Published in final edited form as:

Res Soc Work Pract. 2011 November 1; 1(6): 689–698. doi:10.1177/1049731511406551.

Parent–Child Interaction Therapy in a Community Setting: Examining Outcomes, Attrition, and Treatment Setting

Paul Lanier¹, Patrica L. Kohl¹, Joan Benz², Dawn Swinger², Pam Moussette², and Brett Drake¹

¹Center for Violence and Injury Prevention, Brown School of Social Work, CB1196, Washington University in St. Louis, One Brookings Drive, St. Louis, MO

²Family Resource Center, 3309 S. Kingshighway Boulevard, St. Louis, MO

Abstract

Objectives—The purpose of this study was to evaluate Parent-Child Interaction Therapy (PCIT) deployed in a community setting comparing in-home with the standard office-based intervention. Child behavior, parent stress, parent functioning, and attrition were examined.

Methods—Using a quasi-experimental design, standardized measures at three time points were collected from parent-child dyads (n=120) with thirty-seven families completing treatment.

Results—Growth modeling analyses indicate significant improvements in child and parent outcomes in both treatment settings with more rapid improvements in parent outcomes within office-based treatment. Attrition was predicted by income and parent functioning.

Conclusion—PCIT delivered in the community can produce measureable improvements. In-home PCIT is a feasible option but future research should consider benefits and costs. Treatment completion remains a challenge.

Keywords

child welfare; children; community intervention; evidence-based practice; intervention; quantitative

Certain parent training interventions have received increasing empirical support and are currently being implemented in agencies providing behavioral health and family support programs (Barth et al., 2005). These programs seek to empower parents to appropriately handle child discipline through the development of a positive parent and child relationship. One program, parent–child interaction therapy (PCIT), seeks to strengthen this family relationship with a goal of reducing child behavior problems and eliminating harsh and ineffective parenting (Brinkmeyer & Eyberg, 2003; Eyberg, Nelson, & Boggs, 2008). The

© The Author(s) 2011

Corresponding Author: Paul Lanier, 1 Brookings Drive, St. Louis, MO 63130, USA, planier@wustl.edu.

Reprints and permission: sagepub.com/journalsPermissions.nav

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

current state of the science is grappling with the challenge of moving these treatments from the controlled laboratory setting and into the hands of the clinicians working with families in a “real-world” environment (Whitaker, Lutzker, & Shelley, 2005). As PCIT is further disseminated and garners funding support, it is imperative that the results of these implementations are evaluated. Yet, evidence for the effectiveness of PCIT in community settings is lacking (Thomas & Zimmer-Gembeck, 2007, p. 493). In response to this knowledge gap, we examined outcomes of families that have participated in PCIT in a community setting.

Moving interventions from the “bench to the trench” introduces a variety of challenges. While the barriers to successful treatment are often unique to clinical or community settings, it is imperative to develop strategies to keep families engaged in the treatment process from start to finish (Fernandez & Eyberg, 2009). Adaptation of certain aspects of the program might be necessary to fit the agency and family needs. PCIT was developed to be delivered in an office setting. However, this service delivery strategy may not be feasible for some agencies or families. Adapting PCIT to be delivered in the home may provide insights into ways to improve outcomes and reduce attrition. While replication of the findings from other clinical studies is critical, this study also considers two other aspects of the implementation of PCIT in a community setting. First, we explore the factors that relate to treatment attrition. Second, this is the first analysis of PCIT delivered in the family’s home compared to the standard practice of delivering PCIT in an office setting.

Parent–Child Interaction Therapy (PCIT)

The family systems perspective suggests a “coercion hypothesis” (Patterson, 1982) that describes a pattern of interaction between parents and children (Hakman, Chaffin, Funderbunk, & Silovsky, 2009; Timmer, Urquiza, Zebell, & McGrath, 2005). In this model, harsh discipline is escalated over time and is reinforced by short-term compliance by the child. Due to the insecurity and fear caused by inconsistent and violent parenting, children avoid parental directives and often model the negative behavior. The increase of avoidance and aggressive behaviors in the child triggers further harsh parenting. Parents move further away from positive reinforcement as the emotional gap between parent and child increases. This interaction becomes stable over time and the parent–child interaction coregulates and nurtures a hostile and dangerous relationship (Hakman et al., 2009; Timmer et al., 2005).

PCIT is an empirically supported parent-mediated intervention that targets families who have experienced or are at risk for emotional abuse, physical abuse, and physical neglect that is common in the family interactions patterns described above (Brestan & Eyberg, 1998). The program was designed to primarily focus on young children with behavioral or emotional problems and places an emphasis on improving the quality of the parent–child relationship by changing parent–child interaction patterns. In PCIT, parents are taught specific skills to establish a nurturing and secure relationships with their child while increasing their child’s prosocial behavior and decreasing negative behavior.

This treatment focuses on two basic interactions: Child-directed interaction (CDI) is similar to play therapy in that parents engage their child in a play situation with the goal of

strengthening the parent–child relationship; parent-directed interaction (PDI) resembles clinical behavior therapy in that parents learn to use specific behavior management techniques as they play with their child (Herschell, Calzada, Eyberg, & McNeil, 2002). Therapists coach parents during interactions with their child to teach new parenting skills. These skills are designed to strengthen the parent–child bond, decrease harsh and ineffective discipline control tactics, improve child social skills and cooperation, and reduce child negative or maladaptive behaviors. The two phases of the intervention are delivered sequentially with progress to PDI contingent upon mastery of CDI skills and completion of the entire PCIT program contingent upon mastery of PDI skills. The average length of treatment is between 12 and 14 weeks (Thomas & Zimmer-Gembeck, 2007). PCIT is designed to be an office-based intervention with the therapist observing the parent–child interaction from behind a two-way mirror communicating with the parent through an ear piece (California Evidence-Based Clearinghouse, 2008).

Program Attrition

Attrition among families receiving PCIT, and most behavioral health interventions, is an ongoing challenge. Fernandez and Eyberg (2009) provided an analysis of attrition during standard PCIT treatment and 2-year follow-up conditions in a sample of 99 families, 36 (36%) of whom dropped out during treatment. Attrition rates reported in Thomas and Zimmer-Gembeck's meta-analysis ranged from 18 to 35% among those studies that reported attrition (Eyberg, Boggs, & Algina, 1995; Eyberg et al., 2001; Nixon, Sweeney, Erickson, & Touyz, 2003, 2004; Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998). In exploring predictors of attrition, Fernandez and Eyberg found that the “most common reason for dropout was disagreement with the treatment approach” (2009, p. 436). Being too busy, additional stressors, and logistical problems were also cited. Specific predictors of dropout were socioeconomic status (SES) followed by higher negative talk and less total praise toward the child from mothers. Another study (Harwood & Eyberg, 2004) examined the relationship of the parent and the therapist in predicting attrition. The results show that dropout can be predicted with a high level of accuracy based on a brief and early interaction.

Treatment Setting

PCIT is currently being adapted for implementation in settings other than the mental health clinic or university research labs. In a second edition of *Parent–Child Interaction Therapy* (Roberts, 2010), the preface describes the widespread dissemination of PCIT in over 100 agencies in California including a mobile Winnebago unit. In addition to a chapter entitled “Home-Based PCIT: From the Lab to the Living Room,” there are chapters on “Staff–Child Interaction Therapy” and “Teacher–Child Interaction Therapy” to provide guidance for clinicians working in settings across the continuum of care and in the classroom. It appears that the future of PCIT involves expansion beyond the clinical setting.

No studies could be found that examined PCIT delivered in a community setting that were not part of a larger randomized controlled trial (RCT) or clinical trial. Additionally, only one study was available that explored in-home PCIT. This study examined the use of in-home PCIT in a single subject A/B ($n = 5$) design (Ware, McNeil, Masse, & Stevens, 2008). The

results showed promise that an in-home model may provide similar improvement in child and parent outcomes as an office-based intervention. While an in-home treatment may result in reduced dropout, the authors reported a similar (40%) attrition rate as in prior studies.

Timmer, Zebell, Culver, and Urquiza (2010) examined the use of an additional in-home component to the standard clinic-delivered PCIT. Participants randomly assigned to the adjunct group received an additional 1 hr each week of coaching in the home setting “with distractions and extra family members that typify normal life for the dyad” (p. 38). This study found no differences in the speed of completing CDI, rate of skill acquisition, or caregivers’ report of child behavior at mid-treatment. There were improvements in parental stress and tolerance of children’s behavior. While it provides an example of PCIT being used in the home, this study was based on a model of “overlearning” PCIT skills from increased exposure to coaching and not specifically on the effects of different treatment locations.

Current Study

The purpose of the current study is to examine the outcomes of PCIT implemented in a community setting. The findings are part of an evaluation conducted by a private agency with analysis of data from agency case files through a university partnership. Participants were referred to treatment and consented to be part of evaluation study. PCIT was implemented for 2 years, enrolling around 50 clients per year. This investigation seeks to determine whether or not similar outcomes found in controlled settings can be replicated. Additionally, we examined program attrition and in-home versus office-based PCIT. There are three primary questions that this study sought to answer. The answers to these questions further inform the research literature on PCIT as well as assist agencies in determining how to implement PCIT in a way that is most effective.

Question 1: Do families who complete PCIT show improvements in anticipated outcomes including child behavior, parenting stress, parent functioning, and mental health (program effectiveness)?

Question 2: Is there a difference in outcomes for PCIT based in the office versus in the home (treatment setting)?

Question 3: What factors contribute to program dropout or completion (attrition)?

Method

Participants

Over the 2-year implementation period, 120 families completed at least one session of PCIT. Figure 1 provides a description of the participant flow and attrition from treatment setting selection through the two phases of PCIT. Based on the existing agency design, some PCIT participants were referred by state Children’s Division while referrals from other agencies, self-referral, and friend referral provided the remainder of the participants. Families received PCIT either in their home or at the office. While ideally families would have been randomized into a treatment setting, PCIT was delivered within a naturalistic service-setting

environment. Hence, treatment setting was determined primarily by the family's preference. Based on discussions with the agency, factors such as transportation and availability of day care largely determined whether treatment was home or office based. Participants consented to be part of this study during the intake procedure. This study was approved by the Institutional Review Board of Washington University in St. Louis.

Practitioner Training and Model Fidelity

There were a total of seven therapists who provided PCIT; three Licensed Professional Counselors (LPC), two Licensed Clinical Social Workers (LCSW), and two Provisionally Licensed Clinical Social Workers (P-LCSW). Postgraduate clinical experience working with families ranged from 1 to 19 years. PCIT training was provided in a group training format and therapists used Eyberg's PCIT training manual to guide their work with families. All therapists participated in PCIT group supervision with the trainer one or two times a month for the first 2 years. Therapists then began meeting for PCIT peer supervision two to four times a month. Consistent with the model, practitioners used PCIT coding sheets during each session to indicate client progress and mastery of CDI and PDI behaviors. There were no measured fidelity checks on adherence to the treatment manual.

Measures

The agency used the following measures as part of their intake battery provided for each family that initiates treatment. Each measure was given to the family during the first visit (preintervention), between the CDI and PDI portions (mid-intervention), and at the completion of PCIT (postintervention). Having data collected at three time points provided the ability to examine the change over time during the course of PCIT. This is critical given the two-phase aspect of PCIT. In addition to the measures listed below, parent's income, race, age, and gender were considered as predictors in outcomes. Race was categorized as White, African American, or "other." The other race category included self-reported races including Asian, Indian, American Indian, and Biracial. Referral source (Children's Division or other referral source) was determined at intake to provide further background information in predicting outcomes. Other referral sources included self-referral, school, friend, and others. The standardized outcome measures collected were:

Parenting Stress Index Short Form (PSI-SF; Abidin, 1995)—The PSI-SF was completed by the parent and measured the level of stress experienced by parent-child dyads. The PSI-SF contains 36 items rated on a 1–5 Likert Scale (Strongly Agree, Agree, Not Sure, Disagree, Strongly Disagree) and measured parental distress, and parent-child dysfunctional interaction. Examples of items were "I feel trapped by my responsibilities as a parent" and "My child seems to cry or fuss more often than other children."

Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999)—The ECBI is a widely used scale to measure behavior problems in children containing two subscales: the Intensity Scale and the Problem Scale. The Intensity Scale was comprised of parent's report of the frequency that their child engages in 36 behavioral problems on a 7-point Likert scale (1 Never, 2–3 Seldom, 4 Sometimes, 5–6 Often, 7 Always). Examples include "Sasses adults," "Yells or screams," and "Is easily distracted." The values across the 36 behaviors

were added together to calculate an intensity score ranging from 36 to 252. The parent was then asked if each behavior is “a problem for you” and indicated yes or no (0 or 1) for each of the 36 behaviors to measure whether or not the given behavior was currently a problem. These are also added to create a problem score ranging from 0 to 36 to indicate the number of behaviors that are problems regardless of frequency. Children rated above 130 on the Intensity Scale or 15 on the Problem Scale are in the “clinical range” for behavior problems. In this analysis, the raw scores were converted to *t*-scores.

Behavioral and Symptom Identification Scale (BASIS-32; Eisen, Dill, & Grob, 1994)—The BASIS-32 scale was developed to assess client functioning and mental health outcomes. It was originally used for inpatient public mental health programs and ultimately adapted to self-administered form. Respondents rate perceived difficulties in five areas of symptoms and behavior problems using a 5-point Likert scale ranging from 0 (no difficulty) to 4 (extreme difficulty). The five subscales measure the following; relation to self/others, depression/anxiety, daily living skills, impulse/addictive behavior, and psychosis.

Global assessment of functioning (GAF; DSM-IV; APA, 2000)—Based in the *DSM-IV*, the Axis V GAF score provides a subjective rating of the psychosocial and occupational functioning of the participants by a clinician. The numeric scale ranges from 0 to 100 and a guide to the measure functioning in 10 equivalent 10-point increments is provided in the *DSM-IV*. Examples include “91–100 superior functioning in a wide range of activities, life problems never seem to get out of hand, is sought by others because of his or her qualities. No symptoms.” and “61–70 Some mild symptoms or some difficulty in social, occupational, or school functioning, but generally functioning pretty well, has some meaningful interpersonal relationships.”

Data Analysis

To answer Question 1 and Question 2, multilevel growth modeling was employed to assess the change over time in the outcome measures while controlling for covariates including treatment setting. An iterative model-building approach using maximum likelihood estimation was used to determine the model that provided the best fit to the data. Polynomial growth models that assess curvilinear change were tested to determine whether or not the rate of change was consistent across the three time points. This method is more flexible and efficient compared with repeated-measures multivariate analysis of variance (MANOVA), analysis of covariance (ANCOVA), or ordinary least squares (OLS) Regression methods often employed in longitudinal experimental designs by appropriately handling autocorrelation and heteroskedasticity (Singer & Willett, 2003). This analysis was conducted for the 32 families that completed the entire treatment and thus have available data across three time points.

In addition to assessing for a general trend over time, it is important to determine whether or not demographic and treatment variables impact these trends. There are two ways that these variables can affect an outcome. First, the variable may be related to a higher or lower average value for a given outcome. For example, lower income families may exhibit a higher average level of parenting stress compared to higher income families. Second,

subgroups may exhibit differential rates of change for the outcomes. In this case, males and females may start out with the same level of parenting stress but over time, female stress levels may decrease more rapidly than males. These two types of effects, average and rate of change, were examined for each outcome variable based on the parent's age, race, income, gender, referral source, and treatment setting.

Bivariate analyses (chi-square, *t*-test, ANOVA) were conducted to determine the association between predictor variables and level of program completion. Similarly, bivariate analyses were conducted to compare families who received treatment at home versus the office. Effect sizes were computed for categorical variables using Cramer's V/ϕ and continuous variables using Cohen's d . The ϕ and Cramer's V vary between 0 and 1 with higher values indicating stronger association between variables. Conventionally, Cohen's d is interpreted as 0.2–0.3 indicating a “small” effect size, 0.5 “medium,” and greater than 0.8 as a “large” effect (Cohen, 1988). There is currently some debate about the appropriate way to report effect sizes for change trajectories in growth-model analysis (Feingold, 2009). For this reason, this study calculated effect sizes for the main outcomes to remain consistent with the methods employed by Thomas and Zimmer-Gembeck's (2007) meta-analysis of PCIT trials. The single-group effects from pretreatment to posttreatment for the completion group in Question 1 were determined using the following formula:

$$d = (M_{\text{post}} - M_{\text{pre}}) / SD_{\text{pre}}$$

To answer Question 3, we examined the differences in demographic and outcome measures across three groups in this study, those that dropped out during CDI, dropped out during PDI, and completed the entire course of the intervention. Bivariate tests including chi-square, ANOVA, and *t*-tests were used to analyze these differences. Outcome measures at pre-treatment and mid-treatment time points were used to examine the differences between dropout groups. The probability of dropping out was modeled using multivariate logistic regression to determine which predictors affect attrition. Odds ratios serve as effect sizes in this analysis. All analyses were conducted using R 2.11.

Missing Data

As is common using “real-world” observational data, there was missing data in this study. Baseline demographic data was reported for all of the families. However, the measures that were to be collected at each time point for families in the study were commonly not produced in the case file. The percentage of missing data for the four outcome measures (PSI, GAF, ECBI, and BASIS) ranged from 17 to 26% for the pretest data, 15–30% of the midpoint data, and 5–27% of the posttest data among families still in treatment. Attempts at multiple imputation did not converge likely due to the small sample size and the large amount of missing data. Thus, all multivariate analyses are conducted using listwise deletion.

Results

Question 1—Program Effectiveness

The overall bivariate results for demographic, treatment, and outcome variables for the entire sample and for each completion group are found in Table 1. The first set of analyses will examine results within the 37 families that finished the entire course of PCIT to examine the effectiveness of receiving the entire treatment as indicated. Table 1 provides the descriptive statistics of the outcome measures across the three time points. The average family received 17 sessions before reaching program completion (range 7–29, median = 17).

Overall, there was a change over time in the desired direction for all outcome measures. As measures of dysfunction, the PSI, BASIS, and ECBI are all expected to decrease over time with successful intervention. The GAF score is expected to increase. Figure 2 provides the box-whisker plot at each time point as well as the linear regression line for each outcome across time. The dark horizontal bar at each time point is the median score.

The results of the unconditional growth curve models were consistent with the bivariate results for each outcome. There was a significant linear rate of change found during both the CDI and PDI phases of treatment. Quadratic functions did not significantly improve the model fit for any outcome, thus linear models were retained. Program completers showed over a nine point decrease in PSI over each treatment phase for an overall average decrease in PSI from 103 to 83 ($d = .89$). The GAF scores improved four points per phase for an average increase from 67 to 75 ($d = .82$). The ECBI scores decreased an average of over four points per phase for an average decrease from 64 to 55 for the Problem Scale ($d = .93$) and from 65 to 56 for the Intensity Scale ($d = 1.1$). The BASIS scores decreased over a tenth of a point during each phase for a decrease from 0.80 to 0.58 ($d = .38$).

For the outcome of parental stress, there was no average or rate of change effects as measured by the PSI across the demographic variables. This suggests that all families reported similar levels of parenting stress and had a similar reduction over time regardless of age, race, income, gender, or referral source. Similarly, demographic variables did not predict average BASIS scores and no rate of change effects were found for this measure. Income level had no effect on any of the outcome measures for those who completed the program.

Female parents reported a nine point higher ($b_{\text{FEMALE}} = 9.45, SE = 5.10$) baseline ECBI-Intensity Scale score compared to male parents, indicating that, compared to fathers, mothers reported their children's behavior to be more intense. ECBI-Intensity scores were also related to referral source. While average levels for parents referred from Children's Division were the same for parents from other referral sources at the start of treatment, the rate of decrease in reported behavior intensity ($b_{\text{CD}} \times \text{TIME} = -5.39, SE = 1.78$) dropped more quickly for parents referred from Children's Division. Thus, by the end of treatment parents referred by Children's Division had over a 10 point lower ECBI-Intensity score compared to other referral sources.

As the majority of families did not complete the program, it is important to assess whether or not there is an indication that improvements were being made before they dropped out. Outcome data at midpoint was available for families that dropped out during PDI. Thus, we assessed whether or not improvements were made for these 18 families. Following a similar analytic strategy using only preintervention and mid-intervention data, the outcome variables were assessed for significant changes. Families that dropped out during PDI showed no significant changes in outcome measures from preintervention to mid-intervention.

Question 2—Treatment Setting

Table 2 provides the bivariate results of the home versus office-based PCIT groups. The two groups were essentially similar at the onset of treatment. Additionally, little difference was found in the trajectories of families based on treatment setting. In the multilevel model controlling for other family demographic factors, the rate of change was significantly different for two of the outcomes for the program completers. While there was no significant difference in starting levels of scores on the PSI ($M_{\text{OFFICE}} = 97.2$, $SD = 22.0$; $M_{\text{HOME}} = 102.0$, $SD = 21.1$), families in office-based PCIT had a more rapid decline in PSI scores by the end of treatment ($M_{\text{OFFICE}} = 76.3$, $SD = 20.2$; $M_{\text{HOME}} = 88.4$, $SD = 31.4$; $d = .81$). While parents in home- and office-based PCIT have equal baseline BASIS scores ($M_{\text{OFFICE}} = .97$, $SD = .70$; $M_{\text{HOME}} = .93$, $SD = .58$), only those in office-based PCIT show a significant decrease during treatment ($M_{\text{OFFICE}} = .32$, $SD = .33$; $M_{\text{HOME}} = .82$, $SD = .83$; $d = .86$). The ECBI-Intensity and Problem scores were not significantly altered by the delivery setting. All interaction effects between family demographic variables and treatment setting were analyzed and no significant differences were found.

The effect of treatment setting was also analyzed for the families that dropped out of treatment using only the preintervention and mid-intervention outcome scores. There was no significant improvement in any of the outcome measures for the dropout group regardless of whether PCIT was delivered at home or at the office.

Question 3—Attrition

Of the 120 families that entered treatment, 37 completed the entire program, an attrition of 69%. Of those who dropped out, 65 (54%) dropped out during CDI, and 18 (15%) dropped out during PDI. Table 1 provides a breakdown of the demographic and treatment variables by dropout group as well as the outcome variables that are available for each group. Parents who completed or dropped out during PDI were more likely to be White, while Black parents are overrepresented in the CDI dropout group ($\chi^2 = 9.91$, $p < .05$, Cramer's $V = .20$). Parents in the completed group were about 6 years older on average than parents in the CDI dropout group, $F(2, 117) = 3.93$, $p < .05$, $d = .53$. Income level was significantly different between the three groups, $F(2, 116) = 6.63$, $p < .01$, $d = .70$, with the completer group having a higher average income (\$30,100) compared to both the CDI dropout (\$14,500) and the PDI dropout groups (\$15,400). Post hoc tests showed that the difference in mean income between the PDI and CDI dropout groups was not statistically significant.

As expected, program attrition was related to the number of sessions completed. Families that drop out in CDI averaged 5 sessions, PDI averaged 13 sessions, and the completed group averaged 17 sessions. All differences in sessions were significant between groups, $F(2, 115) = 96.33, p < .001, d = 1.9$. There was no difference in the treatment setting or referral source on completion level. The only treatment outcome related to attrition was the GAF score with families who completed the program having higher baseline ($d = .53$) and midpoint ($d = 1.0$) GAF scores than the dropout group.

Multivariate logistic regression analysis was used to model the probability that a family will dropout or complete the program while controlling for other variables. When entered with income, the effect of race is no longer significant. Further bivariate analysis revealed that the average income for White families was significantly higher (\$10,184) than Black families. For income, each increase in \$10,000 annual salary increases the probability that a family will complete the program by about 24% (OR = 1.24). The GAF score at preintervention was the only outcome measure that was associated with dropout. Each point increase in GAF score was associated with about a 6% increase in the likelihood of completing the program (OR = 1.06). For example, an individual with a GAF score of 65 (the average for the entire sample) had about a 35% chance of completing the program while a parent with a GAF of 85 had a 60% chance of completion.

Discussion and Applications to Social Work

The results of this evaluation suggest that families who complete PCIT will experience significant improvements in child behavior, parenting stress, and parent functioning. Families that drop out of the program do not realize the same results. While the benefits for families that complete the program are quite encouraging, program attrition remains a challenge. The attrition rate of 69% is much higher than those reported in other studies that had a maximum of 36% (Fernandez & Eyberg, 2009; Thomas & Zimmer-Gembeck, 2007). One avenue for exploration of improving program attrition could be location of delivery. However, these results suggest that receiving PCIT in-home is feasible but does not result in an overwhelming benefit to families in terms of outcomes or attrition.

One explanation for the higher attrition in this sample is the difference in delivering treatment in community and university research settings. Community agencies may have less resources than clinical studies and typically do not provide financial incentives to families for participation. Court-ordered parents did not have a choice to receive PCIT and may be more difficult to engage. On the other hand, many families in this study chose to participate which could potentially improve engagement with treatment and motivation thereby decreasing attrition. While treatment setting did not impact attrition, parents of higher income and functional level were more likely to complete treatment. While home-based treatment would potentially remove many of the barriers that lower income families would face, this study provides evidence that income status affects attrition beyond barriers created through treatment location.

Treatment setting (home- versus office-based PCIT) was influential for some outcomes but not for others. Parenting stress and mental health improved more quickly in an office setting

than in a home setting. However, this same trend was not found for child behaviors or parent functioning; treatment was equally beneficial regardless of the setting. Further exploration should weigh the marginal cost of delivering PCIT at home in light of these improvements. Others have suggested that the use of an Internet-based telemedicine technology could be used to provide PCIT to families in their homes, potentially reducing some costs of home-based treatment (Funderbunk, Ware, Altshuler, & Chaffin, 2008).

We observed several advantages and disadvantages to home-based PCIT. Families with challenges in transportation and those with other children or disabled family members in the home benefited from the convenience of home-based therapy. It also provided a more “in vivo” experience for the participants as the skills are taught in the environment where they are intended to be used. This may make the transition from practicing parenting techniques with a coach to real-life application smoother. In-home therapy requires more time due to travel to and from the session, but often the no show rate and cancellation rate for in-home therapy is reduced.

There are also disadvantages to in-home PCIT. If there is chaos in the home and several children present, it is more difficult to work with one parent and one child at a time as the PCIT approach demands. PCIT in the office setting allows more privacy and the ability of the therapist to work effectively with one parent and one child at a time. There were anecdotal reports of parents who were not open to coaching and chose not say the positive statements that the therapist asked them to repeat in front of their child. The parent’s reluctance may be interpreted by the child as rejecting of them, further exacerbating a dysfunctional relationship. In this case, the office-based setting would be more appropriate as the therapist could utilize the bug-in-the-ear coaching and two-way mirror. An alternative approach might be to teach the PCIT skills in the office until the parent and child are comfortable with PCIT and then transfer the sessions to the home to aid in transition of these skills to real-life situations.

Our findings validate the notion that treatment completion matters. Significant improvements were only found for those families who completed the entire program. Among families who completed, significant improvements were found at the midpoint suggesting that meaningful change was occurring early in the treatment process. This is consistent with findings from Hakman et al.’s (2009) work exploring change trajectories across sessions of PCIT. The findings differed in that our study found a consistent linear change throughout the two phases while the prior study found the most rapid improvement during the first three sessions of CDI.

Based on the midpoint analysis, families that did not receive the entire course of treatment did not improve across all outcomes of consideration. Of those who did not complete the program, change from baseline could only be assessed in those who dropped out during the PDI phase. With an average of 13 total sessions, these families completed the CDI portion of PCIT and were working on the PDI phase. It is possible that significant improvements occurred in the PDI phase but were not measured. Also, parents who dropped out during CDI did not have a midpoint assessment and could have had unmeasured improvements. An alternative explanation is that the parents who did not perceive improvements around the

midpoint of treatment decided to terminate treatment. From this analysis though, it is clear that for significant improvement to be realized, offering the entire course of PCIT should be the goal. Given the attrition rates found here and those reported in other studies, efforts should be undertaken to identify barriers to treatment specific to PCIT and to implement strategies to overcome those barriers (Werba, Eyberg, Boggs, & Algina, 2006).

This study has several limitations. First, missing data as well as high rates of attrition create unknown bias in the results. Second, measures of fidelity, such as treatment adherence, therapist competency, and client satisfaction, were not collected diminishing the validity and generalizability of the findings to other populations using PCIT (Brestan, Jacobs, Rayfield, & Eyberg, 1999). Finally, participants were not randomized to the different treatment conditions creating potential for selection bias. These limitations are commonly found in observational studies outside of the controlled laboratory environment. The purpose of the study was to evaluate the delivery of PCIT in a “real-world” community setting. Thus, investigator control was kept at a distance. Despite these limitations, this study has important practice implications. Agencies that deliver PCIT can produce significant positive changes in the families that complete the program. Also, home-delivered PCIT is feasible and can achieve acceptable outcomes. Further implementation partnerships between researchers and practitioners should be forged to develop strategies to reduce attrition and develop innovative methods to apply evidence-supported treatments such as PCIT.

Acknowledgments

Funding

This study was funded by the State of Missouri Children’s Division and Jewish Family and Children’s Services. Mr. Lanier is also supported by an NIMH pre-doctoral training grant (T32 MH019960).

References

- Abidin, R. Parenting stress index. 3. Odessa, FL: Psychological Assessment Resources; 1995.
- American Psychiatric Association. Diagnostic and statistical manual for mental disorders. Washington, DC: Author; 2000.
- Barth R, Landsverk J, Chamberlain P, Reid J, Rolls J, Hurlburt M, Kohl P. Parent-training programs in child welfare services: Planning for a more evidence-based approach to serving biological parents. *Research on Social Work Practice*. 2005; 15:353–371.
- Brestan E, Eyberg S. Effective psychosocial treatments for conduct-disordered children and adolescents: 29 years, 82 studies, and 5272 kids. *Journal of Clinical Child Psychology*. 1998; 27:179–188.
- Brestan E, Jacobs J, Rayfield A, Eyberg S. A consumer satisfaction measure for parent-child treatments and its relation to measures of child behavior change. *Behavior Therapy*. 1999; 30:17–30.
- Brinkmeyer, M.; Eyberg, S. Parent-child interaction therapy for oppositional children. In: Kazdin, AE.; Weisz, JR., editors. *Evidence-based psychotherapies for children and adolescents*. New York, NY: Guilford; 2003. p. 204–223.
- Cohen, J. *Statistical power analysis for the behavioral sciences*. Mahwah, NJ: Lawrence Erlbaum; 1988.
- Eisen S, Dill D, Grob M. Reliability and validity of a brief patient- report instrument for psychiatric outcome evaluation. *Hospital and Community Psychiatry*. 1994; 45:242–247. [PubMed: 8188195]

- Eyberg S, Boggs S, Algina J. Parent-child interaction therapy: A psychosocial model for the treatment of young children with conduct problem behavior and their families. *Psychopharmacology Bulletin*. 1995; 31:83–91. [PubMed: 7675994]
- Eyberg S, Funderburk B, Hembree-Kigin T, McNeil C, Querido J, Hood K. Parent-child interaction therapy with behavior problem children: One and two year maintenance of treatment effects in the family. *Child and Family Behavior Therapy*. 2001; 23:1–19.
- Eyberg S, Nelson M, Boggs S. Evidence-based psychosocial treatments for children and adolescents with disruptive behavior. *Journal of Clinical & Adolescent Psychology*. 2008; 37:215–237.
- Eyberg, S.; Pincus, D. Eyberg child behavior inventory Sutter student behavior inventory – Revised professional manual. Odessa, FL: Psychological Assessment Resources; 1999.
- Feingold A. Effect sizes for growth-modeling analysis for controlled clinical trials in the same metric as for classical analysis. *Psychological Methods*. 2009; 14:43–53. [PubMed: 19271847]
- Fernandez M, Eyberg S. Predicting treatment and follow-up attrition in parent-child interaction therapy. *Journal of Abnormal Child Psychology*. 2009; 37:431–441.10.1007/s10802-008-9281-1 [PubMed: 19096926]
- Funderbunk B, Ware L, Altshuler E, Chaffin M. Use and feasibility of telemedicine technology in the dissemination of parent-child interaction therapy. *Child Maltreatment*. 2008; 13:377–382. [PubMed: 18843144]
- Hakman M, Chaffin M, Funderbunk B, Silovsky J. Change trajectories for parent-child interaction sequences during parent-child interaction therapy for child physical abuse. *Child Abuse & Neglect*. 2009; 33:461–470. [PubMed: 19581001]
- Harwood M, Eyberg S. Therapist verbal behavior early in treatment: Relation to successful completion of parent-child interaction therapy. *Journal of Clinical Child and Adolescent Psychology*. 2004; 33:601–612. [PubMed: 15271617]
- Herschell A, Calzada E, Eyberg S, McNeil C. Parent-child interaction therapy: New directions in research. *Cognitive and Behavioral Practice*. 2002; 9:9–16.
- Nixon R, Sweeney L, Erickson D, Touyz S. Parent-child interaction therapy: A comparison of standard and abbreviated treatments for oppositional defiant preschoolers. *Journal of Consulting and Clinical Psychology*. 2003; 71:251–260. [PubMed: 12699020]
- Nixon R, Sweeney L, Erickson D, Touyz S. Parent-child interaction therapy: One and two year follow-up of standard and abbreviated treatments for oppositional preschoolers. *Journal of Abnormal Child Psychology*. 2004; 32:263–271. [PubMed: 15228175]
- Patterson, G. *Coercive family process*. Eugene, OR: Castalia; 1982.
- Roberts, M., editor. *Parent-child interaction therapy*. 2. New York, NY: Springer; 2010.
- Schuhmann E, Foote R, Eyberg S, Boggs S, Algina J. Efficacy of parent-child interaction therapy: Interim report of a randomized trial with short-term maintenance. *Journal of Clinical Child Psychology*. 1998; 27:34–45. [PubMed: 9561935]
- Singer, J.; Willett, J. *Applied longitudinal data analysis: Modeling change and event occurrence*. New York, NY: Oxford University Press; 2003.
- The California Evidence-Based Clearinghouse for Child Welfare. Parent child interaction therapy (PCIT) – Summary. 2008. Retrieved September 24, 2008, from <http://www.cachildwelfare-clearinghouse.org/program/5>
- Thomas R, Zimmer-Gembeck M. Behavioral outcomes of parent-child interaction therapy and triple-P-positive parenting program: A review and meta-analysis. *Journal of Abnormal Child Psychology*. 2007; 35:475–495.10.1007/s10802-007-9104-9 [PubMed: 17333363]
- Timmer S, Urquiza A, Zebell N, McGrath J. Parent-child interaction therapy: Application to maltreating parent-child dyads. *Child Abuse & Neglect*. 2005; 29:825–842. [PubMed: 16051355]
- Timmer S, Zebell N, Culver M, Urquiza A. Efficacy of adjunct in-home coaching to improve outcomes in parent-child interaction therapy. *Research on Social Work Practice*. 2010; 20:36–45.
- Ware L, McNeil C, Masse J, Stevens S. Efficacy of in-home parent-child interaction therapy. *Child & Family Behavior Therapy*. 2008; 30:99–126.
- Werba B, Eyberg S, Boggs S, Algina J. Predicting outcome in parent-child interaction therapy: Success and attrition. *Behavior Modification*. 2006; 30:618–646. [PubMed: 16894233]

Whitaker D, Lutzker J, Shelley G. Child maltreatment prevention priorities at the Centers for Disease Control and Prevention. *Child Maltreatment*. 2005; 10:245–259. [PubMed: 15983108]

Figure 1.
PCIT participant flow diagram.

Figure 2.
Outcome measures over time for PCIT completers.

Table 1

Bivariate Statistics for Demographic, Treatment, and Outcome Variables

	Total (n = 120)	% / M (SD)	Dropped CDI (n = 65)	% / M (SD)	Dropped PDI (n = 18)	% / M (SD)	Completed (n = 37)	% / M (SD)	Sig ^a	ES ^b
Demographics										
Race									*	.20
White	50.8		40.0		64.7		62.2			
African American	42.5		53.8		33.3		27.0			
Other	6.7		6.2		0		10.8			
Parent gender (female)	90.0		86.5		100		89.1		ns	.01
Income (\$1,000)	19.5 (22.5)		14.5 (19.7)		15.4 (21.4)		30.1 (24.2)		**	.70
Parent age	36.0 (11.0)		33.6 (10.5)		36.6 (13.4)		39.8 (9.5)		*	.53
Treatment variables										
Home treatment	44.2		40.0		50.0		48.9		ns	.06
CD referral	14.2		12.3		16.6		16.2		ns	.04
Sessions	10.0 (6.8)		5.1 (3.8)		13.4 (4.3)		16.7 (4.8)		****	1.9
Outcome variables										
PSI										
Pre	99.2 (21.7)		97.8 (22.5)		95.4 (20.5)		102.5 (21.4)		ns	.25
Mid					93.6 (16.9)		94.5 (24.4)		ns	.04
Post							83.3 (27.5)		n/a	.89 ^c
GAF										
Pre	63.8 (9.8)		62.7 (8.5)		59.9 (10.3)		67.0 (10.2)		*	.53
Mid					62.1 (9.9)		71.5 (8.8)		**	1.0
Post							75.4 (7.8)		n/a	.82 ^c
ECBI-P										
Pre	62.6 (11.6)		62.4 (12.9)		59.3 (12.4)		64.2 (9.7)		ns	.23
Mid					60.3 (13.8)		59.9 (11.1)		ns	.03
Post							55.2 (10.7)		n/a	.93 ^c
ECBI-I										
Pre	62.4 (11.6)		61.5 (13.6)		58.5 (13.0)		64.8 (7.9)		ns	.38
Mid					62.3 (12.9)		58.9 (9.0)		ns	.31

	Total (n = 120) % / M (SD)	Dropped CDI (n = 65) % / M (SD)	Dropped PDI (n = 18) % / M (SD)	Completed (n = 37) % / M (SD)	Sig ^a	ES ^b
Post				56.4 (10.2)	n/a	1.1 ^c
BASIS-32						
Pre	.95 (.65)	1.04 (.72)	1.09 (.60)	.80 (.58)	ns	.41
Mid			.79 (.69)	.64 (.56)	ns	.24
Post				.58 (.68)	n/a	.38 ^c

Note: n/a = no test applicable; ns = not significant; CDI = Child Directed Interaction; PDI = parent-directed interaction; ES = effect size; PSI = Parenting Stress Index; GAF = global assessment of functioning; ECBI-P = Eyberg Child Behavior Inventory-Problem; ECBI-I = Eyberg Child Behavior Inventory-Intensity; BASIS-32 = Behavioral and Symptom Identification Scale.

^aSignificance for categorical variables determined by chi-square test, for continuous variables between three groups determined by ANOVA, for two groups Welch's *t*-test.

^bEffect size is between program completer and combined dropout groups for prescores, *V*/ ϕ for categorical and Cohen's *d* for continuous.

^cEffect size is for the completer group from prescore to postscore.

* .01 < *p* < .05.

** .001 < *p* < .01.

*** *p* < .001.

Table 2

Demographic, Treatment, and Outcome Variables by Treatment Setting

	Office-Based (<i>n</i> = 67) % / <i>M</i> (<i>SD</i>)	Home-Based (<i>n</i> = 53) % / <i>M</i> (<i>SD</i>)	Sig ^a	ES ^b
Demographics				
Race			ns	.04
White	52.2	49.1		
African American	41.8	43.4		
Other	6.0	7.5		
Parent gender (female)	92.5	86.8		
Income (\$1,000)	20.1 (21.0)	18.7 (24.3)	ns	.06
Parent age	35.9 (11.2)	36.1 (10.7)	ns	.02
Treatment variables				
Completion level				
Completed	28.3	33.9	ns	.09
Terminated PDI	13.4	17.0		
Terminated CDI	58.2	49.1		
CD referral	10.5	18.9	ns	.12
Sessions	9.9 (7.0)	10.1 (6.6)	ns	.03
Outcome variables				
PSI				
Pre	97.2 (22.0)	102.0 (21.1)	ns	.22
Mid	89.5 (22.5)	98.0 (23.4)	ns	.37
Post	76.3 (20.2)	88.4 (31.4)	ns	.46
GAF				
Pre	62.3 (8.0)	65.7 (11.5)	ns	.34
Mid	66.5 (8.4)	70.7 (11.4)	ns	.42
Post	71.0 (7.7)	72.8 (11.6)	ns	.18
ECBI-Problem				
Pre	64.0 (11.0)	60.9 (12.3)	ns	.27
Mid	59.4 (11.1)	59.9 (12.7)	ns	.04
Post	54.9 (11.9)	54.7 (10.0)	ns	.02
ECBI-Intensity				
Pre	62.6 (12.7)	62.0 (10.1)	ns	.05
Mid	59.7 (9.6)	59.8 (10.9)	ns	.01
Post	55.7 (11.8)	56.0 (9.8)	ns	.03
BASIS-32				
Pre	.97 (.70)	.93 (.58)	ns	.06
Mid	.66 (.63)	.70 (.55)	ns	.07
Post	.32 (.33)	.82 (.83)	*	.80

Note: ns = not significant; CDI = Child Directed Interaction; PDI = parent-directed interaction; PSI = Parenting Stress Index; GAF = global assessment of functioning; ECBI = Eyberg Child Behavior Inventory; BASIS-32 = Behavioral and Symptom Identification Scale.

^aSignificance for categorical variables determined by chi-square test, for continuous variables Welch's *t*-test.

$b_{V\backslash\phi}$ coefficient for categorical variables and Cohen's d for continuous.

*
 $p < .05$.