FAMILY PROCESS

# Parent-Child Interaction Therapy for Puerto Rican Preschool Children with ADHD and Behavior Problems: A Pilot Efficacy Study

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*This study evaluates the initial efficacy of the Parent-Child Interaction Therapy (PCIT) for Puerto Rican preschool children aged 4–6 years with a diagnosis of attention-deficit/hyperactivity disorder (ADHD), combined or predominantly hyperactive type, and significant behavior problems. Thirty-two families were randomly assigned to PCIT ($n = 20$) or a 3.5-month waiting-list condition (WL; $n = 12$). Participants from both groups completed pretreatment and posttreatment assessments. Outcome measures included child's ADHD symptoms and behavior problems, parent or family functioning, and parents' satisfaction with treatment. ANCOVAs with pretreatment measures entered as covariates were significant for all posttreatment outcomes, except mother's depression, and in the expected direction ($p < .01$). Mothers reported a highly significant reduction in pretreatment hyperactivity and inattention and less aggressive and oppositional-defiant behaviors, conduct problems assessed as problematic, parenting stress associated with their child's behavior, and an increase in the use of adequate parenting practices. For the WL group, there were no clinically significant changes in any measure. Treatment gains obtained after treatment were maintained at*

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*a 3.5-month follow-up assessment. PCIT seems to be an efficacious intervention for Puerto Rican families who have young children with significant behavior problems.*

*Keywords: PCIT; ADHD; Preschool Children; Parent Training; Latino Families*

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Attention-deficit/hyperactivity disorder (ADHD) is a highly prevalent developmental disorder characterized by a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with appropriate social, academic, or occupational functioning (American Psychiatric Association, 2000). Although research on ADHD has focused mostly on school-age children and adolescents (Barkley, 2006), more recent reviews (Sonuga-Barke, Auerbach, Campbell, Daley, & Thompson, 2005) and studies have documented the validity of an ADHD diagnosis in preschool children (Lahey et al., 1998, 2004; Wilens et al., 2002). The purpose of this paper was to test the efficacy of a parenting intervention in decreasing ADHD symptoms and associated behavior problems in a sample of Puerto Rican preschool children.

## PRESCHOOL CHILDREN

Cross-sectional studies indicate that children 4–6 years of age with ADHD have high rates of comorbid psychopathology and substantial impairment in school, social, and overall functioning (Lahey et al., 1998; Wilens et al., 2002). Follow-up studies with preschool children diagnosed with ADHD at baseline reveal that their symptoms and associated impairment persist into elementary school (Lahey et al., 2004, 2005) and that they also exhibit higher levels of symptoms of conduct disorder (CD), major depression, and anxiety disorders in early adolescence (Lahey et al., 2007) compared with children without significant ADHD symptoms. Preschool children who present ADHD type behaviors along with aggressive and conduct problems are especially at risk for serious social, educational, and psychiatric difficulties that can lead to a persistent problematic course of antisocial behavior in adolescence and adulthood (Hinshaw & Lee, 2003; Loeber, Burke, Lahey, Winters, & Zera, 2000). The prevalence of ADHD in preschool children has not been systematically studied (Connor, 2002). In Puerto Rican children ages 4 and 5 years the prevalence is estimated at 11.2% (Bauermeister et al., 2007). In brief, ADHD is a highly prevalent and impairing condition in preschool children that tends to persist and to increase the risk for further developmental maladjustment. These risks stress the importance of early identification and effective treatment of young children with ADHD.

## TREATMENT

Medication treatment (e.g., psychostimulants) and/or family behavioral interventions, such as parent training, are the best researched and validated treatments for ADHD or behavior problems in school age children (Chronis, Jones, & Raggi, 2006; MTA Cooperative Group, 1999; Pelham, Wheeler, & Chronis, 1998). In contrast, little research has examined the effectiveness of these treatment modalities in younger children. Recent evidence from the Preschoolers with ADHD Treatment Study (PATS; Greenhill et al., 2006) in younger children suggests that methylphenidate

seems to be safe and efficacious for the treatment of the symptoms of this disorder in preschool children. However, treatment effect sizes in the PATS are smaller and side effects are greater for this population, when compared with school-age children with the disorder (Greenhill et al., 2006). Furthermore, diagnostic comorbidity appears to be an important moderator of methylphenidate treatment response in preschool children with ADHD. In the PATS, the presence of three or more comorbid disorders predicts no medication treatment response (Ghuman et al., 2007), suggesting that other treatment modalities alone or in combination with medication need to be considered for preschoolers.

Research on parent training for preschoolers with ADHD symptoms is limited and results have been diverse. Some studies reported significant treatment gains on measures of child compliance and parent-child interactions and management skills (Bor, Sanders, & Markie-Dadds, 2002; Pisterman et al., 1989; Strayhorn & Weidman, 1989); ADHD symptoms and maternal well-being (Sonuga-Barke, Daley, Thompson, Laver-Bradbury, & Weeks, 2001); and maintenance of treatment effects (Sonuga-Barke, Thompson, Abikoff, Klein, & Brotman, 2006). In contrast, Barkley et al. (2000) found that a parent training condition did not produce significant effects, probably associated with a low attendance rate of the families. The overall results from the above studies present evidence of the clinical value of parent training in the treatment of ADHD symptoms in preschool children. Nevertheless, none have examined the efficacy of this intervention in Latino children with ADHD and/or behavior problems and their families.

## PARENT-CHILD INTERACTION THERAPY (PCIT)

PCIT is a promising approach for treatment of ADHD and conduct problem behavior in young children. This family oriented treatment was designed for young children (2–7 years) and it is assessment driven, clinically grounded, and empirically supported (Brinkmeyer & Eyberg, 2003; Herschell, Calzada, Eyberg, & McNeil, 2002). Outcome research has demonstrated significant improvements in child problem behaviors and in parent interactional style (Eisenstadt, Eyberg, McNeil, Newcomb, & Funderburk, 1993; Eyberg, Boggs, & Algina, 1995; Nixon, 2001; Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998) and treatment maintenance gains for both children and parents at 1 year follow-up (e.g., Eyberg et al., 2001; Hood & Eyberg, 2003). PCIT assessment and treatment research is beginning to pay attention to ethnic minority groups (Butler & Eyberg, 2006), including Spanish-speaking Latino families (Borrego, Anhalt, Terao, Vargas, & Urquiza, 2006; McCabe, Yeh, Garland, Lau, & Chavez, 2005). McCabe and colleagues culturally adapted PCIT for Mexican American families while Borrego and colleagues obtained some evidence that PCIT could be a promising approach when delivered in Spanish.

PCIT is designed to help parents build a warm and responsive relationship with their child and to manage their child's behavior more effectively. It is conducted in the context of a dyadic play situation. Parents are taught and given time to practice specific communication and behavior management skills with their child in a clinic playroom. Therapists coach parents from an observation room while they are interacting with their child using a bug-in-ear microphone.

PCIT effectiveness has not been established for the ADHD population alone, although it is an evidence-based treatment for oppositional and defiant children most of whom also have ADHD (e.g., Schuhmann et al., 1998). A recent review on PCIT

research and evidence reveals that it shares similar components with other parent trainings used in the treatment of ADHD children and suggests that it may also be effective for young children with ADHD (Wagner & McNeil, 2008). PCIT was culturally adapted for Puerto Rican parents of preschool-age hyperactive children with significant behavior problems (Matos, Torres, Santiago, Jurado, & Rodríguez, 2006). Our culturally adapted version is faithful to the original PCIT but includes linguistic and format modifications. The PCIT manual and handouts were translated into Spanish, and examples were modified to reflect the daily experiences and idiomatic expressions of Puerto Rican families. Additional time was added at the beginning of each treatment session to discuss contextual issues that could affect treatment progress and engage in social interactions with parents. This extra time was also necessary to increase rapport and strengthen the therapeutic relationship. The cultural adaptation of PCIT with Mexican Americans also revealed the importance of spending more time building rapport with families (McCabe et al., 2005). Another adaptation consistent with McCabe et al.'s study was the discussion of how parents can give recommendations to other members of the extended family (especially grandparents), get their support, and prevent them from interfering with treatment process. This reflects the value of familism in our culture in a similar way to other Latino cultures. Additionally, the implementation of the time-out procedures was modified for those children who actively refused to go to the time-out chair or room and demanded the use of excessive force by parents. We also modified the style of presentation and discussion of handouts to make them more attractive and user friendly to this population. Other modifications include establishing a maximum of sessions for child-directed interaction (CDI) and parent-directed interaction (PDI) and developing a handout about pharmacological treatment for ADHD.

## STUDY GOALS

In the present study, we compared the culturally adapted version of PCIT to a waitlist (WL) control group for the treatment of ADHD symptoms and conduct problem behaviors in 4–6-year-old preschool children. This group of children is especially at risk for negative outcomes that can lead to a persistent problematic course of antisocial behavior in adolescence and adulthood (Hinshaw & Lee, 2003; Loeber et al., 2000). We hypothesized that compared with WL, parents in the PCIT condition would report less significant behavior problems and ADHD symptoms in their children, lower levels of family stress and depression, and the use of more positive parenting practices. We also hypothesized that families in the PCIT condition would maintain treatment gains at 3.5-month follow-up.

## METHOD

### Participants

The sample consisted of 32 families. Children met the following criteria: were 4–6 years of age attending a preschool program, parents reported hyperactivity and behavior problems; had an ADHD diagnosis, combined or hyperactive-impulsive (HIT) type, according to the *NIMH Diagnostic Interview Schedule for Children IV—Parent Version (NIMH-DISC IV, 1997)*; had an IQ $\geq$ 80 on the Peabody Picture Vocabulary Test (PPVT); showed no evidence of significant sensory, language, neurological, or pervasive developmental difficulties; their mothers were Puerto Rican and lived with

their children; were not receiving treatment with stimulant or other psychotropic medication; and their parents agreed not to participate in any other form of child psychotherapy and/or pharmacotherapy until completion of study participation. Other inclusion criteria included: absence of domestic violence, severe major depression, substance abuse, psychopathology, or severe mental retardation in participating parents. None of the parents were excluded for any of these criteria. All parents were oriented on other treatment options and informed of their right to leave the treatment at any time. Their primary language was Spanish.

This study targeted the combined (CT) and HIT types of ADHD and excluded the predominantly inattentive type (IT) for three reasons. First, ADHD-CT and HIT, particularly the latter, have a much earlier mean age of onset (4.88 and 4.21 years, respectively) than the ADHD-IT (6.13 years) (Applegate et al., 1997). Second, the ADHD-HIT can be considered an earlier developmental stage of ADHD-CT and not a separate type (Barkley, 2006). Finally, children with a diagnosis of ADHD-HIT and CT appear to present with behavioral disinhibition that places them at a greater risk for problem behaviors and disruptive behavior disorders such as oppositional defiant disorder (ODD) and CD. In contrast, children in the IT present a problem with focused or selective attention and are not particularly at risk for developing disruptive behavior disorders (Barkley, 2006; Bauermeister et al., 2005). In this study, the age range was restricted to 4–6 years because the intended target was only preschool children that could be reliably diagnosed. Evidence indicates that when diagnosed by means of a structured diagnostic protocol, a diagnosis of ADHD is valid for 4- through 6-year-old children (Lahey et al., 1998).

Children were referred from preschool centers and clinics or their parents responded to newspaper, TV, or radio ads. One hundred and twenty-eight children were referred from September 11, 2002, through August 23, 2004. From these, 89 were excluded and 39 met research criteria. Of these, 32 cases were randomized to either PCIT ($n = 20$) or the WL ($n = 12$) conditions. Only one case dropped out immediately from the PCIT; 19 families completed posttreatment measures and 17 the follow-up assessment. Nine fathers from the PCIT attended treatment sessions. All mothers from the WL completed the assessment after a 3.5-month waiting period. See Figure 1.

## Measures

*Disruptive Behavior Scale for Children—Spanish (DBRS; Barkley, Murphy, & Bauermeister, 1998)*

This scale, used as a screening and outcome measure, contains the nine ADHD hyperactivity-impulsivity and nine inattention symptoms, and the eight ODD symptom items defined in the DSM-IV. The items are rated on the following 4-point scale: *never or rarely* (0); *sometimes* (1); *often* (2), and *very often* (3), using the last 6 months as a time frame. For Puerto Rican preschoolers, the internal consistency ($\alpha$) of the ADHD and ODD scales ranges from .90 to .95; the test-retest reliability ranges from .81 to .86 over a 4–6 week period (Cumba, Santiago, Rodríguez, & Matos, 2002).

*Hyperactivity and Aggression Subscales of the Behavioral Assessment System for Children-Parent Rating Scale (BASC-PRS-Spanish)*

The BASC-PRS (Reynolds & Kamphaus, 1998) provides measures of parental ratings of children's behavior and adaptive functioning. We used the subscales that yield

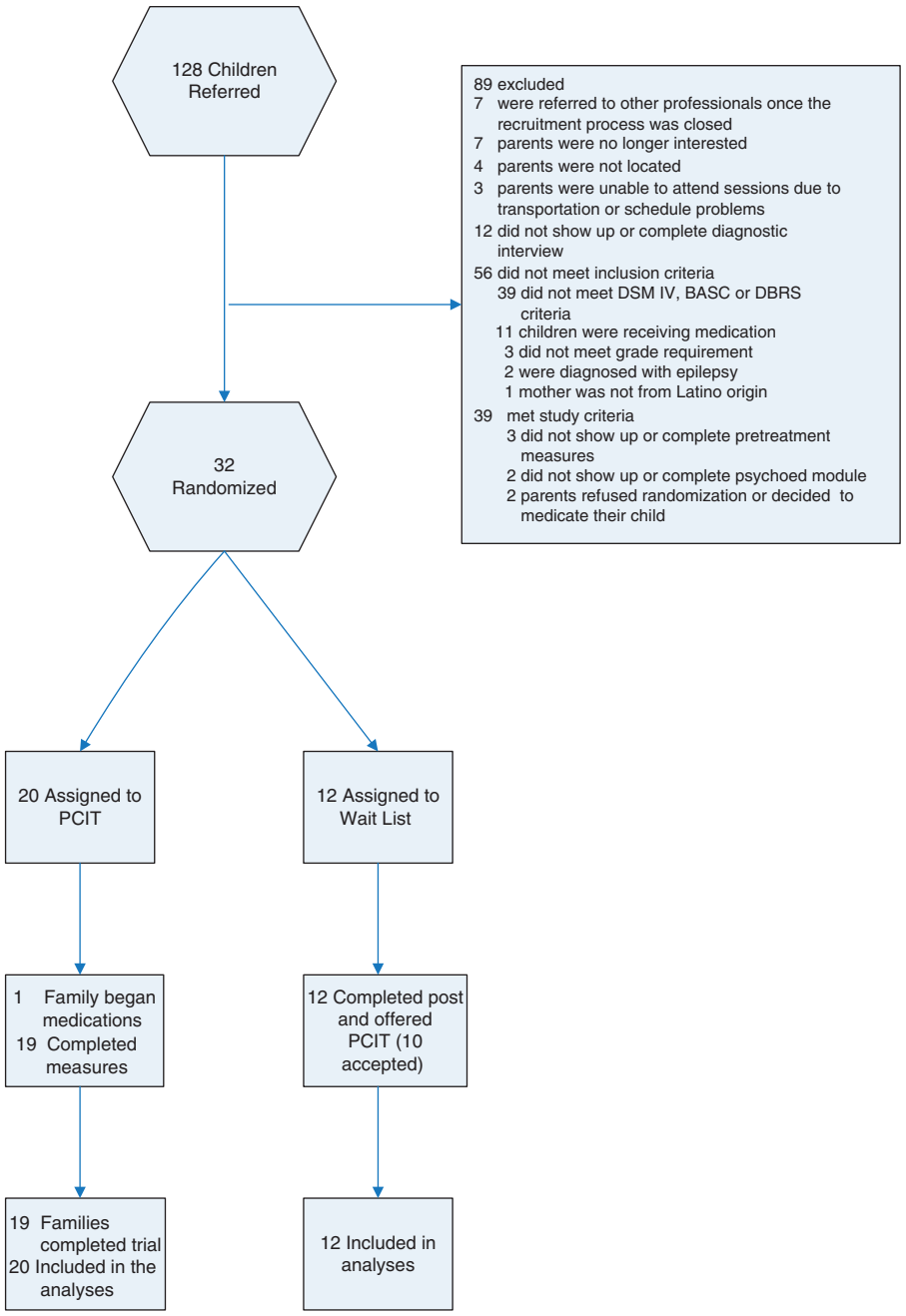


FIGURE 1. Flowchart. PCIT = parent-child interaction therapy.

ratings of hyperactivity and aggression as screening and outcome measures. The α coefficients of these subscales for Puerto Rican preschoolers range from .82 to .93. Concurrent and construct validity are also appropriate (Cumba et al., 2002).

*The Peabody Picture Vocabulary Test (Hispanic American Adaptation) (PPVT-HAA) (Dunn, Padilla, Lugo, & Dunn, 1986)*

This is a standardized test that measures receptive vocabulary and is significantly correlated with intelligence.

*NIMH Diagnostic Interview Schedule for Children IV—Parent Version (NIMH-DISC IV, 1997)*

This structured diagnostic interview was developed to assess DSM IV diagnoses in children (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). The NIMH-DISC-IV was translated and adapted for Puerto Rican children and has good psychometric properties (Bravo et al., 2001). We administered the ADHD, ODD, generalized anxiety disorder, separation anxiety disorder, major depression, and disthymia modules.

*Children's Global Assessment Scale—Spanish (CGAS; Bird, Canino, Rubio-Stipec, & Ribera, 1987)*

This scale yields clinician's ratings of children's impairment in adaptive functioning. Scores range from 1 (most impaired) to 100 (healthiest). The scale has excellent test-retest inter-rater reliability and adequate discriminant and concurrent validity for Puerto Rican children.

*Eyberg Child Behavior Inventory (ECBI)*

This is a 36-item parent report measure of conduct problems with established reliability and validity (Eyberg & Pincus, 1999). The ECBI assesses behavior on two scales: the Intensity Scale (IS) and the Problem Scale (PS). The IS measures the frequency with which conduct problem behaviors occur. The PS measures the number of behavior problem items that parents report to be problematic for them. For Puerto Rican preschoolers, the $\alpha$ coefficients of the IS and PS scales are .95 and .94, and the test-retest reliability .85 and .83, respectively (Cumba et al., 2002).

*Family Experiences Inventory (FEI; Bauermeister, Matos, & Reina, 1999)*

The FEI was developed to assess stressful experiences associated with mother-child relationship, family social life, mother-child's teacher relationship, family finances, and child-siblings relationships. The internal consistency and test-retest reliability for Puerto Rican preschoolers are .95 and .79, respectively (Cumba et al., 2002).

*Parent Practices Inventory (PPI; Salas-Serrano, 2003)*

PPI assesses parental monitoring and supervision, involvement, and discipline in general. Previous analyses with Puerto Rican preschoolers show that the PPI has strong internal consistency (.86) and test-retest reliability (.78) (Cumba et al., 2002). Higher scores indicate better parenting practices.

*Beck Depression Inventory—Spanish (BDI-S; Bonilla, Bernal, Santos, & Santos, 2004)*

This revised Spanish version of the BDI has 22 items. It provides a measure of depressive symptoms with psychometric properties comparable with the original version of the BDI.

*Treatment Evaluation Scale (TES; Matos, 1997)*

This scale includes a variety of items including open-ended questions assessing perceived parent satisfaction with treatment, effective application of treatment

strategies at home, quality of therapist-client relationship, and changes that are recommended to improve treatment. The nature of the items does not permit an analysis of psychometric properties.

*Therapy Attitude Inventory (TAI; Eyberg, 1993)*

The TAI is a consumer satisfaction measure and it addresses the impact of parent training on areas such as confidence in discipline skills, quality of the parent-child interaction, child behavior, and overall family adjustment. The TAI has been shown to have adequate reliability, validity, and sensitivity to treatment effects (Brestan, Jacobs, Rayfield, & Eyberg, 1999).

All measures completed by parents were available in Spanish. The only instruments translated into Spanish following a cross-cultural model in a previous phase of this investigation were the ECBI and the TAI (Matos et al., 2006).

### Study Design and Procedure

Families were first screened by phone. Mothers completed the DBRS- and the BASC-PRS-hyperactivity and aggression subscales. Mothers who reported four or more hyperactivity items and three or more ODD items with ratings of ''often'' or ''very often'' on the *DBRS* or scores above 93rd percentile on the *hyperactivity or aggression subscales of the BASC-PRS* were invited for a clinic intake assessment visit. If they did not meet criteria, they were informed of other treatment options in the community. In the clinic intake visit invited mothers gave informed consent and completed the diagnostic modules of the DISC. Children were administered the PPVT. If children met the IQ criteria and received an ADHD-CT or HIT diagnosis, mothers and children were scheduled for the pretreatment assessment and observation session where they were observed and videotaped in three interaction situations with their child (10 minutes of child-directed play, 10 minutes of parent-directed play, and 5 minutes of clean up). Information collected from the observations was used as baseline data for therapists to use during treatment. Additional observations were made during the therapy sessions to provide feedback to parents.[1] The parent questionnaires and rating scales, except the BDI-S, were administered in a structured interview format. Families who did not meet inclusion criteria were given feedback on their child's behavior, recommendations on how to handle them, and if necessary, referrals to other professionals or service programs in the community.

After the pretreatment assessment, each family participated in a two-session psychoeducational module about ADHD and its relationship with behavior problems, associated difficulties, risks and protective factors, possible etiologies, and treatment options. Following this module, recruited families were organized in six groups of five. In each of these groups, three families were randomly assigned to the PCIT and two to the WL group. The last group only had two families that were randomly assigned to the PCIT. Because of the pilot nature of this study, we opted for a randomization allocation of 3:2 because of budget and ethical considerations. On the one hand, the limited resources made it impossible to offer treatment to all families in the WL at posttreatment. On the other hand, the authors were committed to offering treatment

[1] The Dyadic Parent-Child Interaction Coding System-II (DPICS-II; Eyberg, Bessmer, Newcomb, Edwards, & Robinson, 1994) was used to measure parent and child behaviors (e.g., verbalizations, vocalizations, physical behaviors, and compliance) and to guide treatment decisions.

to families in the WL condition after the 3.5-month waiting period. An important consideration was the ability of the research team to provide treatment to all families selected in the WL. Thus the rationale was to include a relatively larger number of families in the PCIT and a lower number of participants in the WL that would guarantee enough power to detect differences, and at the same time provide treatment to the WL families.

Children and the families assigned to the WL group were contacted by phone on a monthly basis by the research staff. Each family received pretreatment and post-treatment assessments after 3.5 months of waiting. An additional 3.5-month follow-up testing was completed for participants in the PCIT. Participants were given a stipend of $15, $25, and $40 for the completion of pretreatment, posttreatment, and follow-up assessments, respectively. The 3.5-month period for the WL was established based on the approximated shortest time that a family took to complete PCIT in our adaptation study. The same length period was chosen for the follow-up in order to complete the study on time.

### Treatment Condition

PCIT sessions were conducted on a weekly basis and lasted 1.5 hours. Treatment was delivered in Spanish following the adapted treatment manual (Matos et al., 2006). Each family was seen individually by a therapist and a cotherapist. Therapists were advanced graduate clinical psychology students with an average of 3 years of clinical experience. Cotherapists were also graduate clinical students but with less experience. All sessions were videotaped and 60% were observed by the first author who also provided group and individual supervision sessions on a weekly basis.

PCIT phases were conducted in the standard order, beginning with CDI and following with PDI. The major goal of the CDI phase is to create or strengthen a positive and mutually rewarding parent-child relationship. During the first session, parents were taught CDI skills through instruction, modeling, and role-playing. They were instructed to describe, imitate, and praise the child's appropriate behavior, reflect appropriate child speech, ignore inappropriate behavior, and allow their child to lead play activity. Parents were also taught not to criticize the child and not to use commands and questions. Handouts were given to them summarizing the material, and they were instructed to practice CDI skills at home, in daily 5-minute sessions.

The major goal of the PDI phase is to decrease child's problematic behavior while increasing prosocial behaviors. In PDI sessions, parents were taught how to direct their child's activity while being instructed in the use of clear, positively stated, direct commands and consistent consequences for behavior (e.g., praise for compliance, time-out in a chair for noncompliance). Parents learned to establish and enforce ''house rules'' and to manage their child's behavior both at home and in public places. In each coaching session, the parents took turns practicing treatment skills with their child in the playroom while their spouse and the therapists observed through a one-way mirror.

The original PCIT is time-unlimited and is terminated when parents demonstrate mastery of CDI and PDI skills and report that the behavior problems of the children are normalized according to the ECBI (Eyberg & Calzada, 1998). Based on the results of the cultural adaptation process (Matos et al., 2006), we made some modifications

regarding mastery criteria and treatment extension. CDI phase typically ended when parents could attain the goal of 7–10 behavioral descriptions, reflections, and labeled praises, and three or less commands, questions, and criticisms during a 5-minute coding interval. PDI phase ended when at least 75% of the parents' commands were direct and they showed 75% correct follow-through after commands during the 5-minute coding period at the beginning of each treatment session. We established a maximum of eight sessions to be offered in CDI and a maximum of nine PDI sessions. However, two families received an additional CDI session and one family an additional PDI session because they needed additional sessions to move on to the next treatment phase or to end treatment. Finally, the ECBI was not used as a termination criterion but as an outcome measure.

### Treatment Integrity

To ensure treatment integrity, the content of each session was evaluated by means of a checklist of therapists' actions. Weekly supervision meetings were held with therapists and cotherapists to review sessions and plan the next session following the PCIT manual. All treatment sessions were videotaped and 20% (58 sessions) were randomly selected for an analysis of integrity. For treatment integrity, research assistants watched the selected sessions and checked the degree to which therapists' actions were conducted as planned. The obtained integrity rate was 98%.

### Data Analytic Strategy

Chi square and *t*-tests were used to evaluate the randomization procedure on the demographic and dependent measures in the two conditions. Descriptive statistics were employed to identify outliers at baseline or pretreatment and posttreatment for the primary and secondary outcomes, and to assess mean changes from baseline to posttreatment. Confidence intervals were examined to obtain the true value of the changes for the primary and secondary outcomes.

Pretreatment scores were entered as covariates in univariate analyses to assess the study hypotheses. Because posttreatment scores correlate with pretreatment scores and there were no differences in the pretreatment scores on the primary and secondary outcomes by condition, analyses of covariance (ANCOVA) were employed to reduce the standard error of estimates. ANCOVAs were employed to test the efficacy of PCIT versus WL on primary and secondary outcomes using a one-factor design. To control for experimenter-wise error rate, $\alpha$ level (.05) was divided by the number of secondary outcomes (4) for a critical $\alpha$ level of 0.0125.

Upon establishing that there were no significant differences in the participation of evaluation sessions as a function of treatment condition, an expectation maximization (EM) algorithm was used to handle missing data on the outcome measures at post. We followed Graham, Cumsille, and Elek-Fisk's (2002) and Jaccard and Guilamo-Ramos's (2002) suggestions for data missing completely at random (MCAR) or missing at random (MAR). There was no identifiable pattern for the small percentage of missing data. Thus, EM imputations were obtained for 3% of the posttreatment and 9% for the follow-up measures.

## RESULTS

### Parent and Child Characteristics

Analyses indicated that children in the PCIT and WL conditions did not differ significantly in gender, $\chi^2$ (1, $N = 32$) = .039; age, $t(30) = 0.61$; and the Peabody IQ scores, $t(30) = -1.22$. Children's parents did not differ either in years of education for both mother, $t(30) = 1.55$, and father, $t(28) = 1.65$; age for mother, $t(30) = 0.37$, and father, $t(28) = 0.16$, and family income, $t(30) = 0.74$.[2] Family structure was similar for both groups. In the PCIT, 50% of families were comprised by both parents, 15% included a stepfather, and 35% were single mothers. In the WL, 50% were comprised by both parents, 17% included a stepfather, and 33% were single mothers. At pretreatment, the groups were also comparable in their clinical characteristics (Table 1). No significant differences were found for BASC-PRS-hyperactivity, $t(30) = -0.032$, and aggression, $t(30) = 0.007$; DBRS-hyperactivity, $t(30) = -1.09$, and ODD, $t(30) = -1.05$, scores; ECBI-intensity, $t(30) = -0.94$, and problem, $t(30) = -0.63$, T scores; and in CGAS ratings of impairment in adaptive functioning, $t(30) = -1.63$. The mean CGAS score, PCIT = 53.30 ($SD = 6.44$); WL = 56.83 ($SD = 4.97$), was below the cutoff level of 61 established for Puerto Rican children, which indicates that the two groups were clinically impaired (Bird et al., 1990). Twenty-one children met diagnostic criteria for ADHD-CT and 11 for ADHD-HIT. Although a diagnosis of ODD was not a selection criteria, all of the participants except one girl from the PCIT condition met criteria for this disorder. Also, four children in the PCIT and three from the WL met criteria for separation anxiety disorder. Finally parents in the PCIT and WL (Table 1) did not differ in PPI, $t(30) = -1.24$; FEI $t(30) = -1.15$; BDI-S mean scores, $t(30) = 1.89$; and their child DBRS ratings of inattention, $t(30) = -0.71$.

### Intent to Treat Analyses

Table 1 summarizes total mean scores for the primary and secondary measures for the PCIT and WL conditions before and after treatment, standard deviations, and 95% CI of these means. To determine treatment effects ANCOVA were employed using pretreatment scores on each measure as covariates to control for time and initial differences at pretreatment. These analyses are presented in Table 2. PCIT produced significant decreases from pretreatment to posttreatment in the primary outcome measures analyzed. The estimated adjusted mean difference was $-13.09$ units for the BASC-hyperactivity and $-8.31$ units for the BASC-aggression; $-6.13$ and $-6.39$ units for DBRS-hyperactivity and ODD scores, respectively; and $-15.07$ and $-20.31$ units for the ECBI-IS (frequency of conduct problem behaviors) and Problem Scale (number of problematic behavior problems for parents) scores. After treatment, results were in the normal range for the hyperactivity, aggression, ODD, and ECBI-intensity and Problem measures. For the secondary outcomes, Table 2 also shows significant decreases at posttreatment for child-related parenting stress (FEI) and in the DBRS measure of inattention, and significant increases in parenting practices (PPI). The pretreatment scores on the BDI-S for the mothers in the PCIT condition were near the cutoff point between mildly depressed and not depressed. No significant change was found for this measure at posttreatment.

[2] More detailed demographic information is available from the authors.

TABLE 1

*Mean, Standard Deviation, and 95% Confidence Intervals of Mean Primary and Secondary Outcomes for the PCIT Group and WL at Pretreatment, Posttreatment, and Follow-Up*

| | | Pretreatment | | | Posttreatment | | | Follow-up | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ***N*** | ***M*** | ***SD*** | **95% CI** | ***M*** | ***SD*** | **95% CI** | ***M*** | ***SD*** | **95% CI** |
| *Primary outcome* | | | | | | | | | | |
| BASC-PRS-hyperactivity | | | | | | | | | | |
| PCIT | 20 | 37.60 | 3.91 | 35.89–39.31 | 22.36 | 7.53 | 19.06–25.66 | 22.17 | 7.93 | 20.40–23.94 |
| WL | 12 | 37.67 | 6.60 | 33.93–41.41 | 35.50 | 6.60 | 31.76–39.24 | | | |
| BASC-PRS-aggression | | | | | | | | | | |
| PCIT | 20 | 18.85 | 6.90 | 15.82–21.88 | 9.11 | 4.29 | 7.23–10.99 | 9.88 | 4.02 | 8.98–10.78 |
| WL | 12 | 18.83 | 6.00 | 15.43–22.23 | 17.42 | 7.45 | 13.20–21.64 | | | |
| DBRS-hyperactivity | | | | | | | | | | |
| PCIT | 20 | 21.10 | 4.44 | 19.15–23.05 | 13.89 | 5.02 | 11.69–16.09 | 14.44 | 5.58 | 13.19–15.69 |
| WL | 12 | 22.67 | 2.87 | 21.04–24.30 | 20.92 | 3.70 | 18.82–23.02 | | | |
| DBRS-ODD | | | | | | | | | | |
| PCIT | 20 | 13.30 | 3.99 | 11.55–15.05 | 6.38 | 3.39 | 4.89–7.87 | 6.78 | 3.64 | 5.97–7.59 |
| WL | 12 | 14.83 | 4.02 | 12.55–17.11 | 13.50 | 4.30 | 11.06–15.94 | | | |
| ECBI-intensity (T) | | | | | | | | | | |
| PCIT | 20 | 68.86 | 8.46 | 65.15–72.57 | 51.52 | 10.51 | 46.91–56.13 | 54.07 | 8.38 | 52.20–55.94 |
| WL | 12 | 71.93 | 9.79 | 66.38–77.48 | 68.36 | 9.74 | 62.84–73.88 | | | |
| ECBI-problem (T) | | | | | | | | | | |
| PCIT | 20 | 77.22 | 8.26 | 73.60–80.84 | 56.25 | 11.94 | 51.01–61.49 | 54.24 | 11.66 | 51.63–56.85 |
| WL | 12 | 78.98 | 6.46 | 75.32–82.64 | 77.36 | 6.78 | 73.52–81.20 | | | |
| *Secondary outcome* | | | | | | | | | | |
| PPI | | | | | | | | | | |
| PCIT | 20 | 100.35 | 13.15 | 94.58–106.12 | 119.27 | 11.87 | 114.07–124.47 | 116.90 | 13.98 | 113.77–120.03 |
| WL | 12 | 106.42 | 13.78 | 98.61–114.23 | 107.50 | 14.49 | 99.29–115.71 | | | |
| FEI | | | | | | | | | | |
| PCIT | 20 | 48.55 | 17.83 | 40.73–56.37 | 27.86 | 16.47 | 20.64–35.08 | 30.57 | 18.89 | 26.34–34.80 |
| WL | 12 | 41.43 | 15.40 | 32.71–50.15 | 40.33 | 16.30 | 31.10–49.56 | | | |
| BDI-S | | | | | | | | | | |
| PCIT | 20 | 10.50 | 6.44 | 7.68–13.32 | 6.21 | 6.53 | 3.35–9.07 | 5.27 | 3.53 | 4.48–6.06 |
| WL | 12 | 6.25 | 5.61 | 3.07–9.43 | 6.92 | 6.72 | 3.11–13.73 | | | |
| DBRS-inattention | | | | | | | | | | |
| PCIT | 20 | 15.25 | 5.15 | 12.99–17.51 | 9.90 | 4.30 | 8.01–11.79 | 9.85 | 4.78 | 8.77–10.93 |
| WL | 12 | 16.67 | 6.01 | 13.27–20.07 | 15.83 | 6.89 | 11.99–19.67 | | | |

*Note.* BASC-PRS = Behavioral Assessment System for Children-Parent Rating Scale; BDI-S = Beck Depression Inventory—Spanish; DBRS-ODD = Disruptive Behavior Rating Scale-oppositional defiant disorder; ECBI = Eyberg Child Behavior Inventory; FEI = Family Experiences Inventory; PCIT, Parent-Child Interaction Therapy; PPI = Parent Practices Inventory; WL = wait-list group.

ECBI scores are T scores; higher PPI scores indicate better parenting strategies.

TABLE 2
*ANCOVAs for Primary and Secondary Outcomes at Posttreatment*

| | Adjusted means | *F* | *df* | Estimated difference | 95% CI |
|---|---|---|---|---|---|
| *Primary outcome* | | | | | |
| BASC-PRS-hyperactivity | | | | | |
| PCIT | 22.38 | 32.73*** | 1, 30 | – 13.09 | – 17.78/ – 8.41 |
| WL | 35.47 | | | | |
| BASC-PRS-aggression | | | | | |
| PCIT | 9.11 | 20.73*** | 1, 30 | – 8.31 | – 12.05/ – 4.58 |
| WL | 17.42 | | | | |
| DBRS-hyperactivity | | | | | |
| PCIT | 14.23 | 16.38*** | 1, 30 | – 6.13 | – 9.23/ – 3.03 |
| WL | 20.36 | | | | |
| DBRS-ODD | | | | | |
| PCIT | 6.65 | 27.61*** | 1, 30 | – 6.38 | – 8.87/ – 3.90 |
| WL | 13.04 | | | | |
| ECBI-intensity (T) | | | | | |
| PCIT | 52.18 | 20.49*** | 1, 30 | – 15.07 | – 21.88/ – 8.26 |
| WL | 67.25 | | | | |
| ECBI-problem (T) | | | | | |
| PCIT | 56.55 | 31.08*** | 1, 30 | – 20.31 | – 27.76/ – 12.86 |
| WL | 76.86 | | | | |
| *Secondary outcome* | | | | | |
| PPI | | | | | |
| PCIT | 120.99 | 28.81*** | 1, 30 | 16.35 | 10.12–22.59 |
| WL | 104.64 | | | | |
| FEI | | | | | |
| PCIT | 25.98 | 16.66*** | 1, 30 | – 17.47 | – 26.23/ – 8.72 |
| WL | 43.46 | | | | |
| BDI-S | | | | | |
| PCIT | 5.83 | 0.46 | 1, 30 | – 1.72 | – 6.89/ – 3.45 |
| WL | 7.55 | | | | |
| DBRS-inattention | | | | | |
| PCIT | 10.26 | 11.26** | 1, 30 | – 4.99 | – 8.03/ – 1.95 |
| WL | 15.24 | | | | |

*Note*. BASC-PRS = Behavioral Assessment System for Children-Parent Rating Scale; BDI-S = Beck Depression Inventory—Spanish; DBRS-ODD = Disruptive Behavior Rating Scale-oppositional defiant disorder; ECBI = Eyberg Child Behavior Inventory; FEI = Family Experiences Inventory; PCIT, Parent-Child Interaction Therapy; PPI = Parent Practices Inventory; WL = wait-list.
**$p < .01$.
***$p < .000$.

At follow-up, attrition was low (9%) with only three families not completing the assessments but included in the analyses. Due to ethical considerations, the WL was unavailable at follow-up because they were offered PCIT after the post evaluation. Dependent *t*-tests were performed with primary and secondary outcome measures. No significant differences were found between posttreatment and follow-up measures. Table 1 shows the means, standard deviations, and 95% confidence intervals for these two time points. As can be appreciated, the gains achieved at the posttreatment were maintained at the 3.5-month follow-up. The means and standard deviations remained stable at follow-up and there was a marked overlap between the posttest and follow-up 95% confidence intervals, while there continued to be no overlap between the pre-treatment and follow-up 95% confidence intervals.

TABLE 3
*Clinical Significance for Primary Outcomes at Posttreatment and Follow-Up*

| | Posttreatment | | | | Follow-up | |
|---|---|---|---|---|---|---|
| | PCIT | | WL | | PCIT | |
| **Outcome** | ***n*** | **%** | ***n*** | **%** | ***n*** | **%** |
| BASC-PRS-hyperactivity | 13 | 65 | 0 | 0 | 12 | 60 |
| BASC-PRS-aggression | 12 | 60 | 3 | 25 | 11 | 55 |
| DBRS-hyperactivity | 10 | 50 | 0 | 0 | 7 | 35 |
| DBRS-ODD | 12 | 60 | 3 | 25 | 10 | 50 |
| ECBI-intensity (T scores) | 15 | 75 | 0 | 0 | 13 | 65 |
| ECBI-problem (T scores) | 13 | 65 | 1 | 8 | 13 | 65 |

*Note*. BASC-PRS = Behavioral Assessment System for Children-Parent Rating Scale; DBRS-ODD = Disruptive Behavior Rating Scale-oppositional defiant disorder; ECBI = Eyberg Child Behavior Inventory; PCIT, Parent-Child Interaction Therapy; WL = wait-list.

### Effect Sizes and Clinical Significance

Effect sizes were calculated based on the Hedges and Olkin (1985) formula [$g = (M_a - M_b)/s$], where $M_a$ and $M_b$ are the two conditions at posttreatment and $s$ is the pooled standard deviation. The effect size for the adjusted means from Table 2 for PCIT versus WL conditions on the primary outcome measures were large (BASC-hyperactivity = 1.85; BASC-aggressive = 1.37; DBRS-hyperactivity = 1.39; DBRS-ODD = 1.65; ECBI-intensity = 1.49; ECBI-problem = 2.04). The average effect size for all primary outcome measures was 1.57 suggesting that the average participant in the PCIT condition was better than 94% of those in the WL.

To assess the clinical significance of PCIT effects, we considered treatment outcomes on mothers' report of hyperactivity and conduct problems as measured by BASC, DBRS, and ECBI. The proportion of children that moved out of the dysfunctional range into the normative range was examined using the means and standard deviations for each measure obtained from a community sample. The cutoff points obtained for each measure were 15.11 (DBRS-hyperactivity), 11.42 (DBRS-ODD), 25.61 (BASC-hyperactivity), 11.08 (BASC-aggression), 119.46 (ECBI-intensity), and 16.25 (ECBI-problem). Table 3 shows the analyses of clinical significance at posttreatment and follow-up. The percentage of treated cases that showed a significant clinical change ranges from 50 to 75 (posttreatment) and 35 to 70 (follow-up) whereas the percentage of cases in the WL was only 25 for the ODD and aggressive behaviors and 8 for the ECBI-problem scale.

### Consumer Satisfaction

The TAI was only administered to the PCIT at posttreatment. Across all mothers, TAI scores ranged from 41 to 50 (maximum score), with a mean of 47.80 ($SD = 2.93$). Mothers' reports on the TES indicated they felt comfortable and understood by their therapists ($M = 4.82$, $SD = 0.39$; maximum score in each category = 5), as well as confident and supported ($M = 4.94$, $SD = 0.24$).

## DISCUSSION

Our study contributes to the growing literature on parenting interventions for Latino families (Zayas, Borrego, & Domenech Rodriguez, in press). We examined the

efficacy of the culturally adapted version of PCIT for the treatment of Puerto Rican young children with diagnoses of ADHD and (with one exception) ODD, and significant behavior problems. To our knowledge, no published studies have examined the efficacy of this family oriented treatment for children whose primary diagnosis is ADHD, although there is evidence that indicates that children with this disorder have been included in PCIT research studies (Wagner & McNeil, 2008). Consistent with our hypothesis, intent-to-treat analyses revealed significant differences between PCIT and WL conditions at posttreatment evaluation. Mothers reported a significant reduction in children's hyperactivity-impulsivity, inattention, and oppositional defiant and aggressive behavior problems, as well as a reduced level of parent-child related stress and improved parenting practices. They also reported feeling more confident in their ability to manage their child's behavior and less distressed. These treatment gains were clinically significant and were maintained at the 3.5-month follow-up. The findings are consistent with those obtained in our previous study aimed at the adaptation of PCIT (Matos et al., 2006) and with those reported in other treatment studies with preschoolers from different cultural backgrounds with ADHD (Bor et al., 2002; Pisterman et al., 1989; Sonuga-Barke et al., 2001).

The positive impact of PCIT on the core symptoms of ADHD and on clinically significant behavior problems is important because preschool children who present ADHD with aggressive and conduct problems are especially at risk for serious social, educational, and psychiatric difficulties. These risks can lead in turn to a persistent problematic course of antisocial behavior in adolescence and adulthood (Hinshaw & Lee, 2003; Loeber et al., 2000). Thus, the potential of this treatment model as part of a prevention program of antisocial behavior is high and merits continued research.

It is important to note that treatment effect sizes were large (1.37–2.04), which indicates robust and significant behavior changes in the primary outcome measure used. These treatment effects are comparable to those reported for PCIT in other international research studies with young children that present disruptive behaviors (Thomas & Zimmer-Gembeck, 2007). Further confirmation of the efficacy of PCIT is indicated by the finding that the mean percent of treated children with clinically significant changes was 62.5 at posttreatment and 55 at follow-up. These changes are similar to those reported by Bor et al. (2002) and Sonuga-Barke et al. (2001) using other parent training models. Importantly, our treatment effect sizes were equal to or larger than those reported for stimulants in the Preschoolers with ADHD Treatment Study (PATS; Greenhill et al., 2006). Furthermore, in the PATS, comorbidity affected medication treatment response (Ghuman et al., 2007). Thus, in the process of customizing interventions for young children with ADHD and behavior problems, clinicians need to consider PCIT given that it may be a robust treatment alternative for preschoolers. Also, for those cases where medication is necessary, PCIT has the potential to reduce treatment dosage. Additional research is needed to clarify these possibilities with clinical samples.

Initially our intent was to exclude mothers with severe symptoms of depression from the study, but none of them reported significant levels of depression at pretreatment. This result was unexpected because the literature suggests that mothers of children with ADHD are more likely to experience major depression compared with mothers of non-disordered children (Chronis, Chacko, Fabiano, Wymbs, & Pelham, 2004). The absence of clinical depression in mothers may explain why treatment effects were not found for this outcome variable as hypothesized. The low rate of

attrition and the high rate of attendance are also consistent with the absence of clinical depression in mothers as well as good indicators of parents' satisfaction. All of the parents in the PCIT condition completed treatment and nearly all of them returned to the follow-up assessment. Parents expressed high satisfaction with the content and process of PCIT. Although satisfaction measures are subjective and do not necessarily reflect true changes, they provide important information regarding its acceptability.

Our study demonstrates the potential of PCIT for treatment of preschoolers with ADHD. These children present particular challenges. They may require virtually continous monitoring in the clinic and during treatment sessions given their high activity, impulsivity, and inattention levels. These behaviors may intensify and prolong the duration of oppositional defiance and disruptive interactions patterns with parents during treatment interventions. PCIT therapists can make quick modifications as problems arise, and model good problem-solving skills for parents. This intervention approach has the potential to increase treatment efficacy, as compared with those addressed to train parents or that do not include children in the treatment sessions. In addition, PCIT provides for the individualization of treatment sessions to each parent-child dyad. Throughout treatment, parents were encouraged and supported with specific feedback. This encouragement is important because parents of children with ADHD and conduct behavior problems are prone to feel overwhelmed by their child's defiant and aggressive behavior or less competent with regards to their parenting skills (Cunningham & Boyle, 2002). PCIT also follows a developmental perspective. The therapy is conducted in the context of a dyadic play situation, given that play is an important medium through which children develop problem-solving skills and work through developmental problems (Eyberg, 1988). Finally, parents are enlisted as collaborators and encouraged to formulate their own solutions to their child behavioral difficulties as training progresses.

Although results from outcome measures were favorable, there were some limitations worthy of mention. Results were based solely on mothers' reports. Mothers and fathers may have different parenting experiences with their disruptive children. An independent source reporting from a different context would have also provided critical information about children's problems and the impact of PCIT. We collected some data from fathers and teachers but these samples were too small, which limited considerably the interpretation of results. Initially the aim was to collect data from parents and teachers at the three assessment times, yet limited resources and time frame led to a focus primarily on mothers. Future studies should collect data from fathers. There is a literature suggesting that families who have had an involved father in treatment report significant improvements at follow-up, compared with uninvolved-father families and absent-father families (Bagner & Eyberg, 2003). Initially we planned to use the DPICS-II to guide treatment decisions and as an outcome measure but limited resources prevented us from repeating the second assessment of half of the families of the WL group. Consequently, it was not possible to analyze observational data to further support our findings. Also our sample was small. Generalization of our findings may be limited. However, the fact that our findings are consistent with those reported by other investigators (Bor et al., 2002; Sonuga-Barke et al., 2001; Thomas & Zimmer-Gembeck, 2007) suggests that lack of generalization may not be an issue. Finally, our follow-up was limited to 3.5 months. Longer follow-ups are needed to fully assess the maintenance of treatment changes. Despite these

limitations, our results are promising and offer preliminary evidence on the efficacy of PCIT for families of younger children who not only present ADHD but also conduct behavior problems. Further research is warranted with this age and diagnostic group. Our study contributes to the growing literature on psychosocial treatment research of Latino families.

Finally, this study followed culturally informed procedures to maximize the ecological validity of the study (Bernal, Bonilla, & Bellido, 1995). As several scholars have suggested, culture and context is an inseparable part of the research enterprise that includes the formulation of hypotheses, the methods employed, and the design, analysis, and interpretation of the results (Rogler, 1989). In this study, considerable preliminary work was involved in the translation and adaptation of instruments into Spanish (Marin & VanOss Marin, 1991), the testing of the instrumentation, and the adaptation of the treatment manual (Matos et al., 2006). As such, this study contributes to a growing literature on culturally informed treatment research with ethnocultural groups and populations with language diversity.

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