Teachers' Impact on Psychosocial Treatment for Latino Youth with ADHD

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TEACHERS' IMPACT ON PSYCHOSOCIAL TREATMENT FOR LATINO YOUTH WITH ADHD

by

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ABSTRACT

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The current study examined the impact of teacher engagement in psychosocial treatment for Latino youth with ADHD and their families. Participants included sixty-one Latino youth, along with their primary caregiver and teacher. Results revealed that teachers were equally engaged in treatment regardless of the source of the referral to treatment, a finding which is encouraging as it indicates that teachers were motivated to work with their students and families. Additionally, results indicated that referral source and specific aspects of teacher engagement in treatment were related to certain child and parent/family treatment outcomes. Of note, several aspects of teacher engagement in treatment were related to maternal satisfaction with treatment and follow-up analyses identified referral source as a significant predictor of maternal satisfaction with treatment. These findings indicate that higher quality teacher intervention implementation, characterized by greater adherence to intervention components and higher-quality relationships, is related to enhanced child and parent treatment outcomes in the Latino population. Clinical implications and directions for future research also are discussed.

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Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is a mental health disorder beginning in childhood, characterized by a developmentally inappropriate degree of hyperactivity and impulsivity and/or inattention resulting in functional impairment across settings (Bernardi et al., 2012; National Institute of Mental Health [NIMH], 2012). Although Latinos are less likely than European Americans to receive appropriate treatment for ADHD (Flores & the Committee on Pediatric Research, 2010; Morgan et al., 2014), they benefit from evidence-based ADHD treatment when they receive it (i.e., Gerdes, Kapke, Grace, & Castro, under review). Evidence-based treatments for ADHD have been identified, most of which include home- and school-based components, and teachers often play an important role in implementing these treatments (Evans, Sarno Owens, & Bunford, 2014). Specifically, teachers may collaborate with parents and clinicians to create and implement Daily Report Cards (DRCs), in which children's progress towards daily goals is monitored in the classroom setting and paired with a reward in the home setting (Moore, Whittaker, & Ford, 2016). The quality of teacher intervention implementation is related to functional outcomes across domains (Hirschstein, Van Schoiack Edstrom, Frey, Snell, & MacKenzie, 2007). The proposed study aims to add to the current literature by highlighting the important role teachers play in a psychosocial intervention for ADHD with a classroom component, and by examining this in a sample of Latino families, a group in which ADHD is under-diagnosed and under-treated.

ADHD

ADHD is a common mental health disorder of childhood, with research estimating that 8% of youth in the United States are affected (U.S.; Larson, Russ, Kahn, & Halfon, 2011). Elevated levels of inattention and/or hyperactivity and impulsivity, as well as functional impairment across domains, characterize the condition (NIMH, 2012; Bernardi et al., 2012; Pelham, Fabiano, & Massetti, 2005). The symptoms and functional impairment related to ADHD often persist beyond childhood if untreated (Bernardi et al., 2012; Biederman et al., 2012). Mental health disorders commonly comorbid with ADHD include learning disorders, mood and anxiety disorders, and conduct disorders (Bernardi et al., 2012; Larson et al., 2011).

Research has identified well-established psychosocial treatments for ADHD, with most utilizing behavioral techniques including behavioral parent training, behavioral classroom management, and behavioral peer interventions (Evans et al., 2014). Other treatments have received less research support, including organization training, combined training programs, neurofeedback training, and cognitive training. Broadly, evidence-based interventions for ADHD use behavioral principles to reinforce desired behaviors and reduce the frequency of other behaviors, often including both home- and school-based components. Teacher involvement is an important element of many of these treatments (Evans et al., 2014). Additionally, teachers may refer students and their families to treatment for ADHD.

One of the most common ways in which teachers are involved in psychosocial interventions for ADHD is through the use of a DRC, a home-school communication tool through which teachers inform parents about children's progress towards classroom-based goals. Children's success is reinforced by a reward in the home setting (Moore,

Whittaker, & Ford, 2016). DRCs are frequently used to treat ADHD and other conditions, including as part of interventions with multiple components, and have been found to be effective (DuPaul, Weyandt, & Janusis, 2011). Teachers often participate in developing the DRC goals. Their primary role is then to track the child's success on the specified goals and send the DRC home with the child each day. Parents' role, meanwhile, is to ask their child for the DRC and provide a small reward in the home setting, commensurate with the goals achieved, on a daily and/or weekly basis (DuPaul, Weyandt, & Janusis, 2011). Greater parental involvement in DRCs is associated with enhanced treatment outcomes (Vannest, David, Davis, Mason, & Burke, 2010). They have been successfully implemented across a wide age range, from preschool students to junior high school students (Schumaker, Hovell, & Sherman, 1977; Verduin, Abikoff, & Kurtz, 2008) and are sustainable to implement over the course of a school year (Vujnovic, Fabiano, Pariseau, & Naylor, 2013). Importantly, DRCs have been used with individuals of various ethnic backgrounds, including Latino students and families (Gerdes et al., under review).

ADHD in the Latino Population

Regrettably, limited research has examined ADHD treatment in Latino families. As Latinos account for over 15% of the U.S. population (Ennis, Rios-Vargas, & Albert, 2011) and it is predicted that almost a third of the U.S. population will identify as Latino by 2060 (U.S. Census Bureau, 2012), it is of utmost importance that research examine how the condition is best treated in this large and growing population.

Latinos are less likely than individuals of other ethnic backgrounds to seek out and receive treatment for ADHD, as well as other mental health services (Eiraldi & Diaz,

2010; Flores and the Committee on Pediatric Research, 2010; U.S. Department of Health and Human Services, 2001). Both practical and cultural barriers may account for this disparity, including transportation, scheduling, linguistic differences, stigma, and prior experiences with health care providers (Kouyoumdjian, Zamboanga, & Hansen, 2003). Despite these disparities, recent research has begun to examine ADHD in Latino families. Specifically, it has been concluded that evidence-based practices in the treatment of ADHD are appropriate for use with Latinos as further research continues to be conducted (Miranda et al., 2005). At the same time, however, treatment should be adapted as needed in light of practical and cultural considerations, on both the individual and group levels (Rothe, 2005; Miranda et al., 2005).

In a recent example of this, researchers examined treatment outcomes for a culturally-adapted version of Parent Management Training, a version of behavioral parent training that has demonstrated positive outcomes, in a group of Spanish-speaking Latinos less oriented to U.S. mainstream culture. Results indicate that the culturally-adapted treatment (CAT) leads to positive outcomes for Latino families of children with ADHD, resulting in reduced ADHD symptomatology and functional impairment, as reported by both parents and teachers. Additionally, CAT resulted in superior family engagement in treatment, and mothers who participated in CAT reported greater treatment satisfaction than did mothers who participated in standard evidence-based treatment (Gerdes et al., under review).

Teachers' Intervention Implementation

Teacher involvement is an important component of treatment for ADHD and other mental health disorders, through teachers' participation in school-based

interventions. Intervention implementation has been conceptualized in different ways and referred to by different terms throughout the literature, and has been measured both qualitatively and quantitatively. Researchers have made recommendations regarding how to best measure teacher intervention implementation. For example, as teachers often rate the degree and quality of their intervention implementation more highly than do third party observers (Hansen, Pankratz, & Bishop, 2014), it is recommended that the various facets of implementation be measured continuously as opposed to categorically, and via observation as opposed to self-report (Dane & Schneider, 1998; Durlak & DuPre, 2008).

Research has identified factors that impact teachers' implementation of classroom-based interventions. For example, the extent to which teachers considered a classroom-based violence prevention program to be useful was found to be related to their subsequent use of the program (Biggs, Vernberg, Twemlow, Fonagy, & Dill, 2008). Teachers' intervention implementation also may depend in part on their knowledge about relevant topics. Specifically, teachers reported they would put more effort into classroom interventions for a child with ADHD after receiving training on the management of ADHD and disability legislation, as compared to after training on either topic alone (Dielmann, 2005). Teachers' participation in classroom-based treatments for ADHD also may be affected by cultural factors, as teachers recommend different treatments to students and families based on cultural factors pertaining both to themselves and to students. Specifically, teachers in North America, South America, and the Caribbean recommended different treatments for students with ADHD, with teachers in North America more frequently indicating that the combination of pharmacological and psychological treatment would be best and that pharmacological intervention can serve to

support psychological treatment (Palacios-Cruz et al., 2013). Additionally, U.S. teachers are more likely to recommend classroom modification, an intervention requiring less parental involvement, for ethnic minority students with ADHD than for ethnic majority students with ADHD (Wood et al., 2009). This is notable as a teacher's recommendation to seek treatment may be especially influential for families. European American teachers also use harsher disciplinary methods in response to ADHD-related classroom behaviors for African American/Black students than for European American students (Harris, 2013), a finding which may generalize to the treatment context.

Teacher intervention implementation of classroom-based interventions has many important effects. Overall, higher-quality intervention implementation is associated with desired child and parent treatment outcomes. More specifically, when teachers' adherence to a behavioral intervention increases due to enhanced consultation and implementation planning, student outcomes are enhanced as well (Hagermoser Sanetti, Collier-Meek, Long, Byron, & Kratochwill, 2015). Teachers' competence in delivering a bullying prevention program and their integration of components of that program into general classroom instruction is related to greater students engagement in the intervention and improved outcomes. Additionally, teacher intervention adherence is related to students' attitudes about intervention content (Biggs et al., 2008; Goncy et al., 2015; Hirschstein et al., 2007). Considering the impact of different aspects of implementation, better treatment adherence and higher quality treatment delivery are both related to desired student outcomes in bullying and drug use prevention programs (Biggs et al., 2008; Goncy et al., 2015; Pettigrew et al., 2015). Notably, a rapport index developed by researchers to represent both teacher engagement of students and student responsiveness

was more highly related to student outcomes than was either teacher-reported or observed fidelity, as examined within the context of a classroom-based nutrition education program (Resnicow et al., 1998). The qualitative, relational elements of implementation appear to drive the relationship between implementation and outcomes.

Research on teacher intervention implementation also has focused on ADHD more specifically. For example, research has found that teacher adherence to a DRC intervention is stable over the course of an entire school year (Vujnovic et al., 2013). Findings from a different study suggest that moderately high levels of parent and teacher adherence to a DRC intervention last up to four months (Murray, Rabiner, Schulte, & Newitt, 2008). Research also suggests that greater teacher adherence to a classroom-based intervention for ADHD may be related to students' classroom performance. Teacher adherence also is positively related to parent participation in interventions (Murray et al., 2008). Additionally, a questionnaire has been developed to assess teacher investment when implementing a classroom-based intervention for ADHD; preliminary research supports the psychometric and clinical properties of the Teacher Investment Questionnaire (TIQ; Power et al., 2009). Research has identified a moderate correlation between teachers' integrity in implementing behavior intervention plans for students with inattention and/or hyperactivity/impulsivity and increased student academic engagement and reduced disruptive behavior (Willes, 2017). At the same time, however, one study found no significant relationship between teacher integrity in implementing a DRC intervention and student outcomes (Vujnovic, 2009). Nonetheless, further research remains to be done on this topic.

Although much of the research on teachers' role in treatment has focused on intervention implementation, additional aspects of teacher involvement exist as well. Limited consideration, however, has been given to the quality of the teacher-clinician relationship in clinician-facilitated interventions, and possible impact of this relationship on child and family treatment outcomes. One study found that teachers who reported greater satisfaction with clinicians in a clinician-facilitated intervention completed more intervention components than did teachers who were less satisfied with clinicians (Vujnovic, 2009). Research also has examined the role of other mental health professionals. Within the Family-School Collaborative Consultation Project, for example, the role of the school counselor is conceptualized as facilitating a positive and productive working relationship between parents and teachers (Amatea, Daniels, Bringman, & Vandiver, 2004). Again, as mentioned, the role that teachers play in recommending treatment options and referring families to specific treatments is very important as well. Teachers may be more willing to engage in interventions if students are referred or specific treatment programs are recommended by their colleagues or school administration.

In sum, ADHD is a common disorder characterized by symptoms and functional impairment across domains (Larson et al., 2011; NIMH, 2012; Pelham et al., 2005). Although this condition often begins in childhood, it may persist beyond into adolescence and adulthood without appropriate treatment (Bernardi et al., 2012). Latinos experience symptoms of ADHD at rates similar to individuals of other ethnicities, but are less likely to be diagnosed with the condition and to receive high-quality treatment (Flores & the Committee on Pediatric Research, 2010; Morgan et al., 2014). Nonetheless, research

suggests that Latinos benefit from evidence-based treatments for ADHD, especially when appropriate cultural adaptations are made (Gerdes et al., under review; Miranda et al., 2005). Many such interventions require teacher involvement, frequently through the implementation of a DRC (DuPaul, Weyandt, & Janusis, 2011). The quality of teacher intervention implementation is related to positive child and parent treatment outcomes (Murray et al., 2008).

Current Study and Hypotheses

The current study aimed to contribute to the knowledge base about the impact of teacher involvement and engagement in treatment for Latino youth with ADHD. First, it was predicted that teachers would exhibit greater engagement in treatment when families were referred by their child's teacher/school as compared to when families were referred by other referral sources (as indicated by teacher investment in treatment, teacher-clinician relationship quality, percent teacher meetings cancelled, percent teacher meetings no-showed, and percent DRCs correctly completed).

Second, it was predicted that after controlling for relevant pre-treatment ratings, a teacher/school referral and greater teacher engagement in treatment (i.e., teacher investment in treatment, teacher-clinician relationship quality, percent teacher meetings cancelled, percent teacher meetings no-showed, and percent DRCs correctly completed) would predict better child treatment outcomes (i.e., post-treatment parent- and teacher-ratings of ADHD symptoms and functional impairment and percent home- and school-based treatment goals met).

Lastly, it was predicted that a teacher/school referral and greater teacher engagement in treatment (i.e., teacher investment in treatment, teacher-clinician

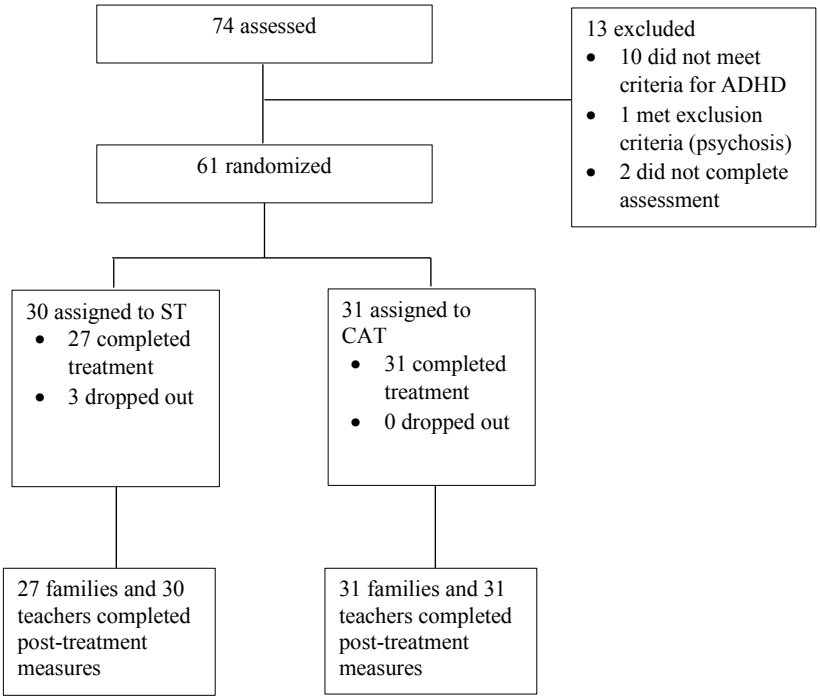
relationship quality, percent teacher meetings cancelled, percent teacher meetings no-showed, and percent DRCs correctly completed) would predict better parent/family treatment outcomes (i.e., maternal and paternal satisfaction with treatment, therapist ratings of family engagement in treatment, family homework completion, and retention in treatment).

Method

Participants

Participants in the current study included Latino youth diagnosed with ADHD and their parent(s) and primary teacher who participated in a psychosocial intervention for ADHD as part of a larger research study. Seventy-four youth were initially recruited to participate; of these, two did not complete the initial assessment process, 10 did not meet criteria for ADHD, and one met exclusion criteria for the larger study, resulting in a final sample size of 61 youth, 61 primary teachers, 61 mothers, and 48 fathers. See Figure 1.

Figure 1. CONSORT Figure.



Most of these 61 youth were male (72.1%) and the mean age was 7.98 years (SD=2.57). Both mothers and fathers in the current study endorsed greater behavioral acculturation towards traditional Latino culture than U.S. mainstream culture, and greater cognitive acculturation towards U.S. mainstream culture than traditional Latino culture. Most mothers and fathers had lived in the U.S. for more than 10 years (67.2% of mothers and 75.4% of fathers) and Mexico was the most common country of origin for both mothers and fathers (80.3% of mothers and 77.0% of fathers). The average socioeconomic status (SES) for families in the current study was 23.46 on Hollingshead's Four Factor Index of Social Status, consistent with semi-skilled labor (Hollingshead, 1975). See Table 1.

Table 1
Demographic Characteristics.

Key Demographic Characteristics	
Child Age, M (*SD*)	7.98 (*2.57*)
Child Gender, *n* (%)	
Male	*44* (72.1%)

Female	*17* (27.9%)
Family SES, M (*SD*)	23.43 (*11.13*)
Treatment Condition, *n* (%)	
PMT	*30* (49.2%)
CAT	*31* (50.8%)
Maternal Country of Origin, *n* (%)	
México	*49* (80.3%)
Puerto Rico	*2* (3.3%)
U.S.	*5* (8.2%)
Other	*5* (8.2%)
Paternal Country of Origin, *n* (%)	
México	*47* (77.0%)
Puerto Rico	*6* (9.8%)
U.S.	*6* (9.8%)
Other	*2* (3.3%)
Additional Demographic Characteristics	
Maternal Acculturation, M (*SD*)	
Latino Behavioral Acculturation	4.43 (*.50*)
Latino Cognitive Acculturation	2.80 (*.54*)
Anglo Behavioral Acculturation	2.46 (*.88*)
Anglo Cognitive Acculturation	3.94 (*.45*)
Paternal Acculturation, M (*SD*)	
Latino Behavioral Acculturation	4.13 (*.56*)
Latino Cognitive Acculturation	3.15 (*.73*)
Anglo Behavioral Acculturation	2.63 (*.83*)
Anglo Cognitive Acculturation	4.04 (*.44*)
Referral Source, *n* (%)	
Teacher/School	*26* (42.6%)
Other	*35* (57.4%)

Note. SES=socioeconomic status. Family SES was measured according to Hollingshead's method, ranging from 8 to 66 (Hollingshead, 1975). PMT=Parent Management Training, CAT=Culturally Adapted Treatment.

Procedure

Pre-Treatment Assessment. Families were recruited through partnerships with local schools, a local community center, a local health clinic, and a network of community-based health care and social services centers. Specific recruitment tactics

included contacting families in-person at school sponsored events, distributing flyers, and working with staff members to identify families who might benefit from the program.

A phone screening was conducted to determine initial eligibility. Eligibility criteria included that parents self-identified as Latino and were fluent in Spanish, and that children were between five and 13 years at the time of the assessment, displayed symptoms consistent with ADHD, and did not have existing diagnoses of intellectual disability, autism spectrum disorder, or psychosis. Following informed consent and assent, a comprehensive, multi-informant ADHD assessment was conducted if families met initial eligibility criteria. The family portion of the assessment took four hours, with the parent portion conducted in Spanish with a graduate student clinician, and the child portion conducted in the child's preferred language (either English or Spanish) with a trained undergraduate research assistant. Parents participated in an unstructured interview and completed a demographic form and measures assessing ADHD symptomatology and functional impairment, parenting stress and family functioning, and acculturation and cultural variables. The measures relevant to the current study are described below. Children participated in an unstructured interview and completed measures assessing internalizing symptoms. Each family received a $100 Target gift card upon completion of the assessment.

Following the family assessment, the graduate student clinician met with each child's primary teacher. Following informed consent, the teacher participated in an unstructured interview and completed measures assessing ADHD symptomatology and functional impairment. Each teacher received a $5 Target gift card upon completion of the assessment.

Treatment. Families whose children met criteria for ADHD and did not meet exclusion criteria for the larger study were randomly assigned to one of two treatment conditions: standard evidence-based parent management training (PMT), or a culturally-adapted evidence-based treatment (CAT). Both PMT and CAT have resulted in positive child and family outcomes when implemented with Latino families (Gerdes et al., under review; Gerdes et al., 2015).

PMT consisted of eight weekly two-hour long parent training classes, focused on a different skill each session, as well as a Daily Report Card school intervention which teachers were responsible for implementing each day, indicating the child's progress on collaboratively established behavioral goals. Specifically, two home-based treatment goals and multiple school-based treatment goals were identified for each participating child by their parent(s), teacher, and clinician. All goals were specific and measurable to facilitate the tracking of children's progress. Parent sessions were led by a graduate student clinician and a social worker, and were conducted in Spanish; they were held in the evening at a university-based outpatient clinic, with snacks and childcare provided. PMT also included weekly meetings between the clinician and each child's teacher, with parents attending the first and last meeting at the school.

CAT consisted of eight weekly two-hour long parent training classes, focused on a different skill each session, as well as a Daily Report Card school intervention, which teachers were responsible for implementing each day, indicating the child's progress on collaboratively established behavioral goals, in the same way as described above for PMT. Parent sessions were led by a graduate student clinician and a social worker, and were conducted in Spanish; they were held in the evening at a community center, with

dinner and childcare provided. CAT also included weekly meetings between the clinician and each child's teacher(s) and parent(s) at the school. Additionally, two home visits were conducted for each family enrolled in CAT over the course of treatment to observe skills being implemented in the home setting and support families as needed.

Post-Treatment Assessment. Following the completion of treatment, parents and teachers again completed measures assessing ADHD symptomatology and functional impairment for each child. Parents also completed a measure assessing satisfaction with treatment.

Measures

The measures of interest for the current study include a demographic form, the Acculturation Rating Scale for Mexican Americans-II (ARMSA-II), the Mexican American Cultural Values Scale (MACVS), the Teacher Investment Questionnaire, therapist-rated teacher-clinician relationship quality, percent teacher meetings cancelled, percent teacher meetings no-showed, percent DRCs correctly completed, the Disruptive Behavior Disorders Rating Scale (DBD Rating Scale), ADHD-FX Scale, percent home- and school-based goals attained, the Therapy Attitudes Inventory, therapist-rated quality of family engagement, family homework completion, and retention in treatment.

Demographic Form. Parents completed a demographic form, providing information about participating children and parents, such as age, sex, and factors related to SES. Hollingshead Four Factor Index of Social Status (Hollingshead, 1975) was subsequently used to compute SES for each family.

Acculturation. To assess parental behavioral acculturation, parents completed the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II; Cuéllar, Arnold, &

Maldonado, 1995). The ARSMA-II is a 30 item self-report measure of behavioral acculturation, which was completed by parents in Spanish. Items are endorsed on a Likert scale from 1 to 5, with higher numbers indicating greater orientation to Anglo and Mexican/Latino culture. When scored, the measure results in the Anglo Orientation (AOS) and Mexican/Latino Orientation (LOS) subscales. This measure has been found to have good psychometric properties in its original form (Cuéllar et al., 1995), as well as when word substitutions are made to make the measure applicable to a greater population (i.e., Gerdes et al., under review). In the current study, the ARSMA-II demonstrated good reliability with Cronbach's alphas ranging from .75 to .88 for mothers and fathers across the two subscales.

To assess parental cognitive acculturation, parents additionally completed the Mexican American Cultural Values Scale (MACVS; Knight et al., 2010). The MACVS is a 50 item self-report measure of cognitive acculturation, which was completed by parents in Spanish. Items are endorsed on a Likert scale from 1 to 5, with higher numbers indicating greater orientation towards U.S. mainstream and Latino American values. When scored, the measure results in the Mainstream Values (MV) and Latino American Values (LAV) subscales. This measure has been found to have strong psychometric properties (Knight et al., 2010), which were upheld in the current study with Cronbach's alphas ranging from .69 to .88 for mothers and fathers across the two subscales.

Teacher investment in treatment. Clinicians completed the Teacher Investment Questionnaire (Power et al., 2009) to assess teacher's engagement and investment in intervention implementation. The TIQ has demonstrated acceptable reliability and validity (Power et al., 2009). The scale was varied slightly to be appropriate for use with

the intervention in the current study, as has been done in previous research (Power et al., 2009). The 11 resulting items were endorsed by clinicians on a Likert scale from 1 (not at all true) to 4 (very true). Sample items include: "teacher was supportive of family involvement in program" and "teacher provided enough time during meetings." Power et al. (2009) found two different versions of the TIQ to have alphas of at least .90. In the current study, the TIQ demonstrated a Cronbach's alpha of .91.

Teacher-clinician relationship. At the end of treatment, the two graduate student clinicians involved in treatment rated the quality of their relationship with each teacher with whom they worked, on a Likert scale from 1 (very poor) to 5 (very good). Inter-rater agreement was almost perfect (κ=0.85, p<0.01; Landis & Koch, 1977). When the two clinicians disagreed, they discussed and decided on a final rating collaboratively. This final rating was used in all analyses for the current study.

Teacher intervention implementation. Several aspects of teacher intervention implementation were calculated. Specifically, the graduate student clinicians kept track of the number of occasions on which each teacher cancelled and no-showed scheduled DRC meetings, in relation to the total number of initially scheduled meetings. At the end of treatment, the percentage of DRC meetings cancelled and no-showed was calculated for each teacher. Additionally, following treatment, all DRCs for each child were evaluated for correctness and the percent DRCs correctly completed was determined for each teacher.

ADHD symptomatology. Parents and teachers completed the DBD Rating Scale (Gerdes et al., 2013; Pelham et al., 1992), a parent and teacher-report measure of symptoms of ADHD, Oppositional/Defiant Disorder (ODD), and Conduct Disorder (CD),

based on the DSM (Pelham, Gagny, Greenslade, & Milich, 1992). Respondents endorse the 45 items that make up the scale on a Likert scale from 0 (symptom is not at all a problem) to 3 (symptom is very much a problem). Examples of items assessing inattention, hyperactivity, and impulsivity include: "[child] is often easily distracted by extraneous stimuli," "child is often 'on the go' or often acts as if 'driven by a motor,'" and "[child] often interrupts or intrudes on others,'" respectively. Teachers completed the English language version, which has good internal consistency, test-retest reliability, and treatment outcome validity (as described in Pelham, Fabiano, & Massetti, 2005). Parents completed the Spanish language version of the DBD Rating Scale (DBD-S), which has similar psychometric properties (Gerdes, Lawton, Haack, & Dieguez Hurtado, 2013). In the current study, the parent and teacher DBD Rating Scales demonstrated Cronbach's alphas ranging from .84 to .91 across pre-treatment and post-treatment.

Functional impairment. Parents and teachers additionally completed the ADHD-FX Scale (Haack & Gerdes, 2014). The ADHD-FX Scale assesses ADHD-related functional impairment. It was specifically developed to be appropriate for use with families of diverse backgrounds (Haack, et al., 2014). Parents and teachers respond to each of the 32 items that make up the scale by indicating how much each behavior affects the child in their day-to-day life or at school, on a Likert scale from 0 (not at all) to 3 (a lot). Examples of items assessing impairment in the home setting and in the school setting include: "[child] needs more attention and/or help than other children" and "[child] doesn't turn in completed schoolwork," respectively. An overall impairment score and home and school subscale scores can be calculated. Parents completed the Spanish language version of the parent ADHD-FX Scale, which has good reliability,

divergent and convergent construct validity, and cultural properties (Haack, Gonring, Harris, Gerdes, & Pfiffner, 2016), while teachers completed the English language version of the teacher ADHD-FX Scale. In the current study, the parent and teacher ADHD-FX Scales demonstrated Cronbach's alphas ranging from .84 to .93 across pre-treatment and post-treatment.

Treatment goals attained. Two home-based treatment goals and several school-based treatment goals were collaboratively established for each participating child by their parent(s), teacher, and clinician. Specifically, as described above, clinicians developed school-based treatment goals based on the concerns teachers reported about each individual student, making sure that goals were specific and measurable to facilitate tracking. For example, a school-based goal for one child was to stay in his seat in the afternoon with 4 or fewer reminders from his teacher. Throughout the course of treatment, teachers tracked children's progress towards each school-based goal on a daily basis, providing data to the clinicians that was used to graphically represent and monitor progress towards goals. The same two specific, measurable home-based goals were implemented for each child, given the significant overlap between the concerns parents reported. The goals were for the child to demonstrate compliance with parental instructions 75% of the time, and for the child to complete homework and daily routines in less time and with less conflict. Parents similarly tracked their child's progress towards these two goals, and clinicians collected this data to monitor progress towards home-based goals as well. At the end of treatment, it was determined whether or not each of the goals had been achieved and the percentage of home- and school-based goals attained was calculated for each child.

Treatment satisfaction. To assess parental satisfaction with treatment, parents completed the Therapy Attitudes Inventory (Eyberg, 1993). The TAI assesses consumer satisfaction with treatment, and is designed to be appropriate with respect to various treatment modalities. Adequate psychometric properties have been demonstrated (Brestan, Jacobs, Rayfield, & Eyberg, 1999). The 10 items making up the scale are endorsed on a Likert scale from 1 (indicating dissatisfaction) to 5 (indicating satisfaction). Items inquire about topics such as their opinion of treatment in general, specific treatment techniques, and improvement noted during treatment. The measure was translated into Spanish for use in the current study. The TAI has been found to have acceptable psychometric properties, including good reliability and validity (Brestan et al., 1999). In the current study, the TAI demonstrated a Cronbach's alpha of .83 when completed by mothers (n=61) and a Cronbach's alpha of .89 when completed by fathers (n=47).

Family engagement in treatment. Following the completion of treatment, the graduate students clinicians and the treatment co-leader rated each parent's engagement in treatment, on a Likert scale from 1 (very low) to 5 (very high). A mean rating was computed for each parent, and in cases in which two parents participated from the same family, a mean family engagement variable was computed.

Homework completion. Families were given weekly homework assignments, which were subsequently checked for completion. Percent homework completed overall was determined for each family at the end of treatment.

Family retention in treatment. Families who completed the last planned treatment session were considered to have been retained in treatment, while families who did not achieve this were considered to have dropped out of treatment.

Results

Preliminary Analyses

Correlations were examined among outcome variables on the same scale to determine if highly correlated variables should be combined. Specifically, a Pearson correlation was examined between teacher outcome variables (percent DRC meetings no-showed and percent DRC meetings cancelled), with no significant relationship detected (r=.08, *ns*). Pearson correlations also were examined among child outcomes (post-treatment parent- and teacher-reports of hyperactivity/impulsivity and inattention and functional impairment, and percent of home- and school-based goals achieved). Although two statistically significant positive correlations were revealed among post-treatment parent- and teacher-reports of hyperactivity/impulsivity and inattention, neither were above the .7 cut-off indicating multicollinearity (see Table 2; Tabachnick & Fidell, 1996).

Table 2
Correlations Among ADHD Symptomatology Variables.

	Parent DBD Inattentive Symptoms	Parent DBD Hyperactive/Impulsive Symptoms	Teacher DBD Inattentive Symptoms	Teacher DBD Hyperactive/ Impulsive Symptoms

Parent DBD Inattentive Symptoms	-	-	-	-
Parent DBD Hyperactive/ Impulsive Symptoms	.65***	-	-	-
Teacher DBD Inattentive Symptoms	-.09	-.06	-	-
Teacher DBD Hyperactive/ Impulsive Symptoms	-.26*	.09	.60***	-

Note. Pearson correlations were utilized; DBD=Disruptive Behavior Disorders Rating Scale; ***$p \leq .001$, *$p \leq .01$.

Relatively low correlations between parent and teacher report of ADHD symptoms such as these are not unexpected based on previous research, particularly within Latino families (Grace, Kapke, Castro, & Gerdes, 2017). No statistically significant relationships were detected between post-treatment parent- and teacher-reports of functional impairment (r=-.14, *ns*) or between percent of home- and school-based goals achieved (r=.09, *ns*). Pearson correlations also were examined between parent/family treatment outcomes (mother and father treatment satisfaction scores), revealing a statistically significant positive correlation (r=.62, p<.001) that did not reach the .7 threshold commonly accepted as indicative of multicollinearity (Tabachnick & Fidell, 1996). Thus, no outcome variables were combined.

Next, all teacher (i.e., referral source, teacher investment in treatment, teacher-clinician relationship quality, percent DRC meetings cancelled, percent DRC meetings no-showed, and percent of DRCs correctly completed), child (i.e., parent and teacher ratings of ADHD symptoms and functional impairment, and percent home- and school-based goals achieved), and parent/family outcome variables (i.e., maternal and paternal satisfaction with treatment, family engagement in treatment, homework completion, and retention in treatment) were examined with respect to key demographic variables (i.e., child gender, child age, family SES, and treatment condition). First, Pearson correlations between child age and family SES with teacher, child, and parent/family outcome variables were examined. Only one statistically significant correlation emerged. Specifically, a negative relationship between child age and percent of DRCs correctly completed emerged (see Table 3).

Table 3
Correlations Between Demographic Variables with Teacher, Child, and Parent/Family Outcome Variables.

	Child Age	Family SES
Teacher Outcomes		
Teacher Investment in Treatment	-.13	-.11
Teacher-clinician Relationship Quality	-.03	-.03
% Teacher Meetings Cancelled	-.02	-.13
% Teacher Meetings No-showed	.13	-.02
% DRCs Correctly Completed	-.45***	.12
Child Outcomes		
Parent DBD Inattention	.03	.04

Parent DBD Hyperactivity/Impulsivity	-.19	.02
Teacher DBD Inattention	.10	.02
Teacher DBD Hyperactivity/Impulsivity	-.17	.09
Parent ADHD-FX Impairment at Home	-.00	-.18
Teacher ADHD-FX Impairment at School	.01	.04
% Home Goals Achieved	.22	-.16
% School Goals Achieved	-.04	.43
Parent/Family Outcomes		
Mother Treatment Satisfaction	.00	-.13
Father Treatment Satisfaction	.01	-.03
Family Engagement	-.06	-.11
Homework Completion	-.05	-.15
Retention	.42	-.12

Note. Pearson's correlations were used for continuous variables, while Spearman's correlations were used for categorical variables. Family SES was measured according to Hollingshead's method (Hollingshead, 1975), ranging from 8 to 66 with a mean of 23.46 in the current sample. DBD=Disruptive Behavior Disorders Rating Scale.
***$p \leq .001$.

Next, a series of independent samples t-tests was conducted to examine child gender and treatment condition (i.e., PMT and CAT) with respect to continuous teacher, child, and parent/family outcome variables. Bonferroni corrections were used and unequal variance was accounted for as appropriate. Only one significant difference was detected with respect to gender. Teachers rated boys as more impaired in the classroom than they rated girls (see Table 4).

Table 4
Results of t-tests for Teacher, Child, and Parent/Family Outcome Variables by Child Gender.

	Child Gender				95% CI for		
	Male		Female		Mean Difference		
	Mean	SD	Mean	SD		*t*	df
Teacher Outcomes							
Teacher Investment in Treatment	3.01	(.64)	3.21	(.30)	-.44-.05	-1.61	56.93
Teacher-clinician Relationship Quality	3.45	(1.28)	3.88	(.60)	-.91-.06	-1.77	56.68
% Teacher Meetings Cancelled	.05	(.13)	.02	(.06)	-.04-.09	.78	59
% Teacher Meetings No-showed	.05	(.10)	.03	(.07)	-.02-.07	1.17	43.38
% DRCs Correctly Completed	.77	(.25)	.71	(.33)	-.10-.22	.75	58
Child Outcomes							
Parent DBD Inattention	1.30	(.66)	1.2	(.64)	-.29-.49	.51	56
Parent DBD Hyperactivity/Impulsivity	1.32	(.70)	1.16	(.50)	-.24-.55	.12	56
Teacher DBD Inattention	1.37	(.78)	1.06	(.56)	-.05-.67	1.72	40.63
Teacher DBD Hyperactivity/Impulsivity	1.08	(.73)	.85	(.45)	-.09-.54	1.18	46.71
Parent FX Impairment at Home	.76	(.44)	.65	(.45)	-.16-.37	.65	56
Teacher ADHD-FX Impairment at School	1.06	(.60)	.79	(.38)	.02-.54	2.16*	46.47
% Home Goals Achieved	.69	(.28)	.64	(.33)	-.11-.22	.67	59
% School Goals Achieved	.60	(.30)	.68	(.33)	-.26-.10	-.89	59
Parent/Family Outcomes							
Mother Treatment Satisfaction	45.67	(3.48)	46.33	(3.64)	-2.77-1.46	-.62	56
Father Treatment Satisfaction	44.19	(4.55)	44.58	(5.33)	-3.65-2.86	-.25	42
Family Engagement	4.38	(.59)	4.03	(1.29)	-.34-1.03	1.06	18.67
Homework Completion	.80	(.20)	.77	(.26)	-.10-.15	.40	59

Note. DBD=DBD Rating Scale; *$p \leq .05$.

Several significant differences also emerged with respect to treatment condition. Mothers who participated in CAT reported greater satisfaction with treatment than did mothers who participated in PMT, families who participated in CAT completed a greater percentage of their weekly homework than did families who participated in PMT, and teachers who participated in CAT completed a greater percentage of DRCs correctly than did teachers who participated in PMT (see Table 5).

Table 5
Results of t-tests for Teacher, Child, and Parent/Family Outcome Variables by Treatment Condition.

	Treatment Condition				95% CI for Mean Difference	*t*	df
	PMT		CAT				
	Mean	SD	Mean	SD			
Teacher Outcomes							
Teacher Investment in Treatment	3.18	(.52)	2.97	(.61)	-.08-.50	1.46	59
Teacher-clinician Relationship Quality	3.83	(1.12)	3.32	(1.14)	-.07-1.09	1.78	59
% Teacher Meetings Cancelled	.04	(.07)	.04	(.15)	-.06-.06	.12	59
% Teacher Meetings No-showed	.03	(.07)	.06	(.10)	-.07-.02	-1.09	54.88
% DRCs Correctly Completed	.66	(.31)	.84	(.21)	-.31--.04	-2.53*	49.65
Child Outcomes							
Parent DBD Inattention	1.44	(.72)	1.13	(.56)	-.02-.65	1.86	56
Parent DBD Hyperactivity/Impulsivity	1.31	(.71)	1.24	(.61)	-.28-.42	.42	56
Teacher DBD Inattention	1.36	(.73)	1.21	(.74)	-.23-.53	.80	59
Teacher DBD Hyperactivity/Impulsivity	.95	(.52)	1.08	(.79)	-.47-.21	-.77	52.32
Parent ADHD-FX Impairment at Home	.83	(.52)	.64	(.35)	-.03-.42	1.71	56
Teacher ADHD-FX Impairment at School	1.03	(.58)	.94	(.55)	-.20-.38	.61	59
% Home Goals Achieved	.63	(.32)	.72	(.26)	-.24-.06	-1.19	59
% School Goals Achieved	.57	(.30)	.67	(.32)	-.26-.05	-1.33	59

Parent/Family Outcomes							
Mother Tx Satisfaction	44.74	(3.57)	46.81	(3.20)	-3.85--.29	-2.33*	56
Father Tx Satisfaction	43.12	(4.91)	43.04	(4.53)	-4.84-1.00	-1.33	42
Family Engagement	4.13	(1.11)	4.43	(.45)	-.75-.14	-1.38	38.11
Homework Completion	.69	(.24)	.89	(.14)	-.30--.10	-3.92***	45.22

Note. PMT=Parent Management Training, CAT=Culturally Adapted Treatment; DBD=Disruptive Behavior Disorders Rating Scale; *$p \leq .05$; ***$p \leq .001$.

Finally, chi square tests of independence were conducted to examine child gender and treatment condition with respect to the categorical family outcome variable, retention. No significant results were noted (see Table 6).

Table 6
Chi-square Test for Retention by Child Gender and Treatment Condition.

Retention	Gender	
	Male	Female
Yes	43	15
No	1	2
	Treatment Condition	
	PMT	CAT
Yes	27	31
No	3	0

Note. For child gender, $\chi^2 = 2.36$, *ns*, df =1; for treatment condition, $\chi^2 = 3.26$, *ns*, df =1; PMT=Parent Management Training, CAT=Culturally Adapted Treatment.

As more than 20% of expected cell counts was less than 5 in both cases, a variation known as the *N*-1 chi square test also was performed (Campbell, 2007; Busing, Weaver, & Dubois, 2016), with findings remaining non-significant.

Primary Analyses

Impact of a teacher/school referral to treatment. To examine the first hypothesis that teachers would exhibit greater engagement in treatment when families were referred by their child's teacher versus by another referral source, independent samples t-tests were conducted; again, Bonferroni corrections were used and unequal variance was accounted for as appropriate. Specifically, based on referral source (i.e., teacher/school vs. others), mean differences were examined with respect to teacher investment in treatment, teacher-clinician relationship quality, percent teacher meetings cancelled, percent teacher meetings no-showed, and percent DRCs correctly completed. As indicated in Table 7, results did not reveal any significant differences based on referral source. [1]

Table 7
Results of t-tests for Teacher Outcomes by Referral Source.

	Referral Source				95% CI for Mean Difference	*t*	df
	Teacher/School		Other				
	Mean	SD	Mean	SD			
Teacher Investment in Treatment	3.17	(.44)	2.99	(.65)	-.45-.11	-1.24	58.62
Teacher-clinician Relationship Quality	3.85	(1.12)	3.37	(1.14)	-1.06-.11	-1.62	59
% Teacher Meetings Cancelled	.02	(.05)	.05	(.15)	-.02-.09	1.38	43.46
% Teacher Meetings No-showed	.03	(.07)	.06	(.10)	-.01-.07	1.32	57.58

[1] Given the significant correlations that emerged between child age, treatment type, and percent DRCs correctly completed, an ANCOVA also was conducted to examine mean differences in percent DRCs correctly completed by referral source while accounting for these covariates. As the pattern of findings remained the same, the results of the t-test are reported above and in Table 7.

% DRCs Correctly Completed	.77	(.29)	.73	(.26)	-.18-.11	-.52	58

Note. DRC=Daily Report Card.

Impact of Teacher Engagement in Treatment on Child Outcomes. To examine the second hypothesis that a teacher/school referral and greater teacher engagement in treatment would predict better child treatment outcomes, correlations were first examined between predictor variables and outcome variables. Specifically, correlations were examined between teacher/school referral and teacher engagement variables (teacher investment in treatment, teacher-clinician relationship quality, percent teacher meetings cancelled, percent teacher meetings no-showed, and percent DRCs correctly completed) and child outcomes while controlling for relevant pre-treatment ratings of symptoms and impairment and demographic variables that previous analyses identified as related to outcome variables. As such, correlations controlled for parent and teacher pre-treatment report of symptoms and functional impairment when examining parent and teacher post-treatment report of symptoms and functional impairment and controlled for child age and treatment type when examining percent DRCs correctly completed. Pearson and Spearman correlations were utilized for continuous and categorical variables, respectively. Results indicate that percent teacher meetings no-showed was significantly and negatively related to percent school goals achieved (r=-.27, p<.05), and referral source was significantly and positively related to parent report of hyperactive/impulsive symptoms (r=-.26, p<.05; see Table 8).

Table 8
Correlations Between Predictors and Child and Parent/Family Outcome Variables.

	Referral Source	Teacher Investment in	Teacher-clinician Relationship	% Teacher Meetings	% Teacher Meetings No-	% DRCs Correctly

		Treatment	Quality	Cancelled	showed	completed
Child Outcomes						
Parent DBD Inattention	-.12	.05	-.06	-.06	.07	.18
Parent DBD Hyperactivity/Impulsivity	-.26*	.02	-.07	-.04	.07	.09
Parent ADHD-FX Impairment at Home	-.05	.20	.05	-.00	-.12	.14
Teacher DBD Inattention	.09	.05	.17	-.09	.08	-.11
Teacher DBD Hyperactivity/Impulsivity	-.01	.03	.07	-.02	-.03	-.01
Teacher ADHD-FX Impairment at School	.12	-.01	.06	.16	.03	-.25
% Home Goals Achieved	-.11	.08	.09	-.01	-.03	.13
% School Goals Achieved	.12	.11	-.08	-.12	-.27*	.16
Parent/Family Outcomes						
Mother Treatment Satisfaction	.31*	.29*	.31*	-.12	-.25	-.02
Father Treatment Satisfaction	.29	.13	.00	-.10	-.05	.07
Family Engagement	-.10	.08	-.01	.03	-.04	-.01
Homework Completion	.09	-.09	-.21	.20	.07	-.16
Retention	-	.02	-.09	.08	.12	.17

Note. Pearson's correlations were used for continuous variables, while Spearman's correlations were used for categorical variables. Partial correlations were used to control for parent and teacher pre-treatment report of symptoms and functional impairment when examining parent and teacher post-treatment report of symptoms and functional impairment, for gender when examining teacher report of functional impairment in the classroom, and for treatment condition when examining maternal satisfaction with treatment and homework completion; DBD=Disruptive Behavior Disorders Rating Scale; *$p \leq .05$.

Impact of teacher engagement in treatment on parent/family outcomes. To examine the third hypothesis that a teacher/school referral and greater teacher engagement in treatment would predict better parent/family treatment outcomes, correlations were first examined between predictor variables and outcome variables. Specifically, correlations were examined between teacher/school referral and teacher engagement variables (teacher investment in treatment, teacher-clinician

relationship quality, percent teacher meetings cancelled, percent teacher meetings no-showed, and percent DRCs correctly completed) and parent/family outcomes while controlling for relevant demographic variables that previous analyses identified as related to outcome variables. As such, correlations controlled for child age and treatment type when examining percent DRCs correctly completed and controlled for treatment condition when examining maternal satisfaction with treatment and homework completion. Again, Pearson and Spearman correlations were utilized for continuous and categorical variables, respectively.

Results indicate that referral source was significantly related to maternal satisfaction with treatment (r=.31, p<.05), teacher investment in treatment was significantly related to maternal satisfaction with treatment (r=.29, p<.05), and teacher-clinician relationship quality was significantly related to maternal satisfaction with treatment (r=.31, p<.05; see Table 8). A chi square test of independence also was conducted to examine the relationship between the categorical predictor and outcome variables of referral source and retention, respectively; no significant relationship was noted, χ^2 =.75, *ns*. As more than 20% of expected cell counts was less than 5, the *N*-1 chi square test also was performed (Campbell, 2007; Busing et al., 2016), with findings remaining the same.

Follow-up Regression. Finally, a hierarchical linear regression was conducted based upon the results of the above correlations, as multiple demographic and predictor variables were significantly correlated with a single outcome variable—maternal satisfaction with treatment. Treatment condition was entered at Step 1, dummy coded with PMT as 1 and CAT as 2. Referral source (dummy coded with teacher/school referral

as 1 and all other referral sources as 0), teacher investment in treatment, and teacher-clinician relationship quality were entered at Step 2. The overall model was significant at step 2, F(4, 53)=4.16, $p<.01$; $R^2=.24$, $p<.05$. Treatment condition and referral source were both significant and positive predictors of maternal treatment satisfaction, β=.35, $p<.01$ and β =.25, $p<.05$, respectively. See Table 9.

Table 9
Hierarchical Linear Regression Predicting Mother Treatment Satisfaction.

	B	*SE B*	*β*	*t*	R^2	ΔR^2
Step 1					.09	.09
Treatment Condition	2.07	.89	.30	2.33*		
Step 2					.24	.15
Treatment Condition	2.44	.86	.35	2.85*		
Referral Source	1.76	.87	.25	2.03*		
Teacher Investment in Treatment	.85	1.27	.14	.67		
Teacher-Clinician Relationship Quality	.40	.64	.13	.63		

Note. *$p\leq .05$; **$p\leq .01$.

Discussion

The aim of the current study was to examine the impact of teacher engagement in psychosocial treatment for ADHD in a sample of Latino youth. The current study adds to the literature base in that it examined teacher engagement in a different context and in an under-served, under-represented population. Findings demonstrate that teachers in the current study were

equally engaged in treatment, regardless of the source of the original referral to treatment. Findings also indicate that certain aspects of teacher engagement in treatment are related to child and parent/family treatment outcomes. These findings add support to findings from previous research indicating that high-quality teacher intervention implementation, as evidenced by adherence to intervention components and positive relationships, is related to improved outcomes for families, including both youth and parents (Hagermoser Sanetti et al., 2015; Murray et al., 2008). These findings are especially important to consider within the context of Latino youth and families.

Impact of a Teacher/School Referral to Treatment

The first hypothesis of the current study hypothesized that teachers would exhibit greater engagement in treatment when families were referred by their child's teacher/school as compared to when families were referred by other referral sources (as indicated by teacher investment in treatment, teacher-clinician relationship quality, percent teacher meetings cancelled, percent teacher meetings no-showed, and percent DRCs correctly completed). No significant differences in teacher engagement in treatment based on referral source were revealed. Although these findings were surprising, they do fit well with some previous research. Specifically, research has identified factors that influence teachers' engagement in interventions, such as the perceived usefulness of a specific intervention (Biggs et al., 2008), as well as factors influencing the degree to which teachers find interventions to be acceptable, which may then influence their engagement in that intervention. These factors include the perceived degree of support and parental involvement necessary and the sustainability of the intervention (Lal, 2014). It may be that the engagement in treatment exhibited by teachers

in the current study depended not only on referral source, but also on factors such as these. As these factors may not have varied greatly from teacher to teacher in the current study, this may explain why teacher engagement did not significantly vary based on referral source.

Although unexpected, the fact that no significant differences in teacher engagement in treatment based on referral source were revealed suggests that teachers in the current study were equally engaged in treatment, regardless of whether a given family's referral to treatment came from the teacher/school or from another source. Teachers adhered to program components (completion of DRCs and attendance of weekly meetings) at an approximately equal rate, and they were rated by clinicians as approximately equally invested in treatment and having approximately equivalent relationships with clinicians. These findings suggest that teachers were motivated to work with students, families, and clinicians to improve students' classroom behavior and outcomes no matter who made the initial referral to treatment.

This finding is especially important within the context of the Latino youth and families who participated in treatment in the current study. Many Latino parents hold a broad definition of education based on cultural values such as *familismo, respeto, personalismo,* and *colectivismo*, and want to have a close, personal relationship with their children's teachers that also is beneficial to their children's education (Calzada, 2010; Hill & Torres, 2010). This often stands in contrast to many U.S. teachers' expectations for the parent-teacher relationship (Zarate, 2007). Additionally, Mexican-American students have endorsed expectations for education and their interactions with teachers that contradict those of many U.S. teachers, and some of these students feel ignored and

criticized by teachers (Andrews, 2016). As such, it is especially meaningful to see teachers actively engaging with Latino parents and students through participation in treatment, regardless of whether that same teacher or another person initially referred the family to treatment.

Impact of Teacher Engagement in Treatment on Child Outcomes

The hypothesis that a teacher/school referral and greater teacher engagement in treatment (as evidenced by teacher investment in treatment, teacher-clinician relationship quality, percent teacher meetings cancelled, percent teacher meetings no-showed, and percent DRCs correctly completed) would predict better child treatment outcomes (post-treatment parent- and teacher-reported symptoms of hyperactivity/impulsivity, inattention, and functional impairment, percent school-based goals achieved, and percent home-based goals achieved) was partially supported. Specifically, correlations revealed that referral source was significantly related to parent post-treatment ratings of hyperactivity/impulsivity, after controlling for parent pre-treatment rating of hyperactivity/impulsivity. Fewer symptoms of hyperactivity/impulsivity were reported post-treatment for children who were referred to treatment by their teacher. Correlations also revealed that percent teacher meetings no-showed was related to percent school-based goals achieved, such that a greater percentage of school-based was achieved when teachers no-showed fewer meetings.

These findings fit well with previous research, which has identified that a high degree of teacher intervention adherence is related to enhanced student outcomes, including for students with ADHD (Hagermoser Sanetti et al., 2015; Willes, 2017). At the same time, however, previous research also has found that the more qualitative,

relational elements of teacher intervention implementation, such as overall quality and rapport, are related to student outcomes (Pettigrew et al., 2015; Resnicow et al., 1998). In the current study, on the other hand, the qualitative, relational elements of teacher intervention implementation (teacher investment and the teacher-clinician relationship) were not related to child outcomes. One possible explanation for these findings may have to do with the way teacher engagement was measured in the current study. Specifically, it's possible that teacher engagement could have been measured in additional ways that would have more accurately captured variation among teachers. For example, previous research has accounted for teachers' competence in implementing interventions and student-teacher rapport (Goncy et al., 2015; Resnicow et al., 1998), neither of which were measured in the current study and which may capture distinct aspects of teacher intervention implementation. Nonetheless, although the qualitative, relational aspects of teacher intervention implementation were not found to be related to child outcomes in the current study, these elements of teacher intervention implementation were indeed found to be related to parental treatment outcomes. Specifically, as will be discussed further below, teacher investment in treatment and the quality of the teacher-clinician relationship were related to maternal satisfaction with treatment.

Again, these findings must be understood within the context of the Latino population. While some of the previous research linking the quality of teacher intervention implementation to student outcomes has included Latino students (i.e., Biggs et al., 2008), no studies have focused specifically on Latino students to examine how teacher implementation impacts their outcomes in particular. The current study adds to the existing literature base by extending previous findings to a sample of exclusively

Latino students, finding that aspects of teacher intervention implementation are related to student outcomes.

Impact of Teacher Engagement in Treatment on Parent/Family Outcomes

Lastly, the hypothesis that a teacher/school referral and greater teacher engagement in treatment (as evidenced by teacher investment in treatment, teacher-clinician relationship quality, percent teacher meetings cancelled, percent teacher meetings no-showed, and percent DRCs correctly completed) would predict better parent/family treatment outcomes (maternal and paternal satisfaction with treatment, family engagement in treatment, homework completion, and family retention in treatment) was partially supported. Specifically, correlations revealed that referral source, teacher investment in treatment, and teacher-clinician relationship quality were all statistically significantly related to maternal satisfaction with treatment, after controlling for treatment condition. Mothers reported being more satisfied with treatment when their child was referred to treatment by their teacher, when teachers were more invested in treatment, and when the teacher-clinician relationship was rated more highly. Of these variables, only referral source was found to be a statistically significant predictor of maternal satisfaction with treatment when the three predictor variables were simultaneously entered in a linear regression already accounting for treatment condition.

These findings also relate well to previous research, as teacher engagement in treatment and parental participation in treatment have been found to be positively related to one another (Murray et al., 2008). In the current study, this finding is extended to highlight the positive relationship between teacher engagement in treatment and maternal satisfaction with treatment. In the case of parent/family outcomes, as opposed to the child

outcomes described above, this finding fits well with previous research, which found that the subjective quality of teacher intervention implementation and the relationship within which it is delivered are related to outcomes (Pettigrew et al., 2015; Resnicow et al., 1998).

As described, many Latino parents feel dissatisfied with their relationship with their child's teacher and school (Olivos, 2004). They are often interested in frequent contact, friendly interactions, and collaboration to facilitate their child's academic achievement (Griego Jones, 2003; Zarate, 2007). These expectations are often based in part on the cultural values of *familismo*, *respeto*, *personalismo*, and *colectivismo* (Calzada, 2010; Hill & Torres, 2010). Many U.S. teachers, however, expect and create more formal relationship with parents, communicating at scheduled times such as conferences or if a specific concern arises (Amatea et al., 2004). Given this disconnect, the findings of the current study make sense and take on greater meaning. When teachers in the current study exhibited greater engagement in treatment and with parents (as evidenced by higher TIQ and teacher-clinician relationship scores), Latino parents may have perceived teachers as behaving more in-line with the cultural values important to them with regards to education, and thus indicated greater satisfaction with treatment. As mothers are the parent more frequently involved in childcare and education, this may have been especially salient for Latina mothers in the current study.

Post-hoc Analyses

Given the lack of expected findings, it was suspected that additional variables such as parental acculturation might be related to the outcome variables of interest. As such, post-hoc analyses were conducted to explore the relationships among parental

acculturation variables and teacher, child, and parent/family outcome variables. Specifically, correlations were conducted among parental cognitive and behavioral orientation towards both traditional Latino culture and mainstream U.S. culture and teacher outcomes (teacher investment in treatment, teacher-clinician relationship quality, percent teacher meetings cancelled, percent teacher meetings no-showed, and percent DRCs correctly completed), child outcomes (post-treatment parent- and teacher-reported symptoms of hyperactivity/impulsivity, inattention, and functional impairment, percent school-based goals achieved, and percent home-based goals achieved), and parent/family outcomes (maternal and paternal satisfaction with treatment, family engagement in treatment, homework completion, and family retention in treatment). Pearson and Spearman correlations were used as appropriate for continuous and categorical variables, respectively, and partial correlations were used to control for demographic variables significantly related to outcomes variables and relevant pre-treatment ratings of symptoms and impairment. Specifically, child age and treatment condition were controlled for when examining percent DRCs completed correctly, child gender was accounted for when examining teacher report of impairment, and treatment condition was controlled for when examining maternal satisfaction with treatment and percent homework completed. Additionally, correlations examining post-treatment parent- and teacher-report of ADHD symptoms and functional impairment accounted for pre-treatment parent- and teacher-ratings of ADHD symptoms and functional impairment.

Significant and negative correlations were detected between father cognitive orientation towards both traditional Latino culture and mainstream U.S. culture and teacher investment in treatment (r=-.36, p<.01, and r=-.34, p<.05, respectively). Father

orientation towards mainstream U.S. culture also was significantly and negatively related to the quality of the teacher-clinician relationship (r=-.31, p<.05). Maternal cognitive orientation towards traditional Latino culture also was significantly and positively related to maternal satisfaction with treatment (r=.39, p<.01). Maternal behavioral orientation towards mainstream U.S. culture was significantly and negatively related to post-treatment parent-report of inattention (r=-.30, p<.05), while father behavioral orientation towards traditional Latino culture was significantly and positively related to post-treatment parent-report of inattention (r=.41, p<.01). Maternal behavioral orientation towards mainstream U.S. culture also was significantly and negatively related to post-treatment parent-report of hyperactivity/impulsivity (r=-.39, p<.01). Additionally, father behavioral orientation towards mainstream U.S. culture was significantly and positively related to post-treatment teacher-report of inattention, hyperactivity, and functional impairment (r=.35, p<.05, r=.36, p<.01, and r=.30, p<.05, respectively), as well as significantly and negatively related to post-treatment parent-report of functional impairment (r=-.32, p<.05). Finally, maternal cognitive orientation towards mainstream U.S. culture was significantly and positively related to maternal satisfaction with treatment, r=.39, p<.01. See Table 10.

Table 10
Correlations Among Parental Acculturation and Teacher, Child, and Parent/Family Outcome Variables.

	Behavioral Acculturation				Cognitive Acculturation			
	Maternal Latino Orientation	Maternal U.S. Orientation	Paternal Latino Orientation	Paternal U.S. Orientation	Maternal Latino Orientation	Maternal U.S. Orientation	Paternal Latino Orientation	Paternal U.S. Orientation
Teacher Outcomes								
Teacher Investment in Treatment	.01	-.15	-.11	-.23	-.02	-.11	-.36**	-.34*
Teacher-clinician Relationship	-.02	-.10	-.12	-.16	.05	-.01	-.25	-.31*
% Teacher Meetings Cancelled	.04	-.09	.15	-.07	.12	.24	.08	.09
% Teacher Meetings No-showed	.05	-.04	.09	.11	-.10	-.01	-.17	-.01
% DRCs Correctly Completed	-.26	.20	-.14	.15	-.08	-.05	.06	.11

Child Outcomes								
Parent DBD Inattention	.22	-.30*	.41**	-.24	-.27	-.15	-.02	.13
Parent DBD Hyperactivity/Impulsivity	.26	-.39**	.30*	-.15	-.02	.05	-.02	.05
Teacher DBD Inattention	-.31*	.24	-.23	.35*	-.00	.08	-.18	.07
Teacher DBD Hyperactivity/Impulsivity	-.26	.10	-.24	.36**	.19	-.17	-.13	-.08
Parent ADHD-FX	.13	-.21	.32*	-.32*	.10	-.12	.15	-.04
Teacher ADHD-FX	-.25	.14	-.24	.30*	-.07	-.06	-.17	-.01
% Home Goals Achieved	-.12	-.19	-.21	-.04	.11	-.03	-.04	-.04
% School Goals Achieved	-.08	-.10	-.16	-.19	-.12	-.11	-.08	-.19
Parent/Family Outcomes								
Maternal Tx Satisfaction	.12	.08	-.28	.08	.18	.39**	-.02	-.16
Paternal Tx Satisfaction	.03	-.02	-.11	-.11	-.06	.00	.07	-.08
Family Engagement in Treatment	-.05	-.24	.10	.05	.14	.03	-.10	.18
Homework Completion	-.05	-.06	.04	.14	.02	.11	-.02	.10
Retention	.07	-.20	.18	.21	.15	.04	.16	.24

Note. Pearson's correlations were used for continuous variables, while Spearman's correlations were used for categorical variables. Partial correlations were used to control for parent and teacher pre-treatment report of symptoms and functional impairment when examining parent and teacher post-treatment report of symptoms and functional impairment, for gender when examining teacher report of functional impairment in the classroom, and for treatment condition when examining maternal satisfaction with treatment and homework completion. DBD=Disruptive Behavior Disorders, ADHD-FX=ADHD Functional Impairment Scale, DRC=Daily Report Card, tx=treatment. *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$.

These findings highlight the significant relationships between aspects of parental acculturation and outcome variables of interest in the current study, further contextualizing the results of the current study. Specifically, it appears that parental acculturation is related to aspects of teacher intervention implementation and child and parent/family treatment outcomes. These initial findings suggest areas for future research, including incorporating acculturation into statistical analyses as covariates. Such analyses would further elucidate the nature of the relationships among acculturation, teacher intervention implementation, and treatment outcomes. This information could then further contribute to efforts to maximize high-quality teacher intervention implementation and treatment outcomes for Latino youth and families.

Limitations and Future Directions

This current study is subject to several limitations. Specifically, the composition of the sample was relatively homogenous, as participants were Latino youth and parents with similar profiles of acculturation residing in the same mid-sized Midwestern city. This may limit the generalizability of findings to Latinos more generally, as the Latino population is heterogeneous in many ways. Future research should aim to recruit a sample of Latino youth and parents that is more diverse with respect to geographical location, language use, and acculturation, so as to best understand the impact of teacher engagement in treatment for this group and facilitate the provision of high-quality services. The sample used in the current study also is limited in that it was comprised of more boys than girls. Future research also should aim to recruit more girls as participants, as well as to consider factors unique to girls with ADHD that may impact the extent to which the benefit from teacher engagement in treatment.

Another limitation of the current study is the lack of data available on participating teachers. Such data would ideally include cultural factors, as these variables have been found to be related to teachers' perceptions of psychosocial interventions in previous research (Palacios-Cruz et al., 2013). These perceptions of specific interventions, as well as teachers' knowledge about ADHD, have been found to be related to teacher intervention implementation (Biggs et al., 2008; Dielmann, 2005). Collecting data on these constructs would provide further information about the ways in which teachers impact youth and family treatment outcomes.

Additionally, the current study is limited in that it relied upon clinician-report of teacher engagement in treatment. Self-report measures of teacher engagement in

treatment were deliberately excluded, as teachers tend to rate their own intervention implementation more highly than do others (Hansen, Pankratz, & Bishop, 2014). Nonetheless, future research could extend the findings of the current study by including a parent-report measure of teacher engagement in treatment. The inclusion of such measures would serve to corroborate or contrast with clinician-report of teacher engagement, and in doing so would also extend the research on measuring teacher engagement.

Lastly, the current study was not able to account for additional factors that may impact both teacher engagement in treatment and child and parent/family outcomes, as these were beyond the scope of the current study. Future research could examine how teacher engagement in treatment and child and parent/family outcomes may be influenced by such factors, including the parent-teacher relationship, as recent research suggests this relationship mediates and/or moderates the effects of psychosocial interventions (Sheridan, Bovaird, Glover, Garbacz, Witte, & Kwon, 2012; Witte & Sheridan, 2014). Examination of the impact of the parent-teacher relationship would be especially important for a similar sample of Latino families, as many barriers threaten the development of a positive parent-teacher relationship for Latino families and their children's teachers, including both practical and cultural barriers (Kouyoumdjian et al., 2003; Zarate, 2007). Similarly, the current study did not account for factors that may impact teachers' engagement in treatment, including factors such as knowledge about ADHD and specific interventions have been found to be related to teacher engagement in classroom-based interventions (Anderson, Watt, & Noble, 2012; Dielmann, 2005). Future

research should account for these and other relevant factors, so as to gain a better understanding of teacher engagement in treatment.

Summary and Clinical Implications

In sum, the current study examined the impact of teacher engagement in psychosocial treatment for Latino youth with ADHD and their families. The study adds to the literature base by using a sample from a population that is under-served and under-represented in research. Although the first hypothesis that a teacher/school referral to treatment would predict greater teacher engagement in treatment was not supported, this finding is encouraging in that it indicates teachers were equally engaged in treatment, regardless of referral source. Meanwhile, the second and third hypotheses, that greater teacher engagement in treatment would predict better child and parent/family outcomes, were partially supported. Referral source was significantly and negatively related to post-treatment parent-report of hyperactivity/impulsivity, such that parents reported fewer symptoms of hyperactivity/impulsivity following treatment when their child had been referred to treatment by their teacher/school, while percent teacher meetings no-showed was significantly and negatively related to percent school-based goals achieved. Additionally, teacher investment in treatment and teacher-clinician relationship quality were significantly and positively related to maternal satisfaction with treatment, as was referral source, such that mothers reported greater satisfaction with treatment when their child had been referred by their teacher/school. These findings indicate that higher quality teacher intervention implementation, characterized by greater adherence to intervention components and higher-quality relationships, are related to enhanced child and parent treatment outcomes.

The findings of the current study have important clinical implications. As Latino youth and families are less likely than their European American counterparts to access high-quality mental health services, including treatment for ADHD (Flores & the Committee on Pediatric Research, 2010; Morgan et al., 2014), it is of the utmost importance that clinicians and teachers know how to best serve these individuals. Evidence-based psychosocial interventions for ADHD can benefit Latino youth and families across domains. Importantly, teacher implementation of such an intervention impacts the extent of this benefit. Specifically, high-quality teacher intervention implementation, characterized by engagement in and adherence to intervention components and positive relationships among those involved in implementation, is related to optimized youth and family treatment outcomes. Schools, teachers, and clinicians must work together to facilitate this type of intervention implementation.

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