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# Efficacy of Adjunct In-Home Coaching to Improve Outcomes in Parent–Child Interaction Therapy

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**Objectives:** The purpose of this study is to test whether increasing the exposure to coaching by adding an in-home component to clinic-delivered Parent–Child Interaction Therapy (PCIT) will increase the speed of parenting skill acquisition and show greater improvements in children's behaviors and parental stress. **Methods:** Seventy-three parent–child dyads participating in clinic-based PCIT are randomly assigned to an adjunct PCIT or Social Support treatment group. The sample of children is 58% male and ranges in age from 1.7 to 8.2 years. **Results:** Analyses show that participation in adjunct PCIT services is associated with greater use of positive verbalizations and leads to improvement on measures of parent functioning. **Conclusions:** The meaning of these findings with respect to change and the process of treatment is discussed.

**Keywords:** *Parent–Child Interaction Therapy; treatment outcomes; adjunct services; in-home services*

Over the past decade, mental health providers have become increasingly interested in using empirically supported treatments. The numbers of empirically supported treatments have increased, but the mechanisms underlying their effectiveness are not well understood. With increased understanding of what a particular treatment does and why it works, mental health providers can more easily determine whether the treatment is suitable for the populations they work with and under the constraints of their workplace. Furthermore, it is important for agencies and providers to understand which parts of empirically supported treatment protocols, if adjusted, would reduce their effectiveness.

Parent–Child Interaction Therapy (PCIT) is a behaviorally oriented treatment developed by Sheila Eyberg for young children with externalizing behavior problems. Although the principles advocated by PCIT are similar to many parent-focused treatments for young children, its mode of delivery is unique. Therapists coach parents in vivo while they are playing with their children. They praise parents' use of the skills they are learning and correct less effective strategies. Caregivers overlearn these skills in the clinic to increase the likelihood that they will use them in their homes. Overlearning is operationalized for caregivers as a goal of achieving "mastery": a predetermined number of specific verbalizations in

5 min while playing with their children. The more time caregivers are coached and spend practicing these skills, the more quickly the parents are expected to master them. Therapeutic change is believed to result from changing parents' behavior. The purpose of this study is to test the hypothesis that increasing the exposure to coaching by adding an adjunct in-home component to clinic-delivered PCIT will improve outcomes by increasing the speed and the likelihood of parenting skill acquisition, resulting in greater improvements in children's behaviors and reducing parental stress. (See [www.pcit.org](http://www.pcit.org) for full description and details.)

## Empirical Support for Parent–Child Interaction Therapy

Research has demonstrated the efficacy of PCIT in reducing child behavior problems (e.g., Eyberg & Robinson, 1982) and maintaining these positive effects up to 6 years posttreatment (Hood & Eyberg, 2003). In

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addition, PCIT also has been shown to be effective for foster parents (Timmer et al., 2004; Timmer, Urquiza, & Zebell, 2006). Given the documented effectiveness of PCIT in helping nonmaltreating parents manage their behavior-problem children, recent research has investigated its effectiveness with high-risk families. A randomized clinical trial showed PCIT as efficacious for abusive parents in reducing the likelihood of allegations of child physical abuse occurring in the year following treatment termination (Chaffin et al., 2004). Research found significant reductions in frequencies of child behavior problems and in their parents' stress for mother-child dyads with a history of maltreatment (Timmer, Urquiza, McGrath, & Zebell, 2005) and dyads exposed to domestic violence (Timmer, Ware, Urquiza, & Zebell, in press). In addition, research has examined the effectiveness of PCIT with different cultural and language groups, including Puerto Rican (Matos, Torres, Santiago, Jurado, & Rodriguez, 2006), Mexican American (McCabe, Yeh, Garland, Lau, & Chavez, 2005), and Chinese (Leung, Tsang, Heung, & Yiu, in press).

### Parent-Child Interaction Therapy Protocol

PCIT is a 14- to 20-week, manualized intervention founded on social learning and attachment theories. It is designed for children between 2 and 7 years of age with externalizing behavior problems (Eyberg & Robinson, 1983). The underlying model of change is similar to that of other parent training programs, asserting that by providing parents with behavior modification skills, they become the agent of change in reducing their child's behavior problems, which in turn promotes more positive parenting. PCIT incorporates both parent and child in the treatment sessions and uses live, individualized therapist coaching for an idiographic approach to changing the dysfunctional parent-child relationship.

PCIT is conducted in two phases. The first phase focuses on enhancing the parent-child relationship (often described as Child-Directed Interaction [CDI]) and the second on improving child compliance (often described as Parent-Directed Interaction [PDI]). Both phases of treatment begin with an hour of didactic training, followed by sessions in which the therapist coaches the parent during play with the child. From an observation room behind a one-way mirror, via a bug-in-the-ear receiver (i.e., a small electronic receiver that looks like a hearing aid, which receives a low-frequency FM signal, transmitted from an adjacent observation room) that the parent wears, the therapist provides the parent with

feedback on their use of the skills. Parents are taught and practice specific skills of communication and behavior management with their children.

In CDI (typically 7-10 sessions), parents are coached to follow their children's lead in play by describing their activities, reflecting their appropriate verbalizations, and praising their positive behavior. By the end of CDI, parents generally have shifted from rarely noticing their children's positive behavior to more consistently attending to or praising appropriate behavior. When caregivers master the skills taught in CDI by demonstrating that they can give 25 descriptions (e.g., "You are building that tower very carefully"), reflections (i.e., repeating back or paraphrasing the child's words), and 15 praises (e.g., "You are doing a great job playing gently with these toys"), with no more than three instances of asking a question, giving a command, or criticizing their child in a 5-min assessment, they move to the second phase of treatment.

In PDI (typically 7-10 sessions), therapists train parents to give only essential commands, to make them clear and direct, maximizing chances for compliance. Parents participating in PCIT traditionally learn, practice, and master a specific method of discipline (e.g., using time-out for dealing with noncompliance). Parents may also be taught "hands-off" strategies (e.g., removal of privileges) if indicated. These strategies are designed to provide caregivers tools for managing their child's behavior while helping them to avoid using physical power or coercion and to focus instead on using positive incentives and promoting children's emotional regulation. By the end of PDI, the process of giving commands and obtaining compliance are predictable and safe for parents and children.

### Coaching

While PCIT is not unique in its focus on increasing positive parenting, it has a unique mode of delivery: coaching. During treatment sessions, PCIT therapists coach parents to adjust their speech and behavior toward their children, often giving them insight into their children's behavior. Therapists stand behind a two-way mirror, instructing via a remote bug in the ear as they train parents by modeling the speech they want parents to use, giving parents immediate feedback on their interactions with their children by praising desirable verbalizations. This results in changing the parents' styles of communication with their children, thereby effecting changes in children's behavior. More practice using the skills taught in PCIT is believed to shift parents toward mastery of these skills (i.e., incorporating skills

into their daily parent–child interactions), which leads to improved outcomes. It is standard protocol to ask parents to practice these skills during a daily “Special Playtime” homework assignment (i.e., parents engage in Special Playtime for 5 min a day). In addition, parents in our clinic are encouraged to participate in adjunct in-home PCIT services. Adjunct in-home PCIT services consist of an additional hour a week of coaching in the home setting, with distractions and extra family members that typify normal life for the dyad. It is believed that the extra coaching in home will help parents acquire and master PCIT skills more quickly as it increases exposure to the new interaction styles and help parents generalize these verbalizations to their everyday lives. However, neither the belief that more coaching will increase the speed or likelihood of skill mastery nor the notion that adjunct home services will improve outcomes has been tested empirically.

In this study, all children were eligible for and received PCIT in the clinic but were randomly assigned to receive either additional PCIT coaching in home or only social support. We compared the effects of receiving additional coaching versus social support on midtreatment outcomes. We hypothesized that compared with caregivers receiving social support services in home, caregivers receiving adjunct in-home PCIT services would progress to mastery more quickly, show greater improvements in target speech patterns (i.e., more positive verbalizations, fewer negative verbalizations), report greater improvements in their children’s behavior problems, and show greater reductions in parental stress.

## Method

### Sample Description

Between July 2004 and July 2006, 175 children were referred to PCIT that were eligible for enrollment in this study. Eligible participants included English-speaking biological, foster, and kin caregiver–child dyads referred to PCIT for clinic-based services for treatment of the child’s externalizing behavior problems. Of these eligible dyads, 27 (15%) parents either refused in-home services or refused to participate in the study and 16 dyads (9%) never returned after an initial clinical appointment so could not be enrolled in the study. In order to equalize the likelihood of attrition and of seeing equivalent treatment outcomes across groups, we implemented a policy of restricting eligibility for enrolling in the study to those who had not had more than three clinic-based PCIT sessions: 27 dyads (15%) could not be enrolled in

the study because they had more than three clinic-based sessions prior to a home visit. Other reasons prevented 25 dyads from participating in treatment, ranging from loss of insurance to placement changes to difficulties participating in home visiting services. A total of 80 dyads were enrolled in the study: 41 were randomly assigned to the adjunct in-home PCIT group and 39 were assigned to receive social support services. One of the dyads assigned to PCIT and 6 dyads assigned to social support services dropped out of treatment before they received any in-home services, resulting in 40 dyads in the PCIT and 33 in the Social Support group.

*Caregivers.* Of the 73 caregivers participating in the study, 43 (59%) were biological parents, 20 (27%) were kin caregivers, and 10 (14%) were nonrelative foster parents. They ranged in age from 20 to 69 years, with an average age of 36.7 years; 52% were Caucasian, 19% were African American, and 22% were Latino. Approximately 62% were single as a result of divorce, separation, or never marrying; 49% had other children living in the household present during a treatment session. Sixty-six (90.4%) primary caregivers were females participating with the child in treatment; 7 were male. Seven children (10%) participated in in-home services with their mothers and fathers.

*Children.* Of the 73 children participating in the study, 42 (58%) were males. The proportion of boys to girls in this study is representative of the overall proportion referred to PCIT for treatment. Children ranged in age from 1.7 to 8.2, averaging 4.4 years of age; 45% were Caucasian, 21% were African American, 22% were Latino, and 4% were of mixed or other ethnicities. Child Protective Services (CPS) referred the majority of children participating in the study; 73% were abused or neglected. Children’s most common initial primary diagnosis on entry into treatment was disruptive behavior disorder ( $n = 30$ ; 41%), followed by adjustment disorder ( $n = 19$ ; 26%), oppositional defiant disorder (11%), anxiety (11%), disorder of infancy (7%), and posttraumatic stress disorder (4%).

### Procedure

*Interventions.* The study plan and consent form was approved by the institutional review board at the University of California, Davis. After caregivers consented to participate in the study, they were randomly assigned to either adjunct in-home PCIT services or social support services in addition to their clinic-based PCIT services. All in-home sessions, whether adjunct

PCIT or Social Support, began with a 10-min check-in with the caregiver followed by a 5-min observation of the caregiver and child playing together. During this time, the treatment provider coded the parent's verbalizations. Following this, the two treatment groups' protocol diverged. Caregivers in the PCIT group would receive feedback on their performance during the 5-min coding and instructions to continue playing with the child, while being coached. The PCIT provider would sit behind the parent and to one side, giving caregivers the directions and feedback similar to that which they receive in their clinic sessions. Caregivers in the Social Support group only received feedback about their performance and an interpretation of the meaning of the child's behavior with respect to the treatment goals (e.g., "He is talking a lot more and really seems to pay attention to your descriptions of his play"). The caregiver might agree and direct the discussion toward times when it was not easy engaging with the child—bedtime, for example. The in-home provider would collect information about this problem, working with the parent to develop strategies for coping with it. In-home providers generally followed the parent's lead during the session, allowing them to raise issues that concerned them. Advice and strategies for handling children's problems were consistent with behavioral or cognitive-behavioral techniques. After approximately 30 min of either coaching (PCIT) or discussion (SS), the provider would wrap up the session, checking to see that they had covered all of the parent's concerns, verify the time and date of the next appointment, then take their leave. After the session, the in-home provider discussed the client's progress with the clinic-based therapist and coordinated treatment plans.

*Treatment integrity.* A monitor accompanied the in-home provider to clients' homes every third visit to collect information about whether the services provided conformed to protocol and to obtain a measure of reliability of the in-home provider's DPICS coding. In many ways the PCIT and Social Support in-home sessions were similar. In each situation, if the parent needed their support, the in-home provider was obliged to provide it. Hence, each treatment group received social support, but only the PCIT group received additional coaching.

## Observational Measures

*Dyadic Parent-Child Interaction Coding System (DPICS).* We used an observationally based measure of parents' verbalizations: the DPICS, second edition (Eyberg, Bessmer, Newcomb, Edwards, & Robinson, 1994). DPICS-2 is a microanalytic coding system

developed to record parents' and children's verbalizations and behaviors associated with the treatment goals of PCIT. DPICS-2 has a total of 52 different codes, distinguishing among verbalizations (e.g., praise, descriptions, commands), vocalizations (e.g., yelling, whining), and behaviors (e.g., compliance). For the purposes of this study, we will focus only on changes in parent verbalizations from the initial observation before treatment began, to the initial in-home visit, to the final in-home visit. The therapist uses the frequency count of the parent's verbalizations during 5 min of child-directed play to help direct that session's treatment goals and as an indicator of treatment progress. Verbalizations fell into two basic categories: those encouraged and those discouraged by the PCIT provider during the treatment session.

*Encouraged verbalizations.* Encouraged verbalizations consisted of labeled (i.e., specific) and unlabeled (i.e., nonspecific) praises, descriptive and reflective statements. Praises are defined in DPICS-2 as statements that provide a positive evaluation of the child, his or her products or attributes. The intraclass correlation coefficient measuring the reliability of in-home providers' codes for positive verbalizations was  $r = .98$ . Descriptive statements were described as parents' descriptions of the child's behavior, objects, activity, or people. Reflective statements were statements that repeated their speech, sometimes varying slightly if it corrected improper grammar or clarified their meanings. The intraclass correlation coefficient measuring the reliability of in-home providers' codes for descriptions and reflections was  $r = .90$ .

*Discouraged verbalizations.* Discouraged verbalizations were types of parent verbalizations that attempted to direct, control, or criticize the child, hence interfering with the flow of play. This category includes commands, questions, and critical statements. The intraclass correlation coefficient measuring the reliability of in-home providers' codes for discouraged verbalizations was  $r = .98$ .

## Standardized Measures

To explore differences in reductions of child behavior problems, we used a parent-rated measure of children's functioning. Reductions in parenting stress from beginning to end of the adjunct in-home intervention were evaluated using a parent-rated measure of parenting stress.

*Eyberg Child Behavior Inventory (ECBI).* The ECBI (Eyberg & Pincus, 1999) is a 36-item scale that measures behavior problems exhibited by children aged 2 to 16 years, specifically those more commonly associated with

disruptive behavior disorders (e.g., dawdling, arguing or fighting with siblings, sassiness). Caregivers indicate the frequency of these behaviors along a 7-point scale (1 = *never* to 7 = *all the time*) and whether they are problems for them (1 = *yes*, 0 = *no*). Resulting scales reflect the Intensity and Number of Behavior Problems. The reliability and validity of the ECBI is well established (see Eyberg & Pincus, 1999, for a description of the validation studies). The two scales are highly correlated with the Externalizing Behavior scale of the Child Behavior Checklist (CBCL; Boggs, Eyberg, & Reynolds, 1990). The Number of Problems scale is thought to reflect parents' tolerance for children's problem behaviors as well as indicate the severity of the problems (Eyberg & Pincus, 1999). Test-retest reliability estimates across a 3-week period yielded coefficients of  $r = .86$  and  $r = .88$  for the Intensity and Problem scales (Robinson, Eyberg, & Ross, 1980).

*Parenting Stress Inventory–Short Form (PSI-SF)*. The PSI-SF (Abidin, 1995) was designed to identify parent-child dyads that are experiencing stress and at risk for developing dysfunctional parenting and child behavior problems. The PSI-SF contains 36 items rated on a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*), grouped into three scales: Parent Distress (PD), Parent-Child Dysfunctional Relationship (P-C Dys), and Difficult Child (DC). The Parent Distress scale measures parents' feelings of distress (e.g., parent competence, depression, social isolation). This scale correlates strongly with an overall measure of parents' psychological symptom severity (Symptom Checklist-90–Revised and the Brief Symptom Inventory's Global Severity Index:  $r(285) = .47, p < .001$ ). The Parent-Child Dysfunctional Relationship scale reflects the degree to which the parent perceives the child as happy, healthy, enjoys being with the parent, and perceives their relationship as rewarding. The Difficult Child Scale measures the parents' perceptions of the child's moods, adaptability, and demandingness. This scale was strongly correlated with other measures of children's behavior problems (ECBI Intensity scale:  $r(290) = .75, p < .001$ ; CBCL Externalizing Behavior Problems:  $r(296) = .71, p < .001$ ). Test-retest coefficients for the three PSI-SF scales were estimated for a sample of 530 across a 6-month period: PD,  $r = .85$ ; P-C Dys,  $r = .68$ ; DC,  $r = .78$ .

## Data Analysis

The first step in analyzing the differential efficacy of adjunct PCIT compared to social support services was to determine whether one group was more likely to complete

treatment than the other. Second, we performed repeated measures analyses of variance with assessment point as the within-subjects factor (i.e., pre-, first in-home, last in-home), and treatment group as the between-subjects factor, using all participants with more than one home visit to maximize power. We also performed chi-square analyses of a three-level measure of participants' progress toward mastery (mastery, near mastery, off mastery) of encouraged (praise, descriptions, and reflections) and discouraged verbalizations (questions, commands, critical statements). Last we used Ordinary Least Squares Regression to examine whether the dyads in the two treatment groups differed in the degree to which they rated their children's behavior and their parental stress as improving from pre- to midtreatment. These last analyses were limited to dyads that completed the first phase of treatment.

*Power of analyses*. Using an alpha of .05, an average sample size of 30 to 40 per group in our analyses of treatment effects was sufficient to detect large effect sizes with a power of .80. The observed power reflects the likelihood that the result can be replicated in other studies. For example, when the observed power equals .80, it is likely to be replicated in 80% of future studies (Cohen, 1988). We present several effect size statistics:  $\eta^2$  (eta-squared) for analyses of variance,  $\phi$  (phi), statistics for chi-square analyses, and  $R^2$  for regression analyses. Eta-squared is roughly the square of  $f$ , the statistic measuring effect size in analyses of variance. According to Cohen (1988), a small effect size for an analysis of variance is  $f = .10$  ( $\eta^2 = .01$ ), a medium effect size is  $f = .25$  ( $\eta^2 = .06$ ), and a large effect size is  $f = .40$  ( $\eta^2 = .16$ ). In a  $2 \times 2$  cross-tabulation, phi is equal to the effect size indicator,  $w$  (Cohen, 1988), in which a small effect size is .10, medium effect size is .30, and large effect size is .50. In multiple regression analyses, the  $R^2$  indicates the effect size. Using an alpha of .05, an  $R^2$  equal to .02 is considered small; an  $R^2$  of .13 is medium-sized, and an  $R^2$  of .51 is large (Cohen, 1988).

*Missing data*. Ten cases had only one in-home observation (6 PCIT, 4 Social Support), though they had more than one home visit. These cases could not be included in analyses of treatment effects.

## Results

Table 1 describes the demographic and risk characteristics of the sample randomly assigned to the PCIT and Social Support groups, and the results of parametric

**Table 1**  
**Descriptive Differences Between Children and Caregivers Receiving**  
**Adjunct In-Home PCIT and Social Support**

	PCIT ( <i>n</i> = 40)	Social Support ( <i>n</i> = 39)	Effects
<i>Child characteristics</i>			
Sex of child (% male)	55.0	60.6	$\chi^2(1, N = 73) = 0.23, p = .63, \phi = -.06$
Age of child (in years), <i>M</i> ( <i>SD</i> )	4.38 (1.6)	4.44 (1.8)	$F(1, 72) = 0.02, p = 0.88, \eta^2 = .001$
Ethnicity of child, %			$\chi^2(1, N = 73) = 1.16, p = .76, \phi = .13$
Caucasian	47.5	42.4	
African American	17.5	24.2	
Latino	20.0	24.2	
Other	15.0	9.1	
Diagnosis, %			
Anxiety	7.5	15.2	$\chi^2(df = 5, N = 73) = 5.9, p = .32, \phi = .28$
Adjustment disorder	17.5	36.4	
Disruptive behavior	47.5	33.3	
Oppositional defiant	15.0	6.1	
PTSD	5.0	3.0	
Disorder of Infancy	7.5	6.1	
Physical abuse history, %	27.5	39.4	$\chi^2(1, N = 73) = 1.16, p = .28, \phi = .12$
Neglect history, %	58.1	62.5	$\chi^2(1, N = 73) = 0.11, p = .74, \phi = .01$
Prenatal exposure to AOD, %	32.5	24.2	$\chi^2(1, N = 73) = 0.60, p = .44, \phi = .23$
<i>Caregiver characteristics</i>			
Age of caregiver (in years), <i>M</i> ( <i>SD</i> )	35.2 (13.0)	38.6 (13.1)	$F(1, 72) = 1.17, p = .28, \eta^2 = .001$
Relationship to child, %			$\chi^2(2, N = 73) = 1.12, p = .57, \phi = .12$
Biological parent	60.0	57.6	
Kin caregiver	30.0	24.2	
Foster parent	10.0	18.2	
Caregiver ethnicity, %			$\chi^2(3, N = 73) = 1.22, p = .75, \phi = .13$
Caucasian	57.5	45.5	
African American	17.5	21.2	
Latino	20.0	24.2	
Other	5.0	9.1	
Caregiver married or cohabiting, %	42.1	32.3	$\chi^2(1, N = 69) = 0.70, p = .40, \phi = -.10$
Caregivers' education (years), <i>M</i> ( <i>SD</i> )	11.9 (2.0)	12.2 (2.3)	$F(1, 69) = 0.48, p = .49, \eta^2 = .01$

Note: PCIT = Parent–Child Interaction Therapy; PTSD = posttraumatic stress disorder; AOD = alcohol and/or other drug.

and nonparametric tests of the significance of differences between the two treatment groups. Results of analyses of variance showed no significant differences between groups in the mean age of children or caregivers, or caregivers' educational attainment. Results of chi-square tests showed no significant group differences in the sex or ethnicity of the child, their maltreatment history, or in demographic characteristics of the caregiver, including relationship of caregiver, ethnicity, or marital status.

In order to determine whether dyads receiving adjunct in-home PCIT services were more likely to remain in treatment, we performed a chi-square analysis. Results showed no significant differences between groups: 52.5% of the dyads assigned to the adjunct PCIT group and 51.5% of the dyads assigned to the Social Support group completed treatment,  $\chi^2(1, N = 73) = 0.01, p = 0.93,$

$\phi = .01$ . To see whether those assigned to the PCIT group would require fewer coaching sessions to reach mastery and end the first phase of treatment, we performed an analysis of variance of the mean differences in dyads' mean number of home visits, in-clinic PCIT treatment sessions, and total number of sessions in which the dyads received PCIT coaching. Results showed no significant differences in the mean of the number of in-home or in-clinic coaching sessions received by each group, although the adjunct PCIT group received significantly more PCIT coaching than the Social Support group (see Table 2).

Table 3 shows mean levels of encouraged and discouraged verbalizations pretreatment, at the first in-home coaching, and at the last in-home coaching for dyads in the adjunct PCIT and Social Support groups. We

**Table 2**  
**Mean Differences in Numbers of Treatment Sessions**  
**in Home and in Clinic by Treatment Group**

	PCIT	Social Support	Univariate Effects
Total participants	<i>n</i> = 34	<i>n</i> = 29	
In-home	8.5 (5.2)	8.5 (5.1)	$F(1, 62) = 0.004$ , $p = .95$ , $\eta^2 = .001$
In-clinic (CDI)	8.8 (3.4)	9.2 (5.6)	$F(1, 62) = 0.13$ , $p = .73$ , $\eta^2 = .002$
Sessions with coaching	17.2 (8.3)	9.2 (6.3)	$F(1, 62) = 21.61$ , $p < .001$ , $\eta^2 = .26$

Note: PCIT = Parent–Child Interaction Therapy; CDI = Child-Directed Interaction.

performed repeated measures analyses of variance with assessment point as the within-subjects variable (i.e., pretreatment, first home visit, last home visit), and treatment group as the between-subjects variable to test differences in treatment effects. All dyads with more than one in-home observation were included in these analyses ( $n = 63$ ). Multivariate results showed a significant overall treatment effect, overall  $F(2, 61) = 62.24$ ,  $p < .001$ ,  $\eta^2 = .87$ , power = 1.0, but no further variation by group, Treatment  $\times$  Group: overall  $F(2, 61) = 0.37$ ,  $p = .89$ ,  $\eta^2 = .04$ , power = .15. To test whether adjunct in-home PCIT services might result in superior skill acquisition for those who terminate treatment early, we reran the repeated measures analysis of variance of parents' encouraged and discouraged verbalizations over the three assessment points, including treatment group and early treatment termination status as independent variables. Results did not support this hypothesis. The interaction of treatment group and early termination status was not statistically significant, Treatment  $\times$  Group: overall  $F(4, 59) = 0.69$ ,  $p = .90$ ,  $\eta^2 = .04$ , power = .15.

Because dyads move from the first to the second phase of PCIT when they achieve mastery criteria for encouraged and discouraged verbalizations, it was also important to investigate the possibility that the two groups would differ in their achievement of mastery by their last in-home session. Hence, we examined the percentage of dyads at mastery, close to mastery, and off mastery during the last home visit (see Table 4). The results of chi-square analyses showed no significant differences between treatment groups in the percentage achieving separate mastery levels of praise,  $\chi^2(2, N = 63) = 1.04$ ,  $p = .60$ , descriptions and reflections,  $\chi^2(1, N = 63) = 0.91$ ,  $p = .63$ , or negative verbalizations,  $\chi^2(2, N = 63) = 1.04$ ,  $p = .60$ .

Table 5 shows the results of five hierarchical ordinary least squares regression analyses testing differences in

treatment outcomes by group: one for each of the scales of the ECBI and one for each of the scales on the PSI-Short Form. In the first step, we regressed the midtreatment assessment scores on pretreatment scores. In the second step, we added treatment group (PCIT vs. Social Support). Results of these analyses showed a significant effect of receiving adjunct PCIT on shifts in caregivers' tolerance of their children's behavior problems (as measured by the ECBI problem scale) and in parent distress (as measured by the PSI Parent Distress scale), a nonsignificant trend for parents in adjunct PCIT to report greater improvements in the quality of the parent–child relationship (as measured by the PSI Parent–Child Dysfunctional Relationship scale) but no significant effects of treatment group on improvements in children's behavior problems over and above the effects of participating in treatment (see Table 5). To better understand the nature of these results, we performed Wilcoxon signed ranks tests examining the significance of the difference between pre- and midtreatment scores for dyads receiving adjunct PCIT ( $n = 18$ ) and social support services ( $n = 16$ ). The Wilcoxon signed ranks test is a nonparametric statistical analysis suitable for small samples. Results of analyses for the adjunct PCIT group showed a significant pre- to midtreatment improvement in parental distress ( $z = -2.87$ ,  $p = .004$ ) and in parents' tolerance of their children's behavior problems ( $z = -2.72$ ,  $p = .007$ ), while the Social Support group showed nonsignificant changes (parental distress:  $z = -0.18$ ,  $p = .86$ ; tolerance of behavior problems:  $z = -0.54$ ,  $p = .59$ ). The adjunct PCIT group showed a nonsignificant trend of reductions in stress associated with dysfunction in the parent–child relationship, while the Social Support group showed no significant reductions (PCIT:  $z = -1.83$ ,  $p = .07$ ; SS:  $z = -0.29$ ,  $p = .78$ ). Both groups showed reduced stress associated with parenting a difficult child (PCIT:  $z = -2.34$ ,  $p = .02$ ; SS:  $z = -2.01$ ,  $p = .04$ ) and neither reported significant changes in the intensity of the children's behavior problems (PCIT:  $z = 1.40$ ,  $p = .16$ ; SS:  $z = -0.23$ ,  $p = .82$ ).

## Discussion and Applications to Practice

The purpose of this study was to test the hypothesis that adjunct in-home PCIT services improved outcomes by increasing the speed of parents' skill acquisition, improved performance, and decreased children's behavior problems and parental stress. We used random assignment to adjunct PCIT or Social Support groups so that we could evaluate the efficacy of extra PCIT coaching, knowing that differences between groups



**Table 3**  
**Results of Analyses of Variance of Mean Parent Verbalizations During the 5-min Coding, Pretreatment, During the First and Final Home Visit, by Treatment**

	PCIT ( <i>n</i> = 34)	Social Support ( <i>n</i> = 29)	Univariate Effects
<i>Encouraged verbalizations</i>			
Praise			$F(1, 61) = 113.5, p < .001, \eta^2 = .65$
Pretreatment	1.6 (2.4)	2.4 (2.7)	
First home visit	8.5 (6.1)	8.0 (5.2)	
Final home visit	10.8 (6.7)	12.1 (7.2)	
Descriptions and reflections			$F(1, 61) = 5.5, p = .02, \eta^2 = .08$
Pretreatment	21.7 (12.0)	23.3 (11.2)	
First home visit	21.1 (12.6)	23.0 (12.7)	
Final home visit	25.8 (13.3)	28.2 (14.2)	
<i>Discouraged verbalizations</i>			
Commands, criticisms, and questions			$F(1, 61) = 150.9, p < .001, \eta^2 = .71$
Pretreatment	40.1 (20.4)	36.2 (14.4)	
First home visit	14.9 (9.8)	15.8 (11.6)	
Final home visit	8.6 (5.9)	7.8 (8.3)	
<i>Multivariate effects</i>			
Treatment			Overall $F(6, 56) = 49.81, p < .001, \eta^2 = .84, \text{power} = 1.0$
Treatment × Group			Overall $F(6, 56) = 0.37, p = .90, \eta^2 = .04, \text{power} = .15$

Note: PCIT = Parent–Child Interaction Therapy.

**Table 4**  
**Percentage of Dyads at Mastery, Near Mastery, or Off Mastery for Praises, Descriptions and Reflections, and Negative Verbalizations at the Final In-Home Session**

	PCIT	Social Support	Effects
<i>Encouraged verbalizations</i>			
Praise			$\chi^2(2, N = 73) = 1.00, p = .61, \phi = .09$
At mastery (15 or more)	25.0	33.3	
Near mastery (10-14)	27.5	24.2	
Off mastery (8 or fewer)	47.5	42.4	
Descriptions and reflections			$\chi^2(2, N = 73) = 0.01, p = .99, \phi = .01$
At mastery (25 or more)	45.0	45.5	
Near mastery (20-24)	17.5	18.2	
Off mastery (19 or fewer)	37.5	36.4	
<i>Discouraged verbalizations</i>			
Commands, criticisms, and questions			$\chi^2(2, N = 73) = 4.75, p = .09, \phi = .26$
At mastery (0-3)	20.6	31.0	
Near mastery (4-7)	30.0	36.4	
Off mastery (8 or more)	55.9	31.0	

Note: PCIT = Parent–Child Interaction Therapy.

would not be a result of either self-selection or therapist selection into a treatment group. This study attempted to overcome previous criticism of the difficulty translating

results of laboratory studies to practice by performing the study in a community agency. However, results of analyses did not allow us to confirm that in-home PCIT unilaterally improved outcomes. We were not able to detect any differences between groups in the speed of completing the first phase of treatment, the rate of skill acquisition, or quality of performance by the last in-home treatment session, although the dyads in the PCIT group had significantly more coaching sessions than the Social Support group. We did not detect any differences between groups in caregivers' report of improvements in child behavior problems by midtreatment. However, we did find that participation in adjunct in-home PCIT services predicted improvements in midtreatment reports of parental stress and tolerance of their child's behavior. The combination of results suggests the need to examine our assumptions and the limitations of the study more closely.

**Assumptions**

We assumed that the model representing how people learned PCIT skills was additive: the more coaching and practice the parent receives, the more quickly he or she achieves mastery. In other words, the PCIT learning model is based on "overlearning." The clinic-based therapist and home visitor attempt to coach the parent to a point where using positive verbalizations becomes automatic; and parents' consistent use of these automated

**Table 5**  
**Results of Ordinary Least Squares Regressions Predicting Midtreatment Scores on ECBI and PSI-SF Scales**

<i>Midtreatment ECBI scores</i>		Intensity Scale	Problem Scale	
Intercept		61.88	3.64	
Pretreatment score		0.53***	0.72***	
Treatment group (1 = PCIT)		-16.65	-4.85*	
Step 2 $F(2, 30)$		9.13, $p < .001$	20.19, $p < .001$	
Step 2 adjusted $R^2$		.34	.55	
Change in $R^2$ from Step 1 to 2		.05	.07	
Significance of change		.12	.04	
<i>Midtreatment PSI-SF scores</i>		Parent-Child	Parent Distress	Difficult Child
Intercept		12.53	9.45	8.50
Pretreatment score		0.47**	0.65***	0.66***
Treatment group (1 = PCIT)		-2.86 <sup>†</sup>	-5.29*	-2.27
Step 2 $F(2, 30)$		7.13, $p = .003$	16.89, $p < .001$	16.64, $p < .001$
Step 2 adjusted $R^2$		.16	.52	.51
Change in $R^2$ from Step 1 to 2		.08	.09	.02
Significance of change		.08	.02	.34

Note: Coefficients are unstandardized *B*s. ECBI = Eyberg Child Behavior Inventory; PSI-SF = Parenting Stress Inventory-Short Form; PCIT = Parent-Child Interaction Therapy.

<sup>†</sup> $p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

patterns of speaking with their children is thought to be further reinforced by their children's positive responses. These results suggest instead that the amount of teaching/coaching and practice does not completely account for changes observed in parent verbalizations.

Second, we assumed that the target of our intervention (e.g., parent's speech) would be likely to change most significantly, and that less proximal outcomes (e.g., child behavior, parent stress) would change less significantly. Adjunct PCIT (vs. Social Support) did not appear to be a potent enough addition to clinic treatment to predict further changes in parents' speech, yet these same dyads showed reductions in parenting stress and increases in their tolerance for their children's problems at midtreatment while those receiving social support services did not. Contrary to our assumptions, the most distal outcomes proved to differ most significantly by group, not the most proximal (i.e., differences in verbalization frequencies).

This pattern of outcomes calls into question both assumptions. While we see clear signs of incremental skill acquisition from assessment point to assessment point, we see improvements for both groups, leading us to conclude that increased weekly exposure to PCIT does not increase rates of skill acquisition. The similarity of the two groups' performance suggests that a single exposure to PCIT coaching a week is sufficient to change parents' behavior. However, the fact that we observed

significant effects of in-home treatment group assignment on parent attitudes about the child's behavior and their own roles as parent suggests that behavioral change accompanied by participation in PCIT is not the sole predictor of parents' attitudes about their children and their parent roles. These findings suggest that there is something about increasing exposure to PCIT coaching that helps shift parents' beliefs about their ability to handle their children's difficult behaviors. Unfortunately, the limitations of this study prevent us from looking more deeply into the mechanisms of change in PCIT. We depend on future research to answer questions about the determinants of positive change.

### Limitations of Study

When designing the study, we believed that the differences between the adjunct in-home PCIT and social support services were large enough so that if we enrolled 63 dyad participants per group, we would be able to detect medium-sized differences between groups. We planned to recruit nearly all dyads entering PCIT in an agency where there is a caseload of over 100 parent-child dyads at any one time. However, we failed to account for the human factor. This factor is quite potent in clinic settings: Therapists have their own ideas about when to make referrals, policies must be "enabled" rather than "enforced," and staff burn out or take family leave. There

## References

- is considerable art to running an efficacy study in a clinic, which we did not fully appreciate before we began. In the end, we were only able to enroll sufficient numbers to detect large effects. If we could do the study again, we would have designed it slightly differently in order to protect ourselves from enrollment problems and ensure our ability to detect group differences. We would have fought our inclination to provide all the services we believed a family needed and randomly assigned some dyads to a "No Adjunct Services" group. A group that did not receive any in-home services might have made it possible to detect more nuanced effects.
- The small sample size put limits on the power of the statistical analyses and the complexity of questions we could ask of the data. Whenever there are nonsignificant findings in a study with low statistical power, one must cautiously interpret the results. It is dangerous to assert that there are no significant relationships between an independent and a dependent variable, or no differences between two groups of interest, because the lack of power may mask significant differences (Type II error). When there are significant relationships, one fears that the small sample might not be representative, increasing the probability of a Type I error. When significant results confirm hypotheses or show consistency across similar measures, then we can feel more confident that the results have meaning as well as statistical significance. We faced these problems in the current study. With respect to nonsignificant findings, we assert that if there were effects that we could not detect, they were not strong. With respect to significant findings, we acknowledge that their effect sizes are medium-small. However, there is some consistency in the types of outcomes that showed treatment group differences. The consistency of the effect of adjunct PCIT coaching on parents' beliefs about their ability to parent their children gives us some assurance that these findings merit further exploration.
- The results of this randomized clinical trial exploring the efficacy of receiving in-home PCIT compared with social support services adjunct to clinic-based PCIT showed that contrary to our hypotheses, extra coaching did not significantly predict improvements in caregivers' performance or in reductions in child behavior problems. However, we did observe that dyads receiving in-home coaching showed significant reductions in parental stress and increased tolerance for their children's problem behaviors. The pattern of results suggests that the relationship between exposure to coaching and caregiver performance is unlikely to be either linear or direct. Results encourage us to explore more thoroughly the mechanisms of change in this empirically supported treatment.
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