were no significant interaction effects of parent reports of homework problems and ethnicity. These results do support the hypothesis. The dependent variable effects, means, and standard errors are reported in Table 2.

Table 2

Dependent Variable Interaction Effects, Means, and Standard Errors for Parents' Reports of ADHD Symptoms and Homework Problems

Variable	df	Error df	F	p	African	Caucasian	Total
					American		
					M (SE)	M (SE)	M (SE)
Parent ADHD Rating Scale—IV	1	70	0.02	.90	85.39(2.58)	84.92 (2.58)	85.15 (1.83)
Homework Problems Checklist	1	70	1.42	.24	6.06 (0.87)	7.53 (0.87)	6.79 (0.62)
Parent BASC—II ADHD score	1	70	0.68	.41	127.08 (3.05)	123.53 (3.05)	125.31 (2.15)

A MANOVA was conducted to test the hypothesis that teacher reports of student ADHD symptoms would be more severe for African American children than Caucasian children. There were no significant main effects of ethnicity on teacher reports of ADHD

symptoms $F(2, 69) = 2.01, p = .14$. These results do not support the hypothesis. The dependent variable effects, means and standard errors are reported in Table 3.

Table 3

Dependent Variable Interaction Effects, Means, and Standard Errors for Teachers' Reports of ADHD Symptoms

Variable	df	Error df	F	p	African	Caucasian	Total
					American		
					M (SE)	M (SE)	M (SE)
Teacher ADHD Rating Scale—IV	1	70	3.14	.08	84.89 (2.44)	78.78 (2.44)	81.83 (1.73)
Teacher BASC—II ADHD score	1	70	3.99	.05	131.08 (2.80)	123.17 (2.80)	127.13 (1.98)

A univariate one-way ANOVA was conducted to test the hypothesis that frequency of teachers' reports of behavioral problems would be greater than frequency of parents' report of behavioral problems for African American students. There was a significant main effect of ethnicity on parent and teacher reports of behavioral problems, $F(1, 140) = 5.98, p < .05$; however, there was no significant main effect of reporter on reported behavioral problems, $F(1, 140) = 0.02, p = .89$. There were no significant interaction effects of reporter and ethnicity, $F(1, 140) = 2.65, p = .11$. This indicates that there are significant differences in reported behavioral problems, such that African

American children had more reported behavioral problems; however, teachers and parents did not report behavioral problems differently. These results do not support the hypothesis. The means and standard errors are reported in Table 4.

Table 4

Means and Standard Errors for Parents' and Teachers' Reports of Behavioral Symptoms

Variable	African American	Caucasian	Total
	<i>M (SE)</i>	<i>M (SE)</i>	<i>M (SE)</i>
Teacher reports of behavioral symptoms	120.36 (4.04)	103.92 (4.04)	112.14 (2.86)
Parent reports of behavioral symptoms	113.25 (4.04)	109.94 (4.04)	111.60 (2.86)
Total report of behavioral symptoms	116.81 (2.86)	106.93 (2.86)	111.87 (2.02)

A MANOVA was conducted to test the hypothesis that parents' reports of behavioral problems would not be significantly different for African American children than for Caucasian children. There were significant main effects of ethnicity on parent reports of behavioral problems, $F(2, 69) = 3.76, p < .05$. These results do not support the hypothesis, as parents of African American children reported more behavioral problems. There were no significant interaction effects of type of behavioral problem reported and

ethnicity for either aggression problems or for conduct problems. The dependent variable effects, means, and standard errors are reported in Table 5.

Table 5

Dependent Variable Interaction Effects, Means, and Standard Errors for Parents' Reports of Behavioral Symptoms

Variable	<i>df</i>	Error <i>df</i>	<i>F</i>	<i>p</i>	African	Caucasian	Total
					American		
					<i>M (SE)</i>	<i>M (SE)</i>	<i>M (SE)</i>
Parent BASC—II aggression scale score	1	70	0.57	.45	53.33 (2.19)	55.67 (2.19)	54.50 (1.55)
Parent BASC—II conduct problems scale score	1	70	2.34	.13	59.92 (2.61)	54.28 (2.61)	57.10 (1.84)

A MANOVA was conducted to test the hypothesis that frequency of teachers' reports of behavioral problems would be greater for African American students than for Caucasian students, while there would be no differences in the report of learning problems by ethnicity. There was a significant main effect of ethnicity on teacher reports of behavior problems, $F(2, 69) = 4.93, p = .01$, and there were significant interaction effects of type of behavioral problem and ethnicity for teacher reports of aggression and teacher reports of conduct problems. Teachers reported more aggression and conduct

problems for African American students. Teacher reports of learning problems were not significantly correlated with either teacher reports of aggression, $r(69) = .04, p = .37$, or teacher reports of conduct problems, $r(69) = .15, p = .10$; therefore a t test was conducted separately for this variable. There were no significant differences in teacher reports of learning problems by ethnicity $t(70) = 0.27, p = .60$. These results do support the hypothesis, as teachers reported significantly more behavioral problems for African American students, but there were no differences by ethnicity for teachers' reports of learning problems. The dependent variable effects, means, and standard errors are reported in Table 6.

Table 6

Dependent Variable Interaction Effects, Means, and Standard Errors for Teachers' Reports of Behavioral Symptoms and Learning Problems

Variable	df	Error df	F	p	African	Caucasian	Total
					American		
					$M (SE)$	$M (SE)$	$M (SE)$
Teacher BASC—II aggression scale score	1	70	9.45*	.003	63.03 (2.24)	53.28 (2.24)	58.15 (1.59)
Teacher BASC—II conduct problems scale score	1	70	7.92*	.006	57.33 (1.68)	50.64 (1.68)	53.99 (1.19)

(continued)

Table 6

Dependent Variable Interaction Effects, Means, and Standard Errors for Teachers'

Reports of Behavioral Symptoms and Learning Problems (continued)

Variable	df	Error df	F	p	African	Caucasian	Total
					American		
					M (SE)	M (SE)	M (SE)
Teacher BASC—II learning problems scale score	--	--	--	--	60.19 (1.91)	59.33 (1.70)	59.76 (2.56)

* $p < .05$

An exploratory chi-square analysis was conducted to examine the likelihood that African American children receive special education services or have a history of grade failure at a higher rate than Caucasian children. History of grade failure did not differ by ethnicity, $\chi^2(1, N = 72) = 1.86, p = .17$. Current receipt of special education services did not differ by ethnicity, $\chi^2(1, N = 72) = 0.70, p = .80$. History of receipt of special education services by type did not differ by ethnicity, $\chi^2(3, N = 72) = 2.60, p = .46$. These results revealed no significant findings. Frequency distributions are reported in Table 7.

Table 7

Frequency Distributions for History of Grade Failure and Receipt of Special Education

Variable	Ethnicity	Yes	No
History of grade failure	Caucasian	3	33
	African American	7	29
	Total	10	62
Receipt of special education	Caucasian	11	25
	African American	10	26
	Total	21	51

Discussion

Summary of Findings

This study sought to determine whether there were significant differences by ethnicity on reports of a variety of symptoms relating to ADHD and behavior in children. It also examined the differences between parent and teacher reports of those symptoms. This study attempted to control for potential sources of variance by matching Caucasian and African American participants on age, gender, IQ scores, ADHD diagnosis, and socioeconomic factors. If significant differences in parent and teacher reports emerged based on ethnicity when potential sources of variability were controlled for, those differences could more reliably be attributed to ethnicity rather than some other factor.

The results of the current study indicate that when potential sources of variance were controlled for, ethnicity was not a predictor of significant differences between parent reports of ADHD in children. It appears that the first part of the first hypothesis, that parents of African American children would underreport ADHD symptoms, was not supported when other sources of variance are controlled for. This finding may indicate that differences in parental recognition of symptoms may be related to some construct other than attitudes associated with ethnicity alone. There are several reasons why this may be the case. First, it is possible that the increase in general awareness of the disorder over the past 8 to 10 years since the previous research was published may have contributed to this difference. Matching for type of ADHD diagnosis may remove some of the variability in reports due to differences in observable symptoms. A previous study of parent report of ADHD that did control for gender and SES found that African American parents were much more likely to attribute their child's behavior to excess

sugar consumption or their child being bad, suggesting more hyperactive-impulsive symptoms (Bussing et al., 1998). Additionally, the characteristics of the sample may also have impacted the results. The parents who took the initiative to bring their child to be evaluated at the hospital may already have had some awareness of the symptoms their child was experiencing, which motivated them to bring their child in to be assessed.

The results of the current study indicate that as predicted, parents did not differ on reports of homework problem behaviors for African American children compared to Caucasian children. This supports the second part of the first hypothesis and is consistent with the research suggesting that African American parents do not differ in reports of concrete behaviors observed in the home setting (Bailey & Owens, 2005; Hillemeier et al., 2007).

The second hypothesis that teacher report of ADHD symptoms would be more severe for African American students than for Caucasian students was not supported. This may be due to the characteristics of the sample, since children would likely already have been perceived to have had some symptoms of ADHD for them to be referred to the hospital. Because research has shown that teachers are often a referral source, it is possible that the teachers would have been equally aware of the symptoms of ADHD in both African American and Caucasian children in this sample (de Nijs et al., 2004; Stevens et al., 2005).

The present study found there were greater reported behavioral problems for African American children, but that parents and teachers did not significantly differ in their reports of these symptoms. This did not support the first part of the third hypothesis, that teachers' reports of behavioral problems would be more severe than

parents' report of behavioral problems for African American students than Caucasian students. One possible explanation for this is that the African American children do, in fact, display a greater number of externalized behaviors. Another possible explanation is that there may be cultural differences in parental attitudes towards externalizing behaviors, as African American parents were found to be more likely to endorse externalizing behaviors than Caucasian parents, and were three times more likely to identify their child's behaviors as bad (Bailey & Owens, 2005; Bussing et al., 1998; Hillemeier et al., 2007). Perhaps African American parents are less likely to label their child's behavior as symptoms of ADHD, but are more likely to endorse aggression and conduct problems because they are more easily identifiable and can present a more pressing and immediate concern than ADHD symptoms. Another possible explanation for the absence of difference between parent and teacher reports may be that the parents who brought their children in to be evaluated at the hospital were motivated to do so because they were aware of behavioral problems in their children.

Additionally, the present study found that parents reported more conduct problems for African American children, which did not support the second part of the third hypothesis, that parents' reports of behavioral problems would not be significantly different for African American children and Caucasian children. A possible reason for this finding could be environmental norms for child behavior within the settings. Information about specific neighborhoods and schools was not available to compare settings between African American and Caucasian students for the present sample.

As predicted, teachers reported significantly more aggression and conduct problems for African American children than Caucasian children. Teachers did not

report learning problems differently based on ethnicity. This supported the fourth hypothesis that frequency of teachers' reports of behavioral problems would be greater for African American students than for Caucasian students, while there would be no differences in the report of learning problems by ethnicity. While it is possible that the African American students did, in fact, display more aggression and conduct problems, it is also possible that differences in teacher perceptions impacted their ratings (Epstein et al., 1998; Lau et al., 2004). The interaction of the ethnicity of the teacher with the ethnicity of the student may have affected teacher ratings; however, information about teacher characteristics was not available for the present sample (de Ramirez & Shapiro, 2005). Also, the rating scales may not be appropriately normed for use with this ethnic population (Bailey & Owens, 2005; de Ramirez & Shapiro, 2005; Reid, 1995).

No significant findings were revealed for the fifth hypothesis, that African American children are currently receiving special education services or have a history of grade failure at a higher rate than Caucasian children. It is possible that this lack of significant differences may be due to the fact that in the present sample, only 10 of 72 participants had a history of grade failure, and only 21 of 72 participants had a history of special education services. This likely resulted in too few participants for an effective comparison between groups.

Limitations

One major limitation of the present study is the characteristics of the sample. The sample was collected from a prominent hospital in a major metropolitan area. The portion of the hospital where parents who submitted their children's information as part of the data set, however, does not accept public assistance healthcare insurance.

Therefore, participants were restricted to those who were able to pay out of pocket for treatment or had private health insurance. The children who were evaluated in the clinic were brought there by their parents for the purpose of diagnostic clarification to determine whether they met criteria for ADHD. Therefore, this was not a randomized sample and was to some degree self-selected by those parents who took the initiative to have their children placed on the waiting list and were able to keep their scheduled appointments. Some of the lack in variance in parental reporting by ethnicity may be due to the fact that parents already were sufficiently concerned about their child's behavior to bring them in to be tested at the clinic. This may limit the generalizability of the results, as well as call into question whether the same outcomes might be found in children whose families receive healthcare through public assistance programs (Hervey-Jumper et al., 2006; Stevens et al., 2005). Additionally, the previous studies were conducted several years ago, and it is possible that information about ADHD has filtered into more mainstream society in recent years.

A further limitation of the present study is the small sample size. Due to matching of participants, the number of individuals selected for inclusion in analyses was fairly small. While the effect size was moderate, and power was sufficient, it would be beneficial to replicate the current study using a larger sample to reduce the possibility of Type I error. While the final sample size was small, it is still noteworthy that participants were able to be matched on many demographic factors. Having such a large pool of participants from which to select allowed for a high degree of control for multiple potentially confounding variables.

Another limitation is the fact that no information was available on the teacher characteristics. The ethnicity of the teacher, the school setting (public or private), the type of classroom, and the ethnic composition of the classroom all would be beneficial pieces of information to have to further elucidate the conditions under which teachers were reporting ADHD symptoms and behavioral problems in the students. Being able to further control for teacher variables would assist in reducing potential variance even further.

Future Directions

The findings indicate that an ethnic disparity may not exist between African American and Caucasian children in parental identification of symptoms of ADHD when multiple sources of variance are controlled for. Perhaps the differences found in previous research are more closely related to SES, type of ADHD diagnosis, or issues related to the need for more culturally sensitive rating scales. Therefore, in order to ensure that all children are receiving the appropriate and necessary services, future research should attempt to uncover exactly where the inequities in reporting stem from, if they do currently exist, so that they can be addressed. Future educational efforts should be tailored to target the specific populations that are less aware of the behaviors associated with ADHD. It is possible that this inequity is not limited to African American children, but may also affect Caucasian children who share these other variables of SES or type of ADHD diagnosis.

Teacher reporting of more behavioral symptoms in African American children could be a function of cultural bias or could be accurate, as few studies have compared ratings on behavioral scales to objective ratings of actual behavior. Teachers may

complete rating scales based on the most pressing and problematic behaviors they observe, which may overshadow reports of ADHD symptoms. It is also possible that while teachers may recognize the symptoms of ADHD, the aggressive behavior and conduct problems in the classroom are a more serious issue to teachers in the moment and therefore are the catalyst for referral for additional services. Future research should not rely on reports on behavioral ratings scales alone, but should use objective ratings by a trained observer to ensure the reliability and validity of ratings. Future research should also attempt to determine what services a child who is acting out is referred to and whether a screening for ADHD is part of this process. The findings of this study indicate that African American children are more likely to be affected by this because teachers report more behavioral problems for this population.

Future research could also attempt to determine whether cultural biases about child behaviors exist, perhaps by using standardized child confederates and examining how African American and Caucasian children are rated by teachers, as was done by de Ramirez and Shapiro with Hispanic and Caucasian children (2005). The effects of teacher ethnicity on ratings of child behavior should be investigated, as well. This would assist in determining whether the ethnicity of the teacher and the ethnicity of the child have an interaction effect on teacher ratings. Future research should also attempt to determine how learning disabilities are diagnosed in African American and Caucasian children. This would help to establish if African American children are identified for special education on the basis of specific testing or due to grade failure. This may have implications for whether teachers perceive problematic classroom behaviors by making attributions due to behavioral problems or due to an underlying learning disability.

Conclusions

The major benefit of these findings is that they shed light on differences in reporting of ADHD symptoms between African American and Caucasian children when the variables of age, gender, IQ scores, ADHD diagnosis, and socioeconomic factors are controlled for. Controlling for these variables allows for a clearer picture of the differences, or lack of differences, in the reporting and identification of ADHD symptoms in African American children. Ruling out potential sources of variance allows for progress to be made in the culturally sensitive assessment and diagnosis of ADHD in African American children.

The results of the present study differed somewhat from what would be expected, given the body of existing literature on differences in reporting of ADHD symptoms in African American children. The parents in this sample did not report fewer symptoms of ADHD for African American children than for Caucasian children. Parents of African American children did not report fewer symptoms of ADHD than teachers reported for their children in the current sample. This study found that parents of African American children reported significantly more conduct problems and did not report significantly fewer behavioral problems than teachers. The participants in this sample were unique in that the parents took the initiative to have them brought to the clinic and evaluated specifically to obtain a diagnostic clarification for ADHD and had either private insurance or the financial means to pay out of pocket. This may explain some of the reduction in variance in parental reporting and the potentially greater awareness of their child's symptoms.

Future research should focus on obtaining a larger sample with a greater degree of randomization, and should seek to obtain demographic information on the teachers making the reports. It is still important to control for participant demographic variables, as it is possible that many of the differences seen in previous research may be the result of differences in age, gender, IQ, type of ADHD diagnosis, presence of other comorbid diagnoses, or other socioeconomic factors, rather than ethnic or cultural differences. The present study was able to control for all of these factors, which makes it a unique contribution to the body of research on this topic.

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