IMPACT OF PARENT-CHILD INTERACTION THERAPY ON THE QUALITY OF THE RELATIONSHIP BETWEEN CAREGIVERS AND THEIR CHILDREN WITH AUTISM

by

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(Under the Direction of Jonathan M. Campbell)

ABSTRACT

Parent-Child Interaction Therapy (PCIT) has been shown to be an effective intervention for improving compliance for preschool-age children with autism spectrum disorders (Masse, 2009; Vess, 2008). Improvements in positive affect for both parents and children with autism have also been demonstrated for school-age children (Solomon, Ono, Timmer, & Goodlin-Jones, 2008). Evaluation of the effectiveness of PCIT is accomplished typically by using the Dyadic Parent-Child Interaction Coding System (DPICS; Robinson & Eyberg, 1981) which consists of parent and child behavior codes that focus on changes in parenting skills and child compliance. The majority of studies using the DPICS to evaluate PCIT have focused on increasing child compliance and parent positive verbalizations (Vess, 2008). The purpose of the current study is to evaluate the efficacy of PCIT in improving the interactional quality of the parent-child relationship including documenting changes in parental sensitivity and child responsiveness.

INDEX WORDS:Autism, PCIT, Sensitivity, Structuring, Responsiveness, Initiations

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CHAPTER 1

INTRODUCTION

Autism spectrum disorders (ASDs) are characterized by impairments in language and communication skills, repetitive and restrictive patterns of behavior and interests, and social interaction skills (American Psychiatric Association, 2000). Although autism and other pervasive developmental disorders are considered low-incidence disabilities, the prevalence of ASDs has increased with recent prevalence estimates ranging from 5.5 to 5.8 per 1,000 children (Chakrabarti & Fombonne, 2005; Schieve, Rice, Boyle, Blumberg, & Visser, 2006). Recently published prevalence rates for autism estimate the disorder affects roughly 1 in 110 children (Center for Disease Control, 2009), indicating a continued increase in prevalence rates. Due to the continuing increases in prevalence rates of autism, effective behavioral and psychoeducational treatments targeting the symptoms affecting this population have been an important area of research (Masse, McNeil, Wagner, & Chorney, 2007; Schreibman, 2000).

In addition to exhibiting difficulties in those areas identified for diagnostic purposes, children with autism often present with significant behavior problems, which is often the most frequently cited referral reason for treatment (Baker et al., 2003; Hastings, 2003; Mandell, Walrath, Manteuffel, Sgro, & Pinto-Martin, 2005). Specifically, research has shown that individuals with autism demonstrate high levels of hyperactive-impulsive behavior, physical aggression and self injury (Mandell et al., 2005; Matson, Wilkins, & Macken, 2009). An investigation by Matson et al. (2009) found that, when compared to typically developing and

atypically developing (e.g., diagnoses of attention-deficit hyperactivity disorder, obsessive compulsive disorder, bipolar disorder) peers, children with autism showed evidence of significantly greater levels of challenging behaviors, including aggressive and stereotypic behaviors. Additionally, the researchers found that the severity of challenging behaviors exhibited by children with autism was positively correlated with ratings of autism symptom severity. Precursors to behavior problem treatment referral, as well as evaluation for specific diagnostic purposes have been noted, include noncompliant and socially delayed or deviant behaviors.

Noncompliance has been noted as an early identifiable behavior that may indicate the potential for future aggressive problem behaviors in children (Loeber, Green, Lahey, Christ, & Frick, 1992). For children with autism, noncompliant behavior can be especially problematic as it may inhibit parents, teachers, and therapists from conducting intervention and educational treatment sessions that are vital to their developmental progress (Matson & Nebel-Schwalm, 2007). Similarly, due to the common presence of deficits in language development, children with autism may be limited to acts of aggression or self injury to communicate noncompliance (Singh et al., 2006). These types of inappropriate responses not only impact their behavioral development but also have negative consequences on the development of social skills.
While noncompliance and challenging behaviors are most often reported as primary reasons for treatment referrals, another common reason for parents and caregivers to seek initial diagnostic evaluation is delayed social competence of their child (Ellingson, Briggs-Gowan, Carter, & Horwitz, 2004) often expressed as a lack of social responsiveness to parents or caregivers (Chawarska et al., 2007). Several retrospective reviews of parents' first concerns regarding their children with autism resulted in social-emotional development as the initial problematic area

recognized by parents, second only to language developmental delay as an area of parental concern (Chawarska et al., 2007; De Giacomo & Fombonne, 1998). Attachment theorists would argue that an early connection to caregivers is a significant milestone necessary for optimal social-emotional development (Ainsworth & Bowlby, 1991) and lifetime personality development (Sroufe, 2005); therefore, early identification and intervention targeting these concerns for children with autism is vital to increase the likelihood of successful social functioning in the future. Extensive research has been conducted evaluating the development of attachment and appropriate interaction skills between parents and their children with autism.

Autism Spectrum Disorders and Attachment

Despite deficits in reciprocal social interaction behaviors (Scheeringa, 2001), children with autism demonstrate capacity to form healthy attachments to their parents. For example, a meta-analysis conducted by Rutgers, Bakermans-Kranenburg, van Ijzendoorn, and van Berckelaer-Onnes (2004) revealed a wide range of attachment styles for children with autism with one study reporting 5% of children demonstrating what Ainsworth (1979) would define as securely attached behaviors while another reported that 63% of children with an autism spectrum disorder were securely attached. Additional differences were found when children with autism were compared to other clinically diagnosed groups, typically developing peers, as well as to other children with autism who differed on cognitive functioning level. While a large portion of the literature surrounding attachment and children with autism primarily focuses on the classification of children into specific attachment groups (Dissanayake & Crossley, 1996; 1997; Naber et al., 2007), additional lines of research have investigated the relationship between attachment style, parenting characteristics, and the effect on child behavior. Especially relevant are the differences

in optimal setting and parent responses for children with autism compared to those that are more favorable for typically developing children.

Rutgers et al. (2007) used rating scales to measure child attachment behavior, parenting style, parenting stress, and family background variables for children with autism (ASD), mental retardation (MR), language disorder (LD), and typical development during naturalistic observation sessions. The authors also divided the ASD group into subgroups identified as low functioning (IQ<70) and high functioning. The primary child variable measured, in addition to diagnosis and cognitive functioning, was attachment security, as rated by psychiatric assistants using the Brief Attachment Screening Questionnaire (BASQ). Parent variables included questionnaires measuring parental efficacy, parenting style (authoritative or authoritarian), daily life stressors associated with raising a child, perceived social support received, and parental psychological functioning. Results indicated that a diagnosis of ASD was associated with less attachment security, regardless of cognitive functioning level. Additionally, more authoritative parenting style (i.e., high responsiveness and high demandingness) was reported more often by the typically developing group compared to all clinical groups. The authors acknowledge that their findings regarding children with ASD exhibiting lower levels of secure attachment contradict previous studies. However, they make an important distinction in that the majority of previous research has focused on measuring attachment in stress-inducing situations (e.g., Strange Situation Procedure) which could elicit more easily observable attachment behaviors than the naturalistic setting used in this investigation. Although the impact of research or observation setting is noteworthy, the interaction between parent behaviors and the resulting effect on child behaviors should continue to be a priority in the parent-child relationship literature.

Doussard-Roosevelt, Joe, Bazhenova, and Porges (2003) found that children with autism tended to demonstrate more withdrawal and ignoring behaviors towards their mothers when compared to typically developing peers, findings that contradicted those of previous researchers (Dissanayake & Crossley, 1996, 1997). One critical finding of the Doussard-Roosevelt et al. study is that mothers of autistic children used more high intensity and physical proximity approaches during interactions compared to mothers of non-autistic children. The children with autism responded with less approach behaviors and significantly more withdrawal behaviors than their non-autistic peers. As discussed by the authors, these findings support the importance of parental responsivity and sensitivity to their child's behavior. Similar conclusions regarding relevant parental characteristics were also reported by Rutgers and colleagues (2004, 2007).

While research on the development of attachment for children with autism is fairly extensive, the results yield varied percentages of children with healthy attachment styles and authors reach varied conclusions. It is clear that some children with autism are capable of forming healthy attachments to their caregivers, but just as the population of children with autism is heterogeneous across symptom clusters so, too, are the factors that influence attachment development, such as cognitive level, situation stress level, and presence or level of specific parent characteristics. One potential reason that may help to account for varied findings reported within the autism literature is that the construct of attachment has been defined too broadly. To date, attachment has been defined in such a way as to include many facets of both parent and child characteristics, but it may be more beneficial for understanding the attachment of children with autism by focusing on specific elements of parent behavior and the resulting influence on areas of deficiency often seen in children with autism, such as general social responses and initiations to involve the parent.

Parent-Child Relationships for Young Children with Autism Spectrum Disorders

Research on attachment and the relationships between children with autism and their caregivers has identified parent characteristics, such as sensitivity, responsivity, demandingness, and scaffolding, (Doussard-Roosevelt et al., 2003; Rutger et al., 2004; Rutgers et al., 2007) that warrant additional investigation. Recent research supports (Ruble, McDuffie, King, & Lorenz, 2008) the use of sensitive and responsive parenting for children with autism and highlights the positive role such parenting plays in emotional regulation, language, and cognitive development in children with autism (Gulsrud, Jahromi, & Kasari, 2010; Warren & Brady, 2007). The importance of parental sensitivity and structuring in establishing and maintaining healthy parent-child interaction has been well documented in previous literature, including the importance of parental sensitivity when parenting a child with developmental delays.

Sensitivity. "Parental sensitivity is particularly crucial in the development of fluid interactions in dyads in which the infant is delayed, produces weak responses, or whose signals are simply difficult to read" (Clark & Seifer, 1985, p. 215). Clark and Seifer's assertions about the critical role of parental sensitivity for children with delays are highly relevant for parenting children with autism who commonly produce weak responses and those that are difficult to interpret. The link between parental sensitivity and their child's behavior was investigated by Moran, Pederson, Pettit, and Krupka (1992) who studied a sample of developmentally delayed infants to assess the relationship between maternal sensitivity and attachment. Moran et al.'s reason for using a developmentally delayed sample was based on research indicating that the "facial, postural, and vocal behavior thought to elicit maternal interaction may be delayed or aberrant [in developmentally delayed infants], making it difficult for mothers to read and respond appropriately to their infants' needs" (p. 431). Across observations which varied the level of

structure provided to the parent, the levels of sensitivity and security were found to be lower for the delayed sample when compared to a non-delayed sample in a previous similarly conducted study (Pederson et al., 1990). Specifically, the mean levels of parent sensitivity and attachment security for the developmentally delayed population were 0.13 and 0.27, respectively, compared to 0.73 and 0.40 in the non-delayed sample. The authors postulated that this was due to the developmental delay of the infants and their specific delay in aspects thought to support sensitive interactions from mothers, such as responsiveness to parent interaction attempts. Results of both Moran et al. and Pederson et al. were consistent in that a significant correlation was evident between maternal sensitivity and infant security.

More recently, van Ijzendoorn et al. (2007) investigated parental sensitivity and attachment in children with ASD, mental retardation (MR), language delays (LD), and typical development. Attachment was assessed using the Strange Situation Procedure at approximately two years of age. Almost half of the ASD children were identified as being securely attached (48%), followed by disorganized attachment (38%) and insecure-avoidant attachment (14%) (van Ijzendoorn et al., p. 601). Parental sensitivity was measured using the Emotional Availability Scales (Biringen & Robinson, 1991). The results indicated that parents of children with ASD did not differ significantly in their levels of sensitivity compared to the parents in the comparison groups. Children with ASD's involvement with their parents were significantly lower than children with MR, LD, and typical development. A noteworthy finding from this study was that "for children with ASD more sensitive parenting was not associated with more attachment security, whereas for children without ASD more sensitive parenting was associated with more attachment security" (van Ijzendoorn et al., p. 604). This finding contradicts the attachment theories of Ainsworth (1979) that there is an association between sensitivity and

attachment because this was not true in this case of children with ASD, as well as previous findings indicating that mothers of securely attached children with ASD exhibited greater sensitivity than mothers of insecurely attached children (Buitelaar, 1995). van Ijzendoorn et al. (2007) posited that, for children with ASD, attachment and social interaction abilities may be associated with other parental characteristics besides sensitivity.

Ruble, McDuffie, King, and Lorenz (2008) examined an additional parent characteristic in social interactions with their children with autism: caregiver responsiveness. Responsiveness is described as somewhat similar to sensitivity as it focuses on positive reactions to child behaviors, including communication and play. Caregiver responsiveness was measured using the Social Interaction Rating Scale which includes six dimensions of responsiveness including: contingency, directiveness, initiation toward the child, movement with the child, affect, and maintenance of interaction with the child. Ruble et al.'s noteworthy finding from this study was that "parent responsiveness was significantly associated with children's ability to initiate social interactions with adults…" (p. 165), providing further evidence for the importance of evaluating characteristics of both members participating in a dyadic interaction.

Responsiveness, along with demandingness, was assessed by Calzada, Eyberg, Rich, and Querido (2004) in their investigation of parent interactions with young children with Oppositional Defiant Disorder (ODD). The researchers utilized the Dyadic Parent-Child Interaction Coding System-II (DPICS-II) to measure the number of parent commands (i.e., demandingness), the number of parent acknowledgements, answers, behavior descriptions, praises, reflections, and positive touches (i.e., responsiveness) and child compliance. Their findings indicated that high levels of parent demandingness accompanied by low levels of responsivity resulted in increased levels of child noncompliance.

Across different clinical groups of children links have been established between the sensitivity with which parents attend and respond to their children and the formation of secure attachment, as well as more specific child behaviors such as interaction initiations and compliance. As evidenced by the results of van Ijzendoorn et al. (2007) there continues to be discrepancies in findings regarding secure attachment and children with autism. However, investigations, such as those of Ruble et al. (2008) and Calzada et al. (2004), focusing on the relationship between parent responsiveness and specific child behaviors, provide justification for studies to explore additional links between parent sensitivity and child interactional abilities.

Demandingness. Demandingness, the extensive use of commands, or an overly intrusive and controlling interaction style is another parental characteristic that has been examined in the research on parent and child interactions, often accompanying measures of parental sensitivity or similar constructs. Crowell and Feldman (1988) found that mothers of developmentally delayed children were less helpful and supportive, and more controlling and directive in their dyadic interactions when compared to mothers of typically developing children. Additionally, it was noted that the children of the controlling and directive mothers demonstrated more avoidant and less affectionate behaviors during the interactions. Webster-Stratton (1985) reported similar findings regarding mothers of conduct-disordered children who demonstrated more criticisms and commands, and were significantly more controlling of their children than the mothers of the typically developing children. The clinical group of mothers was also less enthusiastic and exhibited significantly fewer supportive comments or behaviors towards their children. Similar to Crowell and Feldman, the children in this group demonstrated fewer smiles and expressions of enjoyment than their typically developing peers; however, there were no significant differences in terms of noncompliance or deviant behavior between the groups. As compliance and socially

appropriate behaviors are often an area of deficiency for children with autism, added focus should be placed on these child related variables in the parent-child interaction literature.

Child Variables. As described above, child related variables, such as compliance and social responses, are regularly included in investigations of parent characteristics and the parent-child relationship (Buitelaar, 1995; Calzada et al., 2004; Dissanayake & Crossley, 1996). Child responsiveness to parents during dyadic interactions was discussed in Crowell and Feldman (1988) where results suggested that children showed less positive responses to mothers who were over controlling and demanding in their interaction style. Another area of concern within social interactions of children with autism is the lack of initiation to interact or share with peers or adults (Mandell et al., 2005). Ruble et al. (2008) investigated this and found a positive correlation between parental responsiveness and their child's ability to initiate interactions with adults.

While child related variables have primarily been a secondary area of focus in parent-child interaction investigations, the correlational findings between parental sensitivity and child responsiveness, and parental intrusiveness and child initiations (Biringen & Robinson, 1991) support the need for further investigation targeting the dynamic relationship between these constructs. Specifically, more information regarding the impact that changes in parent sensitivity and intrusiveness have on a child's responses and initiations during interactions with their caregiver need to be assessed through intervention studies. One such intervention possibility is Parent-Child Interaction Therapy (PCIT), which is a behaviorally-based intervention package that targets parent-child interaction behaviors, by specifically focusing on increasing positive parenting practices to deal with and subsequently improve child behaviors (Bell & Eyberg, 2002). As discussed above, improvement in parent use of sensitive and responsive actions can

have favorable effects on children with autism's interaction abilities, responses, and overall secure attachment behaviors, thereby providing preliminary support for the use of PCIT with this population.

Parent-Child Interaction Therapy and Intervention Links to Children with Autism Spectrum Disorders

PCIT is a packaged intervention that targets reduction in child non-compliance and improvement in parent-child attachment through parent training procedures. PCIT is comprised of two distinct phases: Child- Directed Interaction (CDI) and Parent-Directed Interaction (PDI) (Bell & Eyberg, 2002). CDI stems from attachment theory, focusing on the development of a secure and stable attachment between parent and child by establishing sensitive and responsive parenting practices, whereas PDI, which is based on social learning theory, establishes limits and contingencies for child behavior. Progression from CDI to PDI is based on criteria being met during a 5-min observation session which takes place at the beginning of every treatment session. The criteria for the parent are to provide 10 behavioral descriptions, 10 reflective statements, 10 labeled praises, and 3 or fewer questions, commands, or criticisms within the 5-min CDI session (Bell & Eyberg, 2002). The 5-min CDI session continues to take place prior to treatment sessions throughout the PDI and any additional follow-up phases. Throughout PDI parents are encouraged to continue using the positive parenting practices learned during CDI and are taught how to structure and direct their child's activities or behaviors when necessary by providing detailed commands and appropriate and consistent consequences for compliance and noncompliance. Once a dyad has entered into the PDI phase, additional 5-min pre-session observations of PDI and a 5-min clean-up session are often implemented to evaluate parent's

progress and use of the command and consequence skills. For the purposes of the current study only 5-min CDI sessions were recorded prior to each treatment session.

PCIT was designed for implementation with parents and their children exhibiting disruptive behavior problems and has been shown to be effective with this population (Brinkmeyer & Eyberg, 2003; Eyberg et al., 2001). Dr. Sheila Eyberg is the developer of PCIT and has discussed the applicability of adapting PCIT to additional populations of children (Eyberg, 2005). She indicated that functions of the different parent behaviors learned throughout PCIT should not be based on specific phrases or statements but on broad based antecedents and consequences taught to parents to shape their child's social behaviors. Specifically, Eyberg emphasized the original tenet of PCIT as individualizing the process and content to the family receiving treatment as being the key factor in any adaptation, for any population of children.

A systematic replication of PCIT was conducted targeting the disruptive behavior of children with comorbid Oppositional Defiant Disorder (ODD) and intellectual disability (ID) (Bagner & Eyberg, 2007). Findings include that, when compared to families in the control group (n=11), mothers in the treatment group (n=10) used more CDI Do skills (behavior descriptions, reflections, and praises) and fewer CDI Don't skills (questions, commands, and criticisms). Similarly, compliance to commands for children in the treatment group was significantly higher than compliance rates of their control group peers. Several parent report findings were also significant, including mothers in the treatment group reporting fewer child behavior problems and fewer disruptive behaviors after intervention across measures compared to reports from mothers in the control group. The authors discuss the results in terms of the positive and significant improvements made by the treatment group as well as the similarity between these

findings and those of studies targeting typically developing children, suggesting that PCIT, without significant modifications, may be applicable to multiple populations.

Solomon, Ono, Timmer, and Goodlin-Jones (2008) evaluated the effects of PCIT on problem behavior and shared positive affect during the interactions of parents and their children with autism. Similar to Bagner and Eyberg (2007), Solomon et al. used a waitlist control group study to compare the outcomes of participation in PCIT. Results of the effect of PCIT on reducing behavior problems with this population (n=10) were not statistically significant compared to the control group (n=9); however, child behavior problems were no longer in the clinically significant range and parents no longer perceived the behavior problems to be as distressing. This supports additional research of parental perception of and improved confidence in dealing with problem behavior (Vess, 2008). Parents in the treatment group of Solomon et al. reported reduction in the presence of autistic symptomatology (e.g., repeating things over and over, rocking) after intervention. Shared positive affect and parent positive affect also showed significant improvements in the treatment group over time, even during PDI where focus is placed on behavior compliance, and correlated positively with parent perceptions of child behavior.

The goal of PCIT, in its original form, is to increase child compliance and reduce disruptive behaviors; however, that is not the focus of the current investigation. In their study, Solomon et al. (2008) presented the suggestion of "promoting less tangible outcomes" (p. 1774) when applying PCIT to parents and their children with autism. Assessing the levels of parent sensitivity, responsiveness, and structuring during interactions and the resulting involvement and responsiveness of their children allows for the examination of improvements in social functioning, as well as overall growth in the parent-child relationship.

Purpose of the Present Study

Statistically significant positive effects have been reported by parents regarding the affective quality of their relationship with their child with autism as well as joint participation in activities during interactions (Vess, 2008). The purpose of the current study is to test whether parental sensitivity and structuring may be improved during interactions with their child with autism due to participation in PCIT. The Dyadic Parent-Child Interaction Coding System-III (DPICS-III; Eyberg, Nelson, Duke, & Boggs, 2005) was used to identify composite categories linked to parent and child characteristics associated with positive, reciprocal interactions. These categories were measured to evaluate the impact of PCIT on changes in emotional aspects of the parent-child interaction style.

CHAPTER 2

METHOD

Participants

Three parent-child dyads recruited for the Vess (2008) study were employed in the present investigation. The three families consisted of three mothers and their children (two girls and one boy). At the time of entry to the study, the participating children ranged in age from 3 years, 1 month to 4 years, 1 month (*M* = 3 years, 6 months) and maternal age ranged from 34 to 37 years (*M* = 35.5). Vess (2008) reported the following inclusion criteria for the child participants: (a) age between 2 and 6 years, (b) a diagnosis of autism spectrum disorder; confirmed by the administration of two diagnostic measures, (c) a score of 80 or higher on a standardized intelligence measure administered within the year prior to the commencement of the study, (d) a minimum score of 85 on either the Peabody Picture Vocabulary Test, Fourth Edition (Dunn & Dunn, 2007) (*M* = 101, range = 85-115) or a recently administered equivalent measure of receptive vocabulary. Inclusion criteria for caregivers were: (a) willingness to participate in the treatment and (b) the ability to attend weekly sessions at the University of Georgia (UGA). Families were recruited through the UGA School Psychology Clinic, the UGA Department of Special Education, community groups with special interest in autism spectrum disorders, and area occupational therapists and speech and language pathologists (Vess, 2008). This study was approved by the UGA's Institutional Review Board (IRB). Written consent was obtained from participants for the original study including parental consent for child's participation and parent consent for her own participation. Verbal consent for continued analysis of the data in the

current study was obtained from participants via telephone with additional written follow-up information, including an opportunity to withdraw their data from the analysis.

Experimental Design

Data were collected through a single subject, multiple probe design across mother-child dyads with pre-treatment probe conditions staggered across families. The frequency of "Do" and "Don't" skills, assessed with the DPICS-III, during a 5-min CDI observation prior to each treatment session served as a measure for meeting criteria to move on to the next phase of treatment. Data were obtained for all families during pre-treatment, CDI and PDI phases, post-treatment, and follow-up approximately one month after treatment ended. Progression through the phases was determined by data obtained during the 5-min observation periods. Specifically, to enter treatment (i.e., begin CDI phase) the frequency of "Do" and "Don't" skills needed to be stable or "Don't" skills moving in a countertherapeutic direction. To transition from CDI to PDI, 10 behavior descriptions, 10 reflection statements, and 10 labeled praises had to occur during the 5-min CDI observation, per the PCIT protocol. Families remained in the PDI phase until the child complied with seventy-five percent of parental commands and parents had one hundred percent correct follow-through of consequences during a 5-min PDI observation (Vess, 2008). All sessions took place in the School Psychology Clinic at The University of Georgia located in Athens, Georgia.

Procedure

The primary researcher for Vess (2008) served as the therapist for all sessions. Following completion of pre-treatment assessments and probe conditions, each family attended PCIT sessions once per week. Treatment sessions followed standard PCIT protocol with the two distinct phases of CDI and PDI.

Assessments

Multiple measures were administered in the Vess (2008) investigation; however, for the purposes of the present study only the Dyadic Parent-Child Interaction System-III (DPICS-III) is relevant for discussion.

Dyadic Parent-Child Interaction Coding System-III (DPICS-III). The DPICS-III (Eyberg et al. 2005) is the behavior coding system that was utilized across all conditions of the original study to assess specific quality variables of the parent and child social interactions. Event recording was completed with a total frequency of occurrence for each behavior during the 5-min CDI sessions being reported. Behavior variables measured in Vess (2008) included, for the parent: labeled praise, unlabeled praise, reflection statements, behavioral descriptions, commands (direct and indirect), questions (information and reflection), and negative talk, and, for the child: compliance and non-compliance. The primary researcher engaged in live coding during the observation sessions and videotaped sessions for later review and reliability coding. For the purposes of the current study, the videotaped sessions were recoded using supplemental variables from the DPICS-III. Researchers using the DPICS-III often create composite categories using combinations of the parent and child variables (Calzada et al., 2004); thus, recoding the sessions on additional variables allowed for the creation of composite categories designed to measure different emotional qualities of the parent-child relationship.

Creation of the composite categories for the present study stems from research on the construct of emotional availability, and, more specifically, the related elements which have been incorporated within this broad construct (Biringen & Robinson, 1991). Parent elements identified by Biringen and Robinson (1991) include maternal sensitivity and maternal control and child elements of responsiveness and involvement. Based on these concepts, five parent

composite categories and three child composite categories were created using the DPICS-III variables. Parent categories are Positive Sensitivity, Negative Sensitivity, Positive Structuring, Negative Structuring, and Hostility, and Child categories are Responsiveness, Initiation, and Negative Behaviors. Variables included in each category are delineated in Table 1.

Reliability

Treatment Fidelity. As reported in Vess (2008), fifty percent of session tapes from each of the four participant families were randomly selected and checked for integrity by a research assistant using PCIT manual checklists. Accuracy across families was 99.3% with the treatment protocol.

DPICS-III Interrater reliability. Reliability coding of the parent and child variables included in the Vess (2008) investigation were conducted by two research assistants who were trained on DPICS-III coding to 80% agreement with a criterion tape before coding mother-child interactions. Reliability data were collected for one-third of each family's sessions. A total agreement method was used to calculate interrater reliability. Vess reported an average agreement of 81% between the primary investigator and the research assistants. Reliability coding of the parent and child variables in the present investigation was collected similarly with a research assistant being trained on DPICS-III coding to 80% agreement with the primary investigator prior to coding mother-child interactions. Consistent with Vess, the total agreement method was used to calculate interrater reliability for approximately one third of each family's sessions (9 sessions for Anna, 6 sessions for Lucas, 6 sessions for Mabel). Total agreement was calculated as the smaller number of recorded occurrences of a behavior divided by the larger number of recorded occurrences of a behavior multiplied by 100%. Average agreement between the primary investigator and the research assistant was 83% for Parent Codes (range 56%-100%) and 76% for Child Codes (range 64%-89%). The reported average agreement percentages for

Parent Codes and Child Codes reflect the average agreement between the current investigator and research assistant, as well as the primary investigator from Vess (2008) and research assistants for the DPICS-III codes that were included in the original study. Average agreement percentages across participant sessions were calculated using the supplemental codes added for the current investigation; however, the randomly chosen sessions for reliability coding were not congruent with those of Vess (2008); therefore, reliability for the originally included codes could not be calculated. Interrater reliability percentages across sessions and DPICS-III Codes are reported in Tables 2 through 5.

CHAPTER 3

RESULTS

Visual analysis of graphically displayed results of the DPICS-III coding was conducted (see Figures 1-3). Due to technical problems encountered during data collection (e.g., lack of sound) several sessions for two of the families (4 sessions for Mabel and 3 sessions for Lucas) were not recoded for additional parent and child variables and were not included in the current graphs.

Parent Categories

Sensitivity. The data presented in Figure 1 represent the DPICS-III categories of Positive Sensitivity, Negative Sensitivity, and Hostility for the three families. During baseline data collection all three families exhibited low levels across the three categories with Lucas' mother demonstrating an increasing trend of Positive Sensitivity and Mabel's mother exhibiting an increase in Hostility during data collection of the final baseline session. All other categories were stable. Upon introduction to the CDI phase, all three families showed an increase in frequency for Positive Sensitivity while maintaining stable zero rates of Negative Sensitivity and Hostility. Lucas and Mabel's mothers showed immediate absolute changes in level of Positive Sensitivity and maintained stable levels at a high, therapeutic level well above baseline. Anna's mother exhibited some variability in Positive Sensitivity; however, the percentage of nonoverlapping data points was 100% compared to baseline.

During the PDI phase, all three families maintained the low and stable rates of Negative Sensitivity and Hostility behaviors. Lucas and Mabel's mothers exhibited slight decreases in the frequency of Positive Sensitivity behaviors compared to the CDI phase; however, PDI levels

remained above baseline. Anna's mother's Positive Sensitivity data was more stable during PDI with 100% of the data points overlapping with CDI. The mean frequency of Positive Sensitivity behaviors was higher in PDI than CDI (PDI *M*= 22.4; CDI *M*=15) for Anna's mother with the opposite being true for Lucas and Mabel's mothers. Post-intervention data showed low level, zero-celerating trends for all three families for Negative Sensitivity and Hostility. Anna and Mabel's mothers maintained Positive Sensitivity levels above baseline while Lucas' mother had one data point (50%) overlapping with baseline data.

Structuring. Figure 2 represents the Parental Positive and Negative Structuring data for all three families. During baseline data collection all three families exhibited higher levels of Negative Structuring than Positive Structuring (mean levels of Negative Structuring across Anna, Lucas, and Mabel's mothers = 25, 27.5, 47.75, respectively; mean levels of Positive Structuring = 7.3, 14.75, 7.5). Anna's mother exhibited stable levels of both categories, Lucas' mother had slightly accelerating trends for both categories, and Mabel's mother demonstrated a stable level of Positive Structuring and an accelerating trend of Negative Structuring. Beginning CDI training Anna and Mabel's mothers showed immediate absolute increases in the levels of Positive Structuring behaviors and immediate absolute decreases in the levels of Negative Structuring behaviors. Lucas' mother showed similar changes in Negative Structuring behaviors but did not demonstrate as drastic an increase in Positive Structuring behaviors.

Upon beginning PDI training all three families continued to exhibit low, zero-celerating levels of Negative Structuring behaviors and Lucas and Mabel's mothers showed similar levels of Positive Structuring behavior compared to CDI. Anna's mother demonstrated a relative decrease in Positive Structuring behavior compared to CDI (CDI M= 41.83; PDI M=30) but remained stable at this level. Post-intervention all three families maintained stable, near zero rates of Negative

Structuring and above baseline levels of Positive Structuring. Anna's mother's levels of Positive Structuring increased from PDI while Lucas and Mabel's mothers remained at similar levels.

Child Categories

The data presented in Figure 3 represent the three child categories of Responsiveness, Initiations, and Negative Behaviors.

Responsiveness. During baseline, Anna exhibited low levels of Responsiveness while Lucas and Mabel were both progressing in an accelerating, therapeutic trend. Upon entrance into the CDI phase, responsiveness for all three children stabilized at near zero rates with the exception of one data point for Anna. During this session, Anna repeatedly hugged her mother, resulting in tickles and laughs which greatly increased the variable count for Positive Touch and Laugh, both of which factor into the Responsiveness. The immediate decrease in Responsiveness for all three participants is likely due to the parent decreases in Negative Structuring which includes the variable of Questions and Commands. Most of the Responsiveness counts during baseline were child Answers to parent Questions so upon entering CDI where parents are taught that questions are "Don't" skills, opportunities for the child to respond were decreased or eliminated altogether. PDI and post-intervention phases resulted in similar low, stable levels of Responsiveness across families.

Initiations. Baseline levels of Child Initiations for Anna and Mabel were slightly variable with both exhibiting a decelerating trend prior to transitioning to the CDI phase. Lucas progressed with an increasing trend during baseline. During the CDI phase, Anna exhibited similar levels of Initiations compared to baseline, Lucas' level decreased compared to baseline but remained above the other categories and began increasing in a therapeutic direction, and Mabel showed an immediate, therapeutic absolute change in level. Upon entering PDI, Anna had one session with

very low levels of initiations followed by an immediate return to CDI and baseline levels, Lucas had one session of extremely elevated levels of Initiations followed by a decrease to similar levels of CDI, and Mabel exhibited stable levels compared to CDI. Post-intervention, all three children exhibited levels of Initiations similar to previous phases.

Negative Behaviors. During baseline data collection Anna exhibited low, zero-celerating rates of Negative Behavior, Lucas' first session reflected an elevated number of Negative Behaviors but dropped down to near zero rates for the remaining sessions, and Mabel exhibited a changing of trend direction from decelerating to accelerating all within a moderate level of presentation. Upon entering the CDI phase of intervention, Anna and Lucas maintained stable, near zero rates of Negative Behavior and Mabel showed an immediate decrease in level which remained through PDI and post-intervention. Anna and Lucas also continued to demonstrate low levels of Negative Behavior during PDI and post-intervention data collection.

CHAPTER 4

DISCUSSION

The present study represents an attempt to investigate possible effects of PCIT on emotional elements of the parent-child relationship with caregivers and children with ASD. Further, the study aimed to establish the viability of measuring emotional elements of parent-child interaction using the DPICS-III. Previous investigations using rating scales to measure emotional qualities of parent-child interactions resulted in qualitative reports of improvements in attachment and parenting confidence after participation in PCIT (Vess, 2008). Using elements gathered from research on the construct of emotional availability (Biringen & Robinson, 1991), DPICS-III composite categories were created to assess Parent Positive and Negative Sensitivity, Parent Hostility, Parent Positive and Negative Structuring, and Child Responsiveness, Initiations, and Negative Behaviors and the development of these elements over the course of participation in a PCIT intervention.

Findings indicated that over the course of participation in PCIT, mothers of children with autism increased amounts of Positive Sensitivity and Positive Structuring during interactions with their children. Mothers also decreased their use of Negative Structuring behaviors and maintained near zero rates of Negative Sensitivity and Hostility behaviors. All three children with autism in the study showed consistent or elevated rates of Initiations toward their mothers during interactions, maintained low levels of Negative Behaviors, and demonstrated decreased or generally low levels of Responsiveness. The element of Responsiveness was hypothesized to improve with increases in Positive Sensitivity, as discussed in the literature (Biringen &

Robinson, 1991); however, the variables encompassed within this DPICS-III category may not lend themselves to measurement during CDI interactions or may not be sensitive enough to measure improvements in this area for children with autism. More specifically, as parents are taught the "Do" and "Don't" skills during CDI they learn that questioning and providing commands are not how secure and stable attachments are formed during Child-Directed Interactions, which is reflected in the immediate decrease in Negative Structuring behaviors. A decrease in questions and commands eliminates the possibility for children to answer, which is a variable included in the Responsiveness category. The other variables incorporated into Responsiveness are Laugh and Positive Touch, which may not lend themselves to investigations targeting children with autism who often exhibit limited emotional expression both verbally and physically.

Increased levels of child Initiations were expected to be associated with increases in Positive Structuring (and subsequent decreases in Negative Structuring). Increased use of Positive Structuring variables of Reflections and Behavioral Descriptions assist the parent in finding a balance of including themselves in their child's play while being able to provide natural reinforcement of positive behaviors. Similarly, the child will likely recognize the shift from questions about their activities to positive comments about their actions, allowing the child to still maintain relative control over their play while initiating involvement of their parent. These observed therapeutic changes reflect similarly indicated changes through parent report on elements of the Parenting Relationship Questionnaire (PRQ) scales of Attachment, Involvement, and Parent Confidence as reported in Vess (2008). Although not directly linked to each other, maternal report of increased affective interactions, joint participation in activities, and positive

parent control during the activities were all observed through consistent appropriate or positive increases in the levels of child Initiations and parent Positive Structuring behaviors.

PCIT was designed for implementation with families and children with disruptive behavior problems (Eyberg et al., 2001) which is often an area of concern for children with autism (Mandell et al., 2005). The children in the present investigation exhibited only mild levels of negative behavior prior to intervention which allowed for a more clear evaluation of the effects of PCIT on targeted parent behaviors. Without the extraneous effects of parents being required to attend to and deal with the disruptive problem behavior of their child it is difficult to discern whether the positive effects of PCIT, both observable and reported by parents, would have been as evident.

While the target construct being measured was not attachment, findings support previous research indicating improvements in elements of attachment in the parent-child relationship are possible through parent-conducted intervention. Specifically, improvements in parent sensitivity and positive structuring are associated with positive parent perceptions of the interactions with their child and that increases in positive parenting behavior can have an encouraging effect on initiations made by children with autism towards their parent. Measurement of child responsivity using the DPICS-III did not indicate therapeutic benefits; however, that could arguably be due to a lack of sensitivity in measuring affective expression by children with autism and the inclusion of variables that are directly impacted by decreases in parent variables (i.e., answering parent requests).

Implications

The encouraging findings of the present study add to the literature supporting the involvement of parents as intervention providers for children with autism. Additionally, this study extends Vess'

(2008) analysis that indicates that PCIT is applicable without major modifications to children with autism and their parents with generally positive results in areas besides compliance, both reported by parents and measured by investigators. That is not to say that modifications could not be made to increase the applicability of PCIT to this population. The primary area of potential modification identified with the current sample of children surrounds the weight that verbal expression abilities of the child plays in the behaviors of the parent. One portion of the graduation criteria to move from the CDI phase to PDI phase is the use of 10 Reflections, the repetition of a child verbalization by the parent. For the children in this study, clearly articulated utterances or any verbalizations at all were highly variable, thus making it difficult for parents to consistently implement the learned technique of reflecting. Potential modifications could include adjusting the Reflections category to not only include verbal reflections but physical reflections in the form of mimicking the child's play activities (i.e., copying a block structure as the child builds). A physical reflection of this sort would allow for the use of the other "Do skills" of praise and behavior description while encouraging the child's appropriate play behavior. Similarly, child coded behaviors include asking questions and giving commands. Modifications to this aspect of the intervention could include a shift in focus to behaviors such as a shift in gaze to the parent's face, eye contact made, or physical showing or sharing of a toy with the parent. These non-verbal behaviors would still reflect potential initiations and responses made by the child to include the parent without relying on verbal abilities.

Theoretical implications of this investigation include the identification of potential relationships between parental variables of sensitivity and structuring and child variables of initiations and responsiveness. Visual analysis of the current design does not allow for the determination of causal relations between variables; however, the data (particularly for Lucas and Mabel's

families) suggested that improvements in positive parent interaction behaviors correlated with decreases in child negative behaviors. The questionable sensitivity of the DPICS-III in measuring child behaviors may have affected the recorded outcomes of the composite variables and subsequent relationships with parent variables. Assessing additional components of children with autism's behaviors during parent-child interactions, using other measures or new DPICS-III variables, may be necessary to further evaluate the strength of the link between elements of sensitivity and responsiveness, and structuring and initiations. Moreover, the data from this study provide initial evidence of the efficacy of PCIT in impacting other areas of the parent-child relationship beyond compliance, including shared involvement in play and parent control and confidence in interactions with their child.

Limitations and Future Directions

As mentioned above, a primary limitation in the present investigation concerns the ability of the DPICS-III to accurately measure elements of responsiveness and initiations by children with autism. Specifically, the DPICS-III variables included in the child composite category of Responsiveness included the variables Answer, which became somewhat irrelevant as parents were instructed to eliminate questions upon beginning the CDI phase of treatment, Laugh, and Positive Touch, both of which require the child to make obvious expression of enjoyment or affection. Children with autism often have difficulty expressing their emotions, particularly positive emotions, or do so in an atypical manner, such as participating in self-stimulating behavior like hand flapping or rocking, so low levels of laughing and hugging are observed frequently. For the category of Initiations all four variables require some level of verbal ability to be able to make commands, ask questions, or engage in social or play talk with the parent. The three participants in the present study all had limited verbal abilities which allowed for the

recording of one word demands or questions (i.e., “Help” and “Where?”); however, more common methods of initiating by children with autism, like pulling the parents hand, were not coded with the DPICS-III. The focus on child verbal behaviors also impacted the investigators ability to reliably code the targeted variables. The DPICS-III manual provides detailed coding guidelines for all of the variables; however, due to the limited verbal expression abilities of the current participants coding of some behaviors continued to be relatively subjective and difficult to interpret correctly. For example, during an interaction if a child were to look at a toy car and say, “car” the DPICS-III manual does not differentiate whether a one word statement would qualify as a question (i.e., “Can I have the car?”), a command (i.e., “Give me the car”), or prosocial talk (i.e., “That is a car”). How the observer codes this behavior then affects the expected appropriate response of the parent to be either an answer (i.e., “Yes, you can have the car”), compliance (i.e., giving the child the car), or a reflection or praise (i.e., “You’re right that is car, good job!”. Low interrater reliability percentages across numerous child related DPICS-III codes and parent response codes reflect the difference in interpretation by the raters for situations similar to that described above. To more accurately measure the behaviors of children with autism, modifications to the DPICS-III manual would be required, particularly surrounding the focus on verbal behaviors and emotional expressions and the associated codes and definitions. For children with limited verbal abilities including a catch-all code for unclear sequences of child behavior and parent response, such as the “car” example, could be beneficial. Additionally, the creation of a variable for child responsiveness and initiations measuring eye contact or gaze direction toward the parent and showing the parent a toy, with detailed examples of the presentation of these behaviors, could provide additional support of the influence of parent behaviors on child behaviors. Furthermore, inclusion of criteria targeting stereotypic or

repetitive play behaviors may be warranted. As children with autism often exhibit inappropriate play behaviors ignoring these occurrences and encouraging the use of behavioral descriptions and praise only for appropriate play (i.e., rolling a car down a ramp instead of spinning the wheels with their hand) would be appropriate modifications to the DPICS-III with this population.

Additional limitations regarding the design and data collection of the current study were also present. As discussed previously, progression through the phases of PCIT are based on meeting specific criteria, which for the original study design centered around parent "Do" and "Don't" skills and child compliance. Thus, issues of the stability of the data or trend direction prior to phase changes were not controlled with the currently investigated variables. It is therefore difficult to make firm conclusions regarding the changes seen over the course of participation; however, the level of the categories across phases does provide conclusive evidence of the overall effectiveness of PCIT in increasing parent positive sensitivity and structuring. The obvious limitation regarding data collection is the missing video data due to technical difficulties, which would have allowed for more detailed analysis of trend and variability of data for Lucas and Mabel's families.

More research on the efficacy of PCIT with children with autism and their parents needs to be conducted. The limited findings thus far have been positive in terms of increasing parent's positive interaction skills and increasing child compliance; however, additional replications of PCIT in its original form, as well as with modifications pertaining to children with autism, will allow for the evaluation of methodological changes that may be beneficial to this heterogeneous population. Modifications could include redefining variables such as Reflections for parents of a non-verbal child, or increasing the use of non-verbal behaviors by parents for children with low

or limited receptive language abilities. Future research should also include more pre-intervention measurement of child variables including expressive and receptive language abilities. This detailed information will assist researchers in determining the degree of adaptation and modification of PCIT and the DPICS-III required for effective implementation across language levels of children with autism. Likewise, post-intervention measurement of the child's language ability could provide initial evidence of any impact PCIT has on language development for this population. Supplementary measures of changes in the quality of parent-child interactions should also be applied to families participating in PCIT to continue investigating emotional aspects of the relationship that are effected by the strategies taught throughout this intervention.

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APPENDICES

Table 1

Dyadic Parent-Child Interaction Coding System - 3rd Edition (DPICS-III) Codes by Composite Variable

Parent Codes	Child Codes
Positive Sensitivity • Labeled Praise • Unlabeled Praise • Answer • Compliance • Positive Touch	Responsiveness • Laugh • Answer • Positive Touch
Negative Sensitivity • No Answer • Non-compliance • Negative Touch	Initiation • Command • Question • Prosocial Talk • Play Talk
Hostility • Negative Talk • Negative Touch • Yell • Whine	Negative Behaviors • Yell • Whine • Negative Talk • No Answer • Negative Touch
Positive Structuring • Reflective Statement • Behavioral Description	
Negative Structuring • Command • Question	

Table 2

Interrater Reliability for Dyadic Parent-Child Interaction Coding System – 3rd Edition (DPICS-III) Parent Codes by Session

Session	Yell	Wh	An	NAn	Comp	NComp	PosTo	NegTo	Average Reliability
					Anna				
BL 1	100	100	100	100	50	100	0	100	**81.3**
CDI 2	100	100	100	100	100	100	100	100	**100**
CDI 4	100	100	100	100	100	100	100	100	**100**
CDI 5	100	100	0	100	100	100	80	100	**85**
PDI 1	100	100	0	100	100	100	73	100	**84.1**
PDI 4	100	100	100	100	67	100	100	100	**95.9**
PDI 5	100	100	100	100	0	100	67	100	**83.4**
Post 2	100	100	50	100	100	100	100	100	**93.8**
Follow-up	100	100	100	0	0	100	0	100	**62.5**
					Lucas				
BL 1	100	0	100	100	100	0	100	100	**75**
CDI 4	100	100	67	100	100	100	100	100	**95.9**
PDI 1	100	100	100	100	100	100	0	100	**87.5**
PDI 3	100	100	100	100	33	100	100	100	**91.6**
Post 2	100	100	100	100	100	0	100	100	**87.5**
Follow-up	100	100	67	100	100	100	0	100	**83.4**

Table 2 (cont)

Interrater Reliability for Dyadic Parent-Child Interaction Coding System – 3rd Edition (DPICS-III) Parent Codes by Session

	Mabel								
BL 3	100	100	100	100	0	100	0	100	**75**
BL 4	100	100	100	100	100	100	0	100	**87.5**
CDI 3	100	100	100	100	100	100	100	100	**100**
PDI 1	100	100	100	100	75	100	33	100	**88.5**
PDI 2	100	100	100	100	100	100	33	100	**91.6**
PDI 3	100	100	0	100	50	100	0	100	**68.8**

Notes: BL = Baseline session; CDI = Child Directed Interaction session; PDI = Parent Directed Interaction session; Post = Post treatment session; Follow-up = One month follow-up session; DPICS-III code labels: Wh = Whine; An = Answer; NAn = No Answer; Comp = Compliance; NComp = Noncompliance; PosTo = Positive Touch; NegTo = Negative Touch.

Table 3

Interrater Reliability for Dyadic Parent-Child Interaction Coding System – 3rd Edition (DPICS-III) Child Codes by Session

Session	PT	La	An	NAn	Com	Ques	ProTa	NTa	Yell	Wh	PTo	NTo	Average Reliability
						Anna							
BL 1	100	100	100	100	75	0	90	100	100	100	0	100	**80.4**
CDI 2	67	100	100	0	100	100	57	100	100	0	100	100	**77**
CDI 4	100	100	100	100	100	100	70.5	100	100	100	100	100	**97.5**
CDI 5	67	100	100	100	100	100	75	100	100	100	100	100	**95.2**
PDI 1	100	67	100	0	100	67	0	100	100	0	100	0	**61.2**
PDI 4	33	50	0	100	67	100	87.5	100	0	100	100	100	**69.8**
PDI 5	100	0	100	100	100	100	81	100	100	100	0	100	**81.7**
Post 2	100	100	100	100	100	50	74	100	100	100	100	100	**93.7**
Follow-up	86	100	100	100	0	0	62.5	100	0	100	100	100	**70.7**
						Lucas							
BL 1	50	100	80	67	0	100	78.5	90	100	62.5	100	0	**69**
CDI 4	100	100	0	100	100	67	85	0	100	100	100	100	**79.3**
PDI 1	0	100	100	100	0	100	93	0	100	100	0	100	**66.1**
PDI 3	100	100	50	100	50	0	80	0	100	100	100	100	**73.3**
Post 2	50	100	67	100	0	100	75	0	100	100	100	100	**74.3**
Follow-up	50	100	67	100	0	100	70	100	100	100	100	100	**82.2**
						Mabel							
BL 3	0	0	87.5	82	100	100	83	100	0	100	100	100	**71**
BL 4	0	100	78.5	75	100	0	60	100	0	100	100	100	**67.8**
CDI 3	0	50	100	100	100	100	71	100	0	100	0	0	**60.1**
PDI 1	78	100	100	100	83	0	86	100	0	100	0	100	**70.6**
PDI 2	67	100	100	50	100	100	52	100	0	100	100	100	**80.7**
PDI 3	100	100	100	0	100	0	87	100	100	100	0	100	**73.9**

Table 3 (cont)

Interrater Reliability for Dyadic Parent-Child Interaction Coding System – 3rd Edition (DPICS-III) Child Codes by Session

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Notes: BL = Baseline session; CDI = Child Directed Interaction session; PDI = Parent Directed Interaction session; Post = Post treatment session; Follow-up = One month follow-up session; DPICS-III code labels: PT = Play Talk; La = Laugh; An = Answer; NAn = No Answer; Com = Command; Ques = Question; ProTa = Prosocial Talk; NTa = Negative Talk; Wh = Whine; PTo = Positive Touch; NTo = Negative Touch.

Table 4

Interrater Reliability for Dyadic Parent-Child Interaction Coding System – 3rd Edition (DPICS-III) Parent Codes across Participants

DPICS-III Code	Average Interrater Reliability Percentage
Labeled Praise	83*
Unlabeled Praise	70.3*
Answer	80.19
Compliance	75
Positive Touch	56.48
No Answer	95.24
Noncompliance	90.48
Negative Touch	100
Reflective Statement	79.7*
Behavioral Description	85.7*
Command	70*
Question	72.7*
Negative Talk	88.3*
Yell	100
Whine	95.24
Total across all codes	82.82†

* = Average interrater reliability calculated across primary investigator and two reliability coders from Vess (2008)

† = Average across all DPICS-III codes

Table 5

Interrater Reliability for Dyadic Parent-Child Interaction Coding System – 3rd Edition (DPICS-III) Child Codes across Participants

DPICS-III Code	Interrater Reliability Percentage
Play Talk	64.19
Laugh	84.14
Answer	82.38
No Answer	79.71
Command	70.24
Question	65.90
Prosocial Talk	72.29
Negative Talk	80.48
Yell	66.67
Whine	88.69
Positive Touch	71.43
Negative Touch	85.71
Total across all codes	75.99

Figure 1. Frequency of Parent Positive Sensitivity, Parent Negative Sensitivity, and Parent Hostility across treatment sessions.

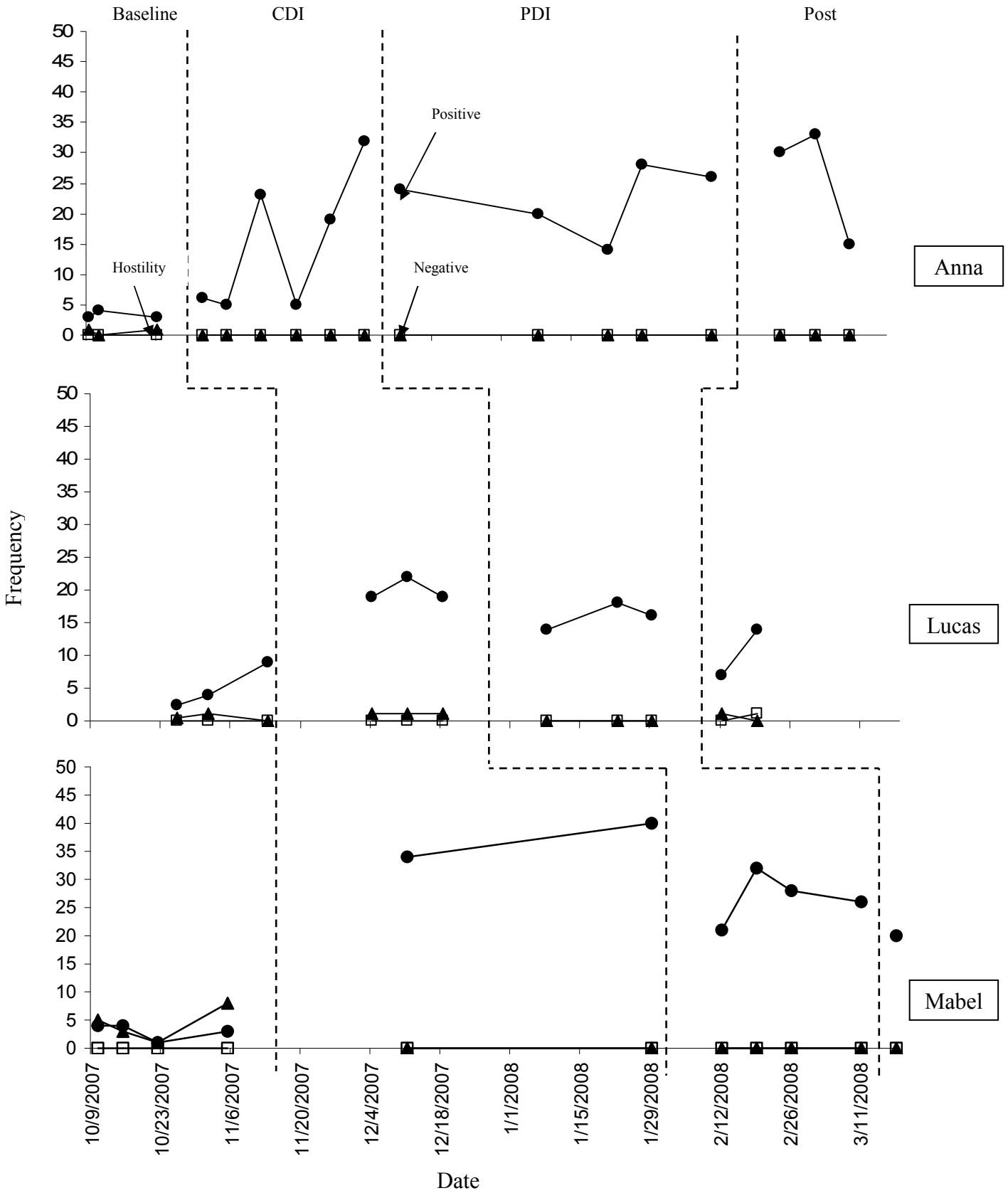

Baseline
CDI
PDI
Post
Positive
Hostility
Negative
Anna
Lucas
Mabel
Frequency
Date
10/9/2007
10/23/2007
11/6/2007
11/20/2007
12/4/2007
12/18/2007
1/1/2008
1/15/2008
1/29/2008
2/12/2008
2/26/2008
3/11/2008

Figure 2. Frequency of Parent Positive Structuring and Parent Negative Structuring across treatment sessions.

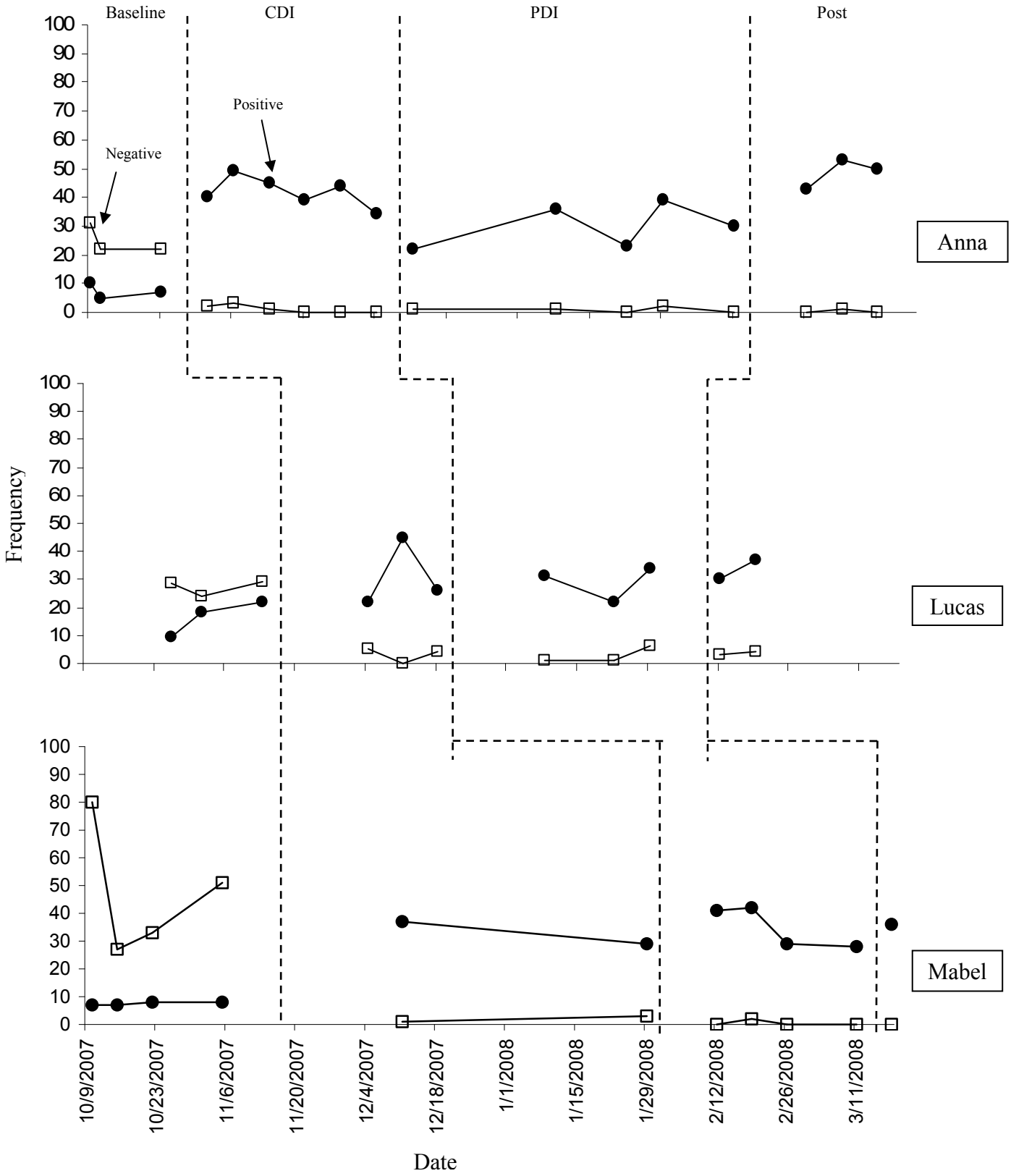
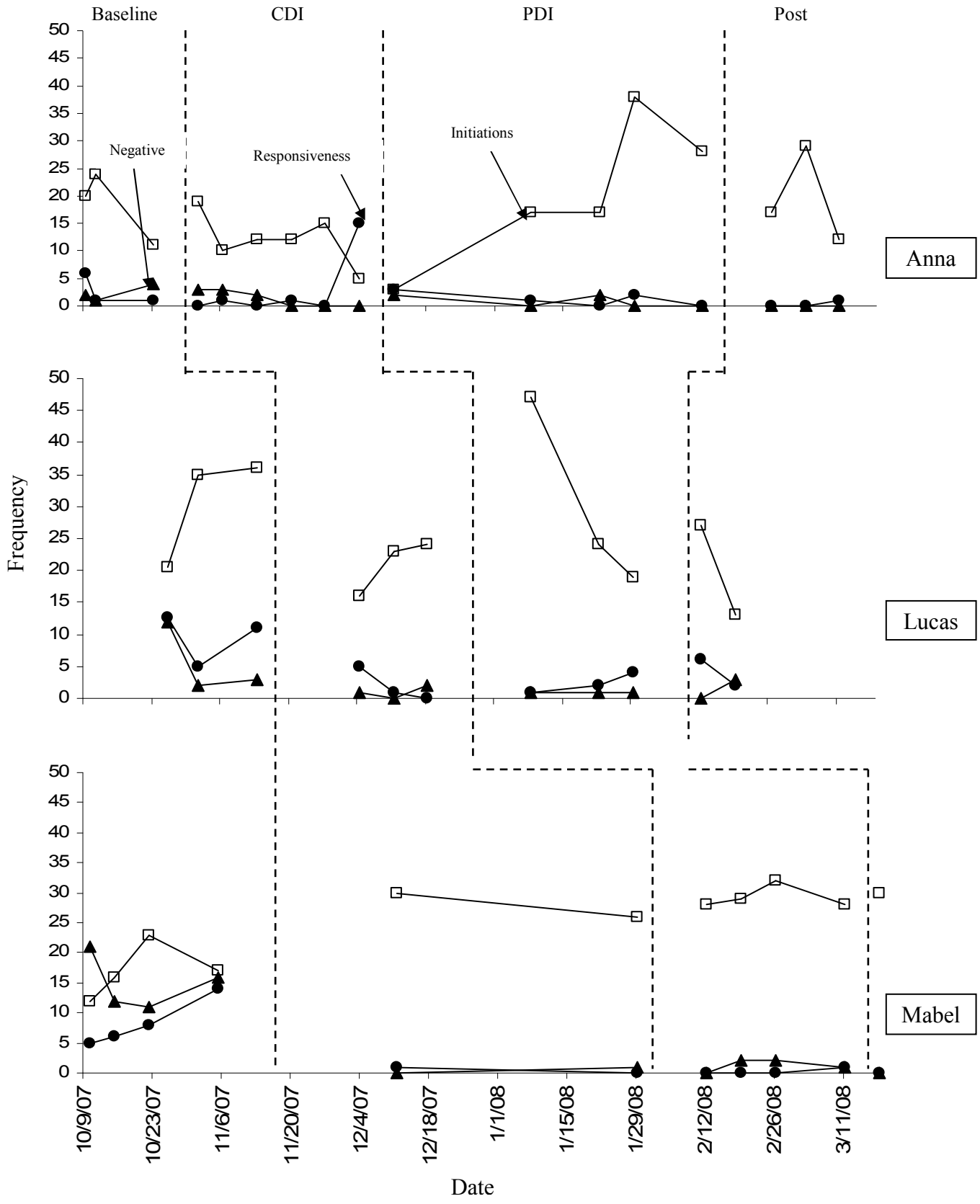

Baseline
CDI
PDI
Post
Positive
Negative
Anna
Lucas
Mabel
Frequency
Date
10/9/2007
10/23/2007
11/6/2007
11/20/2007
12/4/2007
12/18/2007
1/1/2008
1/15/2008
1/29/2008
2/12/2008
2/26/2008
3/11/2008

Figure 3. Frequency of Child Responsiveness, Child Initiations, and Child Negative Behaviors across treatment sessions.


Baseline
CDI
PDI
Post
Negative
Responsiveness
Initiations
Anna
Lucas
Mabel
Frequency
Date
10/9/07
10/23/07
11/6/07
11/20/07
12/4/07
12/18/07
1/1/08
1/15/08
1/29/08
2/12/08
2/26/08
3/11/08