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# Incremental Clinical Utility of ADHD Assessment Measures with Latino Families

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INCREMENTAL CLINICAL UTILITY OF ADHD ASSESSMENT MEASURES WITH  
LATINO FAMILIES

by

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A Thesis submitted to the Faculty of the Graduate School,  
Marquette University,  
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ABSTRACT  
INCREMENTAL CLINICAL UTILITY OF ADHD ASSESSMENT MEASURES WITH  
LATINO FAMILIES

Margaret Grace, B.A.

Marquette University, 2017

Attention-Deficit/Hyperactivity Disorder (ADHD) is a common disorder beginning in childhood, with related symptoms and impairment across settings often persisting into adolescence and adulthood if effective treatment is not provided (Bernardi et al., 2012). Therefore, the early and accurate assessment and diagnosis of ADHD is critical. While the prevalence of ADHD symptomatology has been found to be consistent between Latinos and European Americans (Morgan, Hillemeir, Farkas, & Maczuga, 2014), there is little research on the best practices for assessing ADHD in Latinos. The current study sought to examine the incremental clinical utility of two parent- and teacher-report measures of ADHD symptomatology and functional impairment used to assess ADHD in a sample of Latino children.

A sample of Latino schoolchildren ( $N=53$ ) was recruited to participate in the current study, along with their primary parents and teachers; a comprehensive ADHD assessment was conducted for each participant. Results suggest that teachers in the current sample had a higher rate of agreement with final clinical judgment than did parents in the current sample. Additionally, results suggest that parent- and teacher-reports of functional impairment did not add incremental utility in predicting ADHD diagnostic status, beyond that of parent- and teacher-reports of ADHD symptomatology; follow-up analyses suggest why this may be the case. Lastly, results suggest that teacher-reports of ADHD symptoms and functional impairment added incremental utility in predicting ADHD diagnostic status, beyond parent-reports of ADHD symptoms and functional impairment. Clinical implications of these findings will be discussed.

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## **Introduction**

Estimated to affect over 8% of the population (Larson, Russ, Kahn, & Halfon, 2011), Attention-Deficit/Hyperactivity Disorder (ADHD) is a common mental health disorder of childhood, with associated symptoms and impairment persisting into adolescence and adulthood if untreated (Bernardi et al., 2012). While research has established that symptoms of ADHD are equally as common among Latinos as in their European American counterparts (Morgan, Hillemeir, Farkas, & Maczuga, 2014), there is a relative disparity of research regarding the best practices for the assessment and diagnosis of ADHD in this population. Therefore, the current study examined the incremental clinical utility of adding parent- and teacher-reported functional impairment, which is considered to be a more culturally universal concept than symptomatology (Pelham, Fabiano, & Massetti, 2005), to a standard ADHD assessment battery in a sample of Latino children, in an effort to add to the growing knowledge base about how best to assess and treat ADHD in Latinos.

### **Symptoms and Clinical Correlates of ADHD**

ADHD is one of the most common psychiatric disorders beginning in childhood, with a high prevalence that continues to rise. While estimates vary, the 2007 National Survey of Children's Health (NSCH) indicated that 8.2% of children have a diagnosis of ADHD (Larson et al., 2011). When taken in combination with the results of the previous administration of the NSCH, this figure represents an annual increase of 5.5% every year from 2003 to 2007 (Visser, Bitsko, Danielson, Perou, & Blumberg, 2010). Sources such as the National Institute of Mental Health (NIMH) describe ADHD as being



characterized by persistent and severe inattention, hyperactivity, and impulsivity. More specifically, these broad categories of behavior include being easily distracted, having trouble focusing, and daydreaming; fidgeting, talking nonstop, and having difficulty doing quiet tasks; and being impatient, blurting out comments, and having trouble waiting (NIMH, 2012). These symptoms often persist well into adolescence and adulthood, continuing to cause significant impairment occur across domains (Bernardi et al., 2012), frequently including the home setting, the school setting, and peer relationships.

ADHD also is associated with a number of clinical correlates, including risky behaviors demonstrating a lack of planning, low perceived health and social support, high perceived stress, and comorbid psychiatric conditions, such as mood, anxiety, and personality disorders (Bernardi et al., 2012; NIMH, 2012). The National Comorbidity Survey Replication-Adolescent Supplement (NCS-A) found that 33% of children with ADHD had at least one comorbid condition, most commonly a learning disability, conduct disorder, anxiety, depression, or speech problem (Larson et al., 2011). Based on the findings that these significant behavioral correlates and comorbidities often persist into adolescence and adulthood (Bernardi et al., 2012), ADHD should not be conceptualized as a disorder of childhood exclusively, but understood as a lifelong condition.

### **Assessment of ADHD**

The early assessment and diagnosis of ADHD is crucial in reducing or preventing the negative outcomes associated with leaving the condition untreated. The assessment process should be completed with as little time and expense as possible, so as to facilitate

prompt treatment and limit financial strain on mental health professionals and families alike (Pelham et al., 2005). However, in order to correctly diagnose ADHD and thereby facilitate appropriate and effective treatment, the assessment process also must be comprehensive, including multiple informants and addressing symptomology across all relevant domains of functioning. Pelham, Fabiano, and Massetti's (2005) review designated several types of ADHD assessment measures as being evidence-based, representing the gold standard. These include measures based on the Diagnostic and Statistical Manual, 5<sup>th</sup> Ed. (DSM-IV; American Psychiatric Association [APA], 2013), empirically and rationally derived rating scales, structured interviews, global measures of impairment, and behavioral observations (Pelham et al., 2005).

Importantly, research also has indicated the crucial nature of administering assessment measures to both parents and teachers, so as to obtain information from multiple informants and across multiple settings (Pelham et al., 2005). This conclusion has been supported across the literature, with the additional specification that teacher reports should come from a teacher of a core academic subject (Sibley et al., 2011). Although current or retrospective self-report ADHD assessment measures exist, their use is less common, and self-report measures have not been found to add additional diagnostic utility beyond that of parent-report measures (Sibley et al., 2012).

### **Functional Impairment**

One important area of research on ADHD assessment regards functional impairment. Although a modest correlation has been found between symptoms and impairment in those with ADHD (Fabiano et al., 2006), the two are distinct from one another and contribute uniquely to the full clinical picture of the condition. Sibley et al.

(2011) reported that a focus on assessing impairment, rather than on meeting a specific symptom count, more effectively identified children with ADHD; the suggestion to emphasize impairment in assessing ADHD has been made multiple times (i.e., Sibley et al., 2012). It has been suggested that the main focus of ADHD assessment and treatment should be on impairment, as this is associated with early recognition of problem behaviors and is often the impetus for the initiation of the assessment process, and it can be used to predict long term outcomes (Arcia & Fernandez, 2003; Pelham et al., 2005).

Functional impairment has been suggested to, in combination with symptoms of ADHD and comorbid disorders, successfully differentiate between individuals with and without ADHD (Harrison, Vannest, & Reynolds, 2011). Impairment has been used to successfully differentiate between sluggish cognitive tempo and ADHD as well (Barkley, 2013). Research also has addressed the relationship between the two main symptom domains observed in those with ADHD (i.e., inattention and hyperactivity) and functional impairment, finding that symptoms of inattention predicted impairment in learning, whereas symptoms of hyperactivity predicted impairment in terms of disruptive classroom behavior (Garner et al., 2013).

Additionally, functional impairment is considered to be a more universal concept than symptom presentation, which is often culturally loaded, and can be understood from many different points of view. Latino parents, for instance have been found to be less likely to endorse biopsychosocial explanations of mental health problems (Yeh, Hough, McCabe, Lau, & Garland, 2004). Meanwhile, measures of impairment have been found to be less sensitive to factors, such as ethnicity, while still effectively distinguishing between children with and without ADHD, indicating their usefulness in assessing

ADHD in diverse populations (Pelham et al., 2005). Individuals at risk for barriers to problem recognition may have more limited experience with and knowledge about the mental health field (Gerdes, Lawton, Haack, & Schneider, 2014). Therefore, measures of impairment may actually be more salient for these individuals, given that impairment is more easily identified and understood than is the prevailing biopsychosocial conceptualization of etiology and symptomatology (Yeh et al., 2004).

### **Incremental Utility and Validity**

Given the importance of accurate assessment and early intervention, recent research has focused on comparing various assessment measures for ADHD, with the aim of identifying which measures are the most efficient and effective at distinguishing between those with and those without the disorder. One method of comparison of multiple measures in relation to one another is analyzing the incremental validity and/or utility of each measure, or its ability to effectively diagnose a condition of interest and the various benefits associated with using the measure, respectively. This is often done via hierarchical logistic regression (see Lindenberger & Potter, 1998, for a review). A useful example of this technique can be found in Vaughn and Hoza's (2012) study, which compared the incremental utility of a structured diagnostic interview and rating scales obtained from multiple informants in diagnosing ADHD, for the purpose of identifying those with the highest degree of diagnostic utility. These researchers hypothesized that teacher ratings would significantly improve predictive models using parent ratings alone, and that a structured diagnostic interview would significantly improve a model including teacher-completed rating scales. Hierarchical logistic regressions were used to examine these hypotheses, and it was subsequently found that structured diagnostic interviews did

not add predictive utility beyond that of parent and teacher rating scales, but that teacher rating scales added predictive utility to that of parent rating scales (Vaughn & Hoza, 2012).

### **U.S. Latino Youth**

While the above research represents important advances that have been made related to how best to assess ADHD, certain groups have received limited research attention to date, and our knowledge about ADHD in these specific groups is still lacking. One such under-researched and underserved group is Latino youth. Latinos are the largest and fastest-growing ethnic minority group in the United States today, making up over 15% of the U.S. population (Ennis, Rios-Vargas, & Albert, 2011). Rates of psychopathology in the Latino population are similar or higher as compared to other groups, but Latinos are less likely to seek and receive the high-quality mental health assessment and treatment services they need (U.S. Department of Health and Human Services [DHHS], 2001; Flores, 2010). This general trend observed in terms of Latino mental health is true of ADHD as well.

More specifically, while the prevalence of ADHD symptomatology has been found to be consistent between European Americans and Latinos (Morgan et al., 2014), Latino individuals are less likely to receive an official diagnosis of ADHD and treatment for the condition (Morgan et al., 2014; Eiraldi & Diaz, 2010). This is especially true of Latino children who do not speak English in the home. Again, this discrepancy is not explained by lower rates of symptomatology (Morgan et al., 2014). Additionally, as the prevalence of ADHD rises in general, the greatest increase has been found in Latinos and

in individuals with a primary language other than English. In fact, the lifetime prevalence of ADHD in Latinos increased by 53% between 2003 and 2007 (Visser et al., 2010).

Certain issues specific to certain subgroups of Latinos in the U.S. may contribute to this disparity, including limited English proficiency, financial issues, a lack of knowledge about mental health and mental health services, different beliefs about the etiology of ADHD, and cultural factors, such as acculturation (Lawton, Gerdes, Haack, & Schneider, 2014; Eiraldi et al., 2006). Some studies have found that Latino parents who subscribe to traditional cultural values are more likely to have non-mainstream beliefs about the etiology of ADHD (Lawton et al., 2014). Such beliefs may interfere with seeking diagnostic services from a mental health clinician.

One way in which clinicians can be sensitive to these issues is to incorporate the more universally understood concept of functional impairment into their approach to the assessment and treatment of ADHD, instead of focusing on symptomology exclusively. For example, a culturally sensitive measure of ADHD functional impairment has been developed and validated specifically for use with Latino youth (Haack, Gerdes, Lawton, & Schneider, 2014; Haack & Gerdes, 2014). Early research found no significant relationships between the ADHD Functional Impairment Scale (ADHD-FX Scale) and either U.S. or Latino acculturation, suggesting the appropriateness of this measure as part of a comprehensive ADHD assessment when working with Latino youth (Haack & Gerdes, 2014).

Additionally, higher maternal perceptions of functional impairment have been found to be associated with increased maternal distress in Latina mothers of children with ADHD (Arcia & Fernandez, 2003), even when the same mothers may not identify

symptoms of ADHD. In other words, Latina mothers may seek help for their children's functional impairment, not their ADHD symptoms. A positive association between high levels of functional impairment and subsequent help-seeking behavior in Latinos has been proposed elsewhere in the literature as well (Eiraldi, et al., 2006). This preliminary research is encouraging and offers additional support for the importance of considering functional impairment when assessing ADHD in Latino youth.

### **Current Study and Hypotheses**

The current study makes a new contribution to the knowledge base about ADHD assessment, extending Vaughn and Hoza's (2012) examination of the incremental utility of ADHD assessment measures by 1) incorporating a measure of functional impairment (which has been established as an important clinical correlate of ADHD) and 2) examining Latino youth, an understudied group. First, it was hypothesized that there would be a medium positive correlation and a high percent agreement between each item on the parent and teacher Disruptive Behavior Disorders Rating Scale (DBD Rating Scale) and its corresponding item on the Disruptive Behavior Disorders Structured Interview (DBD Structured Interview), which reflects the clinician's final clinical judgment regarding the symptom. Although specific predictions were not made given the lack of previous research in this area, correlations between mean functional impairment in the home and school settings (parent and teacher ADHD Functional Impairment Scale [ADHD-FX Scale]) and mean hyperactivity/impulsivity and inattention (parent and teacher DBD Structured Interview) also were examined.

Second, it was hypothesized that after controlling for parent- and teacher-reported hyperactivity/impulsivity and inattention (parent and teacher DBD Rating Scale), parent-

reported functional impairment in the home and teacher-reported functional impairment at school (parent and teacher ADHD-FX Scale) would account for additional variance in ADHD diagnostic status. It also was expected that each of these variables would individually add incremental predictive utility to a model predicting ADHD diagnostic status. Lastly, it was hypothesized that after controlling for parent-reported hyperactivity/impulsivity and inattention and functional impairment in the home (parent DBD Rating Scale and ADHD-FX Scale), teacher-reported hyperactivity/impulsivity and inattention and functional impairment at school (teacher DBD Rating Scale and ADHD-FX Scale) would account for additional variance in ADHD diagnostic status. It also was expected that each of these variables would individually add incremental predictive utility to a model predicting ADHD diagnostic status.

## **Method**

### **Participants**

Participants in the current study included 53 school-aged Latino youth who were assessed for ADHD as part of a larger research project, their primary parent, and their primary teacher. 84.9% of the youth were diagnosed with ADHD following the evaluation. The majority of the participating youth were born in the U.S. (94.3%) and most were male (64.2%); the mean age was 8.11 years old ( $SD=2.49$ ). See Table 1 for more demographic information.

Table 1.  
*Demographic Variables*

Age, $M$ ( $SD$ )	8.11 (2.49)
Sex, $n$ (%)	



Male	34 (64.2%)
Female	19 (35.8%)
Youth Generational status, <i>n</i> (%)	
Immigrated to U.S.	1 (1.9%)
Born in U.S.	50 (94.3%)
Parent(s) born in U.S.	2 (3.8%)
Family SES, <i>M</i> ( <i>SD</i> )	24.30 (11.59)
Youth Acculturation, <i>M</i> ( <i>SD</i> )	
BARSMA LOS	3.49 (1.05)
BARSMA AOS	3.88 (.75)
ADHD diagnosis, <i>n</i> (%)	
Yes	45 (84.9%)
No	8 (15.1%)

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*Note.* SES=socioeconomic status (range=8-66); BARSMA LOS=Brief Acculturation Rating Scale for Mexican Americans Latino Orientation Scale; BARSMA AOS=Brief Acculturation Rating Scale for Mexican Americans Anglo Orientation Scale.

## **Procedure**

To facilitate recruitment, partnerships were established with a number of local schools and the United Community Center (UCC), a center that provides services related to health and human services, education, and the arts to families, with an emphasis on Hispanic culture. Specific recruitment efforts included in-person contact with families at school-sponsored events, such as back-to-school night, flyers distributed at school, and staff meetings with school and UCC personnel.

Interested families participated in a brief phone screening to determine eligibility for the larger study, after which a comprehensive, multi-modal, multi-informant ADHD assessment either at Marquette University or the UCC was scheduled for families who appeared to be eligible. Eligibility criteria included that participating parents self-identified as Latino and were fluent in Spanish, and that participating children self-identified as Latino, were between 5 and 13 years of age at the time of the assessment,

displayed symptoms and functional problems consistent with ADHD, and did not have an existing diagnosis of Intellectual Disability, Autism Spectrum Disorder, or a psychotic disorder. The entire assessment process with the family took approximately 4 hours; the parent portion was conducted in Spanish, and the child portion was conducted in either Spanish or English, depending on the child's preference.

After obtaining consent and assent from the parent(s) and child, respectively, a graduate student clinician conducted an unstructured interview with the parent(s) and assisted them, as needed, in completing several measures assessing ADHD symptomatology, functional impairment, parental and family factors, and acculturation and cultural factors, as well as a demographic form. The participating child also completed an unstructured interview with a trained undergraduate research assistant and completed several measures assessing mood, anxiety, and acculturation and cultural factors. The measures relevant to the current study are described in more detail below. Each family received a \$100 Target gift card once they completed the assessment.

After the initial assessment appointment with the parent and child, the graduate student clinician contacted the child's primary teacher and arranged a date to meet at the school. Following the consent process, the graduate student clinician conducted a brief unstructured interview with the teacher and provided him/her with several measures assessing ADHD symptomatology and functional impairment to complete. The measures relevant to the current study are described in more detail below. Each teacher received a \$5 Target gift card once he/she completed the interview and measures.

Diagnostic and subtype decisions were made based on all available information gathered during the assessment, with a specific focus on parent and teacher unstructured

interviews, parent and teacher responses on the DBD Rating Scale and ADHD FX-Scale, and behavioral observations. Specifically, graduate student clinicians and a faculty expert on ADHD used the above information to make a final clinical judgment regarding the severity of each ADHD symptom on the DBD Structured Interview.

## **Measures**

The measures of interest for the current study include a demographic form, the DBD Rating Scale, ADHD-FX Scale, DBD Structured Interview, and Brief Acculturation Rating Scale for Mexican Americans-II (ARSMA-II).

### **Demographic form.**

Parents completed a demographic form that served to gather information about participating children and parents, including age, sex, socioeconomic status (SES), and generational status.

### **DBD Rating Scale.**

The DBD Rating Scale is a well-known, DSM-based parent and teacher-report measure of ADHD, Oppositional/Defiant Disorder (ODD), and Conduct Disorder (CD) symptoms (Pelham, Gagny, Greenslade, & Milich, 1992). The scale has 45 items that are endorsed by parents and/or teachers on a Likert scale from 0 (symptom is not at all a problem) to 3 (symptom is very much a problem). Sample items assessing inattention, hyperactivity, and impulsivity, respectively, include: “[child] often does not seem to listen when spoken to directly,” “[child] is often ‘on the go’ or often acts as if ‘driven by a motor,’” and “[child] often blurts out answers before questions have been completed.” The original English language version, which was completed by teachers, has high

internal consistency and acceptable test-retest reliability, as well as treatment outcome validity (as described in Pelham, Fabiano, & Massetti, 2005). The Spanish language version of the DBD Rating Scale (DBD-S), which was completed by parents, has psychometric properties consistent with the English language version (Gerdes, Lawton, Haack, & Dieguez Hurtado, 2013). For the purposes of the current study, the means of items assessing inattention and hyperactivity/impulsivity from both the parent and teacher scales were used in statistical analyses, as were the ratings of nine individual items from the inattentive category and nine individual items from the hyperactive/impulsive category from both the parent and teacher scales. In the current study, the parent DBD Rating Scale demonstrated a Cronbach's alpha of 0.92 for the items assessing inattention and a Cronbach's alpha of 0.91 for the items assessing hyperactivity/impulsivity, while the teacher DBD Rating Scale demonstrated a Cronbach's alpha of 0.89 for the items assessing inattention and a Cronbach's alpha of 0.90 for the items assessing hyperactivity/impulsivity.

#### **ADHD-FX Scale.**

The ADHD-FX Scale is a measure of functional impairment commonly associated with childhood ADHD. It was developed as a practical and effective measure of ADHD-specific functional impairment appropriate for families of diverse backgrounds (Haack, et al., 2014). The scale has 32 items that are endorsed by parents and/or teachers on a Likert scale from 0 (this does not affect [child's] day-to-day life) to 3 (this affects [child's] day-to-day life very much). Examples of items assessing impairment in the home setting, in the school setting, and with peers, respectively, include: “[child] doesn't effectively complete home routines/ tasks (e.g., the morning routine, chores, etc.),”

“[child] doesn’t pay attention to, follow, and/or obey teacher instructions,” and “[child] doesn’t respect peers’ personal space.” An overall impairment score, as well as three subscale scores for school, home, and peers may be created. The Spanish language version of the parent ADHD-FX Scale, which was completed by parents, has been shown to have adequate reliability, divergent and convergent construct validity, and cultural properties (Haack, Gonring, Harris, Gerdes, & Pfiffner, 2016). Teachers completed the English language version of the teacher ADHD-FX Scale. Statistical analyses utilized the home subscale score on the parent ADHD-FX Scale and the school subscale score on the teacher ADHD-FX Scale. In the current study, the home subscale of the parent ADHD-FX Scale demonstrated a Cronbach’s alpha of 0.92, while the school subscale of the teacher ADHD-FX Scale demonstrated a Cronbach’s alpha of 0.94.

#### **DBD Structured Interview.**

Parents also completed the Spanish version of the DBD Structured Interview, in which the same 45 items that make up the DBD Rating Scale were administered in the form of a semi-structured diagnostic interview. The final rating of each ADHD symptom on the DBD Structured Interview reflects the clinical judgment of the graduate student clinicians and an ADHD expert. ADHD diagnostic status was determined by symptom count.

#### **Brief ARSMA-II.**

Children at least seven years old completed the Brief ARSMA-II, which is a 12 question rating scale designed to assess acculturation in Mexican Americans (Cuéllar, 2004). In the current study, the words “Mexican” and “Mexican American” were

replaced by “Latino” and “Latin American,” respectively, so as to make the measure more appropriate for the current sample; this method has been used previously and has been found to maintain the psychometric properties of the measure (i.e., Lawton, et al., 2014). Participants responded to each question on a Likert scale from 1 (not at all) to 5 (almost always or extremely often). Examples of questions addressing Anglo and Latino cultural orientation, respectively, include: “I enjoy English language movies,” and “I enjoy reading books in Spanish.” Statistical analyses in the current study used both the Anglo Orientation Subscale (AOS) and the Latino Orientation Subscale (LOS). Adequate validity and internal consistency for both subscales has been demonstrated for the Brief ARSMA-II when used with children and adolescents (Bauman, 2005). In the current study, the AOS demonstrated a Cronbach’s alpha of .54, and the LOS demonstrated a Cronbach’s alpha of .79.

## **Results**

### **Preliminary Analyses**

Descriptive analyses were conducted to examine the demographic characteristics of the sample. A series of t-tests and a chi square test of independence were conducted to examine potential group differences between children diagnosed and not diagnosed with ADHD with regard to age, SES, Latino and Anglo acculturation, generational status, and sex. The chi square test revealed that male participants were more likely than female participants to be diagnosed with ADHD,  $\chi^2 = 6.28, p < .05$ . Given that more than 20% of expected counts in the chi square table was less than five, a variation known as the *N-1* chi square (Campbell, 2007; Busing, Weaver, & Dubois, 2016) also was performed; even

with this correction, males were still more likely than females to be diagnosed with ADHD,  $N-1 \chi^2 = 6.16, p < .05$ . No other significant differences between participants with and without ADHD were found.

A series of correlations and ANOVAs were conducted to examine potential differences in severity of parent- and teacher-reports of ADHD symptoms and functional impairment based on age, SES, Latino and Anglo acculturation, generational status, and sex. Results indicated statistically significant differences for teacher-reports of inattention, hyperactivity/impulsivity, and functional impairment in the classroom depending on sex, with boys rated as more severe in each of these categories (see Table 2). No other statistically significant relationships were revealed.

Table 2.  
*ANOVAs for Predictor Variables by Sex*

	Male, <i>M</i> (SD)	Female, <i>M</i> (SD)	<i>F</i>	Cohen's <i>d</i>
PDBD IA	1.56 (.74)	1.32 (.79)	1.19	.02
PDBD HI	1.32 (.83)	1.04 (.80)	1.42	.03
TDBD IA	1.80 (.68)	1.10 (.78)	11.85**	.19
TDBD HI	1.34 (.81)	.80 (.81)	5.47*	.10
PFX	1.07 (.68)	.86 (.56)	1.29	.02
TFX	1.56 (.70)	.86 (.55)	13.97***	.22

*Note.* PDBD IA=Parent Disruptive Behavior Disorders (DBD) Rating Scale: Inattention; PDBD HI= Parent DBD Rating Scale: Hyperactivity/Impulsivity; TDBD IA=Teacher DBD Rating Scale: Inattention; TDBD HI=Teacher DBD Rating Scale: Hyperactivity/Impulsivity; PFX=Parent ADHD Functional Impairment Rating Scale (ADHD-FX Scale): Home; TFX=Teacher ADHD-FX Scale: School; \* $p \leq .05$ ; \*\* $p \leq 0.01$ ; \*\*\* $p \leq .001$ ; 0.2 = small effect, 0.5 = medium effect, 0.8 = large effect (Cohen, 1988).

To examine the exploratory questions related to correspondence between parent and teacher-reports of ADHD symptoms and parent and teacher-reports of functional impairment in the home and at school, correlations were examined between the mean of parent-reported inattention and hyperactivity/impulsivity, mean of parent-reported

functional impairment in the home, mean of teacher-reported inattention and hyperactivity/impulsivity, and mean of teacher-reported functional impairment at school. Several significant relationships were revealed, including between parent- and teacher-reports of hyperactivity/impulsivity ( $r=0.52, p<.01$ ) and parent- and teacher-reports of functional impairment ( $r=0.29, p<.05$ ). Significant relationships also were revealed between parent-reports of inattention and hyperactivity/impulsivity and parent-reports of functional impairment ( $r=0.65, p<.01$  and  $r=0.60, p<.01$ , respectively), and between teacher-reports of inattention and hyperactivity/impulsivity and teacher-reports of functional impairment ( $r=0.71, p<.01$  and  $r=0.68, p<.01$ , respectively). See Table 3.

Table 3.

*Correlations among Parent- and Teacher-Reported ADHD Symptoms and Functional Impairment*

	PDBD IA	PDBD HI	TDBD IA	TDBD HI	PFX	TFX
PDBD IA	1	-	-	-	-	-
PDBD HI	.74***	1	-	-	-	-
TDBD IA	.14	.20	1	-	-	-
TDBD HI	.24	.52***	.51***	1	-	-
PFX	.65***	.60***	.23	.24	1	-
TFX	.18	.35**	.71***	.68***	.29*	1

*Note.* PDBD IA=Parent Disruptive Behavior Disorders (DBD) Rating Scale: Inattention; PDBD HI=Parent DBD Rating Scale: Hyperactivity/Impulsivity; TDBD IA=Teacher DBD Rating Scale: Inattention; TDBD HI=Teacher DBD Rating Scale: Hyperactivity/Impulsivity; PFX=Parent ADHD Functional Impairment Rating Scale (ADHD-FX Scale): Home; TFX=Teacher ADHD-FX Scale: School.

\* $p \leq .05$ ; \*\* $p \leq 0.01$ ; \*\*\* $p \leq .001$ .

## Primary Analyses

### Hypothesis 1.



Correspondence between each item on the parent and teacher DBD Rating Scale and its corresponding item on the DBD Structured Interview was determined via correlations, percent agreement, and kappas; exact ratings on the DBD Rating Scale and Structured Interview were used. Slightly less than half of the correlations between items assessing inattention on the parent DBD Rating Scale and corresponding items on the DBD Structured Interview were significant, ranging from .09 to .55 with a mean of .24. All but one of the correlations between items assessing hyperactivity/impulsivity on the parent DBD Rating Scale and corresponding items on the DBD Structured Interview were significant, ranging from .25 to .69 with a mean of .53. In contrast, correlations between all 18 items on the teacher DBD Rating Scale and the corresponding items on the DBD Structured Interview were significant, ranging from .46 to .65 and with a mean of .60 for inattention item pairs and from .63 to .81 with a mean of .72 for hyperactive/impulsive item pairs (see Table 4). Based on the preliminary analyses, these correlations also were examined taking into account sex. Since the pattern of findings remained the same, results were reported without controlling for sex.

Percent agreement between the parent DBD Rating Scale and the DBD Structured Interview ranged from 34% to 54.7% with a mean of 40.33% for items assessing inattention, and from 35.8% to 67.9% with a mean of 51.14% for items assessing hyperactivity/impulsivity. Similarly, percent agreement between the teacher DBD Rating Scale and the DBD Structured Interview ranged from 43.4% to 60.4% with a mean of 50.32% for items assessing inattention, and from 47.2% to 60.4% with a mean of 48.33% for items assessing hyperactivity/impulsivity.

Finally, one third of kappas for items assessing inattention on the parent DBD Rating Scale items and corresponding items on the DBD Structured Interview were significant, ranging from .07 to .36 with a mean of .16. All but one of the kappas for items assessing hyperactivity/impulsivity on the parent DBD Rating Scale and corresponding items on the DBD Structured Interview were significant, ranging from .09 to .52 with a mean of .29. In contrast, all 9 kappas were significant for items assessing inattention on the teacher DBD Rating Scale and corresponding items on the DBD Structured Interview, ranging from .09 to .41 with a mean of .31. Similarly, all 9 kappas were significant for items assessing hyperactivity/impulsivity on the teacher DBD Rating Scale and corresponding items on the DBD Structured Interview, ranging from .08 to .46 with a mean of .32 (see Table 4).

Table 4.  
Summary of Correlations, Percent Agreement, and Chance-Corrected Agreement (*k*) between Parent and Teacher Ratings of ADHD Symptoms on the DBD Rating Scale and Final Clinical Judgment of ADHD Symptom Severity on the DBD Structured Interview.

	Parent			Teacher		
	Correlation	Percent agreement	<i>k</i>	Correlation	Percent agreement	<i>k</i>
<b>Inattentive symptoms</b>						
Easily distracted	.19	37.7%	.08	.56***	52.8%	.09**
Doesn't seem to listen	.25	37.7%	.11	.58***	45.3%	.29**
Makes careless errors	.09	39.6%	.09	.65***	50.9%	.32**
Doesn't follow through on instructions/tasks	.55***	54.7%	.36**	.63***	50.9%	.35**
Difficulty paying attention to work or games	.14	37.7%	.12	.64***	60.4%	.40**
Loses things	.50***	43.4%	.24*	.64***	47.2%	.30**
Avoids mental effort	.26	39.6%	.18*	.57***	43.4%	.26**
Difficulty organizing activities	.34*	34.0%	.07	.63***	54.7%	.41**
Forgetful	.35**	39.6%	.15	.46***	47.3%	.28*
<i>Mean</i>	.24	40.33%	.16	.60	50.32%	.31
<b>Hyperactive/impulsive symptoms</b>						
Interrupts or intrudes	.49***	35.8%	.14	.73***	50.9%	.37**
Talks excessively	.61***	58.5%	.46**	.72***	58.5%	.46**
Fidgets with hands and feet	.62***	41.5%	.22*	.65***	49.1%	.34**
Responds before questions are complete	.69***	54.7%	.38**	.80***	60.4%	.08**
Difficulty with leisure activities	.25	49.1%	.30**	.65***	58.5%	.45**
Leaves seat	.52***	45.3%	.09*	.81***	49.1%	.09**
Difficulty awaiting turn	.61***	50.9%	.09**	.72***	47.2%	.31**
Seems driven by a motor	.66***	56.6%	.39**	.74***	54.7%	.42**
Running or climbing excessively	.66***	67.9%	.52**	.63***	56.6%	.32**
<i>Mean</i>	.53	51.14%	.29	.72	48.33%	.32

Note. DBD=Disruptive Behavior Disorders; \* $p \leq .05$ ; \*\* $p \leq 0.01$ ; \*\*\* $p < .01$ ; Kappas: 0.00-0.20=slight agreement, .21-.40=fair agreement, .41-.60=moderate agreement, .61-.80=substantial agreement, and -.81-1.00=almost perfect agreement (Landis & Koch, 1977);

## Hypothesis 2.

The incremental utility of measures of ADHD symptoms and functional impairment was explored with two hierarchical binary logistic regressions, with a categorical variable representing ADHD diagnostic status as the dependent variable in both cases. In the first of these regressions, parent- and teacher-reported hyperactivity/impulsivity and inattention (means of items assessing each symptom domain on the parent and teacher DBD Rating Scales) were entered at Step 1, with parent- and teacher-reported functional impairment (the home subscale score of the parent ADHD-FX Scale and the school subscale score of the teacher ADHD-FX Scale) entered at Step 2. Parent- and teacher-reports of ADHD symptoms alone correctly predicted almost 95% of cases, Block  $\chi^2(4, N=53)=29.62, p<.01$ . At this step, teacher reports of hyperactivity/impulsivity was the strongest predictor of ADHD diagnosis, with an odds ratio of 97.79, indicating that participants rated by their teachers as demonstrating more hyperactivity/impulsivity were about 97 times more likely to be diagnosed with ADHD than participants who were rated as demonstrating less hyperactivity/impulsivity. Adding parent- and teacher-reports of functional impairment to this model did not result in statistically significant model improvement; nonetheless, the overall model remained significant, Block  $\chi^2(2, N=53)=3.43, ns$ ; Model  $\chi^2(6, N=53)=33.06, p<.01$ . At this step, the strongest predictor of ADHD diagnosis was teacher-reports of functional impairment, which had an odds ratio of 1755.38, indicating that participants rated by their teachers as experiencing more functional impairment were over 1700 times more likely to be diagnosed with ADHD than those who were rated as experiencing less functional impairment. See Table 5.

Table 5.  
*Summary of Hierarchical Binary Logistic Regressions Predicting ADHD Diagnostic Status*

	Sensitivity	Specificity	Percent Correctly Classified
Regression #1			
Step 1: PDBD and TDBD	.98	.75	94.30
Step 2: PFX and TFX	.98	.75	94.30
Regression #2			
Step 1: PDBD	.96	.25	84.90
Step 2: TDBD	.98	.75	94.30
Step 3: PFX	.98	.88	96.20
Step 4: TFX	.98	.75	94.30
Regression #3			
Step 1: PDBD and PFX	.96	.25	84.90
Step 2: TDBD and TFX	.98	.75	94.30
Regression #4			
Step 1: PDBD	.96	.25	84.90
Step 2: PFX	.96	.25	84.90
Step 3: TDBD	.98	.88	96.20
Step 4: TFX	.98	.75	94.30

*Note.* PDBD=Parent Disruptive Behavior Disorders (DBD) Rating Scale; TDBD=Teacher DBD Rating Scale; PFX= Parent ADHD Functional Impairment Rating Scale (ADHD-FX Scale); Home; TFX=Teacher ADHD-FX Scale: School.

A second follow-up regression was conducted to further examine the incremental utility of these measures individually. Parent-reported hyperactivity/impulsivity and inattention were entered at Step 1, teacher-reported hyperactivity/impulsivity and inattention were entered at Step 2, parent-reported functional impairment was entered at Step 3, and teacher-reported functional impairment was entered at Step 4. Parent-reports of ADHD symptoms alone correctly predicted about 85% of cases, Block  $\chi^2$  (2,  $N=53$ )=14.24,  $p<.01$ . At this step, the strongest predictor of ADHD diagnosis was parent-reports of hyperactivity/impulsivity, with an odds ratio of 14.27, indicating that participants rated by their parents as demonstrating more hyperactivity/impulsivity were 14 times more likely to be diagnosed with ADHD than participants rated by their parents as demonstrating less hyperactivity/impulsivity. Adding teacher-reports of ADHD symptoms resulted in statistically significant model improvement and increased the

predictive power of the model to almost 95%, Block  $\chi^2(2, N=53)=15.39, p<.01$ ; Model  $\chi^2(4, N=53)=29.62, p<.01$ . At this step, teacher-reports of hyperactivity/impulsivity was the strongest predictor of ADHD diagnosis, with an odds ratio of 97.79, indicating that participants rated by their teachers as demonstrating more hyperactivity/impulsivity were about 97 times more likely to be diagnosed with ADHD than participants who were rated as demonstrating less hyperactivity/impulsivity. The addition of parent-reports of functional impairment to this model did not result in statistically significant model improvement; nonetheless, it did result in an additional increase in predictive power, and the overall model remained significant, Block  $\chi^2(1, N=53)=0.18, ns$ ; Model  $\chi^2(5, N=53)=29.80, p<.01$ . At this step, teacher-reports of hyperactivity/impulsivity was again the strongest predictor of ADHD diagnosis, with an odds ratio of 115.23, indicating that participants rated by their teachers as demonstrating more hyperactivity/impulsivity were 115 times more likely to be diagnosed with ADHD than participants who were rated as demonstrating less hyperactivity/impulsivity. Lastly, adding teacher-reports of functional impairment to this model did not result in statistically significant model improvement; the overall model, however, again remained significant, Block  $\chi^2(1, N=53)=3.26, ns$ ; Model  $\chi^2(6, N=53)=33.06, p<.01$ . Again, with all predictor variables entered, the strongest predictor of ADHD diagnosis was teacher-reports of functional impairment, with an odds ratio of 1755.38. See Table 5.

### **Hypothesis 3.**

The subsequent set of regressions further examined the incremental utility of parent- and teacher-report measures. In the first of these regressions, parent-reported hyperactivity/impulsivity, inattention, and functional impairment were entered at Step 1,

while teacher-reported hyperactivity/impulsivity, inattention, and functional impairment were entered at Step 2. Parent-reports of ADHD symptoms and functional impairment alone correctly predicted ADHD diagnostic status for about 85% of cases, Block  $\chi^2$  (3,  $N=53$ )=14.26,  $p<.01$ . At this step, the strongest predictor of ADHD diagnosis was parent-reports of hyperactivity/impulsivity, with an odds ratio of 15.58, indicating that participants rated by their parents as demonstrating more hyperactivity/impulsivity were 15 times more likely to be diagnosed with ADHD than participants rated by their parents as demonstrating less hyperactivity/impulsivity. Adding teacher-reports of ADHD symptoms and functional impairment to this model resulted in statistically significant model improvement and an increase in predictive power of the model, Block  $\chi^2$  (2,  $N=53$ )=18.80,  $p<.01$ ; Model  $\chi^2$  (6,  $N=53$ )=33.06,  $p<.01$ . Again, with all predictor variables entered, the strongest predictor of ADHD diagnosis was teacher-reports of functional impairment, with an odds ratio of 1755.38. See Table 5.

An additional follow-up regression served to further examine the incremental utility of these measures individually. Parent-reported hyperactivity/impulsivity and inattention were entered at Step 1, parent-reported functional impairment was entered at Step 2, teacher-reported hyperactivity/impulsivity and inattention were entered at Step 3, and teacher-reported functional impairment was entered at Step 4. Parent-reports of ADHD symptoms again correctly predicted ADHD diagnostic status for approximately 85% of cases, Block  $\chi^2$  (2,  $N=53$ )=14.24,  $p<.01$ . At this step, the strongest predictor of ADHD diagnosis was parent-reports of hyperactivity/impulsivity, with an odds ratio of 14.27, indicating that participants rated by their parents as demonstrating more hyperactivity/impulsivity were 14 times more likely to be diagnosed with ADHD than

participants rated by their parents as demonstrating less hyperactivity/impulsivity. The addition of parent-reports of functional impairment did not result in statistically significant model improvement or an increase in predictive power, Block  $\chi^2$  (1,  $N=53$ )=.02, *ns*; Model  $\chi^2$  (3,  $N=53$ )=14.26,  $p<.01$ . At this step, the strongest predictor of ADHD diagnosis was still parent-reports of hyperactivity/impulsivity, with an odds ratio of 15.58 at this step, indicating that participants rated by their parents as demonstrating more hyperactivity/impulsivity were 15 times more likely to be diagnosed with ADHD than participants rated by their parents as demonstrating less hyperactivity/impulsivity. Adding teacher-reports of ADHD symptoms to this model, however, did result in statistically significant model improvement, as well as an increase in the predictive power of the model to about 96%, Block  $\chi^2$  (2,  $N=53$ )=15.55,  $p<.01$ ; Model  $\chi^2$  (5,  $N=53$ )=29.80,  $p<.01$ . At this step, the strongest predictor of ADHD diagnosis was teacher-reports of hyperactivity/impulsivity, with an odds ratio of 115.23, indicating that participants rated by their teachers as demonstrating more hyperactivity/impulsivity were 115 times more likely to be diagnosed with ADHD than participants rated by their teachers as demonstrating less hyperactivity/impulsivity. Lastly, when teacher-reports of functional impairment were added to this model, statistically significant improvement of the model did not result; the overall model nonetheless remained significant; Block  $\chi^2$  (1,  $N=53$ )=3.26, *ns*; Model  $\chi^2$  (6,  $N=53$ )=33.06,  $p<.01$ . Again, with all predictor variables entered, the strongest predictor of ADHD diagnosis was teacher-reports of functional impairment, with an odds ratio of 1755.38. See Table 5. Based on the preliminary analyses, the regressions also were examined taking into account sex. Since the pattern of findings remained the same, results were reported without controlling for sex.

## Discussion

The goal of the current study was to extend Vaughn and Hoza's (2012) findings on the incremental utility of ADHD assessment measures by adding a parent- and teacher-report measure of functional impairment and by examining Spanish-speaking, Latino families. While the current teacher findings mirrored Vaughn and Hoza's results, findings for Latino parents in the current study differed from parent findings reported by Vaughn and Hoza. Specifically, correlations, percent agreements, and kappas suggested that teachers consistently agreed with final clinical judgment for both hyperactive/impulsive and inattentive symptoms. On the other hand, parents seemed to be in less agreement with the final clinical judgment when identifying inattentive symptoms relative to hyperactive/impulsive symptoms, based on mainstream DSM-based understandings of these symptoms. Surprisingly, results indicated that parent- and teacher-reports of functional impairment did not add incremental diagnostic utility beyond that of parent- and teacher-reports of ADHD symptoms; however, follow-up analyses to be discussed shed more light on why this may be. Finally, results demonstrated that teacher-reports of ADHD symptoms and functional impairment added incremental diagnostic utility beyond that of parent-reports of ADHD symptoms and functional impairment, indicating the importance of obtaining teacher-reports of symptomatology and functioning in the context of an ADHD assessment.

### **Correspondence between Parent-and Teacher DBD Rating Scales and DBD Structured Interview**

Partial support was found for the first hypothesis, which predicted a medium positive correlation and a high percent agreement and kappa between each item on the



parent and teacher DBD Rating Scale and its corresponding item on the DBD Structured Interview. This prediction held true for the correspondence between teacher-reports and final clinical judgment, as all items on the teacher DBD Rating Scale and corresponding items on the DBD Structured Interview were significantly positively related to each other, and most were medium in magnitude. Additionally, kappas and percent agreement demonstrated fair agreement for inattentive and hyperactive/impulsive item pairs on the teacher DBD Rating Scale and corresponding items on the DBD Structured Interview. On the other hand, this prediction did not hold true for the correspondence between parent-reports and final clinical judgment. Although all correlations between items on the parent DBD Rating Scale and corresponding items on the DBD Structured Interview were positive, and all but one of the correlations for hyperactive/impulsive item pairs were significant, less than half of the correlations for inattention item pairs were significant. Similarly, kappas and percent agreement demonstrated fair agreement for hyperactive/impulsive items on the parent DBD Rating Scale and corresponding items on the DBD Structured Interview, but only slight agreement for inattention items on the parent DBD Rating Scale and corresponding items on the DBD Structured Interview.

It appears that Latino parents in the current sample were in agreement with final clinical judgment when reporting on their children's symptoms of hyperactivity/impulsivity more often than when reporting their symptoms of inattention. This result differs from that of Vaughn and Hoza's 2012 study, in which a significant positive relationship was found between the parent DBD Rating Scale and the DBD Structured Interview, with no difference for items assessing inattention versus hyperactivity/impulsivity. One possible explanation for these findings is that Latino

parents may find their child's hyperactive/impulsive behaviors to be more salient, as this type of behavior may be perceived as a lack of respect for authority figures, an important cultural value for many Latinos (i.e., Calzada, Fernandez, & Cortes, 2010). Thus, hyperactive/impulsive behaviors may be more noticeable and distressing to Latino caregivers, which may increase the likelihood that they will agree with the final clinical judgment for those symptoms. Given that symptoms of inattention do not necessarily connote disrespect towards authority in the same way, Latino parents may be less likely to agree with the final clinical judgment for those symptoms.

Although findings from the current study indicate that parents are most often in agreement with final clinical judgment when reporting on their children's symptoms of hyperactivity/impulsivity, previous research with a community sample of Latino families suggested that parent-reports of hyperactive/impulsive symptoms had lower diagnostic utility than parent-reports of inattentive symptoms (Gerdes et al., 2013). Parents in the current study, however, were able to report on symptoms of hyperactivity/impulsivity in a way that was more diagnostically useful, possibly because the current study was made up of a treatment-seeking sample. The discrepancy in the accuracy of parental report of inattention and hyperactivity/impulsivity highlights the importance of obtaining teacher-reports of symptoms as well, so as to best inform the assessment and diagnostic process.

### **Incremental Utility of Parent- and Teacher-Report of Functional Impairment**

The second hypothesis that parent- and teacher-reported functional impairment would account for additional variance in ADHD diagnostic status beyond parent- and teacher-reports of ADHD symptoms was not supported. This prediction was made based on previous research suggesting that measuring functional impairment is a valuable

component of an ADHD assessment (i.e., Pelham et al., 2005), particularly for Latino families (Haack & Gerdes, 2014; Haack et al., 2016). Although parent- and teacher-reports of ADHD symptoms alone correctly predicted ADHD diagnostic status for the vast majority of cases, adding parent- and teacher-reports of functional impairment to this model, either separately or at once, did not add incremental predictive utility to the model. Nonetheless, it should be noted that the addition of parent-reports of functional impairment alone did result in an additional increase in predictive power, as well as that teacher-reports of functional impairment consistently had the highest odds ratio of any predictors across all four regressions conducted.

One possible explanation for these findings is that parent- and teacher-reports of ADHD symptoms accounted for so much of the variance in ADHD diagnostic status that it was not possible for parent- and teacher-reports of functional impairment to result in statistically significant improvement of the model. Follow-up analyses were conducted to further examine this possibility, in which the predictor variables were entered in reverse order, such that parent- and teacher-reports of functional impairment were entered first and parent- and teacher-reports of ADHD symptoms were entered second. Results indicated that parent- and teacher-reports of functional impairment correctly predicted the vast majority of cases when they were entered first in a model predicting ADHD diagnostic status. Further, adding parent- and teacher-reports of ADHD symptoms to the model did not result in statistically significant improvement of the model or increase predictive power. Thus, parent- and teacher-reports of functional impairment accounted for so much of the variance in ADHD diagnostic status that it was not possible for the addition of parent- and teacher-reports of ADHD symptoms to result in statistically

significant improvement of the model. These findings suggest that both parent- and teacher-reports of both ADHD symptoms and functional impairment were able to predict ADHD diagnostic status for the vast majority of the current sample when entered first, indicating that both can be critical to the diagnostic process.

It also should be noted that the parent ADHD-FX Scale improved the predictive utility of a model that included only parent- and teacher-reports of ADHD symptoms. The opportunity to report on functional impairment may be very important for parents in the current sample, as greater degrees of child functional impairment and maternal distress in Latina mothers have been linked with earlier recognition of child problem behavior (Arcia & Fernandez, 2003). In light of the finding that parents in the current sample were more often in agreement with final clinical judgment when reporting symptoms of hyperactivity/impulsivity than when reporting symptoms of inattention, it is crucial to offer parents the opportunity to report on functional impairment as well as symptomology, as this may be more closely related to their distress and concerns about their children. In combination with teacher-reports of symptoms and functional impairment, this will aid clinicians in obtaining a full clinical picture and reaching an appropriate diagnosis.

Previous research has indicated adequate psychometric and cultural properties of the parent and teacher ADHD-FX Scale in both community and clinical samples. The results of the current study are consistent with existing literature (i.e., Haack & Gerdes, 2014; Haack et al., 2016), similarly demonstrating adequate reliability. Additionally, no significant relationships were found between the ADHD-FX Scale and youth U.S. or Latino acculturation, indicating its cultural universality and usefulness when assessing

ADHD in the Latino population. This finding mirrors that of previous research on the cultural properties of the ADHD-FX Scale (Haack & Gerdes, 2014). Results of the current study support the idea that the ADHD-FX Scale is a reliable and efficient clinical tool, both on its own and in combination with a measure of ADHD symptoms, such as the DBD Rating Scale. The ADHD-FX Scale can be an invaluable tool for clinicians in gathering information that might otherwise be inaccessible to them.

### **Incremental Utility of Teacher-Report of ADHD Symptoms and Functional Impairment**

Finally, the hypothesis that incremental utility of teacher-reports of ADHD symptoms and functional impairment would predict ADHD diagnostic status was supported. It was predicted that these measures would account for additional variance in ADHD diagnostic status, beyond parent-reports of ADHD symptoms and functional impairment. Although parent-reports of ADHD symptoms and functional impairment alone correctly predicted ADHD diagnostic status for the majority of cases, the addition of teacher-reports of ADHD symptoms and functional impairment to this model added incremental predictive utility to the model. This resulted in an increase in predictive power of the model. When examining the incremental utility of teacher-reports of ADHD symptoms and functional impairment separately, the addition of teacher-reports of ADHD symptoms to a model including parent-reports of ADHD symptoms and functional impairment added incremental predictive utility. Adding teacher-reports of functional impairment to this model, however, did not result in statistically significant improvement of the model. Additionally, teacher-reports of both hyperactivity/impulsivity and functional impairment were noted to have high odds ratios

across the four regressions that were conducted, indicating their relationship to an ADHD diagnosis.

These results fit well with previous research, as the importance of gathering information from both parents and teachers and across multiple settings is considered a gold standard in ADHD assessment (i.e., Pelham et al., 2005). For example, Sibley and colleagues (2011) suggested that using both parent- and teacher-reports to assess ADHD is the best practice, as it resulted in the most accurate diagnoses over time. Additionally, Vaughn and Hoza (2012) found that both parent- and teacher-report measures play an important role in ADHD assessment and that both contributed unique predictive utility to models predicting ADHD diagnostic status. Similarly, the results of the current study emphasize the important role that both parent and teacher reports play in ADHD assessment and diagnosis.

### **Limitations**

Several limitations of the current study should be noted. The current study had a relatively small sample size, especially in terms of children not diagnosed with ADHD. Future research could aim to recruit a larger sample, including more children without ADHD. Additionally, the current study's relatively homogenous sample of Latinos from a mid-sized Midwestern city may limit the generalizability of the findings to Latinos in other areas. Future research should strive to recruit a more diverse group of Latinos, across both geographic regions and Latino subgroups, so as to obtain a clearer understanding of whom the findings of the current study apply to. The sample was somewhat homogenous in terms of SES as well; future research also could examine whether the findings of the current study apply to a broader range of SES. Additionally,

although participants in the current study ranged in age from 5 to 13 years, the mean age was approximately 8 years, with a relatively small standard deviation of 2.5 years. Given that the sample was relatively homogenous in this sense as well, future research should examine if the findings hold true in a sample of students of different ages.

### **Summary and Clinical Implications**

In sum, the current study extended Vaughn and Hoza's (2012) study on the incremental clinical utility of ADHD assessment measures by examining a measure of functional impairment as part of an ADHD assessment battery with Spanish-speaking, Latino families. Results of the current study support those of Vaughn and Hoza's study in terms of the correspondence between teacher-reports of ADHD symptoms and final clinical judgment, but diverge from Vaughn and Hoza's findings regarding the relationship between parent-reports of ADHD symptoms and final clinical judgment. While teachers were consistently in agreement with final clinical judgment when reporting on symptoms of inattention and hyperactivity/impulsivity, Latino parents in the current sample were more often in agreement with final clinical judgment when reporting on symptoms of hyperactivity/impulsivity than when reporting on symptoms of inattention. Contrary to expectations, results of the current study also indicate that parent- and teacher-reports of functional impairment did not add incremental utility beyond that of parent- and teacher-reports of ADHD symptoms. Follow-up analyses, however, revealed that both parent- and teacher-reports of ADHD symptoms and functional impairment have high diagnostic utility when examined individually. Lastly, results indicate that teacher-reports of ADHD symptoms and functional impairment add incremental utility beyond that of parent-reports of ADHD symptoms and functional

impairment, highlighting the importance of obtaining both parent- and teacher-reports in ADHD assessments.

The current study also has important clinical implications. Previous research has shown that, although rates of psychopathology in the Latino population are similar to or higher than other groups, Latinos are less likely than other groups to seek and receive high-quality mental health assessment and treatment services (DHHS, 2001; Flores, 2010). As this population continues to grow, mental health service providers need to know how to best serve this group. Research must continue to identify the most efficient and effective measures in diagnosing mental health conditions in Latino youth, including ADHD. Results of the current study shed further light on the degree of agreement between clinicians and parents and teachers, and support the use of parent- AND teacher-reports of symptoms AND functional impairment in assessing ADHD. Use of evidence-based practice is vital to promoting efficient, effective ADHD assessment. This is of the utmost importance when working with Latino families, as both cultural and practical barriers may otherwise interfere with individuals receiving the care they need (Kouyoumdjian, Zamboanga, & Hansen, 2003).



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