

**DISCREPANCIES AMONG PARENT AND TEACHER BEHAVIORAL RATINGS:
A CLOSER LOOK AT RACE**

By

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ABSTRACT

There is no definitive test for Attention-deficit/Hyperactivity Disorder (ADHD); thus, clinicians rely heavily on behavior rating scales from individuals across settings. Discrepancies between parent and teacher ratings are well documented and several variables are implicated, including race of the informant. The current study examines whether matching parents, children, and teachers on race reduces discrepancies between parent and teacher ratings. Using data from a national longitudinal database (ECLS-K:2011), results indicated that matching raters based on race did not significantly reduce rater discrepancies. There was a significant effect of parent/child race on teachers' ratings, with teachers rating Black students as having more attention and learning concerns than White students. Findings suggest that additional factors beyond, or in combination with, race impact discrepancies between parent and teacher ratings of behavior.

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CHAPTER 1: INTRODUCTION & LITERATURE REVIEW

The relationship between attention concerns and academic achievement has been well documented throughout the literature. Students with attention concerns often have lower overall academic achievement (Polderman et al., 2010; Sayal et al., 2015; Scholtens et al., 2013). Attention concerns have been linked to prematurely leaving school at both the high school and college level (Gordon & Fabiano, 2019). Further, attention concerns, when presented at clinically significant levels, often persist beyond the school years and can have a negative impact on lifetime earnings, employment opportunities, job stability, and access to higher education (Gordon & Fabiano, 2019; Howard et al., 2016; Kuriyan et al., 2012).

Attention concerns may result in a formal diagnosis of Attention Deficit/ Hyperactivity Disorder (ADHD), a neurodevelopmental disorder characterized by symptoms of inattention, hyperactivity, and impulsivity. According to the criteria of the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5), these symptoms must cause impairments in major areas of functioning, be developmentally inappropriate, and occur across at least two settings (American Psychiatric Association, 2013). ADHD affects an average of approximately 5% of children and adolescents worldwide (Polanczyk et al., 2007; Sayal et al., 2018). In the United States, approximately 9% of children have received an ADHD diagnosis by a doctor or other health care provider (Danielson et al., 2018). However, child demographics such as gender, race, ethnicity, primary language, and socioeconomic status (SES) are related to ADHD prevalence rates (Coker et al., 2016; Danielson et al., 2018; Russell et al., 2016; Russell et al., 2015).

Lower diagnosis rates of ADHD have been reported for children who are of a racial and/or ethnic minority across multiple studies (Coker et al., 2016; Morgan et al., 2013; Morgan et al., 2014). Further, Morgan and colleagues (2014) found that Black children are less likely

than White children to have an ADHD diagnosis, despite displaying higher levels of ADHD symptoms, suggesting that Black children may be underdiagnosed with ADHD. Additionally, of those children who have a diagnosis of ADHD, Black and Latino children are less likely to be taking medications for ADHD-related concerns when compared to White children (Coker et al., 2016). Depending on the level of impairment, such underdiagnosis of ADHD may impact a child's ability to receive services or medication, thus negatively impacting their academic abilities. Given the high stakes of addressing attention concerns, especially when they occur to a level warranting an ADHD diagnosis, it is important to understand the challenges of an ADHD diagnosis, particularly regarding racial and ethnic differences in the diagnosis of ADHD.

Diagnostic Challenges

There is no definitive test for ADHD (i.e., no brain scan or blood test); thus, doctors and clinicians rely heavily on ADHD rating scales from individuals across at least two settings. For a child, these two settings are most typically home and school, as these are the places in which the child spends most of his or her time. As such, symptom reports are often obtained via behavioral questionnaires given to the child's parent and teacher. Best practice to make an ADHD diagnosis includes observations, interviews, and an in-depth developmental history to corroborate parent and teacher behavior ratings; however, given the short duration of typical medical or clinic appointments, rating scales remain the primary tool for diagnosis. One major challenge to the diagnostic process is that parents and teachers often have discrepant reports of behavioral symptoms. Achenbach and colleagues (1987) documented discrepancies among informant reports of behavioral and emotional problems in a meta-analysis, which showed only low to moderate agreement among informants (e.g., parents, teachers, clinicians). Since that time, numerous studies have also demonstrated similar discrepancies, particularly between parents and

teachers (De Los Reyes et al., 2009; Kennerley et al., 2016; Kennerley et al., 2018; Korsh & Petermann, 2014; Murray et al., 2007; Youngstrom et al., 2000). These discrepancies can depend upon several variables, such as the rater's relationship to the child, race/ethnicity of the child and/or rater, years of experience as an educator, and child gender.

Discrepancies among informant reports makes a clinical diagnosis challenging when only one informant is reporting high ADHD symptoms. Clinicians must decide how to use the information provided to determine the child's level of impairment, and they may use the informant reports differently, depending upon their training, personal views, or previous experiences. This introduces subjectivity to the process, which can lead to under- or over-diagnosis. For example, some clinicians may employ the "or" rule, where a symptom is considered present if either the parent *or* teacher endorses it. Valo and Tannock (2010) demonstrated that this strategy increased the rate of ADHD diagnosis in their sample by approximately 17% versus relying on parent report alone. Other clinicians may use the "and" rule, which requires both parent *and* teacher endorsement of impairment on a particular symptom. Due to the stricter guidelines for this approach, ADHD diagnosis rates can decrease as much as 15-32% (Valo & Tannock, 2010; Wolraich et al., 2004). Shemmassian and Lee (2016) conducted a series of multiple regression analyses to determine which scoring strategy produced more predictive validity of psychopathology and impairment outcomes two years later. The researchers found that the "or" rule had a better prediction of subsequent behavior outcomes when compared to the "and" rule, or when using parent- and teacher-only reports. However, impairment and behavior ratings two years later were obtained via parent and teacher behavioral rating scales, which continued to have low agreement, thus bringing back the issue of how to evaluate the rating scales.

The way in which ratings scales are used to diagnose ADHD may also play a role in the over- or under-diagnosis of children who are of various race, ethnicity, gender, or SES. Children with undiagnosed ADHD often have impairments in psychosocial functioning, including self-esteem, depression, emotional symptoms, conduct problems, and peer relationship problems (Okumura et al., 2019). In a study by Cuffee and colleague (2005), 38% of males and 46% of females had clinically significant symptoms of ADHD but had no history of prior ADHD diagnoses. Additionally, in a study by Okumura and colleagues (2019), 83.5% of their sample had undiagnosed ADHD. As mentioned previously, Black and Latino children have been shown to be less likely to receive an ADHD diagnosis when compared to White children with similar or even lower levels of ADHD symptoms (Coker et al., 2016; Morgan et al., 2013; Morgan et al., 2014). Additionally, children who come from families of a lower SES have been shown to have a higher prevalence rate of ADHD (Russell et al., 2016).

Discrepant rates in parent and teacher behavior ratings may also be reflective of true situational differences. If parents and teachers are observing varying levels of ADHD symptoms in the respective settings, this could have implications for treatment and interventions. For example, if a child has more attention problems in the classroom, thus leaving them susceptible to academic difficulties, it may point to environmental determinants of behavior as opposed to ADHD. Alternatively, if ADHD is diagnosed, symptoms may be more pronounced at school suggesting a need for specialized attention-related treatments in the school setting. Thus, it is important to evaluate why a child struggles in a particular setting over an alternative setting. These observations may help a clinician tailor a treatment or intervention plan to the child, rather than providing them with unnecessary treatments or potentially misdiagnosing the child.

Understanding why these discrepancies exist in informant ratings is essential for the diagnostic process. It is important to know where and why these discrepancies arise, to know how to handle them appropriately. Further, knowing which informant rating scale is more accurate to the child's behavior may change the way in which clinicians assess ADHD. There are several potential theories as to why these discrepancies may arise, such as situational differences, rater characteristics, rater biases, or cultural values. Examining these theories may illuminate why these discrepancies exist and what we can do to reduce them if possible.

Potential Reasons for Rater Discrepancies

Situational Specificity

Rater discrepancies may arise from true observed differences in child behavior across raters. The situational specificity perspective proposes that discrepancies between behavioral ratings are attributed to contextual behavior differences of the child being rated (Achenbach et al., 1987). For example, high ADHD symptom ratings by the teacher may reflect a child's difficulties paying attention in a more structured school setting, whereas the child does not display these difficulties at home in a less structured, one-on-one setting. Stone and colleagues (2013) found that discrepancies in ADHD ratings between mothers and teachers were more frequent in low SES families. This finding implies that perhaps the home-life in students from low SES families is quite different than the school setting, thus leading to a true difference in behavior depending upon setting. Hartman and colleagues (2007) examined parent and teacher behavior rating scales in twins. They found that parents and teachers were observing different, but valid ADHD behaviors in the twins, thus explaining the discrepancy in the rating scales. Harvey and colleagues (2013) found that children with higher pre-academic skills in preschool were rated lower on an attention problem scale by teachers in comparison to mothers. The

researchers speculated that attention problems may be less noticeable if children have strong pre-academic skills to compensate at such an early age, thus becoming less noticeable in the school environment.

Rater Characteristics

Rater characteristics may also play a role in behavioral ratings of attention concerns. DuPaul and colleagues (2014) found that more experienced teachers (i.e., had a greater number of years teaching) tended to report fewer ADHD symptoms overall. This finding is perhaps due to the greater number of years a teacher has spent interacting with children of all different backgrounds, ability levels, and social skill levels. Although parents typically only have a reference group of their own children, teachers can compare children directly to their peers, as well as to children they have encountered across the years. Sciotto and colleagues (2000) examined teacher knowledge of ADHD, including symptoms, treatment, and general information. Not surprisingly, they found that teachers with more experience with students with ADHD had a greater level of knowledge about ADHD generally than those with less experience. Further, teachers with greater ADHD experience have lower ratings of ADHD when compared to teachers without such experience (Busing et al., 2002). Thus, teaching experience appears to play a role in behavioral ratings. When looking at maternal age, it was found that mothers rated their children's externalizing behaviors more similarly to teachers' ratings as the mothers' age increased (Stone et al., 2013). This reduction in discrepancy may be due to additional experience with children to use as a reference group, although the researchers did not account or control for number of children in the home in this study.

Rater gender has also been shown to impact rating scales in both parents and teachers. Schultz and Evans (2012) found that female teachers provided more severe

hyperactivity/impulsivity ratings on ADHD scales than did male teachers. Similarly, Anastopoulos and colleagues (2018) found that females endorsed more symptoms in male children than did male respondents generally. In fact, when comparing parents, female parents identified 7.7% of male children as at-risk, whereas male parents only identified 4.1% as at-risk. Female teachers identified 11.9% of male students as at-risk, while male teachers only identified 5.3% as at-risk. It is important to note however, that parents and teachers were not rating the same child. These results examined rating scales generally across a wide range of children. The results are still important to consider because it appears that female gender increases the likelihood of at-risk symptom ratings for both parents and teachers. When comparing behavior symptom reports of mothers and fathers, mothers tend to rate children as having more problems than fathers. Sollie, Larsson, and Morch (2013) found that mother's ratings had more sensitivity, while father's ratings had more specificity.

There is also some evidence that parent levels of psychopathology directly relate to discrepancies with other raters, such as teachers (De Los Reyes et al., 2008; De Los Reyes & Kazdin, 2009). For example, larger rating discrepancies were reported between teachers and caregivers when caregivers had higher self-endorsement of depressive and stress symptoms (Harvey et al., 2013; Stone et al., 2013; Youngstrom et al., 2000). Being a single parent, which may increase parental stress, is also associated with higher ratings of child ADHD risk (Russell et al., 2015). Parent psychopathology and stress are other important factors to consider when utilizing ratings scales to make diagnoses.

Social-economic Status

As previously mentioned, there is a higher prevalence rate of ADHD among children coming from low SES backgrounds (Russell et al., 2016). Based on a meta-analytic review,

Willcutt (2012) found that individuals from low SES backgrounds were up to four times more likely to meet criteria for ADHD than individuals from high SES backgrounds. In fact, more frequent discrepancies among teachers and parents have been shown with lower SES families (Stone et al., 2013). Phillips and Lonigan (2010) found that children from low-income centers were rated as having more behavioral problems by both teachers and parents. In comparison to clinician observation ratings, teacher behavior ratings were significantly higher in the low SES group. Despite no differences in clinician observation behavior ratings as a function of SES, Lawson and colleagues (2017) found that teachers reported higher levels of inattention in children from low SES backgrounds. Additionally, both parents and teachers reported higher levels of hyperactivity and impulsivity in children from low SES backgrounds. These studies highlight the importance of considering a child's background, especially when such high-stakes diagnoses are considered.

Cultural Background

Implicit cultural values play a role in our perceptions and experiences throughout life. It is also possible that cultural factors could impact behavior ratings, thus explaining the discrepancies among raters who come from different backgrounds. Researchers have used video vignettes of children with ADHD symptoms to compare how raters from different countries perceive and rate the symptoms. In doing so, there have been distinct differences in ratings between clinicians, teachers, and parents across a variety of cultures, including: Chinese, Indonesian, Thai, Japanese, American, and British (Alban-Metcalf et al., 2002; Mann et al., 1992; Meuller et al., 1995). When comparing German and Brazilian samples, researchers found that Brazilian parents tended to over-report behavior symptoms, leading to a higher overall score on the screening measure (Roessner et al., 2007).

A study by Pierrehumbert and colleagues (2006) compared ADHD rating scales from a Switzerland and a North American sample. The researchers found that, while there was no drastic difference in overall ADHD ratings, there were differences in how the symptoms were rated as children aged. In the North American sample, parents and teachers reported fewer ADHD symptoms over time, while in the Swiss sample, greater ADHD symptoms were reported as children aged. This discrepancy may highlight the differences in ratings when compared across cultures. Additionally, in another study, researchers found that despite a child exhibiting the same underlying level of symptomology, there were differences in parent behavior ratings between Black and White families (Hillemeier et al., 2007). This finding indicates that perhaps informant perceptions of the behaviors of the same child are different, and they may vary as a factor of cultural values. Although cultural background likely influences our perceptions of behavior, some have studied to what extent a rater's perspective or biases influence their ratings of others. For example, Gomez and colleagues (2003) found that both parent and teacher ratings had more source than trait variance, indicating a difference in ratings due to the rater's perspective or biases more than true behavioral differences.

Ingroup bias is one such theory that could relate to discrepancies in parent and teacher ratings when the raters are perceived to be a part of two different "groups" (Bigler & Liben, 2006; Gibson et al., 2017; Redding, 2019). These groups could consist of gender, role, age, race, or education level. If the rater perceives the child as outside of their "group," the ratings may be skewed to reflect these unconscious biases. Stemming from the ingroup bias theory is the congruence hypothesis, which explains the differences in ratings and perspectives as a function of cultural differences (Zimmerman et al., 1995). This theory speculates that parental perceptions and ratings of their children would be less influenced by cultural misunderstandings than by the

perceptions of teachers who come from a different background or culture. This theory could apply to the discrepancies that exist among parent and teacher ratings, specifically when considering race.

Race as A Source of Bias

The impact of race and ethnicity on informant ratings is well documented in the literature; numerous studies have documented higher teacher-rated ADHD symptoms in Black children when compared to White children (Bussing et al., 2008; DuPaul et al., 2016; DuPaul et al., 2014; Evans et al., 2013; Lawson et al., 2017). When comparing parent and teacher ratings, teacher ratings are significantly higher than parent ratings for children who are Black (Bussing et al., 2008; Lawson et al., 2017; Zimmerman et al., 1995). Specifically, teachers tend to report more externalizing behaviors in children who are Black in comparison to children who are White (Youngstrom et al., 2000). When teacher ratings of behavior in Black children are compared to observation ratings, there are large discrepancies, with teacher ratings being significantly higher than direct observer reports (Lawson et al., 2017). Likewise, when teacher ratings of behavior in Black children are compared to their parents' ratings, Harvey and colleagues (2013) found that Black parents tended to rate their child as having lower symptoms than did the teacher.

The race of the informant is another important consideration that often leads towards discrepancies, although there are conflicting findings within the literature. Barrett and DuPaul (2018) conducted a study where parents watched video vignettes of a child displaying clinically significant ADHD behaviors. Parents were randomly assigned to watch either a Black child or a White child, both displaying the same clinically significant symptoms. Maternal race was the only significant factor that predicted behavior ratings; mothers who were Black gave higher ratings of inattention and hyperactive/impulsive symptoms than did White mothers, regardless of

the child's race. However, Hillemeier and colleagues (2007) found that perceptions of ADHD symptoms differed among parents of Black and White children in the opposite direction. Despite the same underlying levels of hyperactivity in a child, parents of White children were more likely to endorse those symptoms than parents of Black children. When looking at teacher ratings and race of the informant, Black teachers were found to have lower problem ratings across all student races when compared to White teachers (Pigott & Cowen, 2000). This finding could suggest a higher tolerance for behavior concerns for teachers who are Black when compared to White teachers.

When looking at validity of teacher ratings, overall teacher ratings of ADHD symptoms were more consistent with direct observation data when rating ethnic minority children than when rating White children (Hosterman et al., 2008). Further, teacher ratings generally outperformed parent ratings in sensitivity, specificity, and overall accuracy of diagnostic classification of ADHD (Tripp et al., 2006). However, neither of these studies examined teacher race as a factor.

Purpose of the Current Study

Numerous studies have focused on the rating scale discrepancies between informants when rating Black versus White children (Bussing et al., 2008; Lawson et al., 2017). Additionally, researchers have examined differences in parent ratings of children who display similar symptom levels to determine how informant race impacts ratings (Barret & DuPaul, 2018; DuPaul et al., 2016; Hillemeier et al., 2007). Researchers have also compared parents of different races against teacher ratings; however, informant race is not considered in teacher ratings (Harvey et al., 2013). Further, when examining teacher ratings across children of different races, researchers have also neglected to include parent ratings of the child (Evans et

al., 2013; Hosterman et al., 2008). The lack of comparison between child, parent, and teacher race is leaving out critical information that may have diagnostic implications. No studies to date have examined the racial match between parent, teacher, and child to determine how racial matching may impact rating congruence. The current study seeks to close this oversight to determine if matching ratings based on both parent and teacher informant and child race will impact discrepancies between behavior ratings.

Hypotheses

Given prior research on racial discrepancies among parent and teacher ADHD behavior reports, the current study will evaluate whether matching parents, teachers, and children based on race will reduce behavior rating discrepancies. That is, we hypothesize that parent and teacher ratings will be more congruent when the parent, teacher, and child are all of the same race (Black or White, in this study). Racial-matching of parent-teacher dyads will reveal more similar child ratings on an attention-based measure, signifying more agreement among raters. The researchers will also evaluate whether differences occur depending upon race and if so, which matched-pairs create the least discrepant ratings.

CHAPTER 2: METHODS

Dataset

Data for this study were obtained from a longitudinal dataset sponsored by the National Center for Education Statistics (NCES) within the Institute of Education Sciences (IES) of the U.S. Department of Education. The *Early Childhood Longitudinal Study- Kindergarten Class of 2010-11* (ECLS-K:2011) is comprised of a nationally representative sample of children attending both full-time and part-day kindergarten in both private and public schools during 2010-11. The ECLS-K:2011 followed children from kindergarten through fifth grade. The sample includes children in kindergarten for the first time and kindergarten repeaters. In order to obtain teacher demographics (i.e., race), permission to access the restricted dataset was acquired. The purpose of the ECLS-K:2011 study was to provide comprehensive and reliable data that can be used to describe and better understand children's development and how their early experiences relate to later development, learning, and experiences in school.

The children in the ECLS-K:2011 sample came from diverse SES and racial/ethnic backgrounds. Data were collected from multiple sources, including direct child assessments, student record review, interviews with parents/caregivers, and information obtained from teachers, school administrators, and before- and after-school care providers (Kindergarten year only). For ECLS-K:2011 data collection, parents were considered any individual who primarily cared for the child (e.g., biological parents, adoptive parent, foster parent, grandparents) and would be able to speak to the child's development and abilities. Parent interviews were translated into Spanish before data collection began and was administered by a bilingual interviewer if the parents preferred Spanish. Parent interviews in other languages were conducted through an interpreter who translated the data to English following completion. In total, 18,174 children

took part in the study. Our study uses data only from the ECLS-K:2011 Spring First-Grade round of data collection.

Measures

Parent and Teacher Rating Scale

To approximate ADHD attention problem ratings, the *Approaches to Learning* (ATL) scale collected in the spring of the first-grade year was examined. The spring of first grade year was the only data collection time point in which both parents and teachers were asked the same questions. The ATL scale, which was adapted from the *Social Skills Rating System* (SSRS; Gresham & Elliot, 1990), consists of items that ask parents and teachers to report on how often a child exhibits a set of attention and learning behaviors (i.e., keeps belongings organized, persists in completing tasks, pays attention well, concentrates on a task and ignores distractions, follows classroom rules). There are seven items on the teacher scale and six items on the parent scale. The items are rated on a 1 (*never*) to 4 (*very often*) Likert scale, and parents and teacher had the option to indicate that they had not had an opportunity to observe the described behavior. The mean rating of the items comprises the ATL scale for both parent and teacher. Higher scores indicate that the child exhibits positive learning behaviors more frequently. A score on the ATL scale is computed only when the respondent provides four or more ratings on the items that compose the scale. The ATL scale has a reliability estimate of .91 for each round of data collection for the teacher report and .74 for the parent report in the spring of first grade.

Rater Demographics

Respondent race was obtained via self-report from parents and teachers. The child's race was obtained from parent report. The categories of race to choose from were American Indian or

Alaska Native, Asian, Black, Native Hawaiian/Other Pacific Islander, White, Multiracial, and Other. Ethnicity (i.e., Hispanic, not Hispanic) was reported separately.

Participants

Inclusionary Criteria

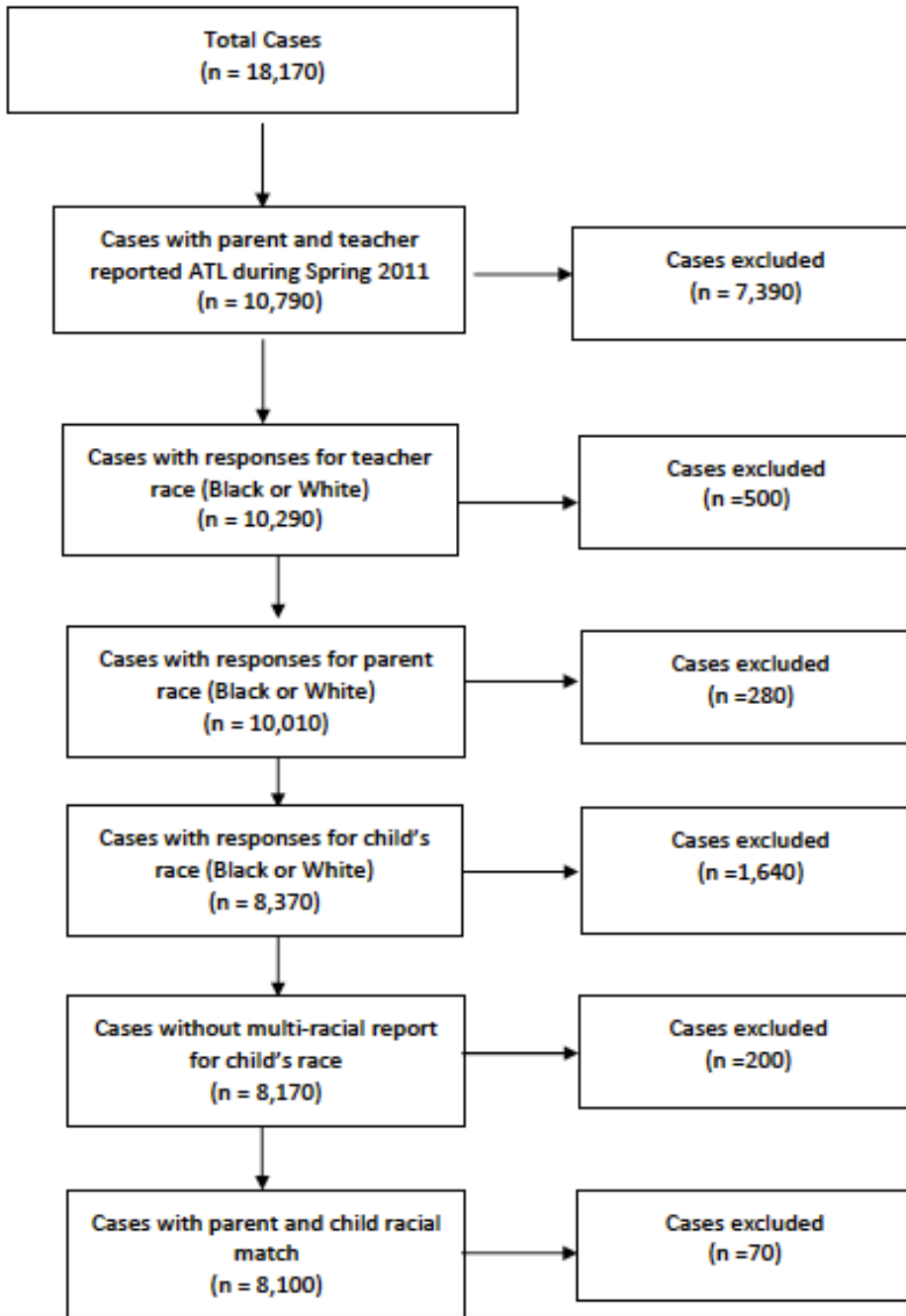
For the current study, only those who identified as White or Black were included in the analyses; those who identified as multi-racial were excluded. Further, if the ATL scale was not completed by *both* parent and teacher, these subjects were excluded. To be included in the analyses, race data was required for child, parent, and teacher triads. Additionally, parent and child reported race was required to match to reduce confounding variables among multi-racial households. See Figure 1 for illustration of inclusionary/exclusionary criteria. The final sample size consisted of 8,099 children and their parents and teachers.

Power Analysis

A sensitivity power analysis was conducted using G*Power (Version 3.1) to determine the smallest effect size detectable with 90% power given the sample parameters and the large sample size. The effect size f was calculated to be $f = 0.036$, $\eta^2 = 0.0013$.

Figure 1

ECLS-K:2011 Participant Selection by Inclusionary & Exclusionary Criteria



SOURCE: U.S. Department of Education, National Center for Education Statistics, “*Early Childhood Longitudinal Study-Kindergarten Class of 2010-2011 (ECLS-K:2011)*.”

NOTE: All unweighted sample sizes from the ECLS dataset are rounded to the nearest 10 per IES restricted-use guidelines.

Data Analysis

Descriptive statistics, analysis of variances (ANOVAs), and contrast tests were run using SPSS-Windows version 27.0. Parents and teachers were grouped into four categories based on race (see Table 1). A 2 X 2 ANOVA was conducted to determine whether ATL scores differed in parent and teacher report based on category membership. Post-hoc contrast tests were conducted following the ANOVA results. There was a disproportionate distribution in sample sizes of groups due to the limits placed upon the group categories based on race. To correct for these differences, results were evaluated using the values that do not assume equal variances across groups.

Table 1. *ANOVA Groups Based on Race*

Group	<i>n</i>	Parent (Child) Race	Teacher Race
1	220	White	Black
2	730	Black	White
3	6,870	White	White
4	280	Black	Black

SOURCE: U.S. Department of Education, National Center for Education Statistics, “*Early Childhood Longitudinal Study-Kindergarten Class of 2010-2011 (ECLS-K:2011)*.”

NOTE: All unweighted sample sizes from the ECLS dataset are rounded to the nearest 10 per IES restricted-use guidelines.

CHAPTER 3: RESULTS

Descriptive Statistics

Table 2 includes information pertaining to the parent and child demographics, including race and gender across both the current study sample and the full ECLS sample. In the current sample, most parents reported their race as White. The child’s race was required to match parent reported race due to exclusionary criteria. In comparison to the larger full ECLS sample, the

Table 2

Parent and Child Descriptive Statistics

Variable	Current Study Sample <i>n</i> (%)	Full ECLS-K:2011 Sample <i>n</i> (%)
Parent Race		
White	7090 (88%)	9680 (74.7%)
Black	1010 (12%)	1590 (12.3%)
Asian	---	1210 (9.3%)
American Indian/AK Native	---	250 (1.9%)
Hawaiian/Pacific Islander	---	140 (1.1%)
Parent Gender		
Male	700 (9%)	1340 (10.4%)
Female	7400 (91%)	11430 (88.2%)
Child Gender		
Male	4130 (51%)	9290 (51.1%)
Female	3970 (49%)	8850 (48.7%)
Child Race		
White	7090 (88%)	12690 (69.8%)
Black	1010 (12%)	2840 (15.6%)
Asian	---	1770 (9.7%)
American Indian/AK Native	---	430 (2.4%)
Hawaiian/Pacific Islander	---	250 (1.4%)
Multi-racial	---	1040 (5.7%)

SOURCE: U.S. Department of Education, National Center for Education Statistics, “*Early Childhood Longitudinal Study-Kindergarten Class of 2010-2011* (ECLS-K:2011).”

NOTE: All unweighted sample sizes from the ECLS dataset are rounded to the nearest 10 per IES restricted-use guidelines.

current study sample maintained the relative proportion of Black and White parents; however, child race in the current sample had a relatively higher proportion of White children and a lower proportion of Black children in comparison to the full ECLS sample. The parent sample of the current study was primarily comprised of female participants, with males making up only 9% of the parent sample, which was relatively consistent with the full ECLS sample. Child gender was fairly evenly split between male ($n = 4130$) and female ($n = 3970$) participants, with 51% of the sample being male, which is consistent with the full ECLS-K study.

As previously mentioned, the label of “parent” was given to anyone who identified as the primary caretaker of the child who could provide insight into the child’s development. A variety of caregiver-child relationships were identified in the current sample (see Table 3) including biological mother and father as well as other parent type, which may include adoptive-, step-, foster-, or grandparents. The types of relationships to the primary child were generally consistent across both the current study sample and the full ECLS-K sample.

Table 3

Respondent Relationship to Child

Relationship	Current Study Sample n (%)	Full ECLS-K:2011 Sample n (%)
Biological Mother	7070 (87%)	10920 (84.3%)
Other Mother Type	120 (2%)	240 (1.85%)
Mother, Unknown Type	< 10 (<1%)	10 (<1%)
Biological Father	670 (8%)	1280 (9.87%)
Other Father Type	20 (<1%)	40 (<1%)
Non-Parent Relative	200 (2%)	280 (2.18%)
Non-Relative	< 10 (<1%)	10 (<1%)
Missing/Not Applicable	---	180 (1.37%)

SOURCE: U.S. Department of Education, National Center for Education Statistics, “*Early Childhood Longitudinal Study-Kindergarten Class of 2010-2011* (ECLS-K:2011).”

NOTE: All unweighted sample sizes from the ECLS dataset are rounded to the nearest 10 per IES restricted-use guidelines.

Among teachers, 94% of the sample identified as White ($n = 7600$). The teachers were primarily female ($n = 7810$), with 4% of the sample being male ($n = 290$), and four individuals not reporting their gender. The teacher demographic data was not available for the full ECLS-K study, as that individual-level data is restricted for public usage.

Most of the sample reported that the child attended a public school, with 12% of the sample attending a private school (See Table 4). In comparison to the full ECLS-K study, the current sample had a higher proportion of both public and private school attendance, likely due to fewer cases of missing data or refusal to report. Parent estimates of percent non-White students within their child's school ranged from zero to 100%, with an average estimate of 40.74% non-White students (See Table 4). The full ECLS-K sample contained a higher average percentage of non-White students at the child's school. Mean ratings on the ATL scale across parents and teachers were more similar in the study sample than the full sample for the Spring 2011 time point (See Table 5). Additionally, the variability in parent ratings in the current sample is less than the full ECLS-K sample. While the reason for the reduction in variability in parent response is not known, the removal of other variables, such as races beyond Black and White, and the subset of the sample, which consists only of the Spring of first-grade timeframe, may be factors that influence the range in which parents are rating their children.

Table 4*School Demographics*

School Characteristic	Current Study Sample <i>n</i> (%)	Full ECLS-K:2011 Sample <i>n</i> (%)
Public School	7150 (88%)	13770 (75.8%)
Private School	950 (12%)	1510 (8.3%)
	Mean (SD)	Mean (SD)
Percent Non-White Students	40.74 (33.32)	47.85 (35.12)

SOURCE: U.S. Department of Education, National Center for Education Statistics, “*Early Childhood Longitudinal Study-Kindergarten Class of 2010-2011* (ECLS-K:2011).”

NOTE: All unweighted sample sizes from the ECLS dataset are rounded to the nearest 10 per IES restricted-use guidelines.

Table 5*Approaches to Learning (ATL) Scores*

Rater	Current Study Sample Mean (SD)	Full ECLS-K:2011 Sample Mean (SD)
Parent	3.10 (0.49)	2.71 (2.14)
Teacher	3.10 (0.69)	3.05 (0.95)

SOURCE: U.S. Department of Education, National Center for Education Statistics, “*Early Childhood Longitudinal Study-Kindergarten Class of 2010-2011* (ECLS-K:2011).”

Hypothesis Testing

We hypothesized that racial-matching of parent-teacher dyads will reveal more similar child ratings on the ATL measure, signifying more agreement among raters. Overall, there were 7,150 matched-race pairs of parents and teachers and 950 unmatched pairs, with a disproportionate number of matched-race pairs being White-White. See Table 6 for matched-race and unmatched-race groups by rating scale informant. A 2 (informant) X 2 (race) ANOVA was conducted to determine whether ATL scores differed by matched-pair or unmatched-pair groups and post-hoc contrast tests were run to determine more meaningful data given the large sample size.

Post-hoc contrast scores indicated a significant effect of parent/child race on teacher ratings, $F(1, 8095) = 46.65, p < .001, d = 1.016$. Specifically, teachers reported higher ATL scores for White children ($M = 3.13, SD = 0.70$) in comparison to Black children ($M = 2.89, SD = 0.73$), indicating better academic performance and lower attention-related concerns for White children. There was no significant effect of teacher race on teacher ratings, $F(1, 652) = 0.48, p = .489, d = 0.103$. Unsurprisingly, there were no significant effects of teacher race on parent ratings, $F(1, 675) = 1.66, p = .199, d = 0.276$. There also were no significant main effects of parent/child race on parent ratings, $F(1, 675) = 0.07, p = .789, d = 0.057$.

Differences between matched and unmatched pairs were explored by examining interactions between parent/child and teacher race. There were no significant differences between matched-race and unmatched-race pairings on resulting parent ratings, $F(1, 675) = 1.08, p = .298, d = 0.223$, or teacher ratings, $F(1, 652) = 0.65, p = .421, d = 0.120$, indicating that matching parents/child and teachers based on race did not significantly reduce the discrepancy in ATL scores. See Table 6 for group means on ATL scores.

Table 6
Approaches to Learning (ATL) Mean Ratings Based on Group

ATL Ratings	<i>n</i>	<i>Mean</i>	<i>SD</i>
Parent Informant			
White parent, Black teacher	220	3.05	0.51
Black parent, White teacher	730	3.09	0.54
White parent, White teacher	6870	3.11	0.48
Black parent, Black teacher	280	3.08	0.53
Teacher Informant			
Black teacher, White parent	220	3.13	0.72
White teacher, Black parent	730	2.86	0.71
White teacher, White parent	6870	3.13	0.68
Black teacher, Black parent	280	2.91	0.75

SOURCE: U.S. Department of Education, National Center for Education Statistics, “*Early Childhood Longitudinal Study-Kindergarten Class of 2010-2011 (ECLS-K:2011)*.”

NOTE: All unweighted sample sizes from the ECLS dataset are rounded to the nearest 10 per IES restricted-use guidelines.

CHAPTER 4: DISCUSSION

The purpose of this study was to examine differences between matched and unmatched parent, teacher, and child race on ratings of attention to determine whether racial matching reduced discrepancies in ratings across parent and teacher reports. Attention was estimated via the ATL scale, which consists of items related to attention and learning behaviors (e.g., keeps belongings organized, pays attention well, concentrate on a task and ignores distractions). Parents and teachers were grouped into categories based on racial matching (i.e., White/White, Black/Black, White/Black, Black/White) to determine whether significant differences in ratings occurred depending upon category membership.

The results of the data analysis indicated that matching parent, teacher, and child based upon race did not reduce the discrepancy in attention ratings; thus, the hypothesis was not supported. There were no significant differences on parent and teacher ratings based on race of the respondents; however, teachers, regardless of their own race, reported higher ATL scores for White children in comparison to Black children. Higher ratings on the ATL measure indicates better academic performance and lower attention-related difficulties. Therefore, teachers generally rated Black children as having more attention-related concerns in comparison to White children. This finding aligns with research findings that teacher ratings of ADHD symptom are typically higher for Black children in comparison to White children (Bussing et al., 2008; DuPaul et al., 2016; DuPaul et al., 2014; Evans et al., 2013; Lawson et al., 2017; Zimmerman et al., 1995). These findings also align with prior literature suggesting that teachers report systematically higher ADHD ratings for Black children versus White children when compared with parent ratings (Bussing et al., 2008). Teacher ratings have been shown to have more sensitivity, specificity, and overall accuracy in comparison to parents when it comes to ADHD

classification (Tripp et al., 2006), which may explain why a difference in teacher rating was found but not in parent ratings.

Considering the prior research indicating potential reasons for rater discrepancies, these findings do not lend support for some rating discrepancy theories, such as situational specificity or in-group bias. The current study did not see global differences in parent versus teacher ratings regardless of child race, suggesting that teachers are not seeing distinct differences in behavior based on environment (e.g., classroom vs. home). Matching teacher and parent/child race did not reduce the discrepancy in ratings, suggesting that in-group bias may not be occurring as teachers are not rating their racial “in-group” any differently than their “out-group.” Rater characteristics (e.g., gender, years of experience, education level) were beyond the scope of the current study and were not examined. The differences in ratings in the current sample could potentially be related to differences in rater characteristics beyond simply race given that matching on race did not significantly impact rating discrepancies. In previous studies, teacher ADHD symptom ratings have been found to be higher in lower SES groups in comparison to high SES groups (Philips & Lonigan, 2010). Given that SES was not examined in the current study, it may be a larger influential factor to consider. Moreover, race and SES are such intersecting variables within the United States, with racial differences in wealth at every level of income, it is important to consider how the interaction of *both* race and SES impact rater discrepancies.

Limitations and Future Research

A major limitation to this study is the assumption that the ATL scores are a valid estimate of ADHD symptoms. Although the measure asks about some specific ADHD-related behaviors, the limited number of items pertaining to ADHD symptoms in particular does not fully capture ADHD symptomology. Further, the ATL measure is only a 4-point scale, which limits the level

of variability among students who could potentially exhibit small behavioral differences, thus having a floor- or ceiling-effect on scores. Additionally, parents and teachers did not differ much on ratings within the current sample (see Table 5). This finding is not representative of the typical findings in the literature, which indicate that parent and teacher ADHD ratings have significant discrepancies (De Los Reyes et al., 2009; Kennerley et al., 2016; Kennerley et al., 2018; Korsh & Petermann, 2014; Murray et al., 2007; Youngstrom et al., 2000).

The ATL score is comprised of an average of ratings across ADHD and school behavior ratings, which could mask some of the differences in ratings. Further, given that the ATL measure was given to both parent and teacher only during the spring of first grade data collection point, these behavior ratings may not be able to accurately reflect ADHD symptomology given the child's young age and early experience with schooling. According to data from the 2016 National Survey of Children's Health (NSCH), the prevalence rate of ADHD in children six years old and under is 2.1% (Danielson et al., 2018). While data from the 2003 to 2007 NSCH highlights the median onset of ADHD for children was 6.2 years (Visser et al., 2014), these diagnoses are likely being made with established ADHD rating scales. The ATL measure may not be able to accurately capture nuanced attention-based symptoms as well as more established measures due to the limited amount of question items. Future research would benefit from more extensively measuring ADHD symptoms and obtaining a pure behavioral rating measure that does not include general academic skills.

Another limitation of the study was the proportion of Black and White individuals. The sample was comprised of 94% of teachers and 88% of parents identifying as White. Moreover, there were only 500 Black teachers within the sample, further limiting the implications of the study results. Teachers within this sample also likely rated numerous students and there is no

data to determine which teachers rated each child. If a teacher had a particular bias or did not accurately complete the ratings, this would impact a number of student ratings, thus skewing the sample. Future research should attempt to balance the proportion of Black versus White parents, teachers, and students to determine if an expanded sample of Black participants reveals any relationship between racial matching and ADHD symptom ratings.

Additionally, future research may consider limiting the number of ratings scales each teacher completes in total, as rating multiple students at once may have an impact on how ratings are completed. Teachers are not often asked to rate multiple students on ADHD symptomology at once, therefore limiting study ecological validity. In the current sample it was not disclosed how many children each teacher had rated and whether there may have been a disproportionate number of ratings completed by select teachers.

Clinical Implications

The findings of this study have potential implications for practice. One implication is that while racial-matching may not have an impact on rater discrepancy, race continues to be a factor impacting attention ratings. In the current study, teacher ratings differed depending upon children's race, with White students on average rated with better attention and learning behaviors than Black students. Yet, it is still unclear whether this difference is due to true behavioral differences, perception differences, biases, or unknown alternative factors. The results from this study suggest that if racial matching does not reduce discrepancies in attention ratings, then the discrepancies may exist due to more individual-level factors (e.g., low-SES), if in fact true behavioral differences are not being observed. Clinicians would benefit from considering more individual-level factors that may influence behavior ratings when attempting to resolve the discrepancies in ADHD symptom reports among raters.

Another implication for practice is the consideration of teacher variables on student ratings. Although child race impacted teacher rating discrepancies, there may be a number of variables that contribute towards these discrepancies. Consideration of a teacher's gender, age, and years of experience are selected variables that may influence teacher ratings in addition to or beyond student race. Clinicians should take these variables into account when evaluating ADHD rating measures for students completed by teachers.

Conclusions

The current study examined whether matching parents, teachers, and children on race would reduce the discrepancies between parent and teacher attention ratings. Although no significant differences in ratings were found based on matched- or unmatched-pairs, teacher ratings differed depending upon parent/child race. Teachers rated Black students as having lower ATL scores, which is representative of having higher attention concerns and lower academic performance. These findings are consistent with prior research and support the notion that race continues to play a role in ADHD ratings. Future studies would benefit from continuing to explore this relationship and better understand the contributing factors in rating scale discrepancies when assessing for ADHD symptoms.

REFERENCES

- Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin, 101*(2), 213-232. doi:10.1037/0033-2909.101.2.213
- Alban-Metcalf, J., Cheng-Lai, A., & Ma, T. (2002). Teacher and student teacher ratings of attention-deficit/hyperactivity disorder in three cultural settings. *International Journal of Disability, Development and Education, 49*(3), 281-299. doi:10.1080/1034912022000007298
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th edition). Retrieved from: <https://doi.org/10.1176/appi.books.9780890425596>
- Anastopoulos, A. D., Beal, K. K., Reid, R. J., Reid, R., Power, T. J., & DuPaul, G. J. (2018). Impact of child and informant gender on parent and teacher ratings of attention-deficit/hyperactivity disorder. *Psychological Assessment, 30*(10), 1390-1394. doi:10.1037/pas0000627
- Barrett, C., & DuPaul, G. J. (2018). Impact of maternal and child race on maternal ratings of ADHD symptoms in black and white boys. *Journal of Attention Disorders, 22*(13), 1246-1254. doi:10.1177/1087054715616489
- Bigler, R. S., & Liben, L. S. (2006). A developmental intergroup theory of social stereotypes and prejudice. *Elsevier Science & Technology, 39*-89. doi:10.1016/S0065-2407(06)80004-2
- Bussing, R., Fernandez, M., Harwood, M., Hou, W., Garvan, C. W., Eyberg, S. M., & Swanson, J. M. (2008). Parent and teacher SNAP-IV ratings of attention deficit hyperactivity disorder symptoms: Psychometric properties and normative ratings from a school district sample. *Assessment, 15*(3), 317-328. doi:10.1177/1073191107313888
- Bussing, R., Gary, F. A., Leon, C. E., Garvan, C. W., & Reid, R. (2002). General classroom teachers' information and perceptions of attention deficit hyperactivity disorder. *Behavioral Disorders, 27*(4), 327-339. doi:10.1177/019874290202700402
- Coker, T. R., Elliott, M. N., Toomey, S. L., Schwebel, D. C., Cuccaro, P., Emery, S. T., . . . Schuster, M. A. (2016). Racial and ethnic disparities in ADHD diagnosis and treatment. *Pediatrics, 138*(3), e20160407. doi:10.1542/peds.2016-0407
- Cuffe, S. P., Moore, C. G., & McKeown, R. E. (2005). Prevalence and correlates of ADHD symptoms in the national health interview survey. *Journal of Attention Disorders, 9*(2), 392-401. doi:10.1177/1087054705280413
- Danielson, M. L., Bitsko, R. H., Ghandour, R. M., Holbrook, J. R., Kogan, M. D., & Blumberg, S. J. (2018). Prevalence of parent-reported ADHD diagnosis and associated treatment among U.S. children and adolescents. *Journal of Clinical Child & Adolescent Psychology, 47*(2), 199-212. doi:10.1080/15374416.2017.1417860

- De Los Reyes, A., & Kazdin, A. E. (2005). Informant discrepancies in the assessment of childhood psychopathology: A critical review, theoretical framework, and recommendations for further study. *Psychological Bulletin*, *131*(4), 483-509. doi:10.1037/0033-2909.131.4.483
- De Los Reyes, A., Goodman, K. L., Kliewer, W., & Reid-Quiñones, K. (2008). Whose depression relates to discrepancies? Testing relations between informant characteristics and informant discrepancies from both informants' perspectives. *Psychological Assessment*, *20*(2), 139-149. doi:10.1037/1040-3590.20.2.139
- De Los Reyes, A., Henry, D. B., Tolan, P. H., & Wakschlag, L. S. (2009). Linking informant discrepancies to observed variations in young children's disruptive behavior. *Journal of Abnormal Child Psychology*, *37*(5). doi:10.1007/s10802-009-9307-3
- DuPaul, G. J., Reid, R., Anastopoulos, A. D., & Power, T. J. (2014). Assessing ADHD symptomatic behaviors and functional impairment in school settings: Impact of student and teacher characteristics. *School Psychology Quarterly*, *29*(4), 409-421. doi:10.1037/spq0000095
- DuPaul, G. J., Reid, R., Anastopoulos, A. D., Lambert, M. C., Watkins, M. W., & Power, T. J. (2016). Parent and teacher ratings of attention-deficit/hyperactivity disorder symptoms: Factor structure and normative data. *Psychological Assessment*, *28*(2), 214-225. doi:10.1037/pas0000166
- Evans, S. W., Brady, C. E., Harrison, J. R., Bunford, N., Kern, L., State, T., & Andrews, C. (2013). Measuring ADHD and ODD symptoms and impairment using high school teachers' ratings. *Journal of Clinical Child & Adolescent Psychology*, *42*(2), 197-207. doi:10.1080/15374416.2012.738456
- Gibson, B. L., Rochat, P., Tone, E. B., & Baron, A. S. (2017). Sources of implicit and explicit intergroup race bias among african-american children and young adults. *PloS One*, *12*(9). doi:10.1371/journal.pone.0183015
- Gomez, R., Leonard Burns, G., Walsh, J. A., & Alves de Moura, M. (2003). A multitrait-multisource confirmatory factor analytic approach to the construct validity of ADHD rating scales. *Psychological Assessment*, *15*(1), 3-16. doi:10.1037/1040-3590.15.1.3
- Gordon, C. T., & Fabiano, G. A. (2019). The transition of youth with ADHD into the workforce: Review and future directions. *Clinical Child and Family Psychology Review*, *22*(3), 316-347. doi:10.1007/s10567-019-00274-4
- Gresham, F.M., & Elliott, S.N. (1990). Social skills rating system. Minneapolis, MN: NCS Pearson.
- Harvey, E. A., Fischer, C., Weieneth, J. L., Hurwitz, S. D., & Sayer, A. G. (2013). Predictors of discrepancies between informants' ratings of preschool-aged children's behavior: An

- examination of ethnicity, child characteristics, and family functioning. *Early Childhood Research Quarterly*, 28(4), 668-682. doi:10.1016/j.ecresq.2013.05.002
- Hillemeier, M. M., Foster, E. M., Heinrichs, B., Heier, B., & Conduct Problems Prevention Research Group. (2007). Racial differences in parental reports of attention-deficit/hyperactivity disorder behaviors. *Journal of Developmental and Behavioral Pediatrics*, 28(5), 353-361. doi:10.1097/DBP.0b013e31811ff8b8
- Hosterman, S. J., DuPaul, G. J., & Jitendra, A. K. (2008). Teacher ratings of ADHD symptoms in ethnic minority students: Bias or behavioral difference? *School Psychology Quarterly*, 23(3), 418-435. doi:10.1037/a0012668
- Howard, A. L., Strickland, N. J., Murray, D. W., Tamm, L., Swanson, J. M., Hinshaw, S. P., ... Molina, B. G. (2016). Progression of impairment in adolescents with attention-deficit/hyperactivity disorder through the transition out of high school: Contributions of parent involvement and college attendance. *Journal of Abnormal Psychology*, 125(2), 233-247.
- Kapil, S., Prasad, V., Daley, D., Ford, T., & Coghill, D. (2018). ADHD in children and young people: Prevalence, care pathways, and service provision. *The Lancet Psychiatry*, 5(2), 175-186. doi:10.1016/S2215-0366(17)30167-0
- Kapil, S., Washbrook, E., & Propper, C. (2015). Childhood behavior problems and academic outcomes in adolescence: Longitudinal population-based study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 54(5), 360-368.e2. doi:10.1016/j.jaac.2015.02.007
- Kennerley, S., Jaquiere, B., Hatch, B., Healey, M., Wheeler, B. J., & Healey, D. (2018). Informant discrepancies in the assessment of attention-deficit/hyperactivity disorder. *Journal of Psychoeducational Assessment*, 36(2), 136-147. doi:10.1177/0734282916670797
- Korsch, F., & Petermann, F. (2014). Agreement between parents and teachers on preschool children's behavior in a clinical sample with externalizing behavioral problems. *Child Psychiatry and Human Development*, 45(5). doi:10.1007/s10578-013-0430-6
- Kuriyan, A. B., Pelham Jr, W. E., Molina, B. S. G., Waschbusch, D. A., Gnagy, E. M., Sibley, M. H., . . . Kent, K. M. (2013). Young adult educational and vocational outcomes of children diagnosed with ADHD. *Journal of Abnormal Child Psychology*, 41(1), 27-41. doi:10.1007/s10802-012-9658-z
- Lawson, G. M., Nissley-Tsiopinis, J., Nahmias, A., McConaughy, S. H., & Eiraldi, R. (2017). Do parent and teacher report of ADHD symptoms in children differ by SES and racial status? *Journal of Psychopathology and Behavioral Assessment*, 39(3), 426-440. doi:10.1007/s10862-017-9591-0

- Mann, E. M., Ikeda, Y., Mueller, C. W., Takahashi, A., Tao, K. T., Humris, E., . . . Chin, D. (1992). Cross-cultural differences in rating hyperactive-disruptive behaviors in children. *American Journal of Psychiatry*, *149*(11), 1539-1542. doi:10.1176/ajp.149.11.1539
- Morgan, P. L., Hillemeier, M. M., Farkas, G., & Maczuga, S. (2014). Racial/ethnic disparities in ADHD diagnosis by kindergarten entry. *Journal of Child Psychology and Psychiatry*, *55*(8), 905-913. doi:10.1111/jcpp.12204
- Morgan, P. L., Staff, J., Hillemeier, M. M., Farkas, G., & Maczuga, S. (2013). Racial and ethnic disparities in ADHD diagnosis from kindergarten to eighth grade. *Pediatrics*, *132*(1), 85-93. doi:10.1542/peds.2012-2390
- Mueller, C. W., Mann, E. M., Thanapum, S., Humris, E., Ikeda, Y., Takahashi, A., . . . Ling Li, B. (1995). Teacher's ratings of disruptive behavior in five countries. *Journal of Clinical Child Psychology*, *24*(4), 434-442. doi:10.1207/s15374424jccp2404_7
- Murray, D. W., Kollins, S. H., Hardy, K. K., Abikoff, H. B., Swanson, J. M., Cunningham, C., . . . Chuang, S. Z. (2007). Parent versus teacher ratings of attention-deficit/hyperactivity disorder symptoms in the preschoolers with attention-deficit/hyperactivity disorder treatment study (PATs). *Journal of Child and Adolescent Psychopharmacology*, *17*(5), 65-619. doi:10.1089/cap.2007.0060
- Okumura, Y., Yamasaki, S., Ando, S., Usami, M., Endo, K., Hiraiwa-Hasegawa, M., . . . Nishida, A. (2019). Psychosocial burden of undiagnosed persistent ADHD symptoms in 12-year-old children: A population-based birth cohort study. *Journal of Attention Disorders*. doi:10.1177/1087054719837746.
- Phillips, B. M., & Lonigan, C. J. (2010). Child and informant influences on behavioral ratings of preschool children. *Psychology in the Schools*, *47*(4). doi:10.1002/pits.20476
- Pierrehumbert, B., Bader, M., Thévoz, S., Kinal, A., & Halfon, O. (2006). Hyperactivity and attention problems in a swiss sample of school-aged children: Effects of school achievement, child gender, and informants. *Journal of Attention Disorders*, *10*(1), 65-76. doi:10.1177/1087054705286050
- Pigott, R. L., & Cowen, E. L. (2000). Teacher race, child race, racial congruence, and teacher ratings of children's school adjustment. *Journal of School Psychology*, *38*(2), 177-195. doi:10.1016/S0022-4405(99)00041-2
- Polanczyk, G., de Lima, M. S., Horta, B. L., Biederman, J., & Rohde, L. A. (2007). The worldwide prevalence of ADHD: A systematic review and meta-regression analysis. *American Journal of Psychiatry*, *164*(6), 942-948. doi:10.1176/ajp.2007.164.6.942

- Polderman, T. J. C., Boomsma, D. I., Bartels, M., Verhulst, F. C., & Huizink, A. C. (2010). A systematic review of prospective studies on attention problems and academic achievement. *Acta Psychiatrica Scandinavica*, *122*(4), 271-284. doi:10.1111/j.1600-0447.2010.01568.
- Polderman, T. J. C., Huizink, A. C., Verhulst, F. C., van Beijsterveldt, C. E. M., Boomsma, D. I., & Bartels, M. (2011). A genetic study on attention problems and academic skills: Results of a longitudinal study in twins. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, *20*(1), 22-34.
- Redding, C. (2019). A teacher like me: A review of the effect of student–teacher racial/ethnic matching on teacher perceptions of students and student academic and behavioral outcomes. *Review of Educational Research*, *89*(4), 499-535. doi:10.3102/0034654319853545
- Roessner, V., Becker, A., Rothenberger, A., Rohde, L. A., & Banaschewski, T. (2007). A cross-cultural comparison between samples of brazilian and german children with ADHD/HD using the child behavior checklist. *European Archives of Psychiatry and Clinical Neuroscience*, *257*(6), 352-359. doi:10.1007/s00406-007-0738-y
- Russell, A. E., Ford, T., & Russell, G. (2015). Socioeconomic associations with ADHD: Findings from a mediation analysis. *PloS One*, *10*(6). doi:10.1371/journal.pone.0128248
- Russell, A. E., Ford, T., Williams, R., & Russell, G. (2016). The association between socioeconomic disadvantage and attention deficit/hyperactivity disorder (ADHD): A systematic review. *Child Psychiatry & Human Development*, *47*(3), 440-458. doi:10.1007/s10578-015-0578-3
- Scholtens, S., Rydell, A., Yang-Wallentin, F. (2013). ADHD symptoms, academic achievement, self-perception of academic competence and future orientation: A longitudinal study. *Scandinavian Journal of Psychology*, *54*(3), 205-212. doi:10.1111/sjop.12042
- Schultz, B. K., & Evans, S. W. (2012). Sources of bias in teacher ratings of adolescents with ADHD. *Journal of Educational and Developmental Psychology*, *2*(1) doi:10.5539/jedp.v2n1p151
- Sciotto, M. J., Terjesen, M. D., & Frank, A. S. B. (2000). Teachers' knowledge and misperceptions of attention-deficit/hyperactivity disorder. *Psychology in the Schools*, *37*(2), 115-122. doi:10.1002/(SICI)1520-6807
- Shemmassian, S. K., & Lee, S. S. (2016). Predictive utility of four methods of incorporating parent and teacher symptom ratings of ADHD for longitudinal outcomes. *Journal of Clinical Child & Adolescent Psychology*, *45*(2), 176-187. doi:10.1080/15374416.2014.971457

- Sollie, H., Larsson, B., & Morch, W. (2013). Comparison of mother, father, and teacher reports of ADHD core symptoms in a sample of child psychiatric outpatients. *Journal of Attention Disorders, 17*(8), 699-710. doi:10.1177/1087054711436010
- Stone, S. L., Speltz, M. L., Collett, B., & Werler, M. M. (2013). Socioeconomic factors in relation to discrepancy in parent versus teacher ratings of child behavior. *Journal of Psychopathology and Behavioral Assessment, 35*(3), 314-320. doi:10.1007/s10862-013-9348-3
- Tripp, G., Schaughency, E. A., & Clarke, B. (2006). Parent and teacher rating scales in the evaluation of attention-deficit hyperactivity disorder: Contribution to diagnosis and differential diagnosis in clinically referred children. *Journal of Developmental and Behavioral Pediatrics, 27*(3), 209-218. doi:10.1097/00004703-200606000-00006
- Valo, S., & Tannock, R. (2010) Diagnostic instability of *DSM-IV* ADHD subtypes: Effects of informant source, instrumentation, and methods for combining symptom Reports, *Journal of Clinical Child & Adolescent Psychology, 39*(6), 749-760. doi:10.1080/15374416.2010.517172
- Visser, S. N., Danielson, M. L., Bitsko, R. H., Holbrook, J. R., Kogan, M. D., Ghandour, R. M., Perou, R., & Blumberg, S. J. (2014). Trends in the parent-report of health care provider-diagnosed and medicated attention-deficit/hyperactivity disorder: United States, 2003-2011. *Journal of the American Academy of Child and Adolescent Psychiatry, 53*, 34-46.
- Willcutt, E. G. (2012). The prevalence of DSM-IV attention-deficit/hyperactivity disorder: A meta-analytic review. *Neurotherapeutics, 9*(3), 490-499. doi:10.1007/s13311-012-0135-8
- Wolraich, M. L., Lambert, E. W., Bickman, L., Simmons, T., Doffing, M. A., & Worley, K. A. (2004). Assessing the impact of parent and teacher agreement on diagnosing attention-deficit hyperactivity disorder. *Journal of Developmental and Behavioral Pediatrics, 25*(1), 41-47. doi:10.1097/00004703-200402000-00007
- Youngstrom, E., Loeber, R., & Stouthamer-Loeber, M. (2000). Patterns and correlates of agreement between parent, teacher, and male adolescent ratings of externalizing and internalizing problems. *Journal of Consulting and Clinical Psychology, 68*(6), 1038-1050. doi:10.1037/0022-006X.68.6.1038
- Zimmerman, R. S., Khoury, E. L., Vega, W. A., Gil, A. G., & Warheit, G. J. (1995). Teacher and parent perceptions of behavior problems among a sample of african american, hispanic, and non-hispanic white students. *American Journal of Community Psychology, 23*(2), 181. doi:10.1007/BF02506935

APPENDIX: IRB Approval Letter



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences Building · Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office 252-744-2914 · Fax 252-744-2284 ·
rede.ecu.edu/umcirb/

Not Human Subject Research Certification

From: Social/Behavioral IRB
To: [Christy Walcott](#)
CC:

Date: 4/21/2020
Re: [UMCIRB 20-000647](#)
Social/Behavioral IRB

On 4/21/20, the IRB Staff reviewed your proposed research and determined that it does not meet the federal definitions of research involving human participants, as applied by East Carolina University.

Therefore, it is with this determination that you may proceed with your research activity and no further action will be required. However, if you should want to modify your research activity, you must submit notification to the IRB before amending or altering this research activity to ensure that the proposed changes do not require additional UMCIRB review.

The UMCIRB appreciates your dedication to the ethical conduct of research. It is your responsibility to ensure that this research is being conducted in accordance with University policies and procedures, the ethical principles set forth in the Belmont Report, and the ethical standards of your profession. If you have questions or require additional information, please feel free to contact the UMCIRB office at 252-744-2914.