STIMULUS GENERALIZATION OF PARENTING SKILLS DURING PARENT-CHILD INTERACTION THERAPY

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This study investigated the generalization of parenting skills to the home from PCIT delivered in a community mental health setting with four urban, low-income, single mothers at risk for child maltreatment. Using a multiple baseline design and direct observation in the home, the research examined changes in positive attention skills (praise, reflections, and behavioral descriptions) and the quality of parent-child interactions at home concurrent with phases of PCIT. We also investigated whether skills that did not transfer spontaneously could be programmed via a transfer training procedure. Findings indicated that, for three of the four mothers, some targeted skills were transferred spontaneously, and they showed systematic increases in the quality of interactions in the home. Implementation of a transfer training intervention resulted in further desired changes for all mothers, although the results appeared to decline somewhat across sessions. Implications and directions for future research are discussed.

Key words: parent training, generalization, parent-child interaction therapy, community, child maltreatment risk

Behavioral parent training is a common approach to addressing externalizing behavior, which is among the most frequent and costly reasons for children's referral to mental health settings (Kazdin, 1997). Parent training focuses on promoting positive interactions and reducing misbehavior by teaching parents to rearrange the social contingencies for their children's behavior. Systematic research beginning several decades ago showed the promise of this approach (e.g., Budd, Green, & Baer, 1976; Eyberg & Johnson, 1974; Forehand & King, 1977; O'Dell, 1974; Patterson & Reid, 1973; Wahler, Winkle, Peterson, & Morrison, 1965). Reviews (Eyberg, Nelson, & Boggs, 2008) and meta-analyses (Maughan, Christiansen, Jenson, Olympia, & Clark, 2005; Serketich & Dumas, 1996) of several contemporary behavioral parent training models indicate that using parents as therapists is efficacious in treatment of disruptive child behavior.

Although 95% of parents report beneficial changes following parent training (Atkeson & Forehand, 1978), the strongest evidence of treatment effects comes from independent observations of parent-child interactions. The meta-analysis by Maughan and colleagues (2005) found that parent-report data indicate more positive outcomes than data collected through independent observers. Maughan et al. speculated this discrepancy may be due to an expectation bias on the part of parents. Patterson and Forgatch (1995) found that changes in parents' interactions with their children, as independently observed after parent training, were better predictors of children's future adjustment than parent or teacher reports. These findings suggest that behavioral parent training is an effective intervention; however, its effects may not be as robust as parent reports would lead us to believe.

The current research focuses on one model, Parent-Child Interaction Therapy (PCIT), with strong empirical support in the treatment of 2- to 7-year-old children (Gallagher, 2003; Thomas & Zimmer-Gembeck, 2007). PCIT is

a manualized, individual intervention, which draws from attachment, social learning, and developmental theories (Brinkmeyer & Eyberg, 2003; Eyberg & Robinson, 1982). Treatment proceeds in two phases: Child-Directed Interaction (CDI), in which parents learn to provide positive attention while following their child's lead in play, and Parent-Directed Interaction (PDI), in which parents use positively-stated commands and behavior management strategies to enhance compliance. As the parent and child play, the therapist provides immediate feedback and support, typically via a bug-in-the-ear device from behind a one-way observation mirror, to refine the parent's use of target skills. The transition from CDI to PDI and from PDI to termination is dictated by parental skill acquisition and child behavior change, as measured by a set of standardized assessment tools. Studies have demonstrated PCIT's effectiveness both immediately following treatment and at follow-up (e.g., Boggs et al., 2004; Nixon, Sweeney, Erickson, & Touyz, 2004; Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998).

The extension of behavior changes from the therapy setting to new situations and circumstances is a universal goal of clinical intervention. Conceptually, the transfer of a response to situations beyond those in which training occurs exemplifies *stimulus generalization*, often referred to as *transfer of training* (Kazdin, 2001). Presumably, the positive effects of parent training accrue from parents' transfer or generalization of skills (e.g., positive attention, limit setting, consistent use of behavior management procedures) outside the therapy setting. In 1977, Forehand and Atkeson reviewed research on the generality of treatment effects with parents as therapists across time, settings, behaviors, and siblings. They found that, the more rigorous the method of assessment, the less positive the results had been. Since then, relatively few studies have examined stimulus generalization using observational methods (for exceptions, see, for example, Webster-Stratton & Hammond, 1997).

The failure to document parent and child behavior change at home is understandable given the high cost of conducting systematic home observations. However, as Stokes and Baer (1977) noted in their classic article on generalization, behavior change does not automatically transfer beyond the training context. Contrary to what may be anticipated or assumed, generalization often needs to be programmed for consistent and widespread change to occur. Stokes and Baer proposed that, rather than relying on the tactic of "train and hope," a much greater emphasis be made on the development of active conceptualizations and technologies for generalized behavior change. Among the strategies they recommended were to train multiple exemplars (e.g., use varied behaviors and situations in treatment, with sufficient diversity to facilitate generalization to untaught examples) and to employ common stimuli (e.g., insure that salient cues or conditions are present in both treatment and generalization settings). Additionally, they recommended explicitly training "to generalize," i.e., by instructing individuals to use the skills in everyday situations and reinforcing the occurrence of generalized performance.

Today, over three decades after Stokes and Baer's (1977) cautionary review, several of their recommendations for facilitating generalization have been incorporated into intervention models; however, applied research documenting generalization across settings remains rare. Lochman and Salekin (2003) noted that, despite the encouraging results of behavioral parent training programs, positive child outcomes sometimes are modest in magnitude and not sufficient to prevent escalating patterns of antisocial behavior. One reason may be that parents fail to use therapeutic skills outside of the clinic in the first place.

The current study sought to investigate the generalized effects of PCIT when applied in a community mental health setting with mothers at risk for child maltreatment. Urquiza and McNeil (1996) articulated the rationale for PCIT with this population based on social learning theory and supportive research. They note that reviews of research with maltreating parents (Milner & Chilamkurti, 1991; Wolfe, 1987) have found abusive parents to engage consistently in fewer positive interactions with their children than nonabusive parents. PCIT's emphasis in CDI on restructuring parent-child interaction patterns by teaching specific positive attention skills directly addresses this concern.

A small body of research suggests the applicability of PCIT with families at risk for or following episodes of child maltreatment (Borrego, Urquiza, Rasmussen, & Zebell, 1999; Chaffin et al., 2004; Timmer, Urquiza, Zebell, & McGrath, 2005). However, most clinical trials of PCIT exclude families with a history of maltreatment or other characteristics associated with maltreatment risk (e.g., substance abuse, severe mental health problems). Among the factors predicting less successful child treatment outcomes are stressful parent and family conditions (Kazdin, 1996; McKay & Bannon, 2004). Given the multiple stressors associated with child maltreatment risk (Milner & Chilamkurti, 1991), parents at risk for maltreatment may have difficulty transferring the skills learned in a parent training program to the home and other settings.

PCIT identifies generalization as a primary goal of intervention and includes several techniques toward that end (Eyberg & Boggs, 1998; Herschell, Calzada, Eyberg, & McNeil, 2002). PCIT employs multiple exemplars via a didactic session at the beginning of each treatment phase (CDI and PDI) to describe, model, and engage parents in role-play of target skills. Further, PCIT simulates various "real-life" scenarios during clinic sessions, prescribes daily homework practice, provides handouts with skill reminders, uses stimuli (i.e., special play time, timeout chair and room) at home analogous to stimuli used in the clinic, and includes a "field trip" in which the therapist accompanies the family to a public place to practice PCIT skills.

Some PCIT research has investigated generalization of child behavior across settings and other children. Two studies found evidence of improvements in teacher reports and in independent observations of child conduct at school following PCIT (Funderburk et al., 1998; McNeil, Eyberg, Eisenstadt, Newcomb, & Funderburk, 1991). Brestan, Eyberg, Boggs, and Algina (1997) examined the generalization of PCIT treatment effects to untreated siblings. They found that, relative to a wait-list control group, treatment group fathers rated the frequency of siblings' behavior as significantly reduced post-treatment, and treatment group mothers reported siblings' behavior as less distressing and difficult to manage post-treatment. This study provides evidence of generalization across children, albeit based on parents' self-report rather than observational data. However, it is unclear whether changes in siblings' behavior reported by Brestan and colleagues were due to changes in treated children's interactions with siblings at home, transfer of parents' skills to interactions with the siblings, or other factors.

Whereas studies have shown generalization of child behavior following PCIT, no research has examined the generalization of parent behavior, the primary focus of the current study. We examined the cross-setting generality of PCIT with four urban, low-income, single mothers at risk for child maltreatment. Using a multiple baseline design, we evaluated the extent to which the mothers' participation in PCIT resulted in systematic changes in their use of target skills at home. We focused mainly on the CDI phase, given research findings of low levels

of positive interactions among families where maltreatment occurred. We asked three questions: (a) Do CDI skills generalize spontaneously across settings? (b) Can skills that do not generalize spontaneously be programmed to generalize via a brief Transfer Training procedure combining instructions with graphic and videotape feedback? (c) How does the overall quality of parent-child interactions change at home during PCIT?

METHOD

Participants

The participants were four mother-child dyads recruited from a child welfare agency that provided a range of mental health services to low-income families in a large Midwestern city. Eligible mothers were referred to PCIT, one of the services offered through the agency's outpatient clinic, for problems in parenting and/or child behavior. The mothers were identified as at risk for child maltreatment due to having one or more of the following characteristics: an indicated report of child maltreatment; psychiatric problems; or a history of substance abuse, domestic violence, or homelessness. Nine mothers referred consecutively to PCIT were invited to participate in the study. They were offered $15 per home observation session as compensation for their time. Two invited parents declined to participate, and three who initially agreed dropped out of the study and PCIT before receiving any parent training. Two of the mothers who dropped out were experiencing stressors (a difficult divorce or child protection involvement) that made it difficult for them to commit to PCIT sessions. The third mother who dropped out expressed ambivalence about parent training programs in the initial meeting with the researcher. She completed only one baseline session and did not indicate her reasons for leaving the study. The four study participants are described below:

Marissa was a 24-year-old Latina mother with two daughters, ages 7 and 3, and a son, age 8. She was referred to PCIT due to her older daughter's difficulty completing her schoolwork. In addition, Marissa identified difficulties controlling her younger daughter's behavior, so both girls participated in PCIT. Marissa was unmarried and lived with her boyfriend. She had completed 9 years of education and had stable employment since the age of 16; however, she had been out of work for 1 year and acquired employment shortly after beginning the study. Marissa reported a history of domestic violence and depression.

Emily was a 20-year-old Latina mother of two daughters, ages 7 months and 4 years old. She participated with her 4-year-old daughter who had no learning, emotional, or behavioral problems. Emily was unmarried and had a boyfriend who was incarcerated. Emily had completed 11 years of school and was unemployed. She had a history of substance abuse, domestic violence, psychiatric problems, and homelessness. Emily participated in PCIT as a condition of her probation following incarceration.

Angela, a 24-year-old Latina mother of two boys, ages 7 and 3, was referred to PCIT for help with her 7-year-old son's emotional and behavioral problems. He became frustrated easily, had temper tantrums, and was aggressive toward other children; his behavior tended to occur in settings outside the home. Angela was unmarried, and she and her boys lived with her boyfriend and his two children. She was a freshman in college at the time of the study. Angela reported chronic depression, for which she has received counseling.

Anna was a 32-year-old Caucasian mother with 4-year-old male twins. Her boys had difficulty getting along with other children in school and exhibited aggressive behavior toward each other at home. Anna sought out PCIT for help in managing her children's

behavior and participated with both of the boys. She had recently been separated from her husband, and the two of them shared custody of the twins. Anna reported a history of substance abuse, domestic violence, psychiatric difficulties, homelessness, and joblessness. Anna had completed 11 years of school. She had maintained a stable job for the past several years; however, she recently lost her job and was unemployed.

Settings and Materials

Settings consisted of a therapy room at the child welfare agency and an open area of the families' homes. PCIT sessions took place in an agency playroom equipped with toys, a table, and four chairs. The playroom had a one-way observation window, which enabled the therapist to observe mother-child interactions from an adjacent room and, during coaching sessions, to provide verbal feedback via a bug-in-the-ear device. In addition to therapy sessions, two meetings with the researcher (the first author) occurred at the child welfare agency: the initial session in which the mother reviewed and signed consent forms, and the first Transfer Training session.

The remainder of research activities took place in participants' homes, where the researcher videotaped mother-child interactions for 25 minutes and periodically administered questionnaires. Sessions occurred in an area (typically the living room) with ample space to play. A standard set of instructions requested the mother to play with her child(ren) in activities they enjoyed, choosing from a box of toys brought by the researcher or from toys at home, for 20 minutes. Five minutes before the end of the session, the mother told the child(ren) it was time to clean up the toys. The television remained off during sessions, and only research participants were allowed in the taping area.

Measures

Measures consisted of the observational coding system, two standardized questionnaires, an initial parent interview; and the therapist's progress notes and in-session coding forms.

Dyadic Parent-Child Coding System II (DPICS II; Eyberg, Bessmer, Newcomb, Edwards, & Robinson, 1994). The coding system for parent-child interactions was adapted from the DPICS II, designed to assess the quality of parent-child interactions. The original DPICS II includes several behaviors (e.g., commands, praise, critical statement, laugh, yell, destructive behavior), which may be coded for both parent and child. For this study, behaviors were collapsed into three general categories of parent attention: *positive, negative,* and *other*. In addition, three subcategories of positive attention were coded: *praise, behavioral descriptions*, and *reflections*. Table 1 provides summary definitions and examples of the coded behaviors. When two children participated in observations, parent behavior to either child was coded.

Table 1. Definitions and Examples of Observational Coding Categories

Behavior	Description	Examples
Positive Attention	Expressions of approval, engagement, interest in the child's behavior, and/or positive touch	
Praise	Verbalizations expressing a favorable judgment of an activity, product, or attribute of the child	"Nice counting to ten!" "I love you." "Thanks for helping me."
Behavioral Descriptions	Declarative phrases that give an account of the child's current or immediately completed actions	"You're drawing a purple zebra." "Now you've closed the door." "We got all the pieces in."
Reflections	Declarative phrases that immediately repeat or paraphrase a child's verbalization	*Child*: "I made a star." *Mother*: "Yes, you made a star."
Negative Attention	Expressions of criticism or disapproval, telling the child what not to do, describing a child's incorrect behavior, or negative gestures	"Don't tease him." "That's the wrong color." "Not like that, honey." "Can't you *ever* do what I asked?"
Other Attention	Verbalizations toward the child that do not fit in the definitions for either of the other categories of attention.	"Can you get down?" "Which one is bigger?" "Close your eyes." "Your brother is tired."

Observers recorded defined behaviors from videotapes in 15-second intervals across the 20-minute free-play period by marking the presence or absence of each category once per interval on a coding form. A 15-second time interval was chosen to provide an approximation to real-time events that was feasible for observational recording. First, the observer watched the videotape and coded the three general categories. Then, in a second viewing, the observer attended to the intervals in which positive attention occurred and coded the three subcategories on a second form. The observer viewed the tape a third time to check for errors. The first author and a post-bachelor's level research assistant served as observers, following training by the second author. Weekly or biweekly meetings occurred throughout the study to review coding categories.

We summarized parent behavior categories in two ways. First, we calculated the percentage of intervals in which the parent engaged in each behavior by dividing the number of intervals of a category or subcategory by the total number of intervals observed. Second, we calculated the proportion of positively-valenced parent behavior by dividing the number of intervals in which the parent provided positive attention by the sum of intervals in which the parent provided either positive or negative attention. Wolfe (1987) suggested that a ratio of positive to negative parenting behaviors may distinguish abusive from non-abusive parents more consistently than rates of any particular

behavior. Haskett, Scott, and Fann (1995) utilized a similar ratio in examining parent-child interactions in maltreating families. This formula yielded a number between 0 and 1, in which 0 indicates a totally negatively-valenced interaction and 1 indicates a totally positively-valenced interaction.

To assess reliability of the observational coding system, two observers independently coded 35% of total observations, with a minimum of one observation per experimental phase per parent. Occurrence and nonoccurrence reliabilities were calculated for each behavior on an interval-by-interval basis; both forms of reliability were computed in light of the differing base rates of behaviors. In addition, we calculated Kappa, which provides an estimate of agreement corrected for chance (Haynes & O'Brien, 2000). According to Landis and Koch (1977), Kappa coefficients between .41 and .60 indicate a *moderate* level of agreement, between .61 and .80 a *substantial* agreement, and between .81 and 1.00 an a*lmost perfect* agreement.

Eyberg Child Behavior Inventory (ECBI: Eyberg & Pincus 1999). The ECBI is a widely used self-report questionnaire to assess parent perceptions of child behavior. The Intensity Scale measures how frequently a child exhibits each of 36 behavior problems on a scale ranging from 1 (*never*) to 7 (*always*). The Problem Scale measures whether the child behavior is perceived as a problem on a binary scale of *yes* or *no*. Children are considered to be within the clinical range with an Intensity Score of 132 or above (*T* scores ≥60). The scales were standardized with a sample of 798 children (Eyberg & Pincus, 1999) and demonstrated strong psychometric properties. In their recent evaluation of the ECBIs utility with low- and middle-income African-American, Latino, and non-Latino White parents, Gross and colleagues (2007) found high internal consistency reliabilities (.92-.95 for the Intensity Scale and .86-.94 for the Problem Scale) across groups. Studies evaluating the effectiveness of PCIT have reported significant changes on ECBI scores with treatment (e.g., Eisenstadt, Eyberg, McNeil, Newcomb, & Funderburk, 1993; Schuhmann et al., 1998). The ECBI was administered at the beginning and end of Baseline and at the end of each subsequent experimental condition.

Parenting Stress Index-Short Form (PSI-SF; Abidin, 1995). The PSI-SF is a 36-item self-report questionnaire, derived from an earlier full-length version, which measures a parent's experience of stress in the context of the parent-child relationship. Parents rate their agreement with each statement on a 5-point scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). A Total Score of 90 or more indicates that a parent is experiencing a clinical level of distress. Based on a standardization sample of 800 parents, the Total Score on the PSI-SF had a test-retest reliability coefficient of .84 and an internal reliability coefficient of .91 (Abidin, 1995). Most studies evaluating the effectiveness of PCIT have used the full-length version of this measure and found sensitivity to change during treatment (e.g., Eisenstadt et al., 1993; Schumann et al., 1998). The PSI-SF was administered at the same five points as the ECBI.

Parent Interview. Background information on the parent and child(ren) was obtained during an initial interview with questions regarding demographics, employment and educational status, history of environmental and personal stresses, and child maltreatment history.

Session Progress Notes and In-Session Coding Forms. We assessed treatment integrity through session progress notes (Eyberg, 1999) and DPICS-II Coding Forms (Eyberg, 1999) filled out by the therapist. The progress notes indicated session participants, topics covered, and parent performance in learning new skills. The PCIT therapist recorded selected DPICS categories on coding

forms during 5-minute observations at the beginning of most CDI and PDI sessions. Information from these observations was used to monitor the parent's progress toward mastery criteria for each treatment phase.

Procedures

Baseline (BL). During the intake session at the child welfare agency, the researcher obtained informed consent and scheduled times to conduct videotaped observations in the home. The number of BL sessions (range of 3-8) and days between observation sessions (1-6) varied depending on the parent's availability and the urgency to begin PCIT. This phase ended when the proportion of positive attention showed a relatively stable or deteriorating trend over sessions. In a deviation to the protocol, Emily received the didactic session, CDI Teach, prior to starting BL sessions.

Parent-Child Interaction Therapy. Intervention followed the PCIT treatment protocol detailed in Hembree-Kigin and McNeil (1995), with minor modifications as noted below. The therapist, a female, Caucasian, Master's level mental health clinician employed at the child welfare agency, typically met weekly with individual families for 50 minutes, although cancellations required rescheduling some sessions. PCIT treatment proceeded along two phases: Child-Directed Interaction (CDI), which focused on enhancing the parent-child relationship, and Parent-Directed Interaction (PDI), which focused on teaching effective discipline strategies. The CDI phase began with a didactic session, in which the therapist used instructions, modeling, and role-play to teach nondirective play skills. Subsequent sessions were devoted to strengthening these skills through live coaching and feedback while the parent and child(ren) played. PDI proceeded similarly, beginning with a teaching session emphasizing the use of effective commands and timeout for responding to child compliance, followed by coaching and feedback in PDI skills.

In CDI, parents were taught to follow the child's lead by providing warm, enthusiastic, and contingent attention during play. The skills taught in CDI consisted of *DO skills, DON'T skills, Selective Attention*, and *Strategic Ignoring* (Hembree-Kigin & McNeil, 1995). DO skills, designed to show interest and support for the child's appropriate behavior, include describing the child's behavior or information about the child's activities, reflecting the child's verbalizations, imitating the child's actions, and praising the child, particularly by specifying what the parent likes about the child's behavior (labeled praise). (Examples of the DO skills are provided under the positive attention category in Table 1.) The DON'T skills, hypothesized to detract from the child's positive play experience, include commands (e.g., "Sit at the table"), questions (e.g., "What color is the flower?"), and criticisms (examples are provides under the negative attention category in Table 1). In addition, the parent was taught when and how to use differential social attention to increase the child's positive behavior and decrease inappropriate behavior. Parents were not only expected to practice these skills in sessions, but they were also assigned homework to engage in special play time with their child for 5 minutes every day, utilizing the behavioral skills taught in the sessions.

Coaching sessions were designed to provide practice and feedback on use of the skills. A typical session included a review of homework (5-10 minutes), observation and therapist recording of parent skills while the mother and child(ren) played (5 minutes), coaching of target skills (25-30 minutes), and providing feedback on progress and homework assignments (10 minutes). The therapist coached using a bug-in-ear device from behind a one-way mirror, thus giving the parent consistent feedback without interrupting

the natural flow of play. Feedback included praising the parent's use of skills, prompting the parent what to say and do, highlighting important aspects of the interaction, and using special exercises to strengthen difficult skills. The CDI portion of PCIT continued until the parent reached mastery of the skills based on standard criteria. During a 5-minute recording session, the parent needed to give at least 20 descriptions plus reflections, give 15 praises (8 labeled praises), make no critical statements, give no commands, ask no questions, and ignore negative attention-seeking behavior (Hembree-Kigin & McNeil, 1995).

During PDI, in which the parent was asked to lead the play, training focused on giving effective commands and implementing consistent consequences for noncompliance. Effective commands are direct, positively stated, specific, simple, and given one at a time. When the child complied with commands, the parent was taught to praise the child and resume playing, whereas when the child disobeyed, the parent was taught to implement a timeout procedure. Timeout consisted of warning the child once to obey or sit in the timeout chair. If the child disobeyed a second time, the parent took the child to the timeout chair for 3 minutes. After the child successfully completed the timeout (i.e., by remaining seated for 3 minutes plus 5 seconds of quiet), the child had to comply with the original instruction and could then resume playing. If the child did not stay on the chair, a back-up method for achieving compliance (isolating the child in a room or holding the child in the chair) was used. The back-up method was individualized to the case; however, because PDI was not the focus of this study, further details on the procedures are not available.

PDI began with a didactic session, followed by coaching sessions (using a format similar to that described above) to guide and support the parent in using the skills. After initially being coached in PDI skills in the clinic, the parent was instructed to practice PDI skills daily at home in a clean-up activity after special time. Later PDI sessions focused on helping the parent apply these procedures in real-life situations and teaching the parent a range of skills to increase the child's desired behaviors and decrease unwanted behaviors. Mastery criteria for PDI included the parent's ability to effectively issue direct commands and use timeout, improved child behavior ratings, and confidence in managing the child's behavior.

During CDI and PDI, the researcher videotaped parent-child interactions in the home approximately once per week in CDI and once every 2-3 weeks in PDI. The therapist informed the researcher when a parent mastered CDI or PDI skills and thus was ready to change conditions, but otherwise the researcher and therapist did not discuss the families' progress in treatment sessions with each other. Likewise, the researcher did not discuss the families' performance in home observations with the therapist (except during the Transfer Training session, as described next).

Transfer Training (TT). To facilitate generalization, we used a brief procedure that combined instructions to use the target skills at home with graphic and videotape feedback. Instructions plus graphic feedback has been used successfully as a booster training technique following behavioral parent training (McDonald & Budd, 1983). Videotape feedback also has been employed to enhance generalization of parenting skills (Lundquist & Hansen, 1998).

TT occurred in 2 sessions between the completion of CDI and the start of PDI. The first session took place at the child welfare agency with the parent and therapist together. The researcher showed the mother graphs of the percentages of her positive and negative attention, as well as her levels of the specific positive attention skills across home observations. The researcher explained how

to read the graphs, pointed out desired changes in the mother's use of skills, and highlighted where change had not yet occurred (e.g., low levels of reflections or behavioral descriptions). She then instructed the mother to use the CDI skills at home and provided her with a written summary of the feedback. In a second session with the mother at the family's home, the researcher and mother watched a 3- to 5-minute videotape of the parent using the positive attention skills correctly. The videotape was created from clips of the BL and CDI phases. The researcher complimented the mother for using the skills correctly and encouraged her to continue to do so in the future. Videotaped feedback focused on highlighting the mother's accomplishments rather than correcting errors, in keeping with the shaping and positive reinforcement principles the mother was being taught to use in CDI. The researcher then resumed videotaping parent-child interactions at home for 3-4 sessions. Because of Anna's difficulties gaining control over her children's behavior, only 1 TT observation was conducted in order to move on to PDI.

Procedural Adaptations. A few adaptations to the standard PCIT protocol occurred for clinical reasons. For two families, more than one target child presented behavioral concerns, so both children were included in treatment, whereas PCIT typically focuses on a single target child. In addition, alterations in the PDI phase occurred for two families due to clinical exigencies: Additional therapy procedures were integrated into Angela's PDI sessions in response to the mother's mental health issues. Emily's treatment was terminated early (after 6 PDI sessions) when she was found to have begun reusing substances and entered a substance abuse treatment program.

Another deviation from standard PCIT protocol relates to the study's purpose -- to examine the generalization of positive attention skills. After CDI, the researcher implemented TT and conducted home observations prior to implementing PDI. This caused a delay of 2-3 weeks between the end of CDI and the beginning of PDI.

Finally, the types of descriptions trained in the clinic differed slightly from those recorded at home. The therapist's coding of descriptions in clinic sessions, and the criteria she used for CDI mastery, included both behavioral descriptions and information descriptions, whereas only behavioral descriptions were coded in home observations. Information descriptions (e.g., "That tower is tall," or "The horse looks hungry") included no description of the child's behavior. Information descriptions were targeted as CDI skills in earlier versions of the PCIT protocol (e.g., Hembree-Kigin & McNeil, 1995) but not in the most recent version (e.g., Herschell et al., 2002).

Experimental Design

This study utilized a multiple-baseline design across individuals to examine the effects of CDI and TT on parent behaviors at home. The multiple baseline design has been used extensively in applied clinical research to evaluate effects of intervention on individuals or dyads (Baer, Wolf, & Risley, 1968; Barlow, Nock, & Hersen, 2008; Budd, 2003; Kazdin, 1982).

RESULTS

Mean levels of occurrence- and nonoccurrence-based interobserver agreement on DPICS coding from videotaped home observations ranged between 75 and 98% for most behaviors on each parent. Exceptions were for occurrence agreement on the low-rate behaviors of negative attention (57-78%), reflections (45-71%), and behavioral descriptions (35-74%). Further, for the high-rate behavior of other attention, nonoccurrence agreement ranged from 68-90% across parents. Kappa agreement across behaviors and parents is displayed in Table 2. Kappa coefficients on most categories were in the

substantial to almost perfect range (Landis & Koch, 1977). Reflections and behavioral descriptions were in the moderate range for Angela, and other attention was in the moderate range for Emily.

Table 2. Range of Kappa Reliability Coefficients across Mothers for Coded Parent Behaviors

Behavior	Kappa
Positive Attention	.79 - 87
Negative Attention	.70 - .85
Other Attention	.45 - 89
Praise	.88 - .95
Reflections	.57 - .81
Behavioral Descriptions	.49 - .83

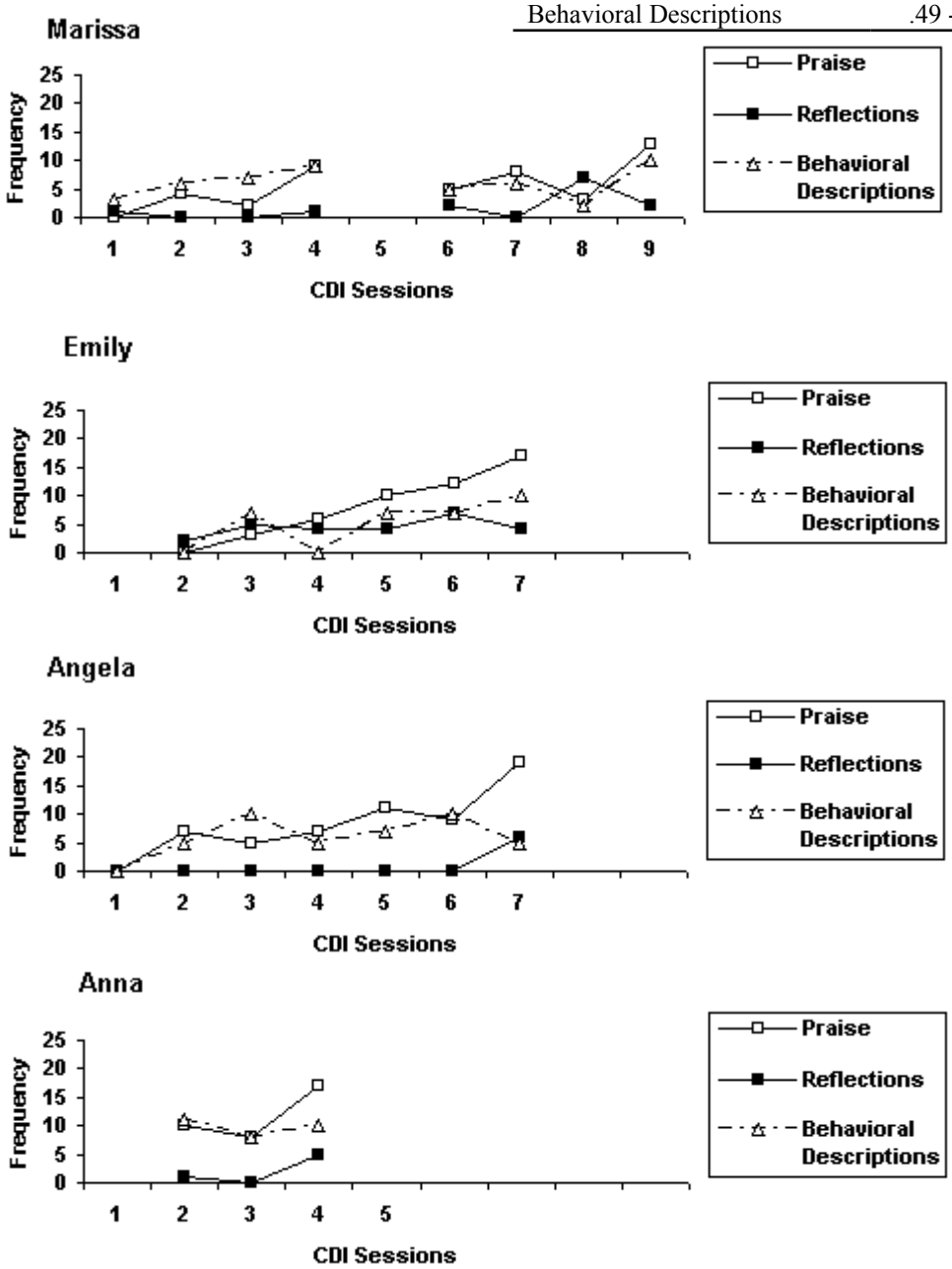

Figure 1. Frequency of CDI Skills Recorded by Therapist in Clinic Sessions

Figure 1 provides an index of treatment integrity by displaying the parents' acquisition of the target positive attention skills in CDI, based on the therapist's records during 5-minute coding periods in sessions. (Coding forms were missing for Marissa's session 5 and Anna's sessions 1 and 5, although the therapist reported that coding occurred in all CDI sessions.) As noted in the procedures, the therapist coded both behavioral descriptions and information descriptions, and she counted both forms in assessing parents' CDI mastery. Only behavioral descriptions are displayed here, to be consistent with parent behavior coded at home. The graphs show varying but generally ascending trends in the mothers' total use of skills. Mothers typically used more praise and behavioral descriptions than reflections. By the end of CDI, each mother's performance was in the range expected for mastery.

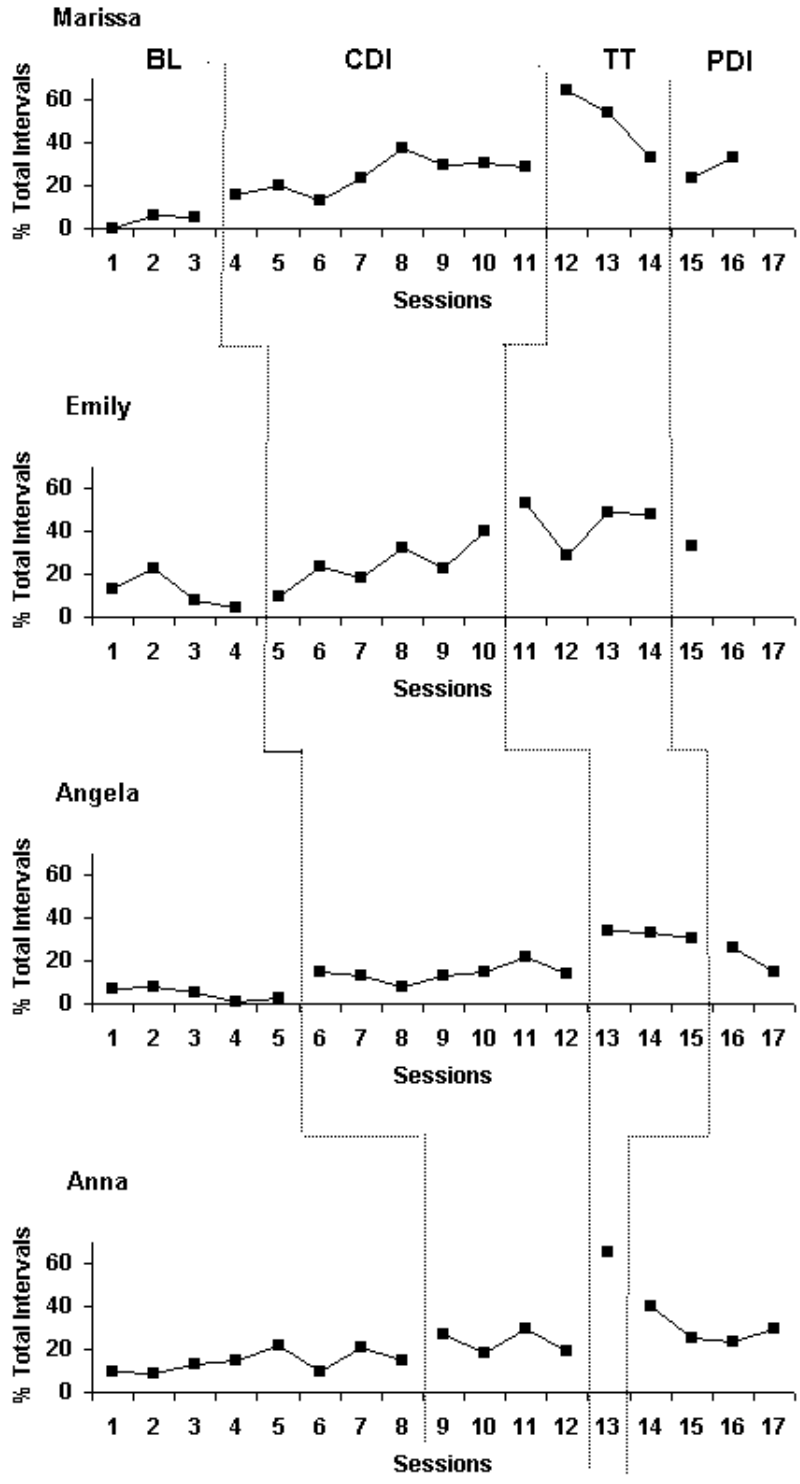

Figure 2. Percent Intervals of Positive Attention of Total Intervals Observed at Home

Mothers' use of positive attention (i.e., praise, behavioral descriptions, and reflections) as a percentage of total intervals observed at home is shown in Figure 2. During BL, the levels of positive attention ranged from a mean of 4% for Marissa to 14% for Anna. During CDI, three mothers showed consistent increases in their use of positive attention, with accelerating slopes for Marissa and Emily and a stable level for Angela. For each of these mothers, mean positive attention percentages more than doubled in CDI relative to BL. Although Anna's mean level of positive attention increased from BL to CDI, there was a gradual ascending trend in BL. All mothers displayed a further increase in positive attention during TT; however, a descending trend was evident for Marissa, and only a single observation occurred for Anna. Levels of positive attention decreased somewhat in PDI, although the mean percentages remained above BL for all mothers.

Table 3. Mean Percent Intervals of Coded Behaviors of Total Intervals Observed at Home across Experimental Conditions

	BL	CDI	TT	PDI
Marissa				
Positive Attention	4	25	50	28
Negative Attention	17	7	2	6
Other Attention	94	92	89	88
Praise	2	13	15	15
Reflections	1	11	23	7
Behavioral Descriptions	1	5	27	11
Emily				
Positive Attention	12	25	45	33[b]
Negative Attention	13	5	3	4
Other Attention	97	99	100	96
Praise	9	14	16	15
Reflections	2	13	23	16
Behavioral Descriptions	1	2	15	6
Angela				
Positive Attention	5	14	33	21
Negative Attention	7	7	7	6
Other Attention	74	80	91	89
Praise	4	12	21	16
Reflections	0	1	6	3
Behavioral Descriptions	0	2	15	4
Anna				
Positive Attention	14	24	66[a]	32
Negative Attention	11	13	4	9
Other Attention	87	90	96	96
Praise	11	22	41	21
Reflections	2	2	36	14
Behavioral Descriptions	2	4	14	5

Note. BL = Baseline, CDI = Child Directed Interaction, TT = Transfer Training, PDI = Parent Directed Interaction.
[a] Means for TT condition on Anna are based on only 1 observation.
[b] Means for PDI condition on Emily are based on only 1 observation.

Figure 3 displays session-by-session levels of the mothers' use of individual positive attention skills across conditions, and Table 3 lists mean percentages of all coded behaviors by parent and condition. Relative to BL, Marissa and Emily evidenced increased levels of both praise and reflections in CDI, whereas Angela showed changes mainly in praise. With TT, all mothers showed noticeably higher levels of reflections, and some mothers displayed higher levels of other skills as well. In PDI, mean levels of reflections and behavioral descriptions tended to decrease more than did praise.

Figure 4 displays changes in the quality of parent-child interactions during home observations across the study, represented by the proportion of positively-valenced behavior (the ratio of positive attention to positive plus negative attention). Three of the four mothers showed systematic increases in their proportion of positively-valenced behavior between BL and CDI, and they maintained or increased this pattern in subsequent conditions. Marissa's BL data showed a slight upward trend; however, her mean level of positively-valenced behavior increased dramatically, from .17 in BL to .78 in CDI, and she continued to demonstrate high mean levels in TT (.96) and PDI (.83). Emily also showed a marked change in her proportion of positively-valenced behavior, from a mean of .46 during

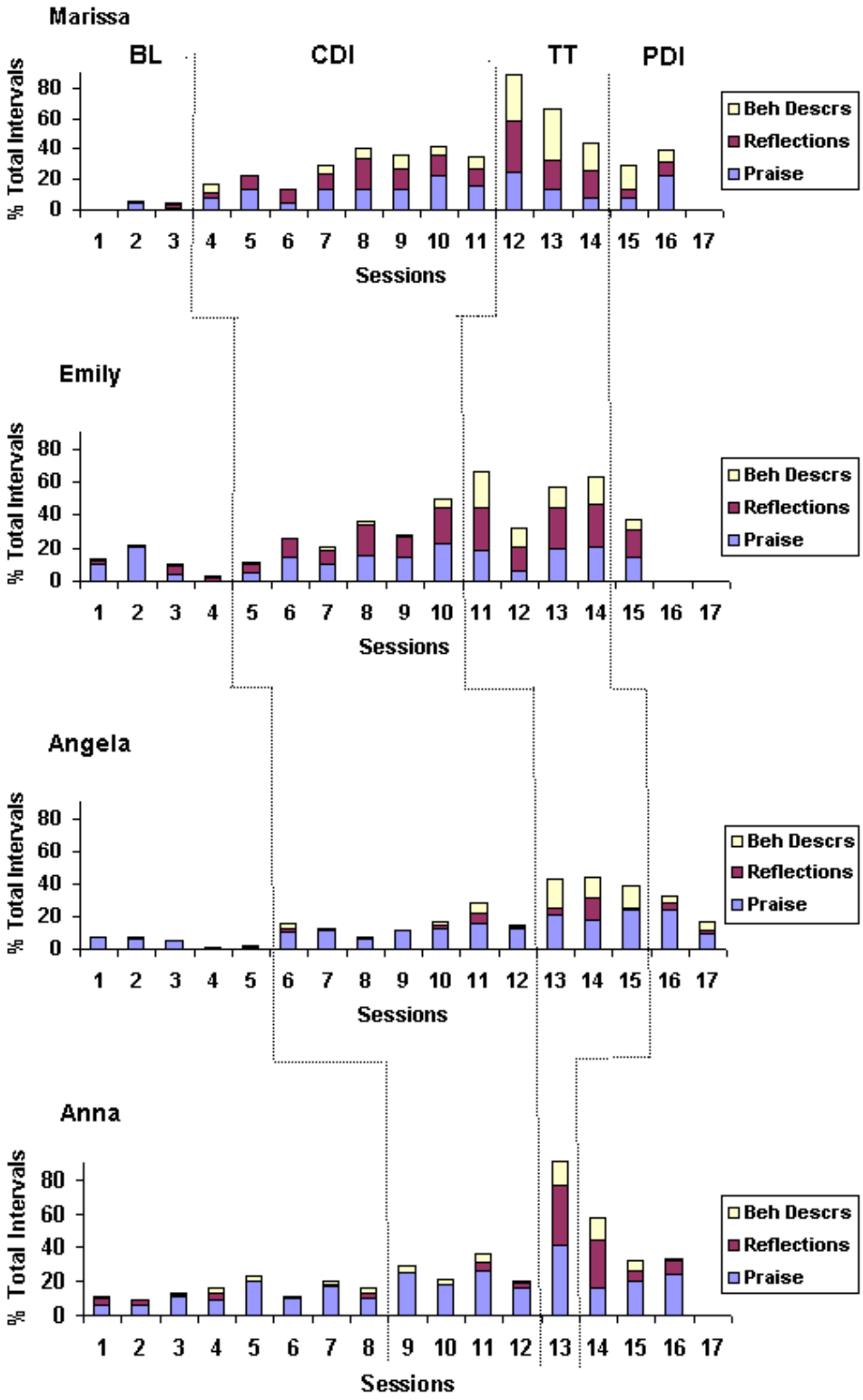

Figure 3. Percent Intervals of DO Skills Observed at Home

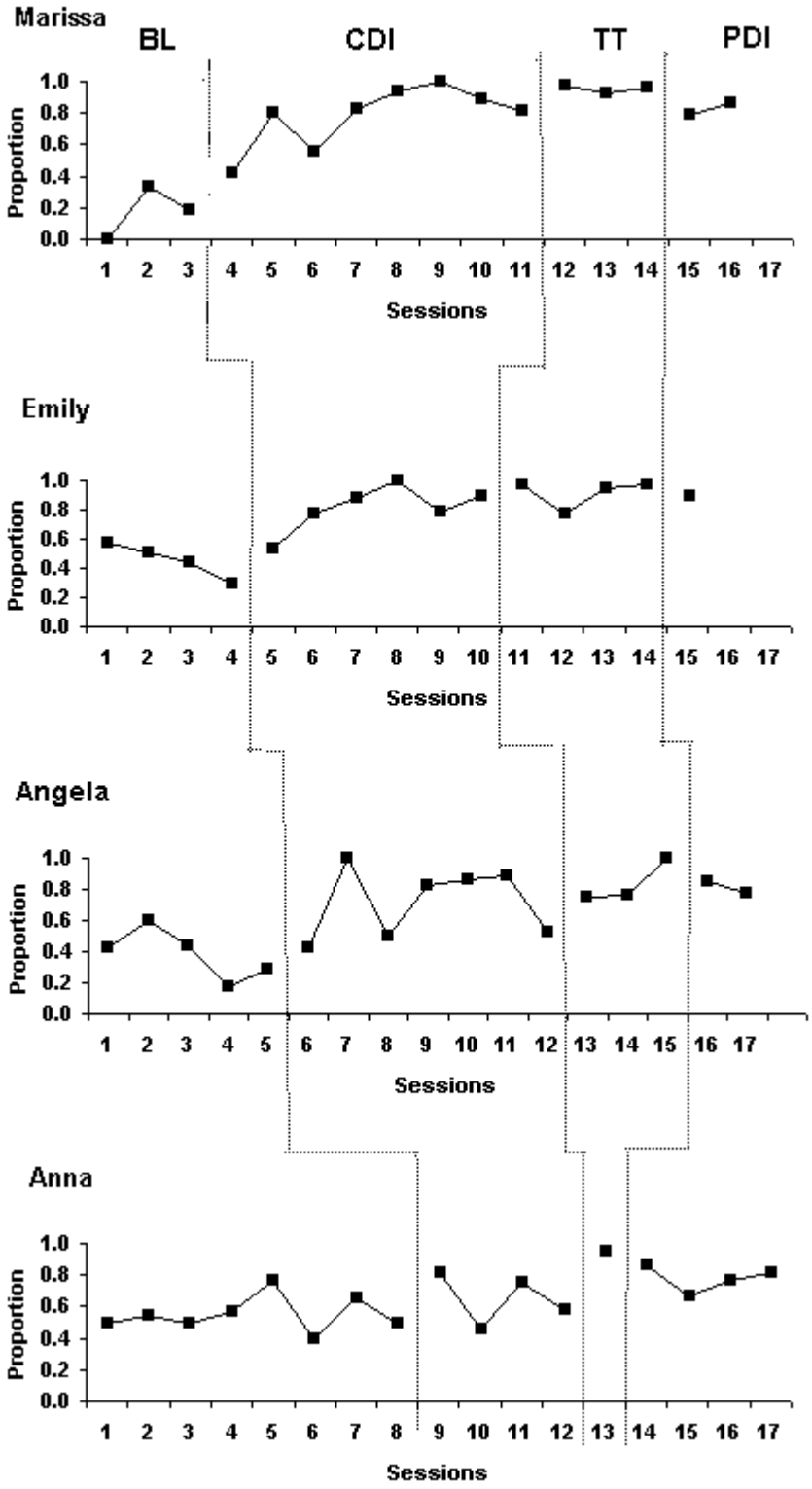

Figure 4. Positively-Valenced Behavior (Proportion of Intervals of Positive Attention to Intervals of Positive plus Negative Attention) at Home

BL to .81 during CDI, and she maintained a high level across the next two conditions (means of .92 and .90, respectively). Angela's behavior across sessions was more variable, but she still evidenced a notable increase in positively-valenced behavior, from a mean of .39 in BL to .72 to CDI. Her pattern stabilized in TT and PDI at levels averaging .84 and .81, respectively. By contrast, Anna's behavior at home did not differ systematically from BL to CDI. Although her mean level of positively-valenced behavior increased slightly from .55 to .65, there was no visible change in trend. Nevertheless, Anna's proportion of positively-valenced behavior increased to .95 in the single TT observation and averaged .78 in PDI.

Examining the mean levels of positive and negative attention for mothers across conditions (Table 3) provides additional information about changes in the quality of parent-child interactions across the study. Whereas all mothers increased their positive attention relative to BL during treatment, Marissa and Emily, who evidenced the highest levels of negative attention in BL, also showed substantial decreases in this category from CDI onward. Angela and Anna, with relatively lower levels of other (i.e., neutral) attention in BL, demonstrated increased levels of other attention as PCIT proceeded.

Table 4 displays the mothers' scores on the intensity and number of child behavior problems on the ECBI and their total parenting stress on the PSI-SF across the study. Prior to treatment, the mothers rated four of the six children in the clinical range on the Intensity Scale of the EBCI, and their ratings decreased to below clinical levels after treatment. Likewise, on the PSI-SF, all of the mothers rated their parenting stress in the clinical range in BL, and their ratings decreased to below clinical levels by the end of treatment.

DISCUSSION

This study investigated stimulus generalization of parenting skills to the home during PCIT. Whereas transfer of training is desired and often assumed to result from parent training, no prior research has investigated cross-setting generality of parents' skills in PCIT. At pre-treatment, four of the six children were rated by their mothers as having clinical levels of child behavior problems, and all mothers reported their parenting stress as clinically elevated. By the end of treatment, parent ratings suggested that both child problems and parenting stress had decreased to below clinical levels. However, in light of meta-analytic findings that studies using parent-report data may inflate the overall results of the effectiveness of parent training (Maughan et al., 2005), it is particularly important to examine the transfer of parent behavior using direct observation.

Our study asked three questions: (a) Do CDI skills generalize spontaneously? (b) Can skills that do not generalize spontaneously be programmed to generalize via a transfer training procedure? (c) How does the overall quality of parent-child interactions change at home during PCIT? In order to answer these questions, it was first necessary to ascertain that the parents learned the targeted skills in parent training. Therapist records of the mothers' acquisition of PCIT skills in the clinic documented that they learned and used the targeted skills during therapy sessions.

Regarding the first question, the findings reveal that, for three of the four mothers, generalization of some CDI skills occurred spontaneously, whereas for one mother (Anna), data are equivocal despite moving in the direction of desired change. The three showed systematic increases in levels of overall positive attention at home during CDI relative to BL. With regard to specific CDI skills, the three mothers evidenced notable increases their use of praise, and two increased their levels of reflections as well, but none

Table 4. Parent Ratings of Child Behavior Problems and Parenting Stress across Assessment Occasions

Measure and Participant	BL 1	BL 2	Post-CDI	Post-TT	Post-PDI
ECBI Intensity/Problem T-Scores[a]					
Marissa – child 1	49/63	49/56	42/52	45/47	44/47
Marissa – child 2	67/72	70/72	58/63	55/50	50/49
Emily	53/68	54/63	41/49	37/46	---
Angela	69/60	63/51	65/56	52/52	51/54
Anna – child 1	86/86	73/85	---	55/60	43/42
Anna – child 2	74/73	65/64	---	46/55	44/42
PSI-SF Total Scores[b]					
Marissa – child 1	92	102	75	55	71
Marissa – child 2	99	112	86	62	67
Emily	98	93	57	64	---
Angela	104	92	100	95	68
Anna – child 1	101	134	---	107	65
Anna – child 2	106	118	---	105	46

Note: Note. BL = Baseline, CDI = Child Directed Interaction, TT = Transfer Training, PDI = Parent Directed Interaction. ECBI = Eyberg Child Behavior Inventory, PSI-SF = Parenting Stress Inventory-Short Form. A dashed line indicates missing data.

[a] An ECBI Intensity Scale T-score of 60 and above is in the clinical range.

[b] A PSI-SF raw score of above 90 is in the clinical range.

showed more than sporadic use of behavioral descriptions at home. In summary, PCIT resulted in some spontaneous generalization across settings for most mothers, but the transfer was incomplete for all mothers.

The second question asked about the effectiveness of TT, which combined graphic and videotape feedback with explicit instructions, to boost levels of CDI skills that did not generalize spontaneously. The findings provide preliminary evidence that TT had a powerful, but perhaps temporary, effect on parent behavior. All four mothers evidenced a substantial increase in their mean levels of positive attention in TT relative to CDI; however, the limited number of observations in this condition and declining trend for Marissa markedly weaken conclusions about the functional effect of TT. All mothers showed sizable jumps in use of behavioral descriptions, which was a major skill targeted in TT. By PDI, the percentages of overall positive attention and some of the specific CDI skills returned to levels during CDI. It is likely that the change in training emphasis from CDI to PDI accounted for at least some of this decline. PDI focused on teaching the parent to give effective instructions and set limits to enhance child compliance in addition to providing positive attention, and thus the mothers may have shifted some of their attention to the new PDI skills, which were not assessed as part of this study.

Examination of the mothers' levels of positively-valenced behavior provides information regarding the third study question, which asked how the overall quality of parent-child interactions changed at home during PCIT. Three of the four mothers demonstrated systematic increases in positively-valenced

behavior from BL to CDI, whereas Anna, who had the highest ratio of positively-valenced behavior in BL, showed no consistent change in this index until TT. Across TT and PDI, each mother maintained or further increased her proportion of positively-valenced behavior. Anecdotally, Anna's delay in shifting to more positively-valenced behavior may have been due to her lack of skills in managing her children's misbehavior, which was more problematic than any of the other child participants. In PDI, Anna gained more behavioral control over the children, and her positively-valenced behavior stabilized at a rate comparable to the other mothers. Marissa and Emily showed reductions in negative attention from CDI onward, and Angela and Anna demonstrated increased levels of other (i.e., neutral) attention across conditions. These changes are consistent with PCIT's emphasis on minimizing critical statements and increasing child-focused interactions.

In considering the current study's contributions, it is useful to place it in the context of other treatment outcome research. A great proportion of the research consists of controlled trials that involved clients, therapists, and settings different from everyday clinical practice (Weisz, Doss, & Hawley, 2005), and this difference may affect their relevance to practice. The current study satisfies Weisz et al.'s criteria for clinical representativeness with regard to all three characteristics -- participant enrollment, therapist, and setting -- because it involved intervention to treatment-seeking, clinic-referred families provided by a practicing therapist in a community mental health center. The mothers in this study were urban, low-income, and single, and each had multiple conditions associated with increased likelihood of child maltreatment (Milner & Chilamkurti, 1991). Given their vulnerabilities, it was expected that they might have difficulty transferring skills from a parent training program to the home. The fact that data for three of the four study participants demonstrated spontaneous generalization of some CDI skills suggests that other, less disadvantaged parents might show even greater transfer of training from PCIT. At the least, it provides encouraging evidence that PCIT delivered in a community context can improve parents' skills and the quality of parent-child interactions at home for families who complete treatment. That these mothers made treatment gains and showed some transfer of skills to the home adds to the small literature of PCIT's effectiveness with families at risk for or following child maltreatment (Borrego et al., 1999; Chaffin et al., 2004; Timmer et al., 2004).

Several limitations of the study warrant caution in interpreting the results. This study did not directly assess the discipline skills taught in PCIT, so it was not possible to examine generalization of PDI skills. In future research, it would be informative to include data on transfer of the full range of PCIT skills. This study also did not record target child behaviors, so it was not possible to determine directly whether implementation of PCIT affected the children's behavior. Further, observation of parent-child interactions in the home involved the presence of a video camera and an observer, which could have increased the likelihood that mothers presented themselves in a socially desirable manner. Although some research suggests that observed family interactions are relatively free of bias (Patterson & Forgatch, 1995), the observed interactions cannot be assumed representative of all home interactions. Nevertheless, the results demonstrate that the mothers were capable of transferring their skills, and in three of four cases, did so prior to any direct programming or instructions.

Additional limitations relate to the applied nature of the study. Because this study was conducted in the context of clinical services, features of the multiple baseline design were

affected. Ideally, all baselines (in this case, families) in a multiple baseline design begin data collection at the same point in time to control for history effects. However, in this study, participants began when they were referred. Although concurrent baselines provide the strongest experimental control, non-concurrent baselines are common in applied research, and it is highly unlikely that important external events would repeatedly coincide with condition changes (Budd, 2003; Hayes, 1981). Also, in the current research, clinical exigencies sometimes required a shorter number of sessions per condition than would have been ideal to establish stable rates of behavior (most notably, Anna received only 1 TT observation). Additionally, Emily's mother received the CDI didactic session prior to BL, and therapist forms were missing for a few PCIT sessions, both of which compromised the experimental analysis to some extent. Finally, three of the seven mothers referred to the study dropped out prior to beginning PCIT. Although this dropout rate is consistent with other PCIT studies (Gallagher, 2003), having more families in the study would have strengthened the results.

The results of this study suggest several directions for future research on generalization of parenting skills during PCIT. Interestingly, the mother who acquired CDI skills the fastest in the clinic showed the least generalization. This finding indicates that it may be difficult to predict which parents will successfully transfer skills to the home without conducting direct observations. One potential marker for lack of generalization may be the parent's failure to report changes in the child's behavior at home. The PCIT protocol now incorporates having parents complete weekly ECBI ratings of the intensity of child behavior problems (Brinkmeyer & Eyberg, 2003), an element that was not yet in the protocol (Hembree-Kigin & McNeil, 1995) used by the therapist in the current study. Future research could examine whether parent-reported improvements on weekly ECBI scores are associated with stimulus generalization of parents' skills during PCIT. Likewise, if minimal transfer is observed at home, the therapist may be able to address this issue clinically via TT intervention as part of ongoing treatment. As a practical modification of TT, it may be sufficient to observe parent-child interactions at home only at strategic points (e.g., prior to treatment, mid-way through CDI, and mid-way through PDI) to monitor stimulus generalization.

Another direction for future research relates to strategies for enhancing the extent of generalization following parent training. This study used a booster training procedure incorporating graphic feedback and instructions (McDonald & Budd, 1983), along with videotaped feedback as suggested by Lundquist and Hansen (1988). Assessment of the TT intervention following CDI was incomplete due to the limited number of observations; however, it appeared that the brief TT protocol might be insufficient to achieve stable changes. Therefore, it would be useful to investigate whether providing 2-4 additional TT sessions would result in more durable and thorough generalization of CDI skills. Another direction for future research would be to assess the transfer of parent skills taught in PDI (e.g., effective commands, use of timeout) to the home. For parents of children with significant oppositional or noncompliant behavior, generalization of PDI skills may be as important as generalization of CDI skills. Finally, an important question for future research is to ask how much generalization is enough – presumably, this would entail examining the child's behavior and parent-child patterns over time, to determine if treatment was sufficient to prevent escalating patterns of antisocial behavior.

In conclusion, this study advances the literature on PCIT by addressing a critical but

little-researched topic: stimulus generalization of parents' skills. The findings provide encouraging evidence of some spontaneous generalization, and they demonstrate that booster training can further enhance these effects. Yet they underscore that, as Stokes and Baer (1977) cautioned over 30 years ago, generalization from behavioral intervention is by no means assured. Parent training researchers are encouraged to pursue stimulus generalization as a major criterion of the effectiveness in their interventions with families, and to investigate it using rigorous empirical methods.

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