

# Understanding and Measuring Functional Impairment in Diverse Children with ADHD: Development and Validation

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UNDERSTANDING AND MEASURING FUNCTIONAL IMPAIRMENT IN DIVERSE  
CHILDREN WITH ADHD: DEVELOPMENT AND VALIDATION  
OF THE ADHD-FX SCALE

by

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ABSTRACT  
UNDERSTANDING AND MEASURING FUNCTIONAL IMPAIRMENT IN DIVERSE  
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The current study sought to develop and validate a measure to assess functional impairment related to ADHD (i.e., difficulties with academic achievement, social competence, and familial relationships) for Latino families, as research suggests that functional impairment may be a more culturally-universal construct than symptomatology. Researchers integrated quantitative and qualitative information obtained from a community sample of 74 Latino parents in order to develop the ADHD-FX scale. The overall ADHD-FX scale, as well as each subscale (i.e., school, peer, and home) demonstrated adequate psychometric properties, diagnostic utility, and cultural properties with 62 Latino parents of school-aged children. Thus, results suggest that the ADHD-FX scale can be used as a culturally- appropriate diagnostic tool, as well as a method to conceptualize cases, guide culturally-appropriate intervention, and measure clinically meaningful treatment gains in the domains of academic, social, and familial impairment often experienced by children with ADHD and their families. Utilization of culturally appropriate methodologies (such as the ADHD-FX scale) by researchers and clinicians alike may contribute to a thorough understanding of how diverse families conceptualize, recognize, and respond to intervention for functional impairment related to childhood psychopathology and subsequently may be instrumental in appeasing mental health disparities for diverse children in our country.

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## Introduction

Measuring and understanding functional impairment in diverse children with Attention-Deficit/Hyperactivity Disorder (ADHD) is an essential, yet frequently overlooked construct in the field of psychology. Beyond displaying inattentive and hyperactive/impulsive symptoms, children with ADHD frequently exhibit lifelong difficulties in functioning within their classroom, peer group, and family system (Flory, Molina, Pelham, Gnagy, & Smith, 2006; Molina et al., 2008; Smith, Barkley, & Shapiro, 2006). Additionally, although culturally-sensitive epidemiological research suggests that ethnic minority children (particularly within the rapidly growing Latino population) are at as great or greater risk for displaying ADHD (Faraone, Sergeant, Gillberg, & Biederman 2003; Flores et al., 2002; Kataoka Zhang, & Wells, 2002; U.S. Department of Health and Human Services, 2001), there are unfortunate mental health disparities which leave Latino children under-diagnosed and underserved compared to non-minority children (e.g., Alegria, Mulvaney-Day, Woo, Torres, Gao, & Oddo, 2007; Eraldi, Mazzuca, Clarke, & Power, 2006; Rothe 2005). Initial research suggests that the unmet service need for Latino children with ADHD may in part be due to disconnect between available mental health services and Latino families' cultural worldviews (Callejas, Nesman, Mowery, & Garnache, 2006; Flores et al., 2002, Rothe, 2005). In order to provide the best possible assessment and treatment for Latino children with ADHD, clinical research and practice should include examination of functional impairment related to ADHD in diverse samples, as this appears to be a more universally-shared construct across cultures than DSM-IV-TR symptoms (Arcia and Fernández, 2003a, 2003b; Bauermeister et al, 2005; Gerdes, Lawton, Haack, & Hurtado, 2011).

Unfortunately, there is a current lack of practical, efficient, and culturally-appropriate assessment measures examining functional impairment related to ADHD (Gordon et al., 2006; Haack & Gerdes, 2011; Karpenko, Owens, Evangelista, & Dodds, 2009; Pelham, Fabiano, & Massetti, 2005). Such a measure not only would improve assessment procedures for Latino

children with ADHD, but also would guide culturally-appropriate treatment and measure clinically meaningful treatment gains in the domains of functional impairment experienced by all children with ADHD and their families. Thus, the goal of the current study was to develop and validate a culturally-appropriate measure to assess functional impairment related to ADHD (i.e., difficulties with academic achievement, social competence, and familial relationships).

### **Functional Impairment Related to ADHD**

ADHD is one of the most prevalent mental health disorders found in children throughout the world, affecting 3-10% of children from various ethnic and cultural backgrounds (American Psychiatric Association [APA], 2000; Bird, ShROUT, Duarte, Shen, Bauermeister, & Canino, 2008; Faraone, Sergeant et al., 2003). To receive an ADHD diagnosis, a child must display six or more symptoms of inattention (IA), six or more symptoms of hyperactivity/impulsivity (HI), or six or more symptoms from both domains for at least six months since the age of seven (APA, 2000). Another required, yet often disregarded, criterion to warrant a diagnosis of ADHD is that children must experience difficulties in at least two settings (i.e., classroom, peer group, or home) that impair their life functioning (APA, 2000; for full review, see Gordon, et al., 2006). Thus, along with the core symptoms, children with ADHD typically experience substantial impairments in areas of academic achievement, social competence, and familial relationships.

Children often are first identified as displaying ADHD when they begin school and start to demonstrate difficulties that interfere with their learning and the learning environment of others (for full reviews, see DuPaul, 2007; Raggi & Chronis, 2006; Smith et al., 2006). For example, children with ADHD often exhibit more negative, off-task classroom behaviors, such as interrupting instruction or leaving their seat, as well as less positive classroom behaviors, such as academic engagement and focusing, than their peers (Abikoff, et al., 2002; Vile Junod, DuPaul, Jitendra, Volpe, & Cleary, 2006). In addition, children with ADHD often experience more negative relationships with their classmates and teachers, as evidenced by more noncompliance and verbal/physical aggression (Abikoff et al., 2002). Such difficulties (along with the frequent

co-occurrence of learning disorders) can lead children to demonstrate poorer academic performance, such as lower standardized test scores and report card grades, as well as higher rates of grade retention, drop-out, and expulsion (DuPaul, 2007; Raggi & Chronis, 2006).

Additionally, ADHD and its associated behaviors of noncompliance, disruptiveness, and aggression have been identified as contributing to childhood peer difficulties (for full review, see Hoza, 2007). In general, children with ADHD are often less well-liked, have fewer friends, and suffer more peer rejection compared to children without ADHD (Hoza et al., 2005). These children often display difficulty making new friends and difficulty maintaining stable relationships with the friends they do have (Blachman & Hinshaw, 2002; Dupaul, McGoey, Eckert, & VanBrakle, 2001). Furthermore, studies have found that even when children with ADHD are placed in new settings, they are immediately rejected and excluded and seen as less well-liked and popular (e.g., Blachman & Hinshaw, 2002), suggesting that the peer difficulties faced by children with ADHD “follow them wherever they go” (Hoza, 2007).

In addition to strained peer relationships, children with ADHD experience more difficult relationships with their parents and families than comparison children. Specifically, children with ADHD and their parents often exhibit more negative behaviors and fewer positive behaviors when interacting with each other (Dupaul, et al., 2001; Keown & Woodward, 2002). Parents of children with ADHD often become overly directive and negative (for review, see Anastopolous & Farley, 2003), feel less knowledgeable and efficacious about their parenting (Cunningham & Boyle, 2002; Shelton et al., 1998), and experience significant stress related to parenting (Dupaul, et al., 2001; Johnson & Mash, 2001; Shelton et al., 1998). In addition to concerns related to their children’s ADHD, these parents often experience a wide variety of personal difficulties. For example, parents of children with ADHD display higher rates of ADHD themselves, as well as depression and substance abuse disorders (Chronis et al., 2003; Cunningham, Bennes, & Siegel, 1988; Cunningham & Boyle, 2002; Schill et al., 1999; Thompson et al., 2004). Finally, families of children with ADHD are likely to experience more overall conflict, adversity, and marital

discord than families of children without ADHD (Cunningham & Boyle, 2002; Murphy & Barkley, 1996; Schill et al., 1999).

Although most of the research examining functional impairment in children with ADHD has been conducted with predominantly middle class, Caucasian families, initial research suggests that these constructs may be relevant to families from various cultural backgrounds. An excellent example can be found in a study by Bauermeister et al. (2005) investigating 98 mothers of school-aged children in Puerto Rico whom did and did not meet criteria for ADHD (based on comprehensive assessments). Within the domain of academic impairment, Latino children diagnosed with ADHD displayed lower reading, spelling, and math achievement scores than Latino children without ADHD. In relation to social impairment, Latino children with ADHD were identified as less socially competent than their peers, with combined-type children displaying less social control and sensibility and inattentive-type children displaying less social initiation and assertiveness. With regards to impairment affecting the family system, Latino parents of children with ADHD reported higher rates of parenting stress and poorer parenting practices in response to their child's behaviors than did parents of children without ADHD. Thus, Latino parental reports of increased academic, social, and familial impairment in children appear considerably similar to results found in predominantly European American samples.

Not only does functional impairment seem to be a relevant construct for Latino families, research suggests it may be an even more culturally-appropriate diagnostic criterion than ADHD symptomatology. For example, in a study by Arcia and Fernández (2003a) investigating Latina mothers' help-seeking behaviors for childhood ADHD, the majority of mothers did not identify ADHD symptoms as present or problematic in their children; however, the most frequently reported catalyst for seeking help was academic impairment (specifically, school reports of negative classroom behavior).

These results are supported by a study by Gerdes et al. (2011) examining problem recognition of ADHD symptoms and related impairment with Latino parents. In this study, HI

symptoms were positively correlated with Anglo orientation, suggesting that parents who are more Anglo-aculturated may endorse more HI symptoms in their children. Although one could argue that this relationship is due to a higher prevalence of HI symptoms in children with Anglo-oriented parents, if the relationship was due to a true difference in ADHD incidence and presentation, one would expect that higher ratings of Anglo-orientation also would relate to impairment, which they did not. To further examine this phenomenon, the diagnostic utility of ADHD symptoms was examined. Interestingly, HI symptoms revealed low diagnostic utility in predicting both the presence and absence of ADHD, suggesting that many Latino parents in the study perceived HI behaviors as developmentally normative, rather than indicative of psychopathology. Additionally, although parental endorsement of ADHD symptoms (particularly HI symptoms) emerged as culturally-biased and failed to provide diagnostically useful information, parental ratings of functional impairment (specifically, problems with learning, aggression, executive functioning, and peer interactions) emerged as culturally-universal. In sum, while problem-recognition related to ADHD symptomatology may differ on cultural background, it appears that the construct of functional impairment related to ADHD is more universal and similarly identified by all parents.

In sum, the research indicating that children with ADHD suffer significant functional impairment in the domains of academic achievement, social competence, and familial relationships is particularly important given the impact these difficulties have on a child's well-being and positive adjustment (Pelham et al., 2010). Additionally, while externalizing symptoms may be difficult for Latino parents to recognize and identify as problematic due to differential cultural values and beliefs (Arcia and Fernández, 2003a, 2003b; Schmitz & Velez, 2003; Rothe 2005), it appears that functional impairment is a construct that may be relevant to all parents (Arcia and Fernández, 2003a; Bauermeister et al., 2005; Gerdes et al., 2011). Thus, the functional impairments children with ADHD and their families experience in the domains of academic

achievement, social competence, and familial relationships are important to consider when working with Latino children and their families.

### **Assessment of Functional Impairment and Cultural Factors in Diverse Children with ADHD**

Current guidelines emphasize that the intent of an ADHD assessment should extend beyond informing diagnostic impressions. Specifically, comprehensive ADHD assessments should contribute to evaluation of treatment considerations, specification of treatment goals and targets, and measurement of treatment progress and outcomes (DuPaul et al., 2007; Pelham et al., 2005). Thus, since functional problems associated with ADHD often are the most salient presenting problems identified in children with ADHD (Gordon et al., 2006; Pelham et al., 2005), especially for ethnic minority children and families (Arcia and Fernández, 2003a, 2003b; Rothe, 2005), attention to functional impairment should be included in the assessment and monitored for clinically meaningful improvement when working with Latino children with ADHD and their families. Additionally, when assessing for ADHD in culturally-diverse populations (such as Latino children), experts emphasize the importance of using culturally-appropriate assessment measures (APA, 2003; Huey & Polo, 2008; Padilla & Medina, 2001). The failure to acknowledge ethnic and cultural background can lead to biased assessments, as well as incorrect inferences and interpretations due to several practical and cultural factors (Canino & Spurlock, 2000; Ridley, Hill, & Wiese, 2001). For example, a substantial proportion of the U.S. Latino population does not speak English and an even higher proportion does not read English above an intermediate grade level (U.S. Census, 2000). Thus, one's reading level and English proficiency are crucial practical factors to consider in order to provide culturally-appropriate assessments for the Latino population (Rothe, 2005; Padilla & Medina, 2001).

Additionally, several cultural factors have been shown to influence mental health assessments for Latino children and families, including attitudes, beliefs, values, and expectations that are different than what is traditionally displayed in European American families (Rothe,

2005; Padilla & Medina, 2001; Schmitz & Velez, 2003). For example, Latino parents who emphasize collectivist cultural values, such as “personalismo” and “familismo,” often are more accepting and understanding of their children’s conduct and thus may be less likely to identify their child’s externalizing behaviors as problematic (Arcia and Fernández, 2003a, 2003b; Schmitz & Velez, 2003). Furthermore, the strong influence of religion or “espiritualismo” in Latino culture may contribute to more alternative or supernatural explanations for mental illness rather than traditional biopsychosocial models that predominate in the U.S. (Lujan & Campbell, 2006; Skinner, Correa, Skinner, & Bailey, 2001; Yeh, Hough, McCabe, Lau, & Garland, 2004; Yeh, McCabe, Hough, Lau, Fakhry, & Garland, 2005). Thus, cultural factors that impact the way parents view mental illness and subsequently respond to assessment questionnaires should be considered when striving for culturally-appropriate assessments with Latino families.

In summary, in order to provide culturally-appropriate ADHD assessments to Latino children and their families, several practical factors, such as reading level and English proficiency, as well as cultural factors, need to be considered. Fortunately, although measures of externalizing symptoms appear to be influenced by cultural factors, examination of functional impairment may be less at-risk for bias. Specifically, given that the Latino population is less likely to display a biopsychosocial model of mental illness (Yeh, et al., 2004; Yeh et al., 2005) and is more likely to display a collectivist worldview with values like “familismo” (Halgunseth, Ispa, & Ruddy, 2006; Miranda, Bilot, Peluso, Berman, & Van Meek, 2006), Latino parents may be more likely to identify functional problems experienced by the environment (e.g., impaired academic, social, or family functioning) rather than symptoms by the child.

Current methodology and limitations. Up to this point, comprehensive, childhood ADHD assessments require utilization of various measures investigating individual domains of functioning (Haack & Gerdes, 2011; Pelham et al., 2005). For example, researchers and clinicians often examine academic impairment with objective school-performance measures, such as report card grades or the Homework Problems Checklist (Anesko, Schoiock, Ramirez, & Levine, 1987).

Additionally, social impairment can be assessed with interpersonal competency questionnaires completed by the parent, teacher, or child themselves, such as the Social Skills Rating System (parent/teacher measure; Gresham & Elliot, 1989) or the Harter Self-Perception Profile for Children (child measure; Harter, 1982). Various questionnaires may be used to assess impairment in familial relations related to childhood ADHD. For example, overall family turmoil and disorder can be assessed with the Confusion, Hubbub, and Order Scale (CHAOS; Matheny, Wachs, Ludwig, & Phillips, 2005). Additionally, several aspects of parenting can be assessed from various scales, such as rates of positive and negative parenting strategies (Alabama Parenting Questionnaire [APQ]; Shelton, Frick & Wootton, 1996), parenting efficacy (Parenting Sense of Competence Scale [PSOC]; as cited in Johnston & Mash, 1989) and parenting stress (Parenting Stress Inventory-Short Form, [PSI-SF]; Abidin, 1995). Furthermore, several larger behavioral questionnaires contain subscales related to functional impairment (e.g., Social Problems and Rule Breaking Behavior on the CBCL/6-18 [Achenbach & Rescorla, 2001; Spanish translation by Rubio-Stipec, Bird, Canino, and Gould, 1990] and Learning and Peer Problems on the Conners-3 [Conners, 2008]), although these subscales are comprised of only a few items. Thus, to offer well-informed, comprehensive ADHD assessments emphasizing functional impairments, providers must make a conflicting choice of utilizing several measures of individual impairment domains (proving time consuming and costly) or utilizing broad measures (lacking rich detail about impairment domains).

In addition, although experts have begun to call for examination of clinically meaningful treatment gains on an individual/family level in addition to traditional null hypothesis significance testing (NHST) examining if group changes are more than what would be expected given chance alone (e.g., Gerdes et al., 2011; Karpenko et al., 2009), there is a lack of ADHD assessment measures emphasizing functional impairment that can perform both types of investigation. Specifically, the “gold standard” of classifying clinically significant treatment outcomes is that of Jacobson and Truax (1991; Lambert & Ogles, 2009), which examines whether

each individual demonstrates reliable change and moves into a range of normal functioning pre to post treatment. The method utilizes reliable change indices (RCI) determined from norms collected from a non-clinical population, while range of normal functioning is determined by norms from both a non-clinical and clinical population. Unfortunately, the norms needed to examine RCI and normal range of functioning are not available for many ADHD assessment measures of functional impairment (e.g., test-retest reliability; Haack & Gerdes, 2011), making calculation of clinically meaningful change impossible (Lambert & Ogles, 2009; Ogles et al., 2001). Thus, clinicians and researchers examining treatment outcomes must rely solely on NHST, despite its lack of information about the “size, importance, or clinical significance” of treatment effects for the individual (Jacobson & Truax, 1991, p. 12).

Finally, despite recent advancements, there are several limitations to the available ADHD assessment methods evaluating functional impairment in diverse populations. To begin, culturally-appropriate, comprehensive ADHD assessments that examine symptoms, as well as functional problems prove to be time-consuming and costly (Fabiano et al., 2009; Pelham et al., 2005). While multiple measures assessing specific areas of functional impairment provide useful and rich information, the use of numerous rating scales can create a tedious and inefficient assessment process. This is especially true considering that functional impairment should be assessed not only prior to treatment, but also at several points during and after treatment to monitor progress and improvement (Pelham et al., 2005). As a consequence, comprehensive assessments are rarely utilized in everyday practice. More often, symptom-rating scales are used to diagnose and assess treatment progress for convenience and practicality (Pelham & Fabiano, 2001), despite research suggesting the limited ability of symptoms to predict functional impairment (Gordon et al., 2006; Pelham et al., 2005). Regrettably, this causes functional problems to go unrecognized, and therefore absent from consideration during treatment planning and evaluation of treatment progress and outcomes (Pelham et al., 2005).

Furthermore, even with recent efforts to translate and validate assessment measures for diverse populations, this effort may be a step short of what is truly necessary. To date, all studies examining the use of functional impairment measures with the Latino population have utilized translation of measures originally developed with predominantly European American families (Haack & Gerdes, 2011). Within these studies, most measures demonstrated psychometric validity, but not necessarily cultural validity. For example, a study by Haack et al. (2011) found that while several measures assessing familial impairment emerged as culturally valid by relating as theoretically hypothesized with measures of acculturation, several subscales assessing specific parenting strategies and discipline did not. It is not difficult to imagine how even impeccably translated questions regarding parenting strategies and discipline commonplace in European American households (e.g., Time Out) may seem irrelevant to families from a dissimilar cultural background who employ different strategies (e.g., corporal punishment; Regalado, Sareen, Inkelas, Wissow, & Halfon, 2004; Monzo & Rueda, 2006). As a solution, rather than simply translating preexisting measures, theorists have suggested that creating measures with input directly from the members of the target population may lead to more culturally-appropriate assessments (Haack & Gerdes, 2011).

In summary, to best assess functional impairment experienced by Latino children with ADHD, it is necessary to create a practical and efficient assessment measure with the specific population and their cultural attitudes, beliefs, values, and expectations in mind. Doing so will improve diagnoses, guide case conceptualization and intervention planning, and provide the ability to examine clinically meaningful treatment gains in the domains of academic achievement, social competence, and familial relations often impaired in children with ADHD. Ultimately, the creation of such a measure may contribute to appeased mental health disparities between Latino and non-minority children with ADHD.

### Specific Aims

The goal of the current study was two-fold. First, following multicultural guidelines emphasizing the importance of creating assessment measures designed for a target population (e.g., Padilla & Medina, 2001), a quantitative and qualitative investigation of parental perceptions of problem recognition and functional impairment related to ADHD in the Latino community was conducted. Based on information collected in this investigation, a scale designed to assess functional impairment related to ADHD in Latino children was developed. Finally, the scale was validated with a different group of Latino parents to establish psychometric properties, diagnostic utility for ADHD assessments, and cultural properties. The following predictions were made:

1. It was predicted that information from the quantitative and qualitative investigation with a community sample of Latino parents would provide ample information for developing the ADHD-FX scale.
2. It was predicted that the ADHD-FX scale would demonstrate adequate psychometric properties.
  - a. Specifically, it was predicted that each theoretical subscale of the ADHD-FX (i.e., school, peer, and home) would demonstrate good reliability, as evidenced by adequate internal consistency (i.e., Chronbach's alpha values  $\geq .70$ ) and test-retest reliability (i.e., significant correlation coefficients between administrations  $p \leq .05$ ).
  - b. Finally, it was predicted that all subscales and the overall ADHD-FX would demonstrate adequate convergent construct validity (i.e., would correlate with theoretically-related measures). Specifically, it was predicted that the ADHD-FX scale would be positively related to brief subscales of impairment on the Child Behavior Checklist/6-18 (CBCL/6-18; Achenbach & Rescorla, 2001; Spanish translation by Rubio-Stipec, Bird, Canino, and Gould, 1990; specifically the

Social Problems and Rule Breaking Behaviors subscales) and the Conners-3 (Conners, 2008; specifically the Learning Problems and Social Problems subscales).

3. It was predicted that all subscales and the overall ADHD-FX would demonstrate good diagnostic utility in correctly predicting the presence or absence of an ADHD diagnosis.
  - a. Specifically, it was predicted that impairment ratings on all subscales and the overall ADHD-FX would reliably predict group membership of children who do and do not meet criteria for an ADHD diagnosis (as evidenced by significant discriminant analysis).
  - b. Additionally, it was predicted that all subscales, the overall ADHD-FX, and individual scale items would demonstrate utility in correctly predicting the presence or absence ADHD diagnosis (as evidenced by high values of positive and negative predictive power).
  - c. Finally, it was predicted that there would be sufficient data from the community sample to establish Reliable Change Indices (RCI) and ranges of normal functioning necessary for measurement of clinically meaningful change.
4. Finally, it was predicted that all subscales and the overall ADHD-FX would demonstrate universal cultural properties.
  - a. Specifically, it was predicted that Latino parents' responses on the Acculturation Rating Scale for Mexican Americans-II (Cuéllar et al, 1995) and the Mexican American Cultural Values Scale for Adolescents and Adults (MACV; Knight et al., 2009) would not be significantly correlated with their responses on the ADHD-FX scale, thus suggesting universal cultural properties of the scale.

## Method Part 1: ADHD-FX Development

### Participants

Participants in this study included 74 parents, all of whom self-identified as Latino and had at least one child between the ages of 5 and 12 years. Participants included 47 mothers and 25 fathers, the majority of whom were Latino, Mexican descent (87.80%), have lived in the United States for more than 10 years (71.6%), and spoke only Spanish (40.50%) or primarily Spanish and some English (41.90%). The mean age of participants was 37.3 years ( $SD = 5.3$ ). See Table 1 for more detailed demographic information.

### Procedure

**Recruitment.** Several multicultural guidelines were employed in an effort to improve Latino participation in clinical research. First, in order to combat language and educational barriers, it is recommended that all research materials be available in both English and Spanish and in easy-to-comprehend and familiar language (Haack et al., 2011; National Institutes of Health [NIH], 2002; Ojeda et al., 2010), which was emphasized in the current study. In addition, to combat practical barriers that often inhibit Latino participation in clinical research, guidelines recommend offering data collection at trusted locations in the community during evening or weekend hours with childcare and financial compensation (e.g., NIH, 2002; Ojeda et al., 2010), all of which were utilized in the current study. To combat cultural barriers, such as potential hesitancy/distrust towards mental health professionals and university personnel, mutually-beneficial partnerships with trusted individuals in the community (e.g., school personnel, religious leaders/personnel) have been recommended (Loue & Sajatovic, 2008; National Institute of Health [NIH], 2002; Yancey, Ortega, & Kumanyika, 2006). In the currently study, researchers established a collaborative relationship with a priest of a large parish in the Latino community and worked closely with him throughout data collection. Additionally, in order to appeal to traditional Latino values, such as “personalismo,” “respeto,” “familismo,” and “machismo,” it is recommended that research staff be warm and friendly and encourage all members of the family

to participate (Haack et al., 2011), which was emphasized in the current study. Please see below for more detailed explanation of recruitment.

First, members of the church personnel distributed a letter describing the current project in the church bulletin. The letter informed parents that in an effort to better help and serve the Latino community, researchers were requesting their participation in a study to examine how Latino parents think about child behavior and family functioning. They were informed that their participation would include viewing a series of video clips displaying a child in several settings, completing several questionnaires, and responding to a brief interview. They also were informed that the procedure would include attending a session at their church for approximately ninety minutes and would result in each participating parent receiving a \$10 gift card. Finally, they were informed that as part of the partnership between their congregation and Marquette University, as well as a thank-you for their congregation's participation in the study, they and all members of their congregation were invited to participate in a workshop intended to benefit the church community by generating discussion about family functioning and discussing ways to improve family harmony.

In addition to the letters, church personnel endorsed participation to congregation members face-to-face. Specifically, the investigation was announced in mass and at church events to initially inform and later remind parents about dates and times that they could participate. These face-to-face endorsements by church personnel were intended to alleviate discomfort and hesitancy with the university investigators and mental health research, which has been suggested to prevent ethnic minority participation in clinical research (Loue & Sajatovic, 2008; NIH, 2002; Yancey et al., 2006).

**Data collection.** Sessions occurred at the congregation at end of church-sponsored events. Each parent was introduced to a bilingual research assistant who was available to answer questions or provide clarification during the session. Parents were given the option to complete the session in English or Spanish. Following the consent process, parents completed a 120 minute

procedure involving the viewing of videos and completion of an interview and questionnaires focused on child behavior and cultural functioning. Relevant to the current study, parents first viewed the ADHD Behavioral Impairment Video (BIV, Haack, Gerdes, Lawton, & Schneider, 2011, as cited in Haack, Schneider, & Gerdes, 2011), which was developed to assess ADHD problem recognition in various domains of functional impairment: at home, at school, and with peers. Following the video, parents completed the Problem Recognition Questionnaire (PRQ) for ADHD (Haack, Gerdes, Lawton, & Schneider, 2011, as cited in Haack, Schneider, & Gerdes, 2011). Parents were shown the BIV settings in counter-balanced order to prevent carryover from domains.

### **Measures**

Measures of interest for Part One of the current study include the ADHD Behavioral Impairment Video (Haack, Gerdes, Lawton, & Schneider, 2011, as cited in Haack, Schneider, & Gerdes, 2011), the Problem Recognition Questionnaire (PRQ) for ADHD (Haack, Gerdes, Lawton, & Schneider, 2011, as cited in Haack, Schneider, & Gerdes, 2011), and a demographic form. All measures were available in English and in Spanish.

**ADHD Behavioral Impairment Video (BIV; Haack, Gerdes, Lawton, & Schneider, 2011, as cited in Haack, Schneider, & Gerdes, 2011).** The ADHD BIV was developed as a stimulus for assessing parental problem recognition of ADHD in a community sample. The BIV consists of nine, 1-minute, language-free clips of an 8-year-old, Latino boy in three settings (i.e., home, school, and with peers). The scenes were scripted in order to ensure that the confederate child in the video displayed behaviors consistent with the core symptoms of ADHD, as well as functional problems commonly associated with ADHD in the domains of academic, social, and familial impairment. A three-phase pilot study was completed to determine which symptoms and functional problems raters consistently endorsed after viewing the BIV. Initially, four members of a university-based ADHD research lab viewed the BIV and completed the PRQ. Symptoms and functional impairments endorsed by at least 75% of the ADHD lab members were considered

present. Next, ten clinical child psychology doctoral students viewed the BIV and completed the PRQ as a manipulation check; the graduate students endorsed items generally consistent with decisions made by the ADHD lab. As a final check, ten mothers of school-aged children from the community viewed the BIV and completed the PRQ. Ultimately, symptoms and functional problems endorsed by at least 70% of the mothers in the pilot study were considered present. Of these items, the ADHD lab endorsed all symptoms and functional problems in the first phase of the pilot and the clinical child psychology doctoral students endorsed 85% of symptoms and 100% of functional problems in the second phase of the pilot.

**Problem Recognition Questionnaire (PRQ) for ADHD (PRQ; Haack, Gerdes, Lawton, & Schneider, 2011, as cited in Haack, Schneider, & Gerdes, 2011).** The PRQ is a measure created to assess problem recognition of ADHD symptoms and related functional problems in a community sample. The measure was designed to be completed after viewing the BIV (see above for description). Specifically, after viewing each setting, parents first were instructed to describe behaviors they saw in the videos. Next, parents were provided a list of all DSM-IV-TR ADHD symptoms, as well as eight functional problems related to ADHD for each setting (i.e., home, school, and with peers). Functional problems from the PRQ were developed based upon common treatment goals identified at a university-based ADHD clinic serving diverse populations. Parents were instructed to circle the symptoms and functional problems they observed in the video, and then give circled items a severity rating on a 4-point Likert scale, with greater numbers indicating greater problem severity. This measure was created in Spanish and English.

**Demographic Form.** A demographic questionnaire was administered to collect general information about each participant, such as age, gender, income, educational attainment, and generational status.

## Results Part 1: ADHD-FX Development

### Coding of Qualitative Responses

Qualitative responses on the PRQ were typed and coded by two bilingual research assistants trained in cultural competency and ADHD assessment. Specifically, each qualitative response on the PRQ was coded with a 1, 2, or 3; a coding of a “1” represented a response identical to a DSM-IV symptom or functional problem on the PRQ, a “2” represented a response similar to a DSM-IV symptom or functional problem on the PRQ. Responses receiving a “1” or a “2” also were coded with as many corresponding symptoms/functional problems from the PRQ as appropriate. For example, a response of “always bothered his brother,” received a “2,” and was coded as corresponding with “disruptive or bothersome to sibling.” A response of “was distracted and didn’t listen during class” received a “2” and was coded with one symptom and one functional problem: “easily distracted” AND “had difficulty listening during class instruction.” Responses were coded with a “3” if they described a new phenomenon not already captured by a symptom or functional problem on the PRQ. For example, a response of, “is in his own world,” was coded with a “3” as the phenomenon was not captured by any of the symptoms or functional problems on the PRQ. Both research assistants independently coded each response.

Next, a panel of the two research assistants and a faculty expert in ADHD met to discuss discrepancies in coding and finalize all coded responses. Specifically, each response was discussed by the panel and decidedly coded with 1, 2, or 3 (see above for more description of numbered codes). Next, all responses that decidedly corresponded with a symptom/functional problem were reviewed by the panel a final time to ensure appropriateness of coding. Lastly, all responses that were decidedly coded as “3” were examined by the panel to determine new phenomena that had not already been captured by DSM-IV symptoms or items on the PRQ. Consistent with other Grounded Theory qualitative research (first introduced by Glaser & Strauss,

1967), themes that were identified repeatedly (i.e., by at least 10% of the sample; i.e., at least 7 parents) were developed into new codes.

### **Reliability of Qualitative Coding**

As seen in Table 2, Columns A and B display information about how many parents qualitatively provided responses corresponding to each functional problem on the PRQ. Specifically, column A displays how many parents provided a response corresponding to the functional problem ( $n$ , % of  $N$ ); column B displays how many of these parents described the behavior as “pretty much or very concerning” ( $n$ , % of parents whom endorsed the behavior). Interrater reliability for initial coding between the two research assistants was high ( $r = 0.97$ ); inter-rater reliability for initial coding between the two research assistants and the final decisions made by the panel was high ( $r = 0.94$  and  $0.96$ , respectively).

In addition to items corresponding to PRQ functional problems, seven new themes emerged (see Table 3). Table 3 provides information about how many parents qualitatively provided responses corresponding to one of the seven new phenomenon codes. Specifically, column A provides how many parents provided a response corresponding to the phenomenon ( $n$ , % of  $N$ ); column B provides how many of these parents described the behavior as “pretty much or very concerning” ( $n$ , % of parents whom endorsed the behavior). Inter-rater reliability for initial coding between the two research assistants was high ( $r = 0.93$ ); inter-rater reliability for initial coding between the two research assistants and the final decisions made by the panel was high ( $r = 0.94$  and  $0.99$ , respectively).

### **Scale Creation**

Items were chosen for the ADHD-FX scale based on the qualitative and quantitative responses on the PRQ. Based on previous research utilizing Grounded Theory, as well as examination of the current data distribution, items were chosen for the scale if they were endorsed by 10% of participants (i.e., at least 7 parents) on the qualitative piece and/or two-thirds of participants (i.e., at least 49) on the quantitative piece. Tables 2 and 3 provide information about

how many parents endorsed each item as present on the qualitative and quantitative pieces of the PRQ, as well as how many of these parents whom endorsed the item as present also endorsed it as “pretty much or very concerning.” In order to best ensure that items were based upon language that would be relevant and comfortable for parents, final wording was chosen based on the responses most often initiated on the qualitative piece of the PRQ. For example, the ADHD-FX item “doesn’t respect others around him (e.g., parents, siblings, and/or family members)” was created because similar wording frequently emerged in the qualitative responses related to the new theme of “respecting others.” Additionally, wording was altered for items from the original PRQ if parental responses trended toward different grammar or vocabulary usage. For example, the PRQ item, “had difficulty following teacher instructions” was worded on the ADHD-FX scale as “doesn’t pay attention to, follow, and/or obey teacher instructions” based on the numerous responses utilizing such wording. Finally, in order to minimize confusion and time-length of the measure, it was decided that items would fall under two settings: school and home. It was decided that items related to peer impairment would be encompassed under school based on overlap that emerged in analysis of school and peer PRQ qualitative and quantitative responses. Please see Appendix for completed version of the ADHD-FX Scale in Spanish and English.

## Method Part Two: ADHD-FX Scale Validation

### Participants

Participants for Part Two of the current study included 62 Latino parents of school-aged children in Southeastern Wisconsin; 50 were from a community sample (i.e., they had a child between the ages of 6-12 years who had never been diagnosed with or treated for ADHD) and 12 were from a clinical sample (i.e., they had child between the ages of 6-12 years who had been diagnosed with ADHD and was currently being treated for ADHD). Briefly, participants included 49 mothers and 13 fathers reporting a reported a mean age of 37.52 years ( $sd = 7.45$ ) and 39.22 years ( $sd = 6.70$ ) for the community and clinical settings, respectively. The majority of participants were of Latino, Mexican descent (65.51%) and Latino, Puerto Rican descent (12.90%). The sample was relatively variable in terms of socioeconomic variables (e.g., education level and income) and cultural variables (e.g., English proficiency, time in the U.S.). Children chosen to be the focus of the parental-rated behavioral questionnaires included 38 boys and 24 girls (mean age = 9.52 years,  $sd = 2.06$ ). See Tables 4 and 5 for more detailed demographic information for parents and children, respectively.

Preliminary analysis examining differences between the community and clinical samples revealed that the groups largely were similar with two exceptions. Specifically, parents in the community sample reported a majority proportion of Latino ethnicity, Mexican descent, whereas parents in the clinical sample were equally split between Latino ethnicity, Mexican descent and Puerto Rican descent ( $t = 3.25, p < .01$ ). Additionally, children chosen in the clinical sample were significantly older ( $t = 2.05, p < .05$ ) and a higher proportion were males ( $t = 6.73, p < .01$ ) than children chosen in the community sample. These results may be reflective of differences in help-seeking for Latino families in the U.S. related to parent ethnicity, child age, and child gender.

## Procedure

**Recruitment.** As described in Part One, researchers followed multicultural guidelines (e.g., Loue & Sajatovic, 2008; National Institute of Health [NIH], 2002; Yancey et al., 2006) to maximize participation of Latino parents in Part Two of this study. Please see below for specific strategies utilized in both the community and clinical settings.

**Community sample.** In order to recruit parents of children in the community, a partnership with a local charter school serving predominately Latino families was established. Bilingual research assistants engaged in face-to-face recruitment by stationing information tables at school events (e.g., parent-teacher conferences, academic orientation). Parents who approached the information tables were informed about the project and were provided with a letter describing the study in more detail. The letter indicated that in an effort to better help and serve Latino families, researchers were conducting a project to develop a culturally-appropriate ADHD assessment measure for use with the Latino community. The letter described that participation would include completing several questionnaires about child behavior and cultural attitudes, beliefs, and expectations. They were informed that eligible participants included parents who self-identified as Latino and had at least one child between the ages of 6-12 years whom had never been diagnosed with or treated for ADHD. The letter also indicated that each parent would receive a \$20 gift card for completing the initial packet of questionnaires (lasting approximately 60 minutes) and an additional \$5 gift card for completing a shorter packet of questionnaires (lasting approximately 15 minutes) 1-2 weeks later. Interested parents provided their names and telephone numbers for a follow-up call to discuss specific dates for data collection and confirm eligibility.

In addition to face-to-face strategies, researchers utilized word-of-mouth recruitment (as recommended by previous studies recruiting Latino families, such as Loue & Sajatovic, 2008; NIH, 2002; Yancey et al., 2006). Specifically, after parents participated, they were asked to recommend the project to other potentially interested friends or family members. Willing parents

were provided with postage-paid postcards addressed to the researchers. Research assistants conducted follow-up calls to parents who returned postcards, discussing the project in more detail, confirming eligibility, and providing specific dates for data collection. While the majority of the ultimate sample was comprised of parents recruited face-to-face, the utilization of word-of-mouth recruitment provided enough augmentation to recruit the desired number of community-sample participants (i.e., 50 eligible parents) in the timeframe agreed upon by the researchers and the charter school (one academic semester).

***Clinical sample.*** Recruitment for the clinical sample occurred through partnerships established with several bilingual child mental health providers. Providers included one licensed marriage and family therapist and one psychiatrist at a children’s hospital, as well as one special education teacher at the charter school employed to recruit the community sample. Providers informed eligible parents (i.e., parents whom self-identified as Latino and had a child aged 6-12 years whom had been diagnosed with and/or treated for ADHD) about the project and provided them a letter describing the study in more detail (see above for letter description). Interested parents were introduced to the research assistants to discuss specific dates for data collection and confirm eligibility.

**Confirmation of correct group placement.**

***Community sample.*** The absence of significant history of child ADHD diagnosis or treatment was confirmed by responses on the demographic form and behavior rating scale scores. Specifically, participants’ data were excluded from the community sample if they listed their child as having been diagnosed with or treated for attention and/or hyperactivity problems, if they endorsed 6 or more symptoms as “2” or “3” on inattentive and/or hyperactive impulsive domains of the DBD, or if their child’s profile on the externalizing disorder subscale of the CBCL was in the borderline or clinical range (i.e., T scores higher than 65). Three participants were excluded from the community sample due to these exclusion criteria (a reasonable number given

the 3-10% base rate of ADHD in diverse children [APA, 2000; Bird et al., 2008; Faraone, et al. 2003]).

**Clinical sample.** The significant history of ADHD diagnosis and treatment was established with responses on the demographic form and confirmation from the referring provider. Specifically, parents of children seen at the children's hospital only were referred from their providers after their child had received an ADHD diagnosis following a comprehensive, multi-informant, and multi-modal assessment (i.e., evaluation integrating information from parents, teachers, and the child in the form of questionnaires, interviews, and neuropsychological testing). Parents of children served in the special education program only were referred from the special education teacher if the child was receiving services for problems of inattention, hyperactivity, and/or impulsivity following an IEP/504 evaluation.

**Data collection.** Based on multicultural recommendations to improve recruitment and satisfaction of Latino families in clinical research studies (e.g., Haack et al., 2012, Ojeda, 2011, Loue & Sajatovic, 2008; NIH, 2002; Yancey et al., 2006), data collection occurred at trusted and convenient locations for Latino parents. Specifically, data collection for parents in the community sample and parents referred from their child's special education teacher occurred at the end of the school day at their child's school. Data collection for parents of children referred by their provider at the children's hospital occurred in the waiting room during or after their child's session. Participants in both samples also had the option of making an appointment to complete data collection at the university if they so desired, although very few participants chose this option.

Following the consent process, parents completed a packet of pencil and paper questionnaires in Spanish or English based on their preference.<sup>1</sup> Parents were asked to choose one of their children between the ages of 6-12 years with or without a history of ADHD (as appropriate per their sample group) to be the subject of all of the behavioral questionnaires.

<sup>1</sup> All analyses were examined between Spanish and English versions and no differences emerged.

Directions for each questionnaire were reviewed and parents in the clinical sample were instructed to complete the behavioral questionnaires based on their child's *un-medicated behavior*. The four behavioral questionnaires were provided in counter-balanced order. Following completion of the behavioral questionnaires, participants completed the two cultural questionnaires (also in counter-balanced order). Parents were encouraged to seek help or clarification from a bilingual research assistant as needed. Once finished, packets were checked for completion and each parent was given a \$20 gift card for their participation. Additionally, parents were asked if they wished to complete two of the measures again in seven to fourteen days for an additional \$5 gift card. Interested parents set up an appointment with the research assistant and completed the procedure similarly. Parents in the clinical sample also were asked if they wished to provide two behavior questionnaires to their child's teacher for completion. They again were informed that teachers should mail the packet directly to the researchers and parents would not receive feedback from the teacher's responses. Interested parents were given a teacher packet including a cover letter describing the project and instructions for the packet completion, the two behavioral questionnaires measures labeled with their participant number, and a postage-paid envelope addressed to the researcher.

### **Measures**

Measures of interest for Part Two of the current study included the ADHD-FX scale, the Disruptive Behaviors Disorder Rating Scale (DBD; Pelham et al., 1992; Spanish translation by Haack, Gerdes, & Dieguez, 2010), the Child Behavior Checklist/6-18 (CBCL/6-18; Achenbach & Recorla, 2001; Spanish translation by Rubio-Stipec, Bird, Canino & Gould, 1990), and the Conners-3 (Connors, 2008). Additionally, the Acculturation Rating Scale for Mexican Americans-II (Cuéllar et al., 1995) and the Mexican American Cultural Values Scale for Adolescents and Adults (MACV; Knight et al., 2009) was utilized. Finally, a demographic form was employed.

**ADHD-FX Scale.** The ADHD-FX scale was created based on the quantitative and qualitative information obtained in Part One of the current study. The measure contains 32 items assessing for functional impairment commonly experienced by children with ADHD and their families, specifically within the domains of academic, social, and familial impairment. The ADHD-FX is available in Spanish and English.

**Disruptive Behavior Disorders (DBD) Rating Scale** (Pelham et al., 1992; Spanish translation by Gerdes et al., 2010). The DBD Rating Scale consists of 45 items containing the DSM-IV-TR symptoms of ADHD (e.g., often has difficulty awaiting turn, often talks excessively), ODD (e.g., often loses temper, often argues with adults,), and CD (e.g., often initiates physical fights, often bullies, threatens, or intimidates others,). Symptoms are rated as not at all (0), just a little (1), pretty much (2), or very much (3) present. Higher scores indicate greater severity of ADHD, ODD, and CD, depending on the specific scale. Higher total scores also indicate greater overall severity of disruptive behavior disorder symptomatology. The English version of the DBD has demonstrated adequate internal consistency (Chronbach alpha values  $>.70$ ; Gerdes & Hoza, 2006), as well as good diagnostic utility in predicting the presence of an ADHD diagnosis (Owens & Hoza, 2003).

The Spanish translation of the DBD rating scale also has demonstrated good internal consistency (Chronbach alpha values  $>.70$ ), as well as good construct validity with significant correlations with theoretically-related measures, such as the CBCL/6-18 (correlations between .60 and .69) and Conners-3 (correlations between .27 and .57; Gerdes et al., 2011). Finally, the Spanish translation of the DBD has demonstrated good concurrent validity in reliably distinguishing problem from non-problem children as measured by borderline or clinical elevations (i.e., T scores of 59 or higher) on the broadband externalizing scale of the CBCL/6-18 (Gerdes et al., 2011). The reliability of the DBD for the current study was good (Chronbach alpha = .98; test-retest reliability  $r_{xx} = .77, p < .001$ ).

**Child Behavior Checklist/6-18** (CBCL/6-18; Achenbach & Recorla, 2001; Spanish translation by Rubio-Stipec, et al., 1990). The CBCL/6-18 is a parent-report measure of the occurrence of several child behaviors, such as problems in behavioral, emotional, and social domains. It contains 112 items rated on a 3-point scale, ranging from “not true” to “very true or often true.” It results in three broadband scores for total, internalizing, and externalizing problems, as well as several of narrowband scores. Higher scores indicate greater severity on each scale. The English version of the scale has demonstrated good internal consistencies (.63-.98), good concurrent criterion validity with the ability to discriminate between referred and non-referred children, as well as good convergent construct validity with associations with DSM criteria and other measures of behavioral and emotional problems (Achenbach et al. 2001). In 1990, Rubio-Stipec, et al. examined the Spanish translation’s internal consistency and convergent construct validity with a Latino sample. The broadband internalizing and externalizing scales showed high levels of internal consistency (.89 to .94), while the narrow-band scales showed good levels (.65 and higher). The measure also demonstrated good convergent construct validity with the theoretically related TRF/6-18 (.13-.38).

**Conners-3** (Connors, 2008). The Conners-3 Parent Report, Short Form is a 43 item measure assessing for ADHD and related learning, behavior, and emotional problems. The English and Spanish versions of the Conners-3 demonstrate good internal consistency (Chronbach alpha coefficients ranging from .77 to .97, as well as good test-retest reliability (all correlations significant,  $p < .001$ ). Additionally, support for the validity for the Conners-3 has been demonstrated using factor analytic techniques on derivation and confirmatory samples; specifically, the Connor-3 has demonstrated the ability to reliably distinguish between children with and without ADHD.

**Acculturation Rating Scale for Mexican Americans-II** (Cuéllar et al, 1995). The ARSMA-II is a 30-item self-report measure available in English and Spanish. It assesses behavioral acculturation in terms of language use, ethnic identity, and ethnic interaction. Items

are rated as not at all (0) to extremely often or almost always (5). Scores result in two subscales with higher scores representing greater affiliation/orientation with the particular culture. The original ARSMA-II frames questions specifically to Mexican Americans; thus, in order to accommodate all Latino subgroups, the word “Mexican” was changed to “Latino.” This method this method has been used previously and maintains good reliability (e.g., Cronbach’s alpha = .78; Steidel & Contreras, 2003).

The Anglo Orientation Subscale (AOS) has 13 items and assesses orientation toward the mainstream Anglo culture in the United States. The Latino Orientation Subscale (LOS) has 17 items and assesses orientation toward the traditional Latino culture. Strong internal consistencies for the AOS (.88) and LOS (.83) have been reported (Cuéllar et al., 1995) In addition, construct validity was found using a sample of 379 individuals representing five generations (Cuéllar et al., 1995). The internal consistency of the ARMSA-II for the current study was good (Chronbach alpha values for AOS and LOS = .86 and .88, respectively).

**The Mexican American Cultural Values Scale for Adolescents and Adults (MACV; Knight et al., 2009).** The MACV, is a 50-item self-report questionnaire to be used to measure cultural value orientations in terms of Latino American Values (LAV) and Mainstream Values (MV), which is available in Spanish and English. Items are rated as not at all (1) to completely believe (5). The LAV is made up of several subscales, including Familism, Respect, Religion, and Traditional Gender Roles. The MV scale is made up of 3 subscales including Material Success, Independence/Self-Reliance, and Competition/Personal Achievement. Strong internal consistency reliability coefficients have been established for the LV (.88), the MV (.81 to .84), as well as the individual LV and MV subscales (.50 to .86) for parents. The MACV also has been shown to have good construct validity and to discriminate between immigrant and nonimmigrant Latinos (Knight et al., 2009). The internal consistency of the MACV for the current study was good (Chronbach alpha values ranging from = .86 - .92).

**Demographic Form.** Individual and cultural factors about participating parents and chosen children were obtained from the Demographic Form. Questions regarding the parent include ethnicity, generational status, language proficiency, occupation, education level, and household income. Questions regarding the child include age, gender, grade, and mental health diagnosis and treatment history.

## Results Part Two: ADHD-FX Validation

### Psychometric Properties

**Reliability.** First, the reliability of each subscale of the ADHD-FX was computed in terms of internal consistency (i.e., Chronbach's alpha values  $\geq .70$ ) and test-retest reliability (i.e., correlation between two administrations given seven to fourteen days apart). All subscales and the overall ADHD-FX revealed adequate internal consistency levels with Chronbach's alpha values ranging from .94 to .98 (see Table 6). Examination of item-total statistics did not suggest that deleting any individual items would improve the internal consistency of the overall measure or subscales. Finally, all subscales and the overall ADHD-FX revealed adequate test-retest reliability with correlations between time one and time two ranging from .72 to .95 (see Table 6).<sup>2</sup>

**Construct validity.** Subsequently, convergent construct validity of each subscale of the ADHD-FX was examined by correlations with theoretically-related measures (i.e., the Social Problems and Rule Breaking Behaviors subscales of the CBCL/6-18 [Achenbach & Rescorla, 2001; Spanish translation by Rubio-Stipec, Bird, Canino, and Gould, 1990] and Learning Problems and Peer Problems subscales of the Conners-3 [Conners, 2008]). All subscales and the overall ADHD-FX revealed adequate convergent construct validity with correlation values ranging from .57 to .83 ( $p < .001$ ; see Table 6).<sup>2</sup>

### Diagnostic Utility

**Discriminant validity.** Next, the diagnostic utility of the ADHD-FX scale in distinguishing between children who do and do not meet criteria for an ADHD diagnosis was examined. Specifically, a discriminant analysis was computed to predict whether impairment

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<sup>2</sup> Analyses were examined with and without the clinical sample and no differences emerged.

ratings on the ADHD-FX subscales reliably predicted whether a child did or did not meet criteria for an ADHD (please see methods section for specific correct group placement). The discriminant function revealed a significant association between the diagnosis of ADHD and impairment ratings on the ADHD-FX scale (Wilkes Lambda = .24,  $p < .001$ ), accounting for 87.20% of the between group variability (see Table 7). Analysis of the structure matrix revealed that all three subscale means were significant predictors (structure matrix values  $> 0.30$ ). The cross validated classification showed that overall 96.70% of children were correctly classified as meeting or not meeting criteria for ADHD based on their impairment ratings on the ADHD-FX scale (see Table 8).

**Corrected predictive power.** Additionally, the corrected positive predictive power (cPPP) and corrected negative predictive power (cNPP) statistics were examined to determine the relative utility of the overall scale, each subscale, and each individual item in correctly predicting the presence of an ADHD diagnosis. The cPPP statistic indicates the conditional probability that the disorder is present if the behavior is present, whereas the cNPP statistic indicates the conditional probability that the disorder is absent if the behavior is absent diagnosis (see Frick et al. [1994] for calculation formulas). The cPPP and cNPP are corrected to control for the base rates of each behavior as endorsed in a community sample. For the current study, a behavior on the ADHD-FX was considered present if parents indicated the behavior affected the child “quite a bit” (2) or “a lot” (3).

As seen in Table 9, the overall ADHD-FX, all subscale means, and the majority of individual items revealed strong diagnostic utility for predicting the presence of the disorder (cPPP mean values ranging from .81-.84; cPPP individual items ranging from .58-1.00). Additionally, several items revealed cPPP values of 1.00, meaning that all children displaying this behavior were diagnosed with ADHD (after controlling for base rates of the behavior in the current community sample). When examining cNPP, the overall ADHD-FX, all subscale means, and the majority individual items revealed relatively weak diagnostic utility for predicting the

absence of the disorder (cNPP mean values ranging from .16-.45; individual items ranging from .07-.71). Only one individual item (i.e., “is distracting, disruptive, and/or bothersome to siblings”) revealed strong cNPP value  $> .70$ . Thus, although the presence of the functional impairment behaviors was highly indicative of an ADHD diagnosis, ADHD was often present without each functional impairment behavior present.

**Clinically Meaningful Change.** Next, Reliable Change Indices (RCI) for each subscale and the overall ADHD-FX were established. Specifically, standard deviations and test-retest reliability coefficients from the community sample were used to determine the amount of change that a child would need to demonstrate pre to post treatment to be considered more than expected from time/variability and thus clinically meaningful. The RCI's were determined based on Jacobson and Truax's (1991) method (see formula in Table 10). The two-tailed prediction is used when improvement or deterioration is expected, such that a post-pre change score above the +RCI indicates reliable improvement, whereas a post-pre change score below the -RCI indicates reliable deterioration. The one-tailed prediction is used when only improvement is expected, such that a post-pre change score above the RCI indicates reliable improvement. Unfortunately, given the small clinical sample size yielded in the current study, range of normal functioning was not able to be determined.

### **Cultural Properties**

Finally, cultural properties of the ADHD-FX scale were examined with correlations between the ADHD-FX scale and measures of behavioral and cognitive acculturation (i.e., the ARSMA-II and MACV). No significant correlations emerged between any subscale or the overall ADHD-FX and measures of behavioral/cognitive acculturation towards Latino/Anglo orientation (i.e., the Latino Behavior subscale (LOS) and the Anglo Behavior subscale (AOS) of the ARSMA-II [Cuéllar et al., 1995] and the Latino Values (LV) subscale and the Anglo Values (AV) subscales of the MACV [Knight et al., 2009]; see Table 11).<sup>2</sup>

## Summary and General Discussion

Overall, researchers were able to integrate quantitative and qualitative responses obtained from a community sample to develop the ADHD-FX scale. Additionally, the overall ADHD-FX scale, as well as each theoretical subscale (i.e., School, Peer, and Home) demonstrated adequate psychometric properties, diagnostic utility, and cultural properties with Latino parents of school-aged children. Thus, results suggest that the ADHD-FX scale is a psychometrically sound, diagnostically useful, and culturally appropriate tool when assessing ADHD in school-aged children of Latino families.

### ADHD-FX Development

As predicted, information from the quantitative and qualitative investigation with a community sample of Latino parents provided ample information for developing the ADHD-FX scale. Utilizing Grounded Theory (first introduced by Glaser & Strauss, 1967), 32 items were developed for the ADHD-FX scale based on most common responses given from community parents. Several items were based upon functional impairment questions from the original PRQ, while several others were based upon new phenomenon that were not captured in the original PRQ. The scale is available in Spanish and English and instructs parents to consider how much each item affects their child in his/her everyday life (from 0: “not at all” to 3: “a lot”). The scale can provide an overall impairment score, as well as subscale scores in the theoretically-derived domains of academic, peer, and familial impairment. Sample items include: [child] “doesn’t pay attention to, follow, and/or obey teacher instructions,” “is ignored, rejected, and/or teased by peers,” and “doesn’t effectively complete home routines/tasks (e.g., the morning routine, chores, etc).”

### ADHD-FX Validation

**Psychometric Properties.** As predicted, all subscales and the overall ADHD-FX demonstrated adequate reliability with high levels of internal consistency and test-retest

reliability. Additionally, all subscales and the overall ADHD-FX demonstrated adequate convergent construct validity by significantly correlating with all theoretically-related subscales of functional impairment (i.e., the Social Problems and Rule Breaking Behaviors subscales of the CBCL/6-18 [Achenbach & Rescorla, 2001; Spanish translation by Rubio-Stipec, Bird, Canino, and Gould, 1990] and the Learning Problems and Peer Problems subscales of the Conners-3 [Connors, 2008]). This is consistent with previous research suggesting that measures of functional impairment related to ADHD emerge as psychometrically sound when given to Latino parents (e.g., Haack, et al., 2011; Solis & Abidin, 1991).

**Diagnostic Utility.** As predicted, all subscales and the overall ADHD-FX demonstrated adequate diagnostic utility by correctly predicting the presence or absence of ADHD diagnoses. Specifically, impairment ratings on the ADHD-FX significantly distinguished between children with or without ADHD, as demonstrated by discriminant analyses. In addition, each subscale emerged as an important predictor, and over 96% of children were correctly classified as meeting or not meeting criteria for ADHD based on their impairment ratings on the ADHD-FX scale. This is consistent with previous research suggesting that measures of functional impairment related to ADHD emerge as diagnostically useful in distinguishing between children whom do and do not meet criteria for ADHD when given to Latino parents (e.g., Haack, et al., 2011; Solis & Abidin, 1991).

Additionally as predicted, all subscales and the overall ADHD-FX demonstrated adequate utility in correctly predicting the presence of an ADHD diagnosis, as demonstrated by high levels of cPPP. In fact, several items demonstrated cPPP values of 1.00 (e.g., “doesn’t get along with teacher,” “distracting, disruptive, and/or bothersome to peers,” and “doesn’t understand, follow, and/or respect the rules of the house and/or society”), meaning that every child with each of these behaviors present had a diagnosis of ADHD (after controlling for current community sample behavior base rates). This suggests that the endorsement of functional impairment by Latino parents is highly indicative of the disorder and not considered part of

normal childhood development. These results are consistent with previous theoretical research suggesting that items assessing functional impairment related to ADHD accurately predict the appropriateness of an ADHD diagnosis (e.g., Gordon et al., 2006; Haack, & Gerdes, 2011; Solis & Abidin, 1991).

Contrary to prediction, with one exception (i.e., “is distracting, disruptive, and/or bothersome to siblings”), the overall ADHD-FX, all subscale means, and the majority individual items revealed relatively weak diagnostic utility for predicting the absence of the disorder. This suggests that even though the presence of the functional impairment behaviors was highly indicative of an ADHD diagnosis, ADHD was often present without each functional impairment behavior being present. This finding may be explained by the fact that while there are well-established domains of functioning that frequently are impaired in children with ADHD (i.e., academic achievement [as reviewed by DuPaul, 2007], social competence [as reviewed by Hoza, 2007], and familial relations [as reviewed by Johnson & Mash, 2001]), individual difficulties may vary from child to child. In fact, experts argue that specific impairment experienced by each child with ADHD should be examined and treatment goals should be individually tailored as such (Pelhem, 2002). Thus, although parents of children with ADHD may not endorse every functional impairment behavior on the ADHD-FX, the endorsement of several items does appear to be indicative of an ADHD diagnosis.

Finally, as predicted, there was sufficient data from the community sample to establish Reliable Change Indices (RCI) necessary for measurement of clinically meaningful change. However, given the small clinical sample size yielded in the current study, range of normal functioning was not able to be determined. Establishment of such norms is particularly important, as experts in the field have begun to call for the examination of clinically meaningful change in functional impairment pre and post ADHD intervention (e.g., Gerdes et al., 2011; Karpenko et al., 2009).

**Cultural Properties.** As predicted, the ADHD-FX demonstrated universal cultural properties, as none of the subscales or the overall ADHD-FX scale were significantly related to parental levels of behavioral and cognitive acculturation (as measured by the ARMSA-II [Cuéllar et al, 1995] and the MACV [Knight et al., 2009]. These results are consistent with previous research suggesting the cultural universality of functional impairment related to ADHD in the domains of academic, familial, and social difficulties (Arcia and Fernández, 2003a, b; Bauermeister et al., 2005; Gerdes et al., 2011).

### **Conclusions, Limitations, and Future Directions**

Overall, the current study was able to successfully develop and validate the ADHD-FX scale, a measure to assess functional impairment related to ADHD (i.e., difficulties with academic achievement, social competence, and familial relationships) in school-aged children of Latino families. The ADHD-FX is one of the only available brief, yet comprehensive measures assessing multiple domains of impairment proven extremely relevant for children with ADHD of any ethnicity (Gordon et al., 2006; Haack & Gerdes, 2011; Rothe 2005). Additionally, to the authors' knowledge, this measure is the first of its kind which was designed specifically for Latinos rather than translated from a preexisting measure. The innovative methodology employing language-free videos and qualitative and quantitative inquiry was utilized in an attempt to limit potential Eurocentric cultural biases and provide an uncensored voice for Latino families to identify the most salient aspects of functional impairment related to ADHD and describe the constructs in their own words.

In addition, this study provided support for not only psychometric validity and diagnostic utility, but also cultural validity of the measure with Latino parents of school-aged children. As outlined in the introduction, while a measure may be deemed psychometrically reliable and valid, it may not necessarily emerge as diagnostically useful or culturally valid (Haack & Gerdes, 2011). Even if a scale is translated and back translated to perfection, if the items are not relevant to a given population, responses may vary depending on cultural background rather than the

intended construct. Not only did the ADHD-FX emerge as reliable and valid, impairment ratings accurately distinguished between the presence/absence of ADHD proved unrelated to acculturation. This provides convincing evidence that the ADHD-FX is a reliable and valid tool that can aid in diagnosing ADHD despite a reporter's cultural values, beliefs, and customs.

Finally, the ADHD-FX can be used not only as an initial diagnostic tool, but also a method to conceptualize cases, guide culturally-appropriate intervention, and measure clinically meaningful treatment gains in the domains of academic, social, and familial impairment often experienced by children with ADHD and their families. As previously discussed, functional impairment related to academic, social, and familial difficulties are often the most salient concerns for families presenting for ADHD services and thus should be used to inform treatment planning and goals (Pelhem, 2002; Pelham et al., 2005; Pelham & Fabiano, 2001). Additionally, given that specific difficulties differ from child to child, clinicians and researchers evaluating intervention effectiveness should examine clinically meaningful change on an individual/family level in addition to statistically significant change between groups (Karpenko et al., 2009). Given its relative brevity but comprehensive coverage of functional impairment, as well as established norms to evaluate clinically meaningful change, the ADHD-FX is a quick and easy tool that can be used to provide an initial view of impairment specific to each child, as well as measure meaningful improvement in relevant impairment throughout and following intervention.

Several limitations of the current study should be noted. First, due to the demographics of Latinos in Southeast Wisconsin (U.S. Census, 2000), the current study examined parents who were primarily of Mexican descent, from relatively low SES levels, and similar levels of Latino and Anglo orientation. Given the diversity of the Latino population, future studies should seek to examine these predictions in other Latino subcultures, as well as with Latino samples with greater variability in SES and acculturation. Additionally, due to several practical and cultural barriers leading Latino children with ADHD to be under-diagnosed and underserved compared to nonminority children (e.g., Alegria et al., 2007; Eraldi, Mazzuca, Clarke, & Power, 2006; Rothe

2005), the clinical population proved difficult to recruit and thus remains a relatively small sample size in the current study, which inhibited the ability to establish range of normal functioning. Future research should strive to employ culturally-sensitive recruitment strategies and examine the current results with a larger sample of Latino children with ADHD diverse in gender, age group, ADHD subtype, and comorbidities. Finally, although the researchers attempted to validate teacher-ratings for the ADHD-FX, the current study was unable to recruit an adequate number of teacher questionnaires to make appropriate inferences. Therefore, as previous research highlights the importance of obtaining diagnostic information from multiple informants (e.g., Pelham et al., 2005), future studies should seek to validate the ADHD-FX as a teacher-report instrument to supplement parental reports of functional impairment.

In order to translate the current study into improved mental health disparities, several steps need to be taken. As outlined in the introduction, unmet service need for Latino children with ADHD may in part be due to disconnect between available mental health services and Latino families' cultural worldviews (Callejas, et al., 2006; Flores et al., 2002, Rothe, 2005). As the current study provided evidence for the use of the ADHD-FX as a psychometrically sound, diagnostically useful, and culturally valid tool for assessing ADHD in school-aged children of Latino families, researchers and clinicians alike must commit to utilizing this and other culturally appropriate methodologies when examining ADHD and services utilization with Latino populations. Finally, as functional impairment appears to be a culturally-universal phenomenon, future research should investigate the conceptualization, assessment, and treatment of impairment in other underserved populations, such as other ethnic minority families, families from rural backgrounds, single-parent families, and families from low SES levels. In addition, as many children with different forms of psychopathology display difficulties beyond that of incapacitating symptoms that interfere with their social/emotional functioning and well-being (Weisz and Kazdin 2010), functional impairment research should be expanded to individuals with other disorders, as well as individuals treated in other settings and with other treatment modules.

In summary, thorough understanding of how diverse families conceptualize, recognize, and respond to intervention for functional impairment related to childhood psychopathology may be the key in providing culturally sensitive services and ultimately eliminating mental health disparities for diverse children in our country.

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Table 1

*Parent Demographics for Part One*

Age, <i>M</i> (SD)	37.03 (5.27)
Gender, <i>n</i> (%)	
Female	47 (63.5)
Male	25 (33.8)
Marital Status, <i>n</i> (%)	
Married	54 (73.0)
Unmarried	20 (27.0)
Number of Children, <i>n</i> (%)	
1-2	32 (43.2)
3-4	33 (44.6)
5 or more	8 (10.8)
Education, <i>n</i> (%)	
Less than high school or some high school	38 (51.5)
Graduated high school or GED	19 (25.7)
Some college or specialized training	7 (9.5)
College or graduate degree	6 (8.1)
Income, <i>n</i> (%)	
Less than \$20,000	27 (36.5)
\$20,001-40,000	33 (44.6)
\$40,001-60,000	6 (8.2)
\$60,001-80,000	2 (2.8)
Ethnicity, <i>n</i> (%)	
Latino, Mexican descent	65 (87.8)
Latino, Puerto Rican descent	3 (4.1)
Latino, Other descent	4 (5.4)
Time in US, <i>n</i> (%)	
1-5 years	1 (1.4)
6-10 years	14 (18.9)
More than 10 years	53 (71.6)
Born in US	4 (5.4)
Language, <i>n</i> (%)	
Only Spanish	30 (40.5)
Primarily Spanish, some English	31 (41.9)
Bilingual	10 (13.5)
Primarily English, some Spanish	1 (1.4)
<i>N</i> = 74	

Table 2

*Summary of Qualitative Responses Corresponding to an Original PRQ Behavior  
(i.e., responses receiving a “1” or a “2” coding)*

	A	B	C	D
	Parents Qualitatively Endorsing ( <i>n</i> , % of <i>N</i> )	Parents Qualitatively Endorsing as Concerning ( <i>n</i> , % of A)	Parents Quantitatively Endorsing ( <i>n</i> , % of <i>N</i> )	Parents Quantitatively Endorsing as Concerning ( <i>n</i> , % of C)
<b>School Behaviors</b>				
Had difficulty listening during class instruction*	31 (42%)	18 (58%)	51 (69%)	48 (94%)
Did not turn in completed schoolwork*	5 (7%)	4 (80%)	51 (69%)	47 (92%)
Had a disorganized or messy desk*	0 (0%)	0 (0%)	55 (74%)	53 (96%)
Had difficulty getting along with teacher*	1 (1%)	1 (100%)	56 (76%)	52 (93%)
Was disruptive or bothersome to peers*	24 (32%)	15 (63%)	59 (80%)	57 (97%)
Had difficulty effectively communicating with peers*	4 (32%)	2 (50%)	59 (80%)	57 (97%)
Was bossy when interacting with peers	0 (0%)	0 (0%)	28 (38%)	27 (96%)
Did not follow the rules of the game when interacting with peers	0 (0%)	0 (0%)	49 (66%)	46 (94%)
Had difficulty completing seatwork*	5 (7%)	4 (80%)	52 (70%)	50 (96%)
Performed poorly on schoolwork	0 (0%)	0 (0%)	44 (59%)	44 (100%)
Did not follow teacher instructions*	42 (57%)	25 (60%)	66 (89%)	64 (97%)
Frequently got into trouble*	1 (1%)	1 (100%)	49 (66%)	48 (98%)
Did not respect peers' personal space*	0 (0%)	0 (0%)	54 (72%)	51 (94%)
Had difficulty effectively working with peers in group*	8 (11%)	5 (63%)	60 (81%)	56 (93%)
Was unable to appropriately play with peers	0 (0%)	0 (0%)	46 (62%)	46 (62%)
Was ignored or rejected by peers*	5 (7%)	5 (100%)	54 (73%)	51 (94%)
<b>Peer Behaviors</b>				
Was disruptive or bothersome to peers*	6 (8%)	4 (67%)	56 (76%)	49 (88%)
Had difficulty effectively communicating with peers*	5 (7%)	2 (40%)	51 (69%)	49 (96%)

Was bossy when interacting with peers	0 (0%)	0 (0%)	21 (28%)	20 (95%)
Did not follow the rules of the game when interacting with peers*	16 (22%)	14 (89%)	62 (84%)	58 (94%)
Did not respect peers' personal space*	0 (0%)	0 (0%)	49 (66%)	46 (94%)
Had difficulty effectively working with peers in group	2 (3%)	1 (50%)	52 (70%)	49 (94%)
Was unable to appropriately play with peers*	32 (43%)	26 (81%)	61 (82%)	60 (98%)
Was ignored or rejected by peers*	23 (31%)	19 (83%)	60 (81%)	58 (97%)
<b>Home Behaviors</b>				
Did not follow parental instructions*	21 (33%)	14 (67%)	61 (82%)	57 (93%)
Had difficulty completing home routines/tasks*	6 (8%)	3 (50%)	58 (78%)	56 (97%)
Was disruptive or bothersome to siblings*	20 (27%)	13 (65%)	60 (81%)	51 (85%)
Created stress for parents*	1 (1%)	1 (100%)	59 (80%)	53 (90%)
Had difficulty completing homework*	20 (27%)	10 (50%)	55 (74%)	50 (91%)
Had difficulty getting along with parents	1 (1%)	1 (100%)	33 (45%)	31 (94%)
Had difficulty getting along with siblings*	3 (4%)	2 (67%)	50 (68%)	48 (96%)
Made home environment chaotic	0 (0%)	0 (0%)	39 (53%)	37 (95%)

$N = 74$

*Note.* \*indicates that this behavior ultimately was chosen for base of an item on the ADHD-FX Scale.

Table 3

*Summary of Qualitative Responses Corresponding to New Qualitative Codes  
(i.e., responses receiving a “1” or a “2” coding)*

Codes	A Parents Qualitatively Endorsing ( <i>n</i> , % of <i>N</i> )	B Parents Qualitatively Endorsing as Concerning ( <i>n</i> , % of A)
Doesn't participate in his/her surroundings; appears if in his/her own world*	16 (21%)	11 (69%)
Doesn't understand, follow, and/or respect the rules of the house, classroom, and/or society*	25 (34%)	24 (96%)
Doesn't respect/treat his/her things and/or materials well*	10 (14%)	4 (40%)
Doesn't respect others around him*	16 (22%)	16 (100%)
Needs more help and/or attention than other children*	14 (19%)	13 (93%)
Doesn't have good social skills; has a lack of social understanding*	18 (24%)	12 (67%)
Doesn't express and/or show his/her feelings in an appropriate way*	7 (10%)	5 (71%)

*N* = 74

*Note.* \*indicates that this code ultimately was chosen for base of an item on the ADHD-FX Scale.

Table 4

*Parent Demographics for Part Two*

	Community Sample ( <i>N</i> = 50)	Clinical Sample ( <i>N</i> = 12)	<i>T</i>
Age, <i>M</i> (SD)	37.52 (7.46)	39.22 (6.70)	0.64
Gender, <i>n</i> (%)			1.14
Female	41 (82.00%)	8 (66.66%)	
Male	9 (18.00%)	4 (33.33%)	
Marital Status, <i>n</i> (%)			2.07
Married	42 (84.00%)	6 (50.00%)	
Unmarried	8 (16.00%)	6 (50.00%)	
Number of Children, <i>n</i> (%) <sup>#</sup>			0.54
1-2	18 (36.00%)	5 (41.67%)	
3-4	22 (44.00%)	6 (50.00%)	
5 or more	5 (10.00%)	1 (8.33%)	
Education, <i>n</i> (%)			0.69
Less than high school or some high school	14 (28.00%)	4 (33.33%)	
Graduated high school or GED	17 (34.00%)	2 (16.67%)	
Some college or specialized training	13 (26.00%)	3 (25.00%)	
College or graduate degree	6 (12.00%)	3 (25.00%)	
Income, <i>n</i> (%)			0.63
Less than \$20,000	21 (42.00%)	6 (50.00%)	
\$20,001-40,000	17 (34.00%)	4 (33.33%)	
\$40,001-60,000	6 (12.00%)	0 (0.00%)	
\$60,001-80,000	6 (12.00%)	2 (16.67%)	
Ethnicity, <i>n</i> (%)			3.25 <sup>**</sup>
Latino, Mexican descent	43 (86.00%)	6 (50.00%)	
Latino, Puerto Rican descent	3 (6.00%)	6 (50.00%)	
Latino, Other descent	4 (8.00%)	0 (0.00%)	
Time in US, <i>n</i> (%)			0.26
1-5 years	1 (2.00%)	1 (8.33%)	
6-10 years	7 (14.00%)	1 (8.33%)	
More than 10 years	30 (60.00%)	7 (58.33%)	
Born in US	12 (24.00%)	3 (25.00%)	
Language, <i>n</i> (%)			0.09
Only Spanish	16 (32.00%)	4 (33.33%)	
Primarily Spanish, some English	14 (28.00%)	2 (16.67%)	
Bilingual	17 (34.00%)	6 (50.00%)	
Primarily English, some Spanish	3 (6.00%)	0 (0.00%)	

*N* = 62. <sup>#</sup> Indicates *n* = 57 due to missing data.

<sup>\*\*</sup> *p* ≤ .01

Table 5

*Child Demographics for Part Two*

	Community Sample ( <i>N</i> = 50)	Clinical Sample ( <i>N</i> = 12)	<i>T</i>
Age, <i>M</i> (SD)	9.26 (1.99)	10.58 (2.07)	2.06*
Gender, <i>n</i> (%)			6.73***
Female	24 (48.00%)	0 (0.00%)	
Male	26 (52.00%)	12 (100.00%)	
Grade, <i>n</i> (%) <sup>#</sup>			1.38
Kindergarten- 2 <sup>nd</sup> grade	12 (24.00%)	2 (16.67%)	
3-5 <sup>th</sup> grade	22 (44.00%)	3 (25.00%)	
6-8 <sup>th</sup> grade	13 (26.00%)	6 (50.00%)	
Mental Health Problems, <i>n</i> (%)			
None	50 (100.00%)	0 (0.00%)	
Inattention/hyperactivity/impulsivity	0 (0.00%)	12 (100.00%)	
Behavior (aggression, oppositionality)	0 (0.00%)	3 (25.00%)	
Mood (anxiety, depression)	0 (0.00%)	2 (16.67%)	
Learning	0 (0.00%)	3 (25.00%)	
ADHD Medication Status, <i>n</i> (%)			
None	50 (100.00%)	3 (25.00%)	
Methylphenidate	0 (0.00%)	4 (33.33%)	
Amphetamine or Dextroamphetamine	0 (0.00%)	1 (8.33%)	
Guanfacine	0 (0.00%)	2 (16.67%)	
Dexmethylphenidate	0 (0.00%)	1 (8.33%)	
Other	0 (0.00%)	1 (8.33%)	
Site Recruited, <i>n</i> (%)			
Bilingual Elementary School	50 (100.00%)	0 (0.00%)	
Children's Hospital	0 (0.00%)	8 (66.67%)	
Special Education Services	0 (0.00%)	4 (33.33%)	
Age, <i>M</i> (SD)	9.26 (1.99)	10.58 (2.07)	2.06*

*N* = 62. <sup>#</sup> Indicates *n* = 59 due to missing data.

\*  $p \leq .05$ , \*\*\*  $p \leq .001$

Table 6

*Psychometric Properties: Internal Consistency, Test-Retest Reliability, and Convergent Construct Validity*

	$\alpha$	$r_{xx}^{\#}$	$r^1$	$r^2$	$r^3$	$r^4$
ADHD-FX Total	.98 <sup>+</sup>	.87 <sup>***</sup>	.81 <sup>***</sup>	.73 <sup>***</sup>	.77 <sup>***</sup>	.62 <sup>***</sup>
School	.97 <sup>+</sup>	.93 <sup>***</sup>	.74 <sup>***</sup>	.63 <sup>***</sup>	.76 <sup>***</sup>	.58 <sup>***</sup>
Peer	.94 <sup>+</sup>	.95 <sup>***</sup>	.74 <sup>***</sup>	.65 <sup>***</sup>	.71 <sup>***</sup>	.57 <sup>***</sup>
Home	.97 <sup>+</sup>	.73 <sup>***</sup>	.83 <sup>***</sup>	.79 <sup>***</sup>	.74 <sup>***</sup>	.62 <sup>***</sup>

$N = 62$ . <sup>#</sup>Indicates  $n = 23$  for test-retest reliability analysis.

<sup>+</sup>indicates adequate reliability with  $\alpha \geq .70$ ; <sup>\*\*\*</sup>  $p \leq .001$

<sup>1</sup>Correlations ( $r$ ) with Social Problems subscale on the CBCL/6-18 (Achenbach & Rescorla, 2001)

<sup>2</sup>Correlations ( $r$ ) with Rule Breaking Behaviors subscale on the CBCL/6-18 (Achenbach & Rescorla, 2001)

<sup>3</sup>Correlations ( $r$ ) with Learning Problems subscale on the Conners-3 (Conners, 2008)

<sup>4</sup>Correlations ( $r$ ) with Peer Problems subscale on the Conners-3 (Conners, 2008)

Table 7

*Wilks's Lambda and Structure Matrix of Discriminate Variables*

	Wilks's $\lambda$	Chi-Square	<i>df</i>	<i>p</i>	Canonical Correlation
ADHD-FX Total	.24	81.51	4	<.001	87.20%
Structure Matrix					
School				.63*	
Peer				.58*	
Home				.98*	

*N* = 61 due to missing data from one participant

\*Indicates important variable with value > .30

Table 8

*Classification Results of Discriminate Functions*

Actual Group Membership	<i>n</i>		Predicted Group Membership		
			Community		Clinical
	<i>n</i>	<i>n</i>	%	<i>n</i>	%
Community*	49	49	100.00%	0	0.00%
Clinical	12	2	16.67%	10	83.33%

*N* = 61 due to missing data from one participant

*Note.* Overall percentage of correctly identified cases = 96.70%

Table 9

*Diagnostic Utility of ADHD-FX subscales and items using cPPP and cNPP*

Item	cPPP	cNPP
<b>ADHD-Fx Total (M)</b>	<b>.84</b>	<b>.36</b>
<b>School (M)</b>	<b>.81</b>	<b>.30</b>
Doesn't listen and/or pay attention during class instruction	.60	.53
Has a disorganized or messy desk	.59	.36
Doesn't respect peers' personal space	.82	.16
Doesn't understand, follow, and/or respect the rules of the classroom and/or society	.69	.14
Is ignored, rejected, and/or teased by peers	.79	.27
Doesn't effectively complete seatwork	.84	.10
Doesn't participate in his/her surroundings; appears if in his/her own world	.58	.13
Is distracting, disruptive, and/or bothersome to peers	1.00	.32
Doesn't respect/treat his/her things and/or materials well	.85	.49
Needs more help and/or attention than other children	.87	.49
Doesn't pay attention to, follow, and/or obey teacher instructions	.84	.35
Doesn't respect others around him (e.g., his teacher and/or classmates)	.69	.07
Frequently gets into trouble	.75	.22
Doesn't effectively work with peers in a group	1.00	.41
Doesn't express and/or show his/her feelings in an appropriate way	1.00	.32
Doesn't get along with the teacher	1.00	.15
Doesn't have good social skills; has a lack of social understanding	.85	.49
Doesn't turn in completed schoolwork	.72	.51
Doesn't appropriately play with peers	1.00	.14
<b>Peer (M)</b>	<b>.84</b>	<b>.24</b>
Doesn't respect peers' personal space	.82	.16
Doesn't understand, follow, and/or respect the rules of the classroom and/or society	.69	.14
Is ignored, rejected, and/or teased by peers	.79	.27
Doesn't participate in his/her surroundings; appears if in his/her own world	.58	.13
Is distracting, disruptive, and/or bothersome to peers	1.00	.32
Doesn't respect others around him (e.g., his teacher and/or classmates)	.69	.07
Doesn't effectively work with peers in a group	1.00	.41
Doesn't express and/or show his/her feelings in an appropriate way	1.00	.32
Doesn't have good social skills; has a lack of social understanding	.85	.49
Doesn't appropriately play with peers	1.00	.14
<b>Home (M)</b>	<b>.89</b>	<b>.45</b>
Doesn't pay attention to, follow, and/or obey parental instructions	.84	.40
Doesn't effectively complete homework	.68	.34
Doesn't respect/treat his/her things and/or materials well	.58	.18
Is distracting, disruptive, and/or bothersome to siblings	1.00	.71
Doesn't participate in his/her surroundings; appears if in his/her own world	1.00	.37
Doesn't understand, follow, and/or respect the rules of the house and/or society.	1.00	.53
Creates stress for parents	1.00	.62
Needs more help and/or attention than other children	1.00	.62
Doesn't get along with and/or fights with siblings	.86	.44
Doesn't have good social skills; has a lack of social understanding	.84	.21
Doesn't effectively complete home routines/tasks (e.g., the morning routine, chores, etc)	.87	.61
Doesn't respect others around him (e.g., parents, siblings, and/or other family members)	1.00	.41
Doesn't express and/or show his/her feelings in an appropriate way	.84	.44

N = 62

Table 10

*Reliable Change Indices for the ADHD-FX*

Reliable Change Indices (RCI)			
	$SD_{com}$	two-tailed prediction	one-tailed prediction
		$1.96 * \sqrt{2}(SD_{com}\sqrt{1-r_{xx}})^2$	$1.645 * \sqrt{2}(SD_{com}\sqrt{1-r_{xx}})^2$
ADHD-FX Total	0.27	+/- 0.27	0.23
School	0.31	+/- 0.24	0.20
Peer	0.28	+/- 0.10	0.08
Home	0.27	+/- 0.33	0.28

$N = 50$  for  $SD_{com}$ ,  $N = 23$  for  $r_{xx}$  values

*Note.* Standard Deviation for the community sample ( $SD_{com}$ ) and test-retest values ( $r_{xx}$ ) obtained in current study

Table 11

*Cultural Properties of the ADHD-FX*

	LOS <sup>1</sup>	AOS <sup>1</sup>	LV <sup>2</sup>	AV <sup>2</sup>
ADHD-FX Total	.05	.06	-.02	.07
School	.07	.07	-.07	.03
Peer	.12	.03	-.07	.04
Home	.02	.06	.03	.09

*N* = 62

*Note.* No correlations *Note.* No correlations significant at  $p < .05$ .

<sup>1</sup>Correlations (*r*) ARSMA-II (Cuéllar et al., 1995)

<sup>2</sup>Correlations (*r*) MACV (Knight et al., 2009)