

THEORETICAL JUSTIFICATION AND EVALUATION OF THE APPLICATION OF
PARENT-CHILD INTERACTION THERAPY (PCIT) TO FAMILIES OF CHILDREN WITH
AUTISM SPECTRUM DISORDERS

by

SARAH FLOYD VESS

(Under the Direction of Jonathan Campbell)

ABSTRACT

Parent-Child Interaction Therapy (PCIT) is an efficacious intervention that combines the behavioral approach to intervention with a relationship-based, naturalistic approach to decrease problem child behavior and improve family functioning in disruptive behavior disorder populations (Brinkmeyer & Eyberg, 2003; Eyberg, Nelson, & Boggs, 2008; Schuhman et al., 1998). A recently published study conducted by Solomon, Ono, Timmer, and Goodlin-Jones (2008) found that the utilization of PCIT with families of school-age children with ASDs produced beneficial results. To the author's knowledge, the present study is the first to evaluate the efficacy of PCIT as an intervention for families of pre-school age children with Autism Spectrum Disorders (ASDs). A multiple probe single subject design was used to evaluate PCIT with four families with children with ASDs (2 with Autistic Disorder, 2 with PDD-NOS) between the ages of 2 and 4 years old ($M = 40$ months). Families participated in weekly PCIT sessions over a four-month period ($M = 14.25$ sessions). Results demonstrated that PCIT was effective in increasing positive parenting behavior, decreasing negative parenting behavior, and increasing child compliance to parental commands. Parents reported greater confidence in their

parenting abilities post-treatment, but did not report significantly reduced stress. Significant improvement in core areas of autism symptomatology, including social approach behaviors and receptive-expressive language communication abilities, was reported by parents post-treatment. Further, parents endorsed significant improvement in aspects of the parent-child relationship, such as attachment and involvement. Results provide support for continued investigation of the efficacy of PCIT with families of preschool-age children. Implications and suggestions for future research applying PCIT to families of children with ASDs are discussed.

INDEX WORDS: autism, PCIT, intervention, behavior problems, family functioning, parent child relationship, parenting skills, compliance

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DEDICATION

This dissertation is dedicated to my husband, Kristopher David Vess, and to my children, Colin Michael Vess and Ava Victoria Vess. My husband supported my decision to return to school as we were starting our family and has sacrificed a great deal the past five years so I could get through the program and this dissertation. Without his love and support, this dissertation research could not have been accomplished. My beautiful, incredible children have missed out on a lot of time that should have been reserved for them so I could complete this dream. I decided to earn my doctorate so I could be an example to them and be someone they could be proud of, but didn't realize the opportunity cost they would pay on my way there. This milestone is a true reason for our family to celebrate as we embark upon the next chapter of our lives, and undoubtedly the next impossible adventure, knowing my husband and me.

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TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	v
LIST OF TABLES	x
LIST OF FIGURES	xi
CHAPTER	
1 INTRODUCTION	1
References	5
2 THEORETICAL JUSTIFICATION FOR PARENT-CHILD INTERACTION	
THERAPY (PCIT) AS AN INTERVENTION FOR FAMILIES OF CHILDREN	
WITH AUTISM SPECTRUM DISORDERS	8
Introduction	9
Impact of ASDs on Family Functioning	14
Principles of Autism Interventions	21
Efficacy of Autism Interventions	24
Justification for Evaluating the Efficacy of PCIT for Children with ASDs.....	29
PCIT Overview.....	30
Efficacy of PCIT	33
Links between PCIT and Clinical Needs of Families Affected by ASDs	39
References	46

3	THE EFFICACY OF PARENT-CHILD INTERACTION THERAPY (PCIT) FOR FAMILIES OF CHILDREN WITH AUTISM SPECTRUM DISORDERS	58
	Introduction	59
	Impact of ASDs on Parents	60
	Potential Contributions of PCIT to Early ASD Intervention	62
	Rationale and Purpose of the Present Study	62
	History and Theoretical Underpinnings of PCIT	63
	Research Questions	68
	Method.....	69
	Experimental Design	70
	Setting.....	71
	Procedure.....	72
	Assessments.....	72
	Intervention Protocol.....	82
	Reliability	83
	Results	85
	Discussion	96
	Implications	102
	Limitations.....	105
	Future Directions	106
	References	108
4	DISSERTATION SUMMARY	120
	References	126

LIST OF TABLES

	Page
Table 1: <i>Comparison of PCIT against Macus, Kuncze, & Schopler's (2005)</i>	
<i>Guidelines for Autism</i>	130
Table 2: <i>Participant Descriptions</i>	131
Table 3: <i>Measures Utilized at each Condition.</i>	132
Table 4: <i>DPICS-III Parent and Child Categories.</i>	133
Table 5: <i>Dependent Variables with Corresponding Measures</i>	134
Table 6: <i>Child Compliance in Clean-up Conditions</i>	135
Table 7: <i>Pervasive Developmental Disorders Behavior Inventory (PDDBI) Scores.</i>	136
Table 8: <i>Parenting Stress Index (PSI) Scores</i>	137
Table 9: <i>Child Behavior and Parenting Competence Measure Scores.</i>	138
Table 10: <i>Parent-Child Relationship and Parenting Affect/Competence Measure Scores.</i>	139
Table 11: <i>Multidimensional Scale of Perceived Social Support (MSPSS).</i>	140
Table 12: <i>Therapy Attitude Inventory (TAI) Scores</i>	141
Table 13: <i>DPICS-III Reliability Data</i>	142
Table 14: <i>Child Behavior Checklist Scores.</i>	143

LIST OF FIGURES

	Page
Figure 1: <i>Mother Do and Don't Skills</i>	144
Figure 2: <i>Percentage of Beta Compliance during Parent-Led Play</i>	146
Figure 3: <i>Eyberg Child Behavior Inventory (ECBI) Scores</i>	148
Figure 4: <i>Total Praise (TP)</i>	150

CHAPTER 1

INTRODUCTION

Autism Spectrum Disorders (ASDs) are neurodevelopmental disorders characterized by ritualistic/repetitive behaviors and impairments in reciprocal social interaction and communication. ASDs are a class of disorders that includes Autism, Asperger's Disorder, and Pervasive Developmental Disorder—Not Otherwise Specified. Autism is the most prevalent ASD (American Psychiatric Association, 2000). Along with the core symptoms of autism, behavior problems, such as self-injurious behavior (SIB), aggression toward others, and temper tantrums, are present in the majority of individuals diagnosed with ASD (Hastings, 2003). ASD literature describes the negative impact of behavior problems on family functioning, such as increased parental stress, depression, anxiety, and marital discord, and decreased family adjustment, cohesion, emotional expression, attachment, and well-being (Harris, 1994; Marcus, Kunc, & Schopler, 2005; Plant & Sanders, 2007; Roberts, Mazzucchelli, Taylor, & Reid, 2003). Associated behavior problems are considered the most significant stressors to the family (Roberts et al., 2003).

In light of research documenting impaired family functioning associated with ASDs, some authors have argued that ASD-related problems should be conceptualized as family problems rather than problems pertaining only to the individual with autism (Kazdin & Whitley, 2003; Harris, 1994). While the child's behavior problems can negatively impact family functioning, family problems can also significantly impact the child's functional and behavioral adjustment. Given the bi-directional influences between family functioning and child behavioral

functioning, positive outcomes for members of the family must be a focus of treatment in order for the post-treatment reduction in associated behavior problems to continue over time (Brookman-Frazee, Stahmer, Baker-Ericzen & Tsai, 2006; Marcus et al., 2005). Family involvement in treatment is associated with improvement in family functioning. Barriers to family participation are reduced and greater therapeutic change is evidenced in children with ASDs when parent factors are directly incorporated into the intervention (Kazdin & Whitley, 2003). Further, the employment of parents as therapists in the intervention of their children has been successful in both autism literature and parent training research with other clinical and typically developing populations (Eyberg, Nelson & Boggs, 2008; Brinkmeyer & Eyberg, 2003; Schreibman, 2000).

Family-based and parent training programs strive to decrease inappropriate child behavior, increase desirable child behavior, improve family relationship quality, and enhance family functioning (Marcus et al., 2005). Behaviorally-based treatments, such as Applied Behavior Analysis (ABA), demonstrate the most empirical support of the available interventions (Campbell, Herzinger, & James, 2008; Rogers & Vismara, 2008; Kasari, 2002). Relationship-based treatments, such as Integrated Play Groups and Floor Time, show some efficacy support (Simpson, 2005). Modified behavioral interventions that are more naturalistic and child-driven, such as Pivotal Response Training (PRT), have been shown to improve family functioning, even when disruptive behavior or skills specific to the core symptoms of autism were the target of the intervention (Koegel et al., 1992). Parent Child Interaction Therapy (PCIT), a behaviorally-based intervention package designed for use with families of preschool-age children with disruptive behavior disorders, is similar to PRT in that it employs behavioral principles in a natural, child-led social context.

The effectiveness of PCIT in treating children with disruptive behavior disorders has been documented comparing the effects of PCIT to wait-list and classroom controls (Eyberg, et al., 2008; Brinkmeyer & Eyberg, 2003). Additionally, the efficacy of PCIT in decreasing disruptive behavior and improving family functioning has been demonstrated for families of children with Separation Anxiety Disorder (SAD), Intellectual Disability (ID), Oppositional Defiant Disorder (ODD), Attention Deficit Hyperactivity Disorder (ADHD), and histories of physical child abuse (Bagner & Eyberg, 2007; Chase & Eyberg, 2008; Eyberg, 2005; Pincus, Santucci, Ehrenreich, & Eyberg, 2008). A recently published study (Solomon, Ono, Timmer, & Goodlin-Jones, 2008) demonstrated the feasibility of applying PCIT to families of high functioning children diagnosed with an ASD and clinically significant behavioral problems. The authors found PCIT effective in reducing parental perception of child atypicality and problem behaviors and in increasing shared positive affect and parental perception of child adaptability. However, this study employed several deviations from the PCIT manual (Eyberg & Child Study Lab, 1999), such as utilizing children outside the age range for which PCIT was designed and modifying the required number of positive parenting skills for graduation.

Rogers and Vismara (2008) call for more integration of developmental and behavioral practices in the treatment of individual with ASDs. Examples of effective blended intervention approaches have been documented in autism literature. For example, Kasari, Freeman, and Paparella (2006) successfully combined a developmental intervention approach with a traditional behavioral approach to teach symbolic play and joint attention skills to pre-school children with autism. Several techniques employed in their research are similar to techniques employed in PCIT, such as following the child's lead in play, commenting on the child's actions, repeating the child's comments, and imitating the child's actions with toys (Eyberg & Child Study Lab,

1999; Kasari et al., 2006). Possibly by applying techniques known to work with children with autism (i.e., behavioral and naturalistic) in the format of an intervention package already proven efficacious with other clinical populations, families affected by ASDs may benefit from PCIT.

The author of this dissertation has chosen the two paper option to propose that the implementation of PCIT, without modification, will be effective in decreasing disruptive behavior and increasing family functioning and adjustment in families of children with ASDs. In the first paper, I present a theoretical justification for the application of PCIT to the ASD population. I review autism literature citing the associated behavioral problems in children with autism and the impairment in family functioning that often stems from these behavioral problems. The principles of autism intervention and the efficacy of existing autism interventions are also reviewed. After the delineation of the theoretical underpinnings and efficacy of PCIT, an explanation of how PCIT can treat common family problems associated with autism is presented.

The second paper describes the study I conducted to evaluate the efficacy of PCIT in treating associated behavior problems and family adjustment problems in families of children with ASD. After a literature review which summarizes the ASD and PCIT information presented in Chapter 1, I describe the implementation of the intervention, present data analysis results, interpret study results, and discuss the implications and limitations of the current research study. The final chapter provides a concise summary which highlights the most significant results and implications of the entire dissertation document.

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CHAPTER 2

THEORETICAL JUSTIFICATION FOR PARENT CHILD INTERACTION THERAPY (PCIT)

AS AN INTERVENTION FOR FAMILIES OF CHILDREN WITH AUTISM SPECTRUM

DISORDERS

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ABSTRACT

Research literature has shown that the most significant stressors for families of children with Autism Spectrum Disorders (ASDs) are the child's behavior problems (Bebko, Konstantareas, & Springer, 1987; Hastings & Brown, 2002). Families of children with ASDs report increased parental stress and depression and diminished family cohesion, adjustment, well-being, and emotional expression (Harris, 1994; Marcus et al., 2005; Dissanayake & Sigman, 2001). There is a growing consensus that autism interventions should be conceptualized to target family problems, rather than problems pertaining only to the individual with autism (Kazdin & Wassell, 2000; Harris, 1994). Within the autism treatment literature, behaviorally-based treatments, such as Applied Behavior Analysis (ABA) and Pivotal Response Training (PRT), demonstrate the most empirical support (Campbell, Herzinger, & James, 2008; Rogers & Vismara, 2008; Kasari, 2002), while relationship-based treatments demonstrate promise as possible interventions (Simpson, 2005). Parent Child Interaction Therapy (PCIT) is an efficacious intervention that combines the behavioral approach to intervention with a relationship-based, naturalistic approach to decrease problem child behavior and improve family functioning in disruptive behavior disorder populations (Brinkmeyer & Eyberg, 2003; Eyberg, Nelson, & Boggs, 2008; Schuhman et al., 1998). This paper presents a theoretical justification for the application of PCIT as an intervention for families of children with ASDs.

KEY WORDS: autism, PCIT, intervention, behavioral problems, family functioning

Introduction

Autism Spectrum Disorders (ASDs) are neurodevelopmental disorders characterized by impairments in communication, reciprocal social interaction, and ritualistic and/or repetitive behaviors. Impairment in social-communication skills is qualitatively different from typical

development, rather than quantitatively different, as in individuals with Mental Retardation. For instance, individuals with ASDs may converse with others, but often fail to appropriately use nonverbal communication skills (e.g., eye contact coordinated with gesture) and follow social rules, such as knowing when to end a conversation or talking about topics that interest the other person. Persons with ASDs may speak with an odd vocal intonation or meaninglessly echo what someone has previously said to them. Ritualistic behaviors can be manifested as odd finger movements, hand flapping, interest in parts of an object rather than the object itself, unusual gait patterns, self-injury, and/or spinning of objects. For autism, manifestation of symptoms is required by the age of three, while for other ASDs, caregivers frequently report concerns with development within the first five years of a child's life. ASDs are a class of disorders comprised of Autism, Asperger's Disorder, and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS) (American Psychiatric Association [APA], 2000).

The disorders represent either varying degrees of symptomatology (e.g., Autism vs. PDD-NOS), the absence of impairment in a symptom area (e.g., Autism vs. Asperger's Disorder), or differences in developmental progression of symptoms. Despite the separation of ASDs into separate disorders, great variation still occurs between individuals falling within the same diagnostic category. For example, 80% of individuals with Autism reportedly function in the range of intellectual disability, while the other 20% may evince normal intellectual functioning, but exhibit more severely impaired social functioning (APA, 2000). Autism is the most common ASD, with recent figures estimating that Autism affects 13 out of 10,000 people. The overall estimate for all ASDs is 0.6% (Fombonne, 2005). Research data from a multi-site surveillance network study conducted by the Centers for Disease Control and Prevention found the prevalence of ASDs averaged 6.7 per 1,000 children aged 8 years in the year 2000 (Centers

for Disease Control and Prevention; CDC, 2007). Prevalence rates ranged from 4.5 in West Virginia to 9.9 in New Jersey. Data from the same study collected from 14 sites in 2002 demonstrated a stable prevalence rate of ASDs; 6.6 per 1,000 children were identified as having an ASD. Prevalence rates remained stable in the states with two-year data available, with the exception of an increasing trend in West Virginia and Georgia. While the finding of a stabilizing trend in the prevalence rate of ASDs is encouraging, the fact that one out of 150 children will be identified as having an ASD continues to make early identification and intervention significant public concerns (CDC, 2007). Males are three to four times more likely than females to be diagnosed with Autism (APA, 2000; CDC, 2007). A single cause of Autism has yet to be established, but research provides strong evidence to implicate genetic and neurobiological influences as important etiological factors. Several conditions have high comorbidities with autism, such as seizure disorders, genetic disorders (i.e., Fragile X syndrome), Tourette's Disorder, and mood disorders (e.g., depression; APA, 2000).

The significant variability in functioning and symptom manifestation of ASDs can complicate accurate diagnosis, interfere with intervention planning and initiation, and result in parents managing multiple professional relationships in coordinating the care of their child (Marcus, Kunc, & Schopler, 2005). Further contributing to these stressors are the behavioral problems associated with autism that are not essential for diagnosis, yet cause serious distress to the family (Dominick, Davis, Lainhart, Tager-Flusberg, & Folstein, 2006). Research has shown that the most significant family stressors are the behavior problems exhibited by children with developmental disabilities (Bebko, Konstantareas, & Springer, 1987; Hastings & Brown, 2002). Parents of children with developmental delays, including autism, report significantly more behavior problems during the child's first year of life, as well as longer persistence of behavior

problems, when compared to parents of typically developing children (Roberts, Mazzucchelli, Taylor, & Reid, 2003). For example, Dominick et al. (2006) found that 98% of children with autism in their sample exhibited at least one associated behavior problem. The most common abnormal behaviors associated with ASDs are unusual eating habits, abnormal sleep patterns, temper tantrums, aggression, and self-injurious behavior. Atypical eating behavior includes excessive food selectivity by type and texture, food refusal, and rituals surrounding eating. Sleep problems in children with Autism include the overall amount of sleep as well as the quality of sleep, specifically difficulty falling asleep, waking up frequently during the night, and awakening very early in the morning. Sleep difficulties are more common in younger children and are related to aggression, impulsivity, self-injurious behavior, and tantrums (Dominick et al.).

Temper tantrums and non-compliance are common in young children with Autism and tend to decrease with age. No universal and primary cause for temper tantrums in children with ASDs has been determined, however changes in routine and denial of a preferred activity or object are the most common causes cited in literature (Hastings & Brown, 2002). In research conducted by Dominick et al. (2006), 70% of the sample with autism had experienced temper tantrums, with 60% of those children experiencing temper tantrums on a daily basis. While temper tantrums and non-compliance do not pose as much immediate danger as aggression toward others, they have significant consequences for the individual with autism as they are associated with the development of more serious conduct problems later in development (Roberts et al., 2003).

Aggression toward self and others has been cited as the most recurrent and disruptive behavior problem associated with ASDs. In addition to the obvious danger to self and others, such as tissue damage, problems with aggression can also interfere with the child's learning

environment, academic progress, and daily living skills (Dawson, Matson, & Cherry, 1998; Koegel, Frea, & Surratt, 1984). Dominick et al. (2006) found 33% and 38% of children with ASDs engaged in self-injurious behavior (SIB) and aggression toward others, respectively. The most common types of SIB documented by Dominick et al. were head banging (65%), hitting oneself (50%), and biting oneself (30%). For children with ASDs, SIB typically arises as a problem during the toddler years and decreases with age. In 92% of the sample of children with ASDs, aggression was directed at more than one person. The most common targets of aggression were parents (88%), siblings (75%), and teachers (70%). Onset of aggression toward others typically occurs later than the onset of temper tantrums, but usually prior to age five. Aggressive behavior in individuals with ASDs has often been associated with lower cognitive functioning and expressive and receptive language problems. Aggression toward others typically becomes worse at the onset of puberty in roughly half of individuals with ASDs. While aggression often stays at prepubertal levels in at least 50% of adolescents with ASDs, the fact that the child is much bigger, stronger, and harder to restrain is problematic to teachers and caregivers (Gillberg & Schaumann, 1989).

The frequent co-occurrence of associated behavior problems, along with their severity, early age of onset, and persistence throughout adolescence, highlight how difficult adjusting to a child with ASD may be for families. This difficult period has significant implications on family functioning. For example, maternal stress has been directly linked to child behavior problems (Hastings et al., 2005) and behavior problems have been found to be more significant predictors of parental stress than intellectual disability (Baker et al., 2003).

Impact of ASDs on Family Functioning

Literature examining the impact of ASDs on family functioning consistently documents problems with stress, depression, marital discord, and anxiety. With respect to general family functioning, families of children with ASDs report diminished family cohesion, adjustment, well-being, and emotional expression (Harris, 1994; Marcus et al., 2005; Nachshen & Minnes, 2005; Roberts et al., 2003; Norton & Drew, 1994; Seltzer, Wyngaarden-Krauss, Orsmond, & Vestal, 2001). The impact of ASDs in each area is briefly reviewed in the next section.

Parental affect. Parents of children with ASDs report significant levels of stress (Roberts et al., 2003; Nachshen & Minnes, 2005; Gray, 1997; Hastings & Johnson, 2001; Sharpley, Bitsika, & Efremidis, 1997). Research has documented that parents of children with autism report more stress than parents of typically developing children (Baker, Blacher, Crnic, & Edelbrock, 2002; Baker-Ericzen, Brookman-Frazee, & Stahmer, 2005; Sharpley, Bitsika, & Efremidis, 1997; Woolfson & Grant, 2006) and parents of children with Down syndrome (Abbeduto et al., 2004; Wolf, Noh, Fisman, & Speechley, 1989). In general, mothers report more stress than fathers of children with ASDs (Baker-Ericzen et. al, 2005; Moes, Koegel, Schreibman, & Loos, 1992; Seltzer et al., 2001), however some studies found no differences between parental reports of stress (Hastings, 2003). Both mothers and fathers of children with Autism report significant stress associated with their inability to relate to their children (Koegel et al., 1992). Hastings (2003) found mothers' stress to be related to child behavior problems and fathers' mental health symptoms, while fathers' stress was unrelated to characteristics of the child or the mother's mental health. For both mothers and fathers, amount of parental stress has been positively related to severity of ASD symptomatology (Bebko et al., 1987; Konstantareas & Homatidis, 1989).

Sources of stress most frequently reported by family members are embarrassing, disruptive behaviors in public places, the restrictions that disruptive behavior places on the family's activities and ability to make spontaneous plans, level of child disability, and difficulty completing specific caregiving tasks due to behavior problems (Gray, 1997; Marcus et al., 2005; Plant & Sanders, 2007). Baker-Ericzen et al. (2005) found the child's level of social skills to be a significant predictor of maternal stress in mothers of children with Autism. Lecavalier, Leone, and Wiltz (2006) found the presence of behavior problems to be more strongly associated with stress than any other parent or child characteristic measured in the study. Specifically, child conduct problems and lack of prosocial behavior were the biggest predictors of parental stress. Parental reports of stress and child behavior problems were stable over a 12-month period, suggesting a reciprocal relationship between parental stress and child behavior problems. Koegel et al. (1992) identified a specific profile of parenting stress in parents of children with autism. Specifically, stress was related to concerns regarding the future of the child, the child's level of cognitive impairment, the child's ability to function independently, and the ability of the child to be accepted by the community.

Children with ASDs produce a pattern of stressors that appear to be unique from other childhood disorders. Diagnostic confusion, uneven course of development, atypical social communication, typical physical appearance, inconsistencies in responses across situations, embarrassing and disruptive public behavior, management of multiple professional relationships, and the continual development of fad therapies all contribute to the unique pattern of stressors associated with ASDs (Marcus et al., 2005). Parents often serve dual roles as parent and therapist/teacher in response to their child's extensive intervention needs, thereby creating additional stress. Additional parenting stress may result from the demands created by the dual

parent/therapist relationship, from discontinuing a career to serve as their child's full-time intervention provider, or a combination of the two (Seltzer et al., 2001).

Mothers of children with autism report more depressive symptomatology when compared to mothers of children with intellectual disability (Abbeduto et al., 2004), mothers of children with Down syndrome (Wolf et al., 1989), and mothers of typically developing children (Baker-Ericzen et al., 2005; Olsson & Hwang, 2001). Pakenham, Samios, and Sofronoff (2005) found clinically significant ratings of depression and anxiety in 20% and 30% of mothers of children with Asperger disorder, respectively. In a sample of 430 families in Sweden, 50% of mothers of children with autism had elevated depression scores, compared to 45% of mothers of children with intellectual disability, and 15 – 21% of mothers of typically developing children. Mothers of children with autism and/or intellectual disability had higher depression scores than fathers of children in the same diagnostic groups (Olsson & Hwang, 2001). Likewise, Hastings (2003) found that mothers reported significantly more anxiety than fathers in families of children with ASDs. While mothers and fathers might report differing levels of depression, both maternal and paternal depression have strongly predicted partner stress (Hastings et al., 2005).

Parental competence. Mothers of children with Autism report lower parenting competency than mothers of typically developing children (Rodrique, Morgan, & Geffken, 1990). Woolfson and Grant (2006) found a relationship between level of parental stress and parenting style in parents of children with developmental delay (DD). Increased parental stress was associated with more controlling parenting styles (i.e., authoritarian and authoritative) for parents of children with DD. The opposite was found in parents of typically developing children as neglectful parenting was associated with increased stress for this group. Further, differences in parenting styles between pre-school and older children were found for parents of both

typically developing and developmentally delayed children. In the DD group, 36% of parents of preschool children used authoritative parenting, while only 5% of parents of older children reported authoritative parenting styles. The inverse was seen in the typically developing population, with 9% of parents of younger children demonstrating authoritative parenting styles, and 34% of parents of older children reporting authoritative parenting. The authors suggest that factors related to the child's disability may make implementation of authoritative parenting techniques extremely stressful (Woolfson & Grant).

Parenting self-efficacy may be an important variable in understanding the effects of a child's disability on his/her parents. Self-efficacy refers to the perceptions of one's skills in a given domain or situation. Generally, greater self-efficacy is positively related to psychological well-being and inversely related to psychological distress (Bandura, 1977). Relationships between self-efficacy and parenting stress and competence have been identified in the parenting literature in both clinical populations and parents of typically developing children. Within samples of families with DD, caregiver demands and child behavior problems are predictive of parenting self-efficacy (Gowen, Johnson-Martin, Goldman, & Appelbaum, 1989). Hastings and Brown (2002) found that self-efficacy served as a mediating variable for mothers of children with autism, indicating interventions which improve self-efficacy will directly improve the mother's mental health, regardless of child characteristics. Similarly, self-efficacy served a moderating role for fathers of children with autism, and improvements in self-efficacy reduced the impact of child behavior problems on anxiety in fathers dealing with the most behaviorally challenging children.

Attachment. Research on attachment in children with autism has demonstrated that, despite deficits in reciprocal social interaction, children with autism do become attached to their

mothers and experience positive parent-child interactions (Dissanayake & Sigman, 2001; Rutgers, Bakermans-Kranenburg, van IJzendoorn, & van Bercklaer-Onnes, 2004). For example, children with autism display attachment behavior toward their parents when distressed, increase proximity seeking behavior upon reunion with the parent after a period of separation, and show discrimination between their parent and a stranger by directing more social effort toward the parent than the stranger. In a meta-analytic review of attachment and autism, Rutgers et al. (2004) found the average percentage of securely attached children with autism was 53% across sixteen studies. The meta-analysis of these sixteen studies suggested that children with autism score approximately one-half of a standard deviation lower than children without autism. While children with autism are capable of secure attachment, children with autism show less attachment security than typically developing children and demonstrate impairments in responsiveness, contact seeking, and maintaining contact with their mothers compared to controls. Differences in attachment security disappeared when samples of children with higher cognitive development and samples of children with less severe symptoms of autism were included. The latter findings led the authors to conclude that co-morbidity of mental retardation with autism is associated with insecure attachment.

Maternal-child relationship patterns. In a study comparing psychological well-being for mothers of children with autism, Down syndrome, and Fragile X, Abbeduto et al. (2004) found that mothers of adolescents with autism reported higher levels of pessimism, more distant parent-child relationships, and less feelings of reciprocated child closeness than mothers of adolescents with Down syndrome. Similarly, Hoppes and Harris (1990) found that mothers of children with autism rated their children as less responsive and less expressive of emotional closeness and attachment than mothers of children with Down syndrome. The authors found that mothers'

self-reports of feeling gratified and reinforced by their children were positively related to mothers' perceptions of child attachment. Further, mothers' perceptions of gratitude and reinforcement from the child correlated with the amount of emotional responsiveness, attachment, and reciprocity they perceived from the child. Given this finding, increasing children's emotional reciprocity and attachment behavior may alter mothers' perceptions of child reinforcement and result in an improved parent-child relationship.

Similarly, Orsmond, Mailick-Seltzer, Greenberg, and Wyngaarden-Krauss (2006) found that 90% of mothers of children with autism reported high levels of affection for their child, but they perceived significantly less positive affect reciprocated by the child. Higher levels of reported positive affect were associated with greater parent-child relationship warmth and less criticism. Maladaptive child behaviors and maternal pessimism were the most significant predictors of affect, warmth, and criticism. Less criticism and greater warmth and positive affect were associated with less maternal pessimism and less severe child maladaptive behaviors. Mothers reporting higher levels of warmth and positive affect reported less caregiver strain and more benefits of caregiving for a child with autism (Orsmond et al., 2006).

Family adjustment. Despite the increased prevalence of stress and family problems in families of children with ASDs, not all families experience the same degree of adjustment difficulties. Research has demonstrated that family functioning is not entirely determined by the stressor, but rather the family's perception of the stressor and their ability to cope with that stressor is related to overall family functioning (Harris, 1994). The biggest risk factor for poor adaptation in families of children with autism is parental appraisal of the situation. Other risk factors for poor family adaptation include maternal self-blame and the "pile-up" of other multiple life stressors, such as marital discord, financial hardship, poor health, and management

of service providers (Seltzer et al., 2001). Parental coping skills and perceived adequacy of social support have been demonstrated to buffer stress associated with having a child with an ASD and positively impact family adjustment. For example, Henderson and Vandenburg (1992) demonstrated that in families of children with autism, family adjustment is highest when parents have an internal locus of control, more social support, and when the severity of the child's symptoms are lower.

The ABCX model of family adjustment. Recent research applying the ABCX model of family adjustment to families of children with autism has supported earlier findings that perception of stressors, coping skills, and social support are better predictors of family outcomes than the presence of the disorder itself (Pakenham et al., 2005; Nachshen & Minnes, 2005). The ABCX model was originally developed by Hill (1949) to conceptualize the family stress process. In the ABCX model, the stressor (A), the family's resources to meet crisis (B), and the definition the family attributes to the stressor (C) contribute to prevent or produce a family crisis (X). McCubbin and Patterson (1983) expanded upon Hill's original model to create the Double ABCX model; (aA) represents the severity of the stressor and the pile-up of demands and stressors, (bB) represents family resources applied to solve a crisis, (cC) are the changes the family makes to their definition of the situation in order to understand it, (BC) refers to the coping strategies employed by the family, and the outcome on the family's adjustment is represented by (XX). Salovita, Italinna, and Leinonen (2003) used the double ABCX model to guide their research on family adjustment and found the single largest predictor of stress in parents with developmental disabilities was the negative definition the family applied to their situation. Interestingly, for mothers, the negative definition was associated with the behavioral problems of the child, while social acceptance of the child was associated with the negative

definition for fathers. Nachshen and Minnes (2005) also used the ABCX model to guide their research with families with developmental disabilities and found that the relationship between child behavior problems and parental empowerment was mediated by parent well-being and formal/informal sources of support. The double ABCX model was also used to study the psychological adjustment of mothers of children with Asperger disorder. For example, Pakenham et al. (2005) found that higher levels of emotional approach coping and social support, and lower levels of child behavior problems, stressor pile-up, and passive avoidant coping were associated with better family adjustment (Pakenham et al.). Research guided by the ABCX model of family adjustment lends support to the argument that intervention services for children with ASDs should be family-centered in order to optimize positive development for the child.

Principles of Autism Interventions

While the core features of autism and the behavioral problems associated with the disorder can significantly impact family functioning, family problems can also negatively impact children's behavioral adjustment. The reciprocal relationship between the child's behavior problems and family dysfunction necessitates early intervention that focuses not only on reducing the child's behavior problems, but also on improving family functioning, so that improvements in child behavior can be maintained (Harris, 1994; Pakenham et al., 2005, Rogers & Vismara, 2008). Given that ASDs are pervasive disorders that affect most areas of family life, problems should be conceptualized as family problems rather than problems pertaining only to the individual with autism (Harris, 1994). In order for the initial reductions in child disruptive behavior to be maintained over time, positive outcomes for other members of the family, such as reduced stress and increased competence, must be a focus of treatment (Rogers & Vismara, 2008). Gray (2002) conducted longitudinal research on the psychosocial adaptation of families

of children with autism and found that 75% of families experienced improvements in psychological well-being, social experiences, relationships with extended family members, and strategies for coping with stressful experiences after a 10-year period. Yet, 25% of the sample reported either no improvement or deterioration of their family situation 10 years after their children were diagnosed with autism (Gray, 2002).

Intervention literature for children with ASDs consistently states that parents should play a collaborative and active role in the design and implementation of their child's intervention services (Brookman-Frazee et al., 2006; Kasari, 2002; Marcus et al., 2005; Rogers & Vismara, 2008). Several studies have documented the success of interventions that utilize parents as co-therapists and primary therapists for their children with autism (Harris, 1994; Harris, 1987; Marcus, Kuncze, & Schopler, 2005; Pakenham et al., 2005; Roberts et al., 2003). Literature on parent training with clinical populations other than autism demonstrates that when parents are actively involved as change agents in their child's treatment, improvement extends beyond the child's observed symptoms. Research enlisting parents as intervention providers has documented increased parental self-efficacy and competence, generalization to other family members, and longer maintenance of treatment gains (Eyberg, Nelson, & Boggs, 2008; Eyberg & Matarazzo, 1980; Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998; Schopler, 1994).

Parent training and family-based programs commonly strive to increase appropriate child behavior, decrease inappropriate child behavior, enhance family functioning, and improve family relationship quality. Marcus et al. (2005) argue that, while the above goals are appropriate for families of children with autism, individualized assessment of each family's needs must be conducted in order to identify goals that address stressors facing family members, as well as the common stressors facing families of children with autism. The three general principles of

family-based intervention that are most applicable to families of children with autism are: (a) emphasis on collaborative parent-professional relationships that respect family views, (b) conceptualization of parent-child relationships as a transactional model established and maintained over time, and (c) individualization to both the family's and child's specific needs (Marcus et al., 2005).

Marcus et al. (2005) identified eight general approaches to family-based interventions that are most important in treating families of children with autism: (a) education, (b) enlisting parents as therapists, (c) adopting a behavioral approach, (d) targeting relationship enhancement, (e) including a cognitive approach, (f) providing emotional support, (g) providing instrumental support, and (h) advocacy training. The educational approach involves providing family members with information from the ASD literature in a non-threatening, easy to understand format. Enlisting parents as co-therapists is a strategy that includes training parents on behavior management techniques or how to implement instructional techniques. Family members apply learning principles to child education and management in interventions utilizing the behavioral approach. For example, families learn to use the techniques of shaping, extinction, positive reinforcement, and relaxation. Alternatively, the cognitive approach teaches family members to modify behavioral and emotional responses with cognitive techniques, such as problem solving and self-monitoring. Relationship enhancement approaches focus on helping families increase the positive aspects of the parent-child relationship, while simultaneously decreasing negative aspects. Families learn attending skills, child-directed play time, and how to deliver effective commands. In the emotional and instrumental support approaches, family members are assisted by providing empathy and problem solving support or via assistance in obtaining access to services and resources, respectively. The advocacy training approach supports families in

developing the skills to advocate for the child's needs across his/her lifetime (Marcus et al., 2005). While many intervention packages include several of the above approaches to meet treatment goals, no single intervention encompasses all eight approaches. For example, pivotal response training (PRT: Koegel, Koegel, & Carter, 1999) combines parental education, employs a behavioral approach and enlists parents as therapists. While the ASD intervention literature documents advantages and disadvantages of these eight approaches, general agreement on the best treatment approaches has not been reached. For example, no large-scale, methodologically sound, replicated study comparing major intervention approaches exists (Rogers & Vismara, 2008; Kasari, 2002; Marcus et al., 2005).

Efficacy of Autism Interventions

Within the autism treatment literature, behaviorally-based treatments, such as Applied Behavior Analysis (ABA), demonstrate the most empirical support (Campbell, Herzinger, & James, 2008; Kasari, 2002), while relationship-based treatments demonstrate promise as possible interventions (Simpson, 2005). Early intervention programs based on ABA, social learning theory, and parent training have demonstrated the ability to reduce behavior problems and build competencies for children with ASD (Rogers & Vismara, 2008). Within the autism intervention literature there is general consensus that ABA approaches are more effective when implemented intensively and when conducted with younger children and children of higher intellectual ability (Roberts et al., 2003; Kasari, 2002). PRT has been shown to improve family functioning, even when family functioning was not a specific target of the intervention (Koegel, Koegel, & Carter, 1999). Parent-child relationship quality in families of children with autism has also been improved when directly targeted in the relationship enhancement approach designed by Greenspan (Simpson, 2005).

Behavioral interventions for ASD. Practitioners began developing behavioral interventions for children with autism based on operant learning principles beginning in the 1960's. Behavioral techniques do not target the "cause" of autism or attempt to treat the disorder at a syndromal level, rather behavioral techniques are employed based upon the principle that autism is comprised of specific behavioral deficits and excesses (e.g., Lovaas & Smith, 1989). Once the controlling factors of a behavioral deficit or excess have been determined, the behavioral interventionist manipulates the environment in a manner that maintains, increases, or decreases the addressed specific behavioral deficit or excess (Schreibman, 1994). Early behavioral interventions demonstrated that children with autism were able to respond to treatment and make improvements. The promising results achieved by early behavioral intervention efforts have informed contemporary ABA techniques used today (Koegel et al., 1999). ABA is the conceptual basis for several types of intervention aimed at improving functioning in individuals with autism. Techniques such as Discrete Trial Training (DTT), Incidental Teaching (IT), Milieu Teaching (MT), and Pivotal Response Teaching (PRT) are utilized to improve communication, language, socialization, cognitive, joint attention, and play skills of individuals with autism. Similar to earlier behavioral treatments, newer ABA techniques target specific behaviors for intervention, either acquiring skills to address deficits or reducing problem behaviors (Campbell et al., 2008). While ABA encompasses a wide variety of specific techniques, the concept of systematic instruction informs all ABA instructional techniques. Universal steps of systematic instruction are to: (a) identify the content of the curriculum, (b) conduct ongoing, curriculum-based assessments, (c) involve an interdisciplinary team in program planning and implementation, (d) plan an individualized instructional program, (e) implement instruction and monitor the student's progress, and (f) evaluate the student's

overall progress at regular intervals (Wolery, Jones-Ault, & Munson-Doyle, 1992). For example, functional and reinforcer assessments are typically conducted to assist in identifying curriculum content and planning the instructional program, as well as determining which reinforcers should be used systematically throughout the intervention.

Discrete Trial Teaching (DTT). DTT, a highly structured version of behavioral intervention based on operant conditioning principles, has often been employed as an intervention technique for children with autism (Campbell et al., 2008). DTT employs repetitive practice in the structure of learning trials presented in block format. Each trial consists of a concise task instruction or question, the child's response, and a specific consequence determined by the child's response (i.e., correct or incorrect; Schreibman, 2000). DTT has been effective in both suppressing problem behaviors, such as SIB, and in increasing desired behaviors, such as joint attention and language. Although extensive DTT programming has been associated with remarkable developmental gains, DTT intervention does not yield positive outcomes for all children with ASDs, and gains have been thought to be proportional to the amount of time spent in treatment (Lovaas, 1987). Critics of the DTT approach to intervention argue that the intervention is time-consuming and has failed to show consistent generalization of effect to other environments and maintenance of effects over time. In response to these criticisms of DTT, less structured and more naturalistic techniques have been developed, such as Milieu Teaching (MT) and Pivotal Response Training (PRT). These techniques have a broader conceptualization of the instruction and consequence concepts (Schreibman, 2000).

Pivotal Response Training. PRT utilizes both a developmental framework and ABA procedures to increase a child's motivation to participate in learning new skills (Koegel, Odell, & Koegel, 1987). Rather than focusing on specific tasks, such as saying the word "ball," PRT

targets pivotal behaviors thought to produce broad improvements, such as decreases in overall problem behavior. Pivotal behaviors are central to wide areas of functioning and PRT operates on the notion that changes in these pivotal behaviors will produce widespread changes across a number of behaviors. Examples of targeted pivotal behaviors include self-management, motivation, child self-initiations, and responding to multiple cues (Schreibman, 2000).

Specific strategies employed in PRT include: (a) presenting clear instructions only when a child is attending, (b) interspersing new difficult tasks with previously mastered tasks, (c) allowing the child to select activities, (d) reinforcing attempts, (e) employing naturally occurring consequences, and (f) incorporating turn taking (Koegel et al., 1999; Koegel et al., 1987; Koegel et al., 1984). PRT employs a DTT format in that clear instructions, response consequences, and prompts are utilized to ensure correct responding (Koegel et al., 1999). However, PRT departs from typical analog DTT in that specific variables are altered, rather than specific behaviors, in order to produce wider effects. Other differences between PRT and analog DTT include the use of natural rather than arbitrary reinforcers, employment of interspersed mastery trials rather than massed trials, use of child-selected materials rather than adult-selected materials, play-based interaction rather than stimulus-question driven interaction, and child-initiated responses rather than adult-initiated interactions (Koegel et al., 1999).

While typically utilized with school-age children, several research studies demonstrate the efficacy of PRT teaching methods with preschool-age children (Rogers & Vismara, 2008). PRT techniques have been employed to improve symbolic play skills, joint attention behaviors, self-initiations, expressive language, and social skills in preschoolers (Brookman-Frazee et al., 2006; Kasari, 2002; Koegel et al., 1999; Rogers & Vismara, 2008; Whalen & Schreibman,

2003). Results of these PRT studies are encouraging as they demonstrate that core deficit areas experienced by children with ASDs can be ameliorated.

Combined behavioral and developmental approaches to ASD intervention. Rogers and Vismara's (2008) recent review of comprehensive treatment for Autism highlighted the need to integrate developmental and behavioral practices when designing and employing future ASD interventions. As previously stated, ABA research is not only prevalent within autism literature, but also shows the most empirical support (Brookman-Frazee et al., 2006; Campbell et al., 2008). However, the majority of community-based intervention services are conducted by providers trained from a developmental perspective, such as early childhood educators and occupational therapists. While peer-reviewed publications often refer to behavioral and developmental interventions as separate entities, many interventions children with ASD receive in the community and school are actually blended from the two perspectives (Rogers & Vismara, 2008). Kasari, Freeman, and Paparella (2006) combined a developmental intervention approach with a traditional behavioral approach to teach joint attention and symbolic play skills to pre-school age children with autism. The authors combined ABA with developmental procedures, specifically responsive and facilitative interactive methods. The rationale for combining the two approaches was to maximize learning through repetition and drill and then facilitate generalization by teaching the skills in a semi-structured social-play context.

In the Kasari et al. (2006) study, each child participated in 5 – 8 minutes of DTT in order to prime the treatment goal specific to the group in which they were participating (i.e., joint attention vs. symbolic play vs. control). A system of least prompts (SLP) hierarchy was utilized, along with positive reinforcement, to achieve the desired response. The child was moved to the floor to work on the same skill with the experimenter using naturally occurring opportunities

similar to MT. The floor session was child-directed. The experimenter employed systematic prompting and reinforcement to shape the target skill. Principles employed during the floor session included: talking about what the child was doing, repeating back what the child said, expanding upon what the child said, following the child's lead, imitating the child's actions with toys, use the child's play activities to develop play routines, sitting close to the child, making eye contact with the child, giving corrective feedback, and making adjustments to the environment in order to keep the child engaged (Kasari et al., 2006).

Utilizing this approach, children with autism acquired joint attention and play skills and generalized these skills to new people and situations. Children in the play group showed more sophistication of play and greater variety of play, while children in the joint attention group showed improvement in responding to joint attention and in initiating shows. Not only were these gains seen with the treatment provider, the children also showed improvement in these same areas during play with their mothers (Kasari et al., 2006).

Justification for Evaluating the Efficacy of PCIT for Children with ASDs

In the final section of this paper, the author argues that an empirically supported therapeutic intervention, Parent-Child Interaction Therapy (PCIT), is a worthwhile intervention strategy to evaluate for use with families affected by ASD. The section begins with a brief theoretical overview of PCIT followed by a review of the empirical support for PCIT when evaluated with children and families with childhood disorders. Finally, the author links the clinical needs of families affected by ASD with the domains targeted for therapeutic change in PCIT. The linkage is guided by Marcus et al.'s (2005) recommendations for family-based early intervention for children with autism.

PCIT Overview

Parent-Child Interaction Therapy (PCIT) is a behaviorally-based intervention package that emphasizes changing parent-child interaction patterns, improving child behavior, and enhancing the quality of parent-child relationships. During PCIT, parents are taught specific skills to establish a secure, nurturing relationship with their child, while simultaneously increasing their child's prosocial behavior and decreasing their child's negative behavior (Bell & Eyberg, 2002). PCIT includes two distinct phases of treatment, Child-Directed Interaction (CDI) and Parent-Directed Interaction (PDI). CDI resembles play-based therapy in that parents engage their child in play in order to improve the child's social skills, increase positive parenting, and strengthen the parent-child bond. CDI is reported to improve parent-child interactions by facilitating a secure attachment between parent and child. PDI trains the parent to implement specific behavior management techniques during play in order to establish consistent contingencies for child behavior (Eisenstadt, Eyberg, McNeil, Newcomb, & Funderburk, 1993; Eyberg & Child Study Lab, 1999).

History and Theory of PCIT. PCIT was originally developed 30 years ago by Dr. Sheila Eyberg to treat children experiencing behavioral and emotional problems. The development of PCIT was heavily influenced by the work of Diana Baumrind. Attachment and learning theories provided focus to PCIT, while Hanf's two-stage theory provided PCIT's structure (Herschell, Calzada, Eyberg, & McNeil, 2002).

Parenting styles. Baumrind (1966; 1967; 1991) identified three different parenting styles (authoritarian, permissive, and authoritative) and studied the effects of these parenting styles on child development. The authoritarian parent utilizes an absolute, set standard of conduct to shape, control, and evaluate the behavior and attitudes of the child. This type of

parent values obedience, restricts child autonomy, and uses punishment when the child violates the behavioral standard. The permissive parent utilizes acceptance and affirmation of the child's actions and impulses. This type of parent allows the child to regulate his own actions, avoids exercising control or punishment, and does not encourage the child to obey externally defined standards. She makes few demands on the child and uses reason, rather than power, to achieve her parenting goals. The authoritative parent uses a rational, issue-oriented approach to direct the child's activities. This type of parent shares the reasoning behind her parental policy with the child and listens to his objections when he refuses to conform. An authoritative parent gives affirmation to the child's present qualities while setting standards for future conduct by enforcing her own perspective and recognizing the child's individuality. She exerts firm control at times of parent-child disagreement, but does not overwhelm the child with restrictions (Baumrind, 1967).

Baumrind's (1966; 1967; 1991) research documents that children have a dual need for nurturance and limit-setting from their parents in order to achieve optimal outcomes. The authoritative parenting style best addresses these needs and has been associated with the most successful outcomes for children. The authoritarian and permissive parenting styles result in maladaptive parent-child interactions. PCIT provides a framework which assists in understanding the behavioral and relational patterns within family systems that lead to the development and maintenance of disruptive behavior. PCIT provides a mechanism for changing these maladaptive patterns into parent-child interactions that characterize authoritative parenting (Brinkmeyer & Eyberg, 2003).

Attachment and Social Learning Theory. PCIT draws on attachment and social learning theories to promote the change to authoritative parenting techniques (Bell & Eyberg, 2002). Attachment theory states that parents who recognize and warmly respond to their children's

emotional needs enable their children to develop a more secure working model of relationships and more effectively regulate their emotions (Ainsworth, 1979). Children who have parents that do not effectively respond to their distress or are intolerant of their emotional expression are often insecurely attached. A stable parent-child attachment is essential in the child's behavioral, emotional, and social development (Ainsworth, 1989). Insecure attachment has been related to increased maternal stress and child abuse and neglect (Dissanayake & Sigman, 2001). Further, problematic parent-child attachment has been correlated with children's aggressive behavior, low self-esteem, poor peer relationships, ineffective coping skills, and underdeveloped social competence (Hoppes & Harris, 1990). PCIT capitalizes on the notion that parents can have a significant impact on their child's behavior during the preschool years when children are more responsive to parental attention and less influenced by peers (Eyberg, Schuhmann, & Rey, 1998). The first phase of PCIT, Child Directed Interaction (CDI), was developed to facilitate a secure attachment between parent and child (Bell & Eyberg, 2002).

Social learning theory. Social learning theory informed the development of the second stage of PCIT, PDI. The goal of PDI is to decrease problematic behaviors while increasing low-rate prosocial behaviors (Eisenstadt et al., 1993). Social learning theory emphasizes the contingencies that shape dysfunctional interactions between children and their parents and emphasizes that children learn behavioral control by observing how their parents control their own behavior. Patterson's (1982) coercion theory posits that maladaptive parent-child interactions are the mechanism by which child disruptive behavior is developed and maintained. Based on Patterson's model of coercive parenting, parents must alter their behavior and incorporate firm limit setting within the context of an authoritative relationship to alter the

dysfunctional interaction pattern. PCIT aims to establish the authoritative relationship in CDI and addresses the need to set firm, clear limits in PDI (Brinkmeyer & Eyberg, 2003).

Hanf's Two-Stage Treatment Model. The therapeutic techniques employed in PCIT are based on Hanf's (1969) two-stage treatment model. Hanf developed a methodologically sophisticated treatment program to train mothers of developmentally disabled children to improve child compliance. Stage 1, called Child's Game, trained mothers to engage in differential social attention (i.e., ignoring problem behavior and paying attention to cooperative behavior) when playing with their children. Stage 2, called Mother's Game, trained the mothers to give direct commands, employ time-out procedures for disobeying, and to praise the child for obeying (Eyberg, 2004). Hanf's model informed the development of PCIT by providing both the structure to teach parents play therapy skills and the nurturance necessary for authoritative parenting, while providing the opportunity for children to experience play therapy more than the traditional one hour per week with their therapist. Similar to Hanf's program model, PCIT consists of two distinct intervention phases, CDI and PDI (Eisenstadt et al., 1993).

Efficacy of PCIT

The efficacy of PCIT in treating children with disruptive behavior has been documented in studies comparing the effects of PCIT to wait-list controls (Bagner & Eyberg, 2007; McNeil, Capage, Bahl, & Blanc, 1999; Schuhmann et al., 1998), classroom controls (McNeil, Eyberg, Eisenstadt, Newcomb, & Funderburk, 1991; Funderburk et al., 1998), group parent training (Eyberg & Matarazzo, 1980), and modified PCIT (Nixon, Sweeney, Erickson, & Touyz, 2003). Along with decreasing disruptive behavior in children, PCIT efficacy studies have shown key changes in parents' behaviors toward their children, such as increased prosocial verbalization, physical proximity, and reflective listening. Research on the effectiveness of PCIT has

demonstrated improvement in parents' self report measures of personal distress, parenting locus of control, and psychopathology (Schuhmann et al., 1998). PCIT treatment effects have also been found to generalize to untreated siblings, to the school setting, and across time (Edwardes, Eyberg, Rayfield, Jacobs, Bagner, & Hood, 2002; Eyberg, Funderburk, Hembree-Kigin, McNeil, Querido, & Hood, 2001; Funderburk et al., 1998; McNeil et al, 1991).

A recently published meta-analysis of PCIT and Positive Parenting Program (Triple P; Sanders, Markie-Dadds, & Turner, 1998) outcome research supported the efficacy of PCIT across 13 studies conducted by multiple research teams and concluded that PCIT meets criteria for a "well-established treatment" (Thomas & Zimmer-Gembeck, 2007; Chambless & Hollon, 1998). Large effect sizes for differences in observed parent behaviors (.76 – 5.67) and medium to large (.61 – 1.45) effect sizes were found across PCIT studies comparing treatment groups to waitlist groups. Medium to large pre-post treatment effect sizes for both observed changes in child behavior (-.54 to .94) and parental report of child negative behavior (-.83 to -1.31) were found in single-group design studies, while large effect sizes were reported for changes in observed parental positive and negative parenting behaviors (1.11 – 3.11). PCIT was reported to demonstrate greater effect sizes than Triple P on most outcome variables (Thomas & Zimmer-Gembeck).

Child behavior. Several efficacy studies have demonstrated statistically and clinically significant improvements in children's home and school behavior problems. Schuhman et al. (1998) randomly assigned 64 families to an immediate treatment (IT) or waitlist control (WL) to test the efficacy of PCIT. Parents in the IT group were more successful in obtaining child compliance post-treatment than parents in the WL group. The IT group reported statistically and clinically significant improvements in child behavior after treatment. Eisenstadt et al. (1993)

conducted a PCIT efficacy study with 24 mother-child dyads and found that children moved from clinical ranges to within normal limits on measures of compliance, activity level, and conduct problems post-treatment. Childhood self-esteem also improved as a result of treatment. Similarly, Eyberg and Robinson (1982) demonstrated a significant reduction in the frequency and intensity of behavior problems measured by the ECBI after PCIT.

Relationship between parent and child. In addition to improvements in child behavior and compliance, significant changes in parents' interactional style have been demonstrated after participating in PCIT (Bagner & Eyberg, 2007; Eisenstadt et al., 1993; McNeil et al., 1991; Schuhmann et al., 1998). Schuhman et al. (1998) found that parents interacted more positively with their child post-treatment while Dombrowski et al. (2005) demonstrated improvement in mother and child emotional availability scores post-treatment in a case study adapting PCIT to the toddler population (Parent Child Attunement Therapy; PCAT). During post-treatment play, the mother was more creative, more positive, more involved, and less directive than during pre-treatment play.

Parent functioning. Outcome research has also documented positive effects of PCIT on both parental competence and affect. Parents have reported more confidence in the ability to manage their child's behavior, less personal distress, improvement in the psychological wellbeing of the parent, and satisfaction with the process and result of PCIT (Schuhmann et al., 1998; Eyberg & Robinson, 1982). Schuhmann et al., (1998) found that parents in the IT group reported less parenting stress and a more internal locus of control than parents in the WL group. All families completing treatment reported satisfaction with the process and content of PCIT. Eyberg and Robinson (1982) reported significant changes in maternal adjustment and maternal attitude to child post-treatment. Eisenstadt et al. (1993) demonstrated a decrease in maternal

stress from clinical levels to within normal limits both at post-treatment and six-week follow-up. Improvement in positive parenting skills and reduction of negative parenting behaviors have been documented across PCIT efficacy studies (Eyberg & Robinson, 1982; Bagner & Eyberg, 2007; Eyberg et al., 1987; Eisenstadt et al., 1993).

Generalization. Efficacy studies have also demonstrated that the effects of PCIT generalize to untreated siblings (Brestan, Eyberg, Boggs, & Algina, 1997) and to the school setting (McNeil et al., 1991). McNeil et al. (1991) demonstrated the generalization of treatment effects from home to the school setting by finding that the treatment group experienced significantly greater improvement on measures of conduct problems in the classroom than the normal control group and the deviant behavior control group. Maternal report of behavioral improvement magnitude was significantly related to degree of school behavior problem improvement rated by the teacher. Brestan et al. (1997) found mothers rated sibling behavior as less problematic post-treatment and fathers rated sibling behavior problems as occurring less frequently post-treatment.

Maintenance. The effects of PCIT have been shown to be stable across time (Edwards et al., 2002; Eyberg et al., 2001; Funderburk et al., 1998; Hood & Eyberg, 2003). Eyberg et al. (2001) demonstrated maintenance of treatment effects at one-year follow-up for 62% of families. Treatment was maintained at a two-year follow-up for 69% of families. Hood and Eyberg (2003) assessed maintenance of treatment effects 3 to 6 years after participating in PCIT. Post-treatment reports of child behavior and time interval after treatment were predictive of long-term outcome. Disruptive behavior post-treatment decreased with time and reported changes of child behavior and maternal locus of control were maintained 3 to 6 years post-treatment (Hood & Eyberg, 2003).

Evaluation of PCIT with other clinical populations. While substantial empirical evidence exists documenting the efficacy of PCIT with disruptive behavior disorders, such as Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD), several studies have extended the application of PCIT to different clinical populations. Research has shown that PCIT is effective in reducing ADHD symptomatology in children with co-morbid diagnoses of ODD and ADHD (Eyberg et al., 2001). Recent empirical research has extended the application of PCIT to children with Separation Anxiety Disorder (SAD; Choate, Pincus, Eyberg, & Barlow, 2005; Pincus, Santucci, Ehrenrich, 2008), children with co-morbid SAD and ODD (Chase & Eyberg, 2008) children with Mental Retardation (MR; Bagner & Eyberg, 2007), children at risk for physical child abuse (Borreggo, Jr., Urquiza, Rasmussen, & Zebell, 1999; Timmer, Urquiza, Zebell, & McGrath, 2005), and children with high functioning ASD and comorbid externalizing behavior problems (Solomon, Ono, & Timmer, 2008).

Choate et al. (2005) utilized a single-subject design to demonstrate that PCIT was effective in clinically reducing separation anxiety and disruptive behavior in three children diagnosed with SAD. Pincus et al. (2008) expanded upon Choate et al. (2005) by conducting a pilot study which examined the efficacy of a modified version of PCIT designed to specifically address the needs of children with SAD uncovered during the previous study. Children receiving standard PCIT in the pilot study showed many positive gains, but did not evidence a clinically significant change in separation anxiety. Therefore, a new component, Bravery Directed Interaction (BDI), was incorporated into standard PCIT in order to enhance the treatment's relevance to children with SAD. BDI closely follows the structure and format of the two existing PCIT phases, CDI and PDI, and combines parental psychoeducation about anxiety with child graduated exposure to feared situations. In addition to teaching parents how to avoid

inadvertently reinforcing anxious outbursts, parents are taught how to apply CDI skills during separation situations and how to conduct “separation practices”. The family works with the therapist to create a fear and avoidance hierarchy, called a “Bravery Ladder”, along with a reward list (“Reward Store”). The child chooses one exposure exercise from their “Bravery Ladder” each week to complete during the session. Parents are coached on structuring situations during the week that will reinforce the child’s success during the clinic session (Pincus et al., 2008). The same research group is currently conducting a randomized clinical trial to examine the efficacy of PCIT (with the inclusion of BDI) in treating 4- to 8-year old children with SAD at the Center for Anxiety and Related Disorders (CARD) at Boston University. This research provides an illustration of the principles delineated by Eyberg (2005) necessary for tailoring and adapting PCIT to new populations and supports Chase and Eyberg’s (2008) postulation that PCIT can impact a range of emotional and behavioral symptom clusters in young children.

Bagner and Eyberg (2007) found significant improvements in mother report of child compliance in a randomized, wait-list control assessment of PCIT efficacy in families of children with co-morbid ODD and MR. Significant changes in the mothers’ interactional style were also obtained, including improvement in positive attention skills and the avoidance of commands during CDI. Similarly, Timmer et al. (2005) demonstrated the efficacy of PCIT in 91 parent-child dyads where the child had previously experienced maltreatment. Decreases in parental stress, child behavior problems, and risk for future abuse were found post-treatment in 164 families regardless of presence of previous child maltreatment ($N = 91$ maltreated; $N = 73$ control).

Solomon, Ono, Timmer and Goodlin-Jones (2008) employed a waiting-list control group design to conduct a pilot study investigating the effectiveness of PCIT in families with male

children ages 5 – 12 who were diagnosed with an ASD and who demonstrated clinically significant externalizing behaviors as measured by standardized parent report instruments. Solomon et al. (2008) found that, after participating in PCIT, parent-rated child problem behaviors improved and parental perception of child adaptability increased. Reductions in parenting stress were not demonstrated and standardized measures of parental stress remained in the clinical range. Of note, parents demonstrated a significant increase in positive affect and shared parent-child positive affect (SPA) increased after participation in PCIT. The researchers concluded that implementation of PCIT with school-age children with ASDs is feasible and that traditional PCIT measures were “useful” with families of children with ASDs (Solomon et al., 2008).

The aforementioned studies have demonstrated PCIT’s efficacy in reducing child behavior problems, increasing the number of positive parent-child interactions, decreasing parental stress, and increasing child compliance in families of children with anxiety problems, intellectual disability, social-communication deficits, and physically abusive tendencies.

Links between PCIT and Clinical Needs of Families Affected by ASDs

PCIT appears to address many of the clinical needs of families of children with ASDs since it utilizes four of the eight most important approaches to autism intervention identified by Marcus et al. (2005): (a) behavioral approach, (b) relationship enhancement, (c) parents as therapists, and (d) emotional support. PCIT also incorporates the three general principles essential to autism intervention: (a) conceptualization of the parent-child relationship as a transactional model established and maintained over time, (b) individualization to the family’s and child’s specific needs, and (c) emphasis on collaborative parent-family relationships (Eyberg & Child Study Lab, 1999; Marcus et al., 2005).

In a review of autism intervention research, Roberts et al. (2003) found that interventions based upon either ABA or social learning theory showed the most promise for children with ASD. PCIT utilizes both social learning theory and behavioral management techniques. Other successful components of intervention identified by Roberts et al. (2003) were the inclusion of modeling, role playing, and active skill training; as well as pivotal response training and approaches tailored to the specific family's needs. PCIT includes modeling, role playing, active skills training, and flexibility to focus the intervention around specific needs of the family (Eyberg & Child Study Lab, 1999).

PCIT has many similarities to the combined behavioral/developmental intervention approach successfully employed by Kasari et al. (2006) to increase joint attention skills and symbolic play in children with autism. Like the Kasari et al. (2006) study, PCIT utilizes both behavioral and naturalistic interaction methods to improve targeted behaviors. Many of the principles Kasari et al. (2006) employed in the semi-structured social-play context are essential components of PCIT: following the child's lead in activities, close physical proximity to the child, making eye-contact and environmental adjustments to engage the child, imitating the child's play actions, talking about the child's activities, repeating the child's verbalizations, and expanding upon what the child says. While PCIT does not include DTT, it uses modeling and positive reinforcement, similar to Kasari et al. (2006) to achieve appropriate responses. This research demonstrates that a combined behavioral and developmental intervention approach can be successful in increasing joint attention and symbolic play in children with autism. Similar findings from other studies reinforce Kasari et al.'s (2006) findings that children with ASDs can learn social, play, and communication skills through the utilization of PRT and other blended behavioral/developmental techniques (Brookman-Frazee et al., 2006; Kasari, 2002; Whalen &

Schreibman, 2003). It is reasonable to conclude that an intervention that contains principles similar to PRT, such as PCIT, will be successful in improving other target behaviors in children with autism as well. A recently published preliminary study conducted by Solomon et al. (2008) provides encouraging evidence of PCIT's utility for families of children with ASDs. Reductions in parents' perceptions of child atypicality and child problem behaviors, increases in parents' perceptions of child adaptability, and increases in shared positive affect in parent-child dyads were found post-PCIT in families of school-age males diagnosed with comorbid high functioning autism and externalizing problems (Solomon et al., 2008).

PCIT is designed to be implemented early. Interventions that target preschool-age children with ASD are preferred over interventions designed to address behavior problems later in life because the preschool timeframe is the window that leads either to a developmental trajectory of adaptive development or serious, maladaptive behavioral problems (Roberts et al., 2003; Rogers & Vismara, 2008). PCIT is designed for children ages 2 – 6 years of age (Eyberg, 2005). Further, due to the amount of influence parents have over their children during the preschool years, parent training is recommended as the first line of approach with young children (Eyberg et al., 2008). Many autism interventions have successfully utilized parents as change agents (Brookman-Frazee et al., 2006). Parents play a pivotal role in PCIT and work as a interventionist with their child both at home and at the clinic (Eyberg & Child Study Lab, 1999).

PCIT targets family's behavioral functioning. Literature on autism interventions clearly calls for further study of how specific intervention strategies impact child and family outcomes (Roberts et al., 2003; Rogers & Vismara, 2008; Smith et al., 2007). In a review of 13 parent training programs designed to improve child noncompliance, Breiner and Beck (1984) found evidence that Parent Management Training (PMT) could be effective in reducing problem

behaviors and increasing positive parent-child interactions of families of children with ASD, but stipulated more intervention research targeting those specific outcomes needs to be conducted before a definitive conclusion can be reached. PCIT utilizes behavior management techniques similar to those taught in PMT, and, like PMT, targets family functioning (Eyberg & Matarazzo, 1980).

Interventions that bolster the entire family system of children with ASDs are more likely to be durable over time by preventing future problems alongside reducing current problems. ASD research has demonstrated that child effects from intervention are enhanced when parental factors are also targeted in the intervention (Brookman-Frazee et al., 2006; Kazdin & Wassell, 2000). Thus, interventions with components designed to produce positive effects for immediate family members must be conducted in order to increase the likelihood that improved child compliance is maintained over time (Roberts et al., 2003). Parents of children with developmental delays who experience significant amounts of stress appraise their caregiving roles more negatively, perceive caregiving as more difficult, experience more difficult behavior during caregiving tasks, and report more problem behavior than mothers with lower stress levels (Plant & Sanders, 2007). PCIT is designed to elicit positive effects for immediate family members and has been proven to decrease parental stress and psychopathology, increase parental self-efficacy, and locus of control while simultaneously decreasing child disruptive behavior (Schuhmann et al., 1998).

PCIT targets reduction of maternal stress, depression, and anxiety. A significant number of mothers of children with ASD experience clinical levels of depression and anxiety (Baker-Ericzen et al., 2005; Olsson & Hwang, 2001). Social causation effect stipulates that changes in family and extra-family resources can decrease depression (Moos, Cronkite, & Moos, 1998).

Parent education programs that utilize naturalistic behavioral strategies have resulted in reduced stress and depression in parents of children with ASDs (Baker-Ericzen et al., 2005). For example, Bristol, Gallagher, and Holt (1993) employed a psychoeducational treatment program designed to teach parents behavior management techniques and successfully reduced depressive symptomatology in mothers of young children with autism. PCIT augments the family's resources by teaching effective parenting skills, providing emotional support to the parent, and assisting the parent in transferring resources learned in the clinic into the home and public places. Therefore, PCIT can contribute to the reduction of depressive symptomatology and stress in parents of children with ASDs as it has in parents of children with externalizing problems (Schuhmann et al., 1998).

As reviewed earlier in the manuscript, findings from the attachment literature demonstrate that children with autism are capable of forming secure attachments. In typically developing children, attachment security is positively related to maternal sensitivity. Research has demonstrated that mothers of securely attached children with autism showed greater sensitivity than mothers of insecurely attached children with autism. Possibly, increasing sensitivity in parents of children of autism could enable secure attachment relationships, thus creating a protective factor which could allow the child a better prognosis for social development (Rutgers et al., 2004). PCIT has been effective in increasing positive parental attention, decreasing negative parental attention, and improving the parent-child relationship in children with externalizing problems. Based on prior empirical findings, PCIT may have the potential to increase parental sensitivity in parents of children with ASD, thus enabling the possibility of a secure attachment relationship.

Research has demonstrated that children with autism respond less to positive affect and praise than typically developing children. Individual differences in children with autism, such as looking at and responding to adult affect, have been shown to be stable over 5-year periods (Dissanayake & Sigman, 2001). As PCIT relies heavily on positive attention and on the child experiencing the parent as a reinforcer, the finding that children with autism are *less* responsive to praise could be a limitation to the application of PCIT to families of children with ASDs. The failure to respond to praise is hypothesized to result from a child with autism's difficulty in evaluating themselves in relation to others and lack of appreciation of others' appraisals of them. Pride is contingent on references to other people, a social referencing skill that theory of mind research suggests many children with autism lack. However, studies demonstrating that children with autism can differentiate between affective displays and show selective responses to displays of affect support the application of PCIT to families of children with ASDs. Solomon et al.'s (2008) research with families of school-age children with high functioning autism and clinical externalizing problems provides further encouragement that children with ASDs will effectively respond to PCIT as the author's reported that shared positive affect in parent-child dyads increased after participation in PCIT.

PCIT efficacy has been established with similar populations. Research with PCIT has demonstrated successful adaptation to clinical populations other than the disruptive behavior disorder population for which it was designed. In addition to the aforementioned SAD example, recent research utilizing PCIT with families of children with comorbid Mental Retardation and ODD found that children who completed treatment demonstrated: (a) greater improvement in compliance than wait-list controls, (b) lower ratings of externalizing behavior, and (c) less parenting stress post-treatment (Bagner & Eyberg, 2007). By extending PCIT to the ASD

population, both children with ASD and their caregivers may experience these same benefits. Solomon et al. (2008) provided preliminary evidence of the efficacy of PCIT when applied to school-age males with comorbid high functioning autism and clinical behavior problems, thus providing further support to test the efficacy of PCIT with families of children with ASDs who fall within the age range for which PCIT was designed and who do not experience comorbid behavior problems.

Overall, the purpose of the literature review is to provide a clear conceptual justification for extending the use of PCIT to preschool age children with ASD. Although PCIT has been shown to be effective for varied clinical populations, preschool children with pervasive developmental disorders have not been included in efficacy trials. Based on the literature review documenting child behavior and family adjustment problems associated with autism and PCIT's past success in treating these same problems in other clinical populations, the author argues that PCIT represents a viable intervention option for families of preschoolers with ASD. Interventions emphasizing skill improvement have successfully improved adaptation in families of children with ASDs (Schopler, 1984). As reviewed earlier, parents of children with autism experience significantly more stress, depressive symptomatology, negative attitudes toward their children, more marital discord, and less self-confidence in their parenting abilities than families of typically developing children. Children with ASD display significantly more disruptive and aggressive behavior than typically developing children and exhibit less appropriate emotional expressiveness and social interaction with others than typically developing children. The application of PCIT to families affected by ASD may significantly improve family adaptation and quality of life.

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CHAPTER 3

EVALUATION OF THE EFFICACY OF PARENT-CHILD INTERACTION THERAPY
(PCIT) FOR FAMILIES OF CHILDREN WITH AUTISM SPECTRUM DISORDERS

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ABSTRACT

A recently published study conducted by Solomon, Ono, Timmer, and Goodlin-Jones' (2008) found that the utilization of PCIT with families of school-age children with ASDs was feasible. To the authors' knowledge, the present study is the first to evaluate the efficacy of Parent-Child Interaction Therapy (PCIT) as an intervention for families of pre-school age children with Autism Spectrum Disorders (ASDs). A multiple probe single subject design was employed to investigate the efficacy of PCIT with four families with children with ASDs (2 with Autistic Disorder, 2 with PDD-NOS) between the ages of 2 and 4 years old ($M = 40$ months). Families participated in weekly PCIT sessions over a four-month period ($M = 14.25$ sessions). Results demonstrated that PCIT was effective in increasing positive parenting behavior, decreasing negative parenting behavior, and increasing child compliance to parental commands. Parents reported greater confidence in their parenting abilities post-treatment, but did not report significantly reduced stress. Significant improvement in core areas of autism symptomatology, including social approach behaviors and receptive-expressive language communication abilities, was reported by parents at post-treatment. Further, parents endorsed significant improvement in aspects of the parent-child relationship, such as attachment and involvement. Results provide support for continued investigation of the efficacy of PCIT with families of preschool-age children. Implications and suggestions for future research applying PCIT to families of children with ASDs are discussed.

KEY WORDS: pcit, autism, intervention, family functioning, parenting skills, compliance

Introduction

Autism Spectrum Disorders (ASDs) are pervasive developmental disorders characterized by impairment in social interaction, restricted patterns of behavior, and communication delays.

Problems with social interaction and communication include odd, one-sided conversations, aloofness and indifference to others, lack of spontaneous initiation of contact with others, difficulty understanding the nonverbal aspects of language, and lack of desire to respond to communications from others. Restricted patterns of behavior refer to body movements, object-directed activities, and repetitive sensory experiences that are nonfunctional and abnormal in intensity or focus. Many children with autism function within the range of intellectual disability, with concordance rates reported as high as 80%. Typically, verbal skills are weaker than visual-spatial skills in individuals with autism. Associated behavioral problems, such as temper tantrums, sensory sensitivities, aggression, self-injurious behavior, hyperactivity, and deficits in attention often co-occur with ASDs (American Psychiatric Association; [APA], 2000).

Impact of ASDs on Parents

As illustrated by the pervasive and varied symptoms exhibited by children with ASDs, parents face unique and significant stressors associated with parenting a child with an ASD. Research with parents of children with autism has consistently documented significant levels of stress associated with parenting a child with an ASD (Roberts, Mazzucchelli, Taylor, & Reid, 2003; Nachshen & Minnes, 2005; Gray, 1997; Hastings & Johnson, 2001; Sharpley, Bitsika, & Efremidis, 1997). For example, parents of children with autism report more stress than parents of typically developing children (Baker, Blacher, Crnic, & Edelbrock, 2002; Baker-Ericzen, Brookman-Frazee, & Stahmer, 2005; Sharpley et al., 1997; Woolfson & Grant, 2006) and parents of children with Down Syndrome (Abbeduto et al., 2004; Wolf, Noh, Fisman, & Speechley, 1989). In general, mothers report more stress than fathers of children with ASDs (Baker-Ericzen et al., 2005; Moes, Koegel, Schreibman, & Loos, 1992; Seltzer et al., 2001), however some studies have found no differences between parental report of stress (Hastings,

2003). Hastings (2003) found mothers' stress to be related to child behavior problems and fathers' mental health symptoms, while fathers' stress was unrelated to characteristics of the child or the mother's mental health. Amount of parental stress has been positively related to severity of ASD symptomatology (Bebko, Konstantareas, & Springer, 1987; Konstantareas & Homatidis, 1989) and inversely associated with parental ability to relate to the child (Koegel et al., 1992) and child social skills (Baker-Ericzen et al., 2005).

For parents of children with an ASD, parenting stress is exacerbated by the necessity of parental involvement in intervention. Additional stress can result from the demands created by the dual parent/therapist relationship, from discontinuing a career to serve as the child's full-time intervention provider, or a combination of the two (Seltzer et al., 2001; Harris, 1994).

Intervention literature for children with ASD consistently states that parents should play a collaborative and active role in the design and implementation of their child's intervention services (Marcus et al., 2005; Brookman-Frazee et al., 2006; Kasari, 2002; Marcus et al., 2005; Rogers & Vismara, 2008). Several studies have documented the success of interventions that utilize parents either as co-therapists or primary therapists for their children with autism (Harris, 1994; Harris 1987; Marcus, Kuncze, & Schopler, 2005; Pakenham et al., 2005; Roberts et al., 2003; Schopler, 1994). Literature on parent training with clinical populations other than autism demonstrates when parents are actively involved as change agents in their child's treatment, improvement extends beyond the child's symptomatology. Further, the child's benefit from intervention is enhanced when parental factors are targeted (Brookman-Frazee et al., 2006; Kazdin & Whitley, 2003). Research using parents as intervention providers across clinical populations has documented increased parental self-efficacy and competence, generalization to other family members, and longer maintenance of treatment gains (Eyberg, Nelson, & Boggs,

2008; Eyberg & Matarazzo, 1980; Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998; Schopler, 1994). That is, effective parenting interventions result in larger child, parent, and family benefits.

Potential Contributions of PCIT to Early ASD Intervention

Early intervention programs based on applied behavior analysis (ABA), social learning theory, and parent training have produced reductions in behavior problems and increases in competencies in children with ASD (Rogers & Vismara, 2008; Kasari, 2002; Campbell et al., 2008). ABA interventions appear to be more effective with younger children, children of higher intellectual ability and when implemented intensively (Roberts et al., 2003). Pivotal Response Training (PRT) has been shown to improve family functioning for families affected by ASDs, even when family functioning was not a specific target of the intervention (Kasari, 2002; Koegel, Koegel, & Carter, 1999). Parent-child relationship quality in families of children with autism has also been improved when directly targeted in the relationship enhancement approach designed by Greenspan (Simpson, 2005).

Similarly, improvement of the parent-child relationship and overall family functioning are central tenets of Parent-Child Interaction Therapy (PCIT). PCIT is a behaviorally-based intervention package designed for preschool-age children that emphasizes changing parent-child interaction patterns in order to improve child behavior and enhance the quality of parent-child relationships. During PCIT, parents are taught specific skills to establish a secure, nurturing relationship with their child while simultaneously increasing their child's prosocial behavior and decreasing their child's negative behavior (Bell & Eyberg, 2002).

Rationale and Purpose of the Present Study

Given that the goals of PCIT are to improve the parent-child attachment relationship along with the parent's behavior management skills (Brinkmeyer & Eyberg, 2003), PCIT has

garnered empirical support for treating a variety of clinical problems. As briefly reviewed in the present paper, disruptive behavioral problems, increased parental stress, and impaired parent-child communication are well documented problems for families affected by ASD; however, these families have largely not been included in efficacy trials of PCIT despite exhibiting a cluster of clinical problems targeted by PCIT. Families with ASDs may benefit from PCIT by experiencing reduced parental stress, stronger parent-child bonds, improved parenting skills, decreased child disruptive behavior, and improved prosocial interactions. One recently published study conducted PCIT with families of male school-age children co-morbidly diagnosed with ASD and clinically significant behavior problems (Solomon, Ono, Timmer, & Goodlin-Jones, 2008) and presented encouraging evidence regarding the feasibility of applying PCIT to the ASD population. To the author's knowledge, the present study is the first to test the efficacy of PCIT, without modification, with families of preschool-age children with ASDs.

History and Theoretical Underpinnings of PCIT

PCIT was originally developed by Dr. Sheila Eyberg 30 years ago to intervene with children experiencing behavioral and emotional problems. The theory and practice of PCIT was based on Hanf's (1969) two-stage treatment model, originally developed to train mothers to improve child compliance. Stage 1, called *Child's Game*, trained mothers to engage in differential social attention (i.e., ignoring problem behavior and paying attention to cooperative behavior) when playing with their children. Stage 2, called *Mother's Game*, trained mothers to give direct commands, employ time-out procedures for disobeying, and to praise the child for obeying (Eyberg, 2004). Similar to Hanf's program model, PCIT has two distinct intervention phases, CDI and PDI. CDI resembles traditional play therapy and focuses on strengthening parent-child attachment, increasing positive parenting, and improving child social skills.

Complementing the child directed component, PDI is behaviorally-driven. During PDI, the therapist teaches parents the ability to set limits with consistent follow-through and to reduce child noncompliance and other negative behavior (Eisenstadt et al., 1993; Eyberg & Child Study Lab, 1999).

Parenting style. The development of PCIT was also heavily influenced by the work of Diana Baumrind (Herschell, Calzada, Eyberg, & McNeil, 2002). Baumrind identified three different parenting styles (authoritarian, permissive, and authoritative) and studied the effects of these parenting styles on child development (Baumrind, 1967; 1991). Baumrind's (1967; 1991) research documented that children have a dual need for nurturance and limit-setting from their parents in order to achieve optimal outcomes, best exemplified by the authoritative parenting style. PCIT provides a framework which assists in understanding the behavioral and relational patterns within family systems that lead to the development and maintenance of disruptive behavior. As such, PCIT provides a mechanism for changing maladaptive patterns into parent-child interactions characterized by authoritative parenting (Brinkmeyer & Eyberg, 2003).

Attachment. PCIT also draws on attachment and social learning theories to promote an authoritative parenting style (Bell & Eyberg, 2002). Attachment theory states that parents who recognize and warmly respond to their children's emotional needs enable their children to develop a more secure working model of relationships and more effectively regulate their emotions (Ainsworth, 1979). Children who have parents that do not effectively respond to their distress or are intolerant of their emotional expression are often insecurely attached (Ainsworth, 1989). PCIT asserts that parents can have a significant impact on their child's behavior during the preschool years when children are more responsive to parental attention and less influenced

by peers (Eyberg, Schuhmann, & Rey, 1998). The first phase of PCIT, CDI, was developed to facilitate a secure attachment between parent and child (Bell & Eyberg, 2002).

Social learning theory. Social learning theory informed the development of the second stage of PCIT, PDI. The goal of PDI is to decrease problematic behaviors while increasing low-rate prosocial behaviors (Eisenstadt et al., 1993). Social learning theory emphasizes the contingencies that shape dysfunctional interactions between children and their parents. Patterson's (1982) coercion theory posits that maladaptive parent-child interactions are the mechanism by which child disruptive behavior is developed and maintained. Based on Patterson's model of coercive parenting, parents must alter their behavior and incorporate firm limit setting within the context of an authoritative relationship to alter the dysfunctional interaction pattern. PCIT aims to establish the authoritative relationship in CDI and addresses the need to set firm, clear limits in PDI (Brinkmeyer & Eyberg, 2003).

Efficacy. The efficacy of PCIT in treating children who present with disruptive behavior has been documented in studies comparing the effects of PCIT to wait-list controls (Bagner & Eyberg, 2007; McNeil, Capage, Bahl, & Blanc, 1999; Schuhmann et al., 1998), classroom controls (McNeil, Eyberg, Eisenstadt, Newcomb, & Funderburk, 1991; Funderburk et al., 1998), group parent training (Eyberg & Matarazzo, 1980), and modified PCIT (Nixon et al., 2003). A detailed review of PCIT efficacy trials is presented in Chapter 2; a brief summation is presented below.

Several efficacy studies have documented statistically and clinically significant improvements in children's home and school behavior problems, as well as improvements in parents' interactional style after participating in PCIT (Eisenstadt et al., 1993; McNeil et al., 1991; Schuhmann et al., 1998). Outcome research has also documented positive effects of PCIT

on both parental competence and affect. Parents have reported more confidence in the ability to manage their child's behavior, less personal distress, improvement in psychological wellbeing, and satisfaction with the process and result of PCIT (Schuhmann et al., 1998; Eyberg & Robinson, 1982). Efficacy studies have also demonstrated that the effects of PCIT generalize to untreated siblings (Brestan, Eyberg, Boggs, & Algina, 1997; Funderburk et al., 1998; McNeil et al., 1991) and to the school setting (McNeil et al., 1991). Furthermore, the effects of PCIT have been shown to be stable across time (Edwardes, Eyberg, Rayfield, Jacobs, Bagner, & Hood, 2002; Eyberg, Funderburk, Hembree-Kigin, McNeil, Querido, & Hood, 2001; Funderburk et al., 1998; Hood & Eyberg, 2003).

A recently published meta-analysis of PCIT and Positive Parenting Program (Triple P; Sanders, Markie-Dadds, & Turner, 1998) outcome research concluded that PCIT meets criteria for a "well-established treatment" and supported the efficacy of PCIT across 13 studies conducted by multiple research teams (Thomas & Zimmer-Gembeck, 2007; Chambless & Hollon, 1998). Large effect sizes for differences in observed parent behaviors (.76 – 5.67) and medium to large (.61 – 1.45) effect sizes were found across PCIT studies comparing treatment groups to waitlist groups. Medium to large pre-post treatment effect sizes for both observed changes in child behavior (-.54 to .94) and parental report of child negative behavior (-.83 to -1.31) were found in single-group design studies, while large effect sizes were reported for changes in observed parental positive and negative parenting behaviors (1.11 – 3.11). PCIT was reported to demonstrate greater effect sizes than Triple P on most outcome variables (Thomas & Zimmer-Gembeck, 2007).

PCIT has received empirical support for the treatment of conduct-disordered preschool children (Nixon et al., 2003), children with anxiety disorders (Pincus, Santucci, & Ehrenreich,

2008; Choate, Pincus, Eyberg, & Barlow, 2005), children with co-morbid Separation Anxiety Disorder (SAD) and Oppositional Defiant Disorder (ODD; Chase & Eyberg, 2008), and children with intellectual disability (Bagner & Eyberg, 2007; McDiarmid & Bagner, 2005). A recent study utilizing PCIT with families of children with Mental Retardation and co-morbid ODD found: (a) greater child compliance than wait-list controls, (b) less child externalizing behavior, and (c) less parenting stress post-treatment (Bagner & Eyberg, 2007). Likewise, Chase and Eyberg (2008) reported significant reductions in both internalizing and externalizing behaviors post-PCIT in children with co-morbid SAD and ODD. These findings demonstrate how general PCIT theory can be efficacious when applied to children with intellectual disabilities and internalizing problems and further support the hypothesis that treatments which teach parenting skills and focus on parent-child interaction can generalize across diagnostic categories.

Solomon et al. (2008) conducted a pilot study utilizing a wait-list control group design to investigate the effectiveness of PCIT with families of 5 – 12-year old males diagnosed with an ASD and clinically significant externalizing behaviors as measured by standardized parent questionnaires. After participating in PCIT, parental perception of child problem behavior and child atypicality reduced and parental perception of child adaptability increased. While parental report of child problem behaviors was not significantly reduced, the results are encouraging as none of the participants behavior problems remained in the clinical range after PCIT. Parental stress was not significantly reduced by PCIT in this study and parents continued to self-report stress scores in the clinical range post-treatment. Of note, parents demonstrated significant increases in positive affect and shared parent-child positive affect (SPA) after participating in PCIT. Solomon et al. (2008) concluded that implementation of PCIT with families of children is feasible and warrants further investigation. Author recognized limitations of this study included

small sample size, lack of treatment fidelity measures, and utilization of parent-report measures only to assess child problem behaviors pre and post-treatment.

The current research addresses several of the limitations discussed in Solomon et al. (2008) by including behavioral observation as a measure of child behavior, by assessing reliability and treatment fidelity, and by incorporating measures specific to autism-related behaviors. According to recommendations for autism intervention design, routine PCIT measures were supplemented in the current research with standardized measures designed to assess characteristics specific to children with ASDs (Smith et al. 2007; Rogers & Vismara, 2008). Further, participants in the Solomon et al. (2008) study were outside the age range for which PCIT has empirical support and some treatment procedures, such as mastery criteria, delineated in the article deviated from those outlined in the PCIT manual (Eyberg & Child Study Lab, 1999). The current study implemented PCIT according to the treatment manual (Eyberg & Child Study Lab, 1999) and the age of child participants was within the range for which PCIT has been deemed efficacious (Eyberg et al., 2008; Thomas & Zimmer-Gembeck, 2008; Eyberg & Child Study Lab, 1999). The only participant characteristic that differed from traditional PCIT efficacy research was child diagnosis, i.e., ASD instead of OD, CD, or ADHD.

Research Questions

The research questions are organized in three domains, parent functioning, parent-child relationship, and child functioning, to correspond with expected benefits of treatment. (1) What effect will PCIT have on parental competence and affect. Parents are predicted to exhibit more positive and effective parenting behavior after participating in PCIT, as well as report greater confidence in their parenting abilities. Further, PCIT is predicted to reduce parental self-report of stress and depression in mothers of children with ASDs. (2) What impact will PCIT have on

the parent-child relationship? PCIT is hypothesized to improve the relationship between children with ASDs and their mothers as evidenced in increased attachment, emotional availability, and favorable attitudes toward family functioning. (3) How will PCIT affect child functioning? PCIT is predicted to improve compliance to parental commands, as well as decrease disruptive behavior and increase prosocial behavior, in children with ASDs in this study.

Method

Participants. Four families of children with ASD participated in the study (see Table 2 for characteristics of participants). All four parents participating in the study were mothers; two of the children were girls and two were boys. All participants were Caucasian. At study entry, children ranged in age from 2 years, 8 months to 4 years, 1 month ($M = 3$ years, 4 months) and maternal age ranged from 34 to 38 years ($M = 36.25$). Two children met criteria for Autistic Disorder and two children met criteria for PDD-NOS according to DSM-IV TR criteria (APA, 2000). Inclusion criteria were as follows: child between the ages of 2 and 6 with an ASD diagnosis, which was confirmed using two diagnostic measures prior to study enrollment, score of 80 or higher on a standardized intelligence measure administered within the past year, minimum score of 85 on either the Peabody Picture Vocabulary Test, Fourth Edition (PPVT-IV) or a recently administered equivalent measure, caregiver willing to participate in treatment alongside their child, and reliable transportation to attend weekly sessions.

Families were recruited through the University of Georgia (UGA) School Psychology Clinic, the UGA Department of Special Education, community groups with special interest in ASDs, and area occupational therapists and speech and language pathologists. This study was approved by the UGA's Institutional Review Board (IRB). Written consent for both parental consent for the child's participation and the parent's informed consent for her own participation

in the study was obtained from participants. Families did not receive compensation for participation in the study.

Experimental Design

A single subject, multiple probe across families research design was implemented. This design type is advantageous because it allows developmental maturation and exposure to treatment setting to be controlled, as well as enables the researcher to measure several target behaviors simultaneously while assessing the efficacy of the intervention (Smith et al., 2007; Woolery & Ezell, 1993; Gast & Tawney, 1984). Further, single subject research design (SSRD) addresses several well-recognized issues in intervention research. First, within participant variability can be measured and treatment trends for each family can be easily tracked because of continuous data collection, unlike statistical analysis in group designs which can underestimate or overestimate the effect of the intervention (Gast & Tawney, 1984). Second, treatment does not need to be completely withheld for the families of children with ASD (Smith et al., 2007; Whalen & Schreibman, 2003).

Per design requirements, the length of the pre-treatment probe condition was staggered across families (Tawney & Gast, 1984). The number of “Do” and “Don’t” skills were monitored to determine the start of intervention for each family. Primary criteria for entry into intervention was stability in the frequency of both “Do” and “Don’t” skills. Secondary criteria was continued movement in a non-therapeutic direction. If data had not yet stabilized for a family during baseline, but the number of “Don’t” skills was either increasing or maintaining at a high level, then the secondary criteria was satisfied and families entered intervention. A review of study data indicates that family 3 should have remained in baseline for at least one more session.

Additional data point(s) would have established stability and allowed the researchers more confidence in determining if B had an immediate effect on “Do” and “Don’t” skills for family 3.

Data were obtained for all four families during pre-treatment probe, both phases of treatment, post-treatment, and follow-up approximately one month after treatment ended. The DPICS-III was the dependent measure utilized to determine when families could move from the CDI phase to the PDI phase of treatment, as well as to determine when families could end the PDI phase of treatment and enter post-treatment assessment. Per PCIT protocol, in order for a family to exit phase B and enter phase C, 10 Labelled Praise statements (LP), 10 Reflection statements (RF), and 10 Behavior Description statements (BD) had to occur during the 5-minute CDI coding session. As the RF category requires the parent reflect a child’s vocalization and children with ASDs often have delayed expressive language skills, it was anticipated that a child might not verbalize at least 10 statements during a five-minute session, thus preventing the family from moving into the second phase of the treatment. In order to allow for this possibility, an alternate decision criteria of 10 LP, 10 BD, and RF 90% of child’s intelligible words spoken during the session was added for this study. This alternate decision criteria was employed for family 4 only. Per PCIT protocol, families remained in the PDI phase of treatment until the child complied to seventy-five percent of parental commands and parents had one hundred percent correct follow-through on commands during the five-minute PDI coding segment at the beginning of the session.

Setting

The research was conducted in the School Psychology Clinic at the University of Georgia located in Athens, Georgia. Pre-treatment probe, treatment, post-treatment, and follow-up sessions took place in a 10 x 7 foot room equipped with one 3 x 5 rectangular table, three chairs,

two to three sets of toys predetermined by the condition, and a one-way observation mirror with a viewing room on the other side from which sessions were videotaped for behavioral coding and fidelity/reliability assessment. Generalization sessions took place in the snack bar on the first floor of the building, in hallways and stairwells throughout the building, on campus buses operated by the university transit system, the crosswalk, and the parking lot.

Procedure

The researcher served as the therapist for all sessions. After completing pre-treatment assessment and the probe condition, each family attended PCIT sessions once per week. Treatment consisted of two phases: (a) Child Directed Interaction (CDI) and (b) Parent Directed Intervention (PDI). Therapy sessions followed standard protocol as delineated in the PCIT manual (Eyberg & Child Study Lab, 1999). Two measures, DPICS-III and ECBI, were repeated at every session beginning with the initial probe session and ending with the one-month follow-up session. Pre-treatment assessments were re-administered post-treatment. Table 3 lists the measures administered at each stage of the study and Table 5 summarizes the measures employed to assess each dependent variable.

Assessments

Assessment: Pre-treatment. All participants were administered the Autism Diagnostic Observation Schedule – Generic (ADOS-G; Lord, Rutter, DiLavore, & Risi, 2000) to assess social interaction, communication, play, and imaginative use of materials prior to inclusion in this study. One participant had completed an ADOS-G within the past six months, so information from the previous administration was utilized to describe the participant.

Demographic Information Questionnaire. This questionnaire was created by the researcher to elicit demographic information, such as age, gender, and income, necessary to describe the sample for journal publications.

Peabody Picture Vocabulary Test-Fourth Edition (PPVT-4; Dunn & Dunn, 2007). The PPVT-4 is a brief test designed to measure receptive vocabulary, provide a screening test of verbal ability, and contribute information to a test battery of cognitive processes. The test is appropriate for individuals ages 2.5 years to 90+ years. The PPVT-4 was used in this study to ensure the child had an adequate level of receptive vocabulary to benefit from the intervention. With respect to reliability, internal consistency ($M_a \text{ coefficient} = .97$ for Form A and $.96$ for Form B), test-retest (four-week interval, $M_r = .92$ across age groups), and alternate form ($M_r = .88$ across age groups) reliabilities are satisfactory for the PPVT-4. Validation studies presented by test authors also provide initial support for the PPVT-4. The PPVT-4 shows concurrent validity as evidenced by its strong and positive relationships with various measures of expressive and receptive language, including the PPVT-III ($M_r = .92$ across age groups). Support for the validity of the PPVT-4 also exists in the form of special population studies. For example, children with language delay ($N = 63$; $M = 87.5$), hearing impairments with cochlear implant ($N = 46$; $M = 72.0$), and intellectual disability ($N = 70$; $M = 70.6$) performed significantly below normative means. Adults with language disorders ($N = 45$; $M = 86.4$) also performed below normative expectations.

Childhood Autism Rating Scale (CARS; Schopler, Reichler, & Renner, 1988). The purpose of the CARS is to identify children with autism by rating 15 domains of child functioning. The CARS is completed by a trained clinician after a period of child observation. CARS items are rated from one to four (midpoints are allowed, i.e., 2.5) with a rating of one

indicating that the child's behavior is within normal limits and a rating of four indicating that the child's behavior is severely abnormal when compared with children of the same age. Total CARS scores can range from 15 to 60. Children with scores below 30 are considered non-autistic, while children with scores over 30 are categorized as autistic. Scores falling within the autistic range (30-60) can be subcategorized to indicate severity. The CARS was employed in this study to provide information about the severity of autistic symptoms experienced by the participants. The CARS manual reports a coefficient alpha of .94, but does not indicate the number of subjects upon which this statistic is based. Interrater reliability ($r = .71$; $n = 280$) and one-year test-retest reliability statistics indicate adequate reliability for the CARS. Test authors report that the CARS total score correlates $r = .84$ with clinical ratings made during the same diagnostic sessions and $r = .80$ with independent clinical assessments made by child psychologists (Schopler et al., 1988).

Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1998). The MSPSS is a 12-item scale completed by the parent. Items are rated on a 7-point likert scale. The MSPSS assesses the parent's perceived adequacy of social support from friends, family, and significant others. Sample items include, "I get the emotional help and support I need from my family," and "I can count on my friends when things go wrong". Zimet et al. (1998) reported test-retest reliability at .85 at a 2 – 3 month interval and Cecil, Stanley, Carrion, and Swann (1995) found a moderate ($r = .31$) correlation between the MSPSS and the Network Orientation Scale (NOS), a measure of willingness to use social support. Zimet, Powell, Farley, Werkman, and Berkoff (1990) found the MSPSS to have adequate internal reliability ($r = .84$ to $.92$) and confirmed the three-subscale structure of the MSPSS.

The Pervasive Developmental Disorders Behavior Inventory (PDDBI; Cohen & Sudhalter, 2005). The PDDBI was developed to evaluate change in functioning in individuals with autism over time, and was designed to document treatment outcomes in various domains of functioning (Cohen, Schmidt-Lackner, Romanczyk, & Sudhalter, 2003). As such, the PDDBI consists of 10 domains; sensory/perceptual approach behaviors, ritualisms/resistance to change, social pragmatic problems, semantic/pragmatic problems, arousal regulation problems, specific fears, aggressiveness, social approach behaviors, expressive language, and learning, memory, and receptive language. The domains combine to form four composite scores of adaptive and maladaptive behaviors, as well as a summary Autism Score that indicates severity of condition. The PDDBI is age-standardized to allow examination of change over time due to treatment versus change due to age (Cohen & Sudhalter). Cohen (2003) demonstrated criterion-related validity of the PDDBI with the Childhood Autism Rating Scale ($r = .53$) and the Autism Diagnostic Interview-Revised. Correlations of the adaptive scales of the PDDBI and the Vineland Adaptive Behavior Scales Parent Form ranged from .40 to .81 indicating that the adaptive subscales on the PDDBI are valid. Factor analyses conducted by Cohen et al. (2003) confirmed the factor structure of the PDDBI and indicated good construct validity. The PDDBI was included in this research to provide additional participant descriptive information, as well as to evaluate the impact of PCIT on the child's functioning.

Parenting Relationship Questionnaire (PRQ; Kamphaus & Reynolds, 2006). The PRQ assesses the parent's perspective of the parent-child relationship. The PRQ is a self-report measure that provides information regarding constructs such as, attachment, parenting style, involvement, and parenting confidence. The PRQ-P (Preschool Version), appropriate for parents of children ages 2 – 5, was utilized in the present study. Median internal consistency values are

adequate across norm groups ($r = .82 - .87$). Reported median test-retest correlations are $r = .81$ for the PRQ-P and $r = .79$ for the PRQ – CA. Convergent and discriminant validity evidence with other parent-child relationship measures as well as child behavior measures is presented in the test manual. The Total Stress score of the Parenting Stress Index (PSI; Abidin, 1995) correlated moderately ($r = .47$) with the Relational Frustration scale of the PRQ-P. Similarly, the Competence scale of the PSI Parent Domain demonstrated a moderate relationship ($r = -.44$) with the Parenting Competence scale of the PRQ-P in the expected inverse direction (Kamphaus & Reynolds, 2006).

Child Behavior Checklist for Ages 1 ½ - 5 (CBCL; Achenbach & Rescorla, 2000). The CBCL is a parent rating scale designed to measure the frequency of children's behavior and emotional problems. The CBCL/1 ½ - 5, a revision of the CBCL/2-3, contains 99 items which ask the parent to rate how true the statement is regarding the child's behavior during the past two months. The CBCL/1 ½ - 5 provides scoring information across seven syndrome scales, two broad summary scales, and an overall Total Problems score. The seven syndrome scales represent problems that tend to co-occur; *Emotionally Reactive*, *Anxious/Depressed*, *Somatic Complaints*, *Withdrawn*, *Sleep Problems*, *Attention Problems*, and *Aggressive Behavior*. *Internalizing* and *Externalizing* summary scores are also provided. The test manual states that the CBCL demonstrated adequate test-retest reliability (Total Problems $r = .90$ and mean $r = .85$ across all scales). The manual also reports a CBCL average stability correlation of .61 over a 12-month period.

Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II assesses depressive symptomatology. The BDI-II is a 21-item measure that asks questions regarding problems in areas, such as loss of energy and irritability. Internal consistency data is

presented in the BDI-II manual in the form of coefficient alpha ($r = .92$ for outpatients and $r = .93$ for college students). Test-retest reliability over a 1-week period was .93 (Beck et al., 1996). The BDI-II was employed in this study to measure maternal depression.

Parenting Locus of Control-Short Form (PLOC-SF; Werba, Eyberg, Boggs, & Algina, 2000). The PLOC-SF is a 25-item measure of the degree to which parents believe they can control the behavior of their child. PLOC-SF items are rated on a 5-point Likert scale with lower total scores reflecting a higher perceived locus of control. The PLOC-SF is an adaption of the Parental Locus of Control Scale (PLOC; Campis, Lyman, & Prentice-Dunn, 1986). The two measures correlate .92 with each other. Test authors report a Cronbach's alpha of .79 for the PLOC-SF. The measure has demonstrated sensitivity to treatment effects and convergent and discriminant validity (Werba et al., 2000).

Parenting Stress Index (PSI; Abidin, 1995). The PSI is a 120-item Likert-format parent self-report questionnaire which contains 54 parent-focused and 47 child-focused items. The Child Domain assesses behavior problems that lead to frustration in trying to develop a relationship with a child. The Child Domain is made up of six subscales: Adaptability, Acceptability, Demandingness, Mood, Distractability/Hyperactivity, and Reinforces Parent. The Parent Domain reflects sources of stress in the parenting role that emanate from the parent. The Parent Domain is comprised of seven subscales: Depression, Attachment, Role Restriction, Sense of Competence, Social Isolation, Relationship with Spouse, and Parental Health. The PSI manual (Abidin, 1995) delineates cut-off scores for clinical significance and provides reliability and validity evidence for the domain scores. The PSI has been highly correlated with other measures of child problem behavior, such as the Eyberg Child Behavior Inventory (ECBI; Eyberg, 1992).

Childhood Autism Rating Scale-Parent Version (CARS-P; Bebko, Konstantareas, & Springer, 1987). The CARS-P, a direct adaptation of the CARS (Schopler et al., 1988), is a self-report measure designed to assess parent perception of the child's level of functioning. The categories of the CARS-P are the same as the categories of the CARS, with the exception of the deletion of the general impressions category. Symptom severity is rated on a 4-point scale, as well as the perceived stressfulness of behaviors included in each domain of functioning. Validity studies have demonstrated that stress reported by parents on the CARS-P was comparable to reported stress on the PSI and the Questionnaire on Resources and Stress-F (Konstantareas & Homatidis, 1989). Tobing and Glenwick (2002) found severity of impairment to be a significant predictor of child-related parenting stress with the CARS-P and found that parents of children with autism reported significantly more impairment on the CARS-P than parents of children with PDD-NOS. The CARS-P was utilized in this study to assess parental stress experienced specific to the symptoms of ASD.

Parent Daily Hassles- Frequency Scale (PDH; Crnic & Greenberg, 1990). The PDH Frequency Scale provides information regarding how often stressful events occur in parent-child interactions. The measure is a 20-item parent self-report scale with items rated on a 4-point likert scale. Sample items include “kids interfere with adult chores”, it is “hard to find babysitters”, and “kids are hard to manage in public”. Harwood and Eyberg (2006) found an internal consistency coefficient of .84 for mothers’ pretreatment PDH frequency scores. Crnic and Greenberg (1990) utilized the PDH to determine that parenting daily hassles were the most significant predictor of child, parent, and family status. Mothers’ instrumental social support was found to moderate the effect of these hassles on maternal behavior. The PDH Frequency Scale was employed in this study to assess parental stress specific to the role of parenting.

Family Attitude Scale (FAS; Kavanagh, O'Halloran, & Manicavasagar, 1997). The FAS is a 30-item measure of expressed emotion (EE) that can be completed by the patient or the parent. Expressed emotion is a construct regarding the family environment that reflects the presence of critical, hostile, or emotionally overinvolved attitudes that the parent might possess toward the child. Greenberg, Setzer, Hong, and Orsmond (2006) found that high EE was related to increased levels of maladaptive behavior and increased symptom severity in individuals with autism over time. Further, level of maternal EE was influenced by characteristics of the child. Kavanagh et al. (1997) reported high internal consistency and sound concurrent validity for the FAS with a sample of parents of male and female students. Fathers' and mothers' FAS scores were associated with expression of anger, trait and state anxiety, trait and state anger, frequency and duration of arguments, and seriousness of worst argument. The authors also demonstrated that total FAS scores correlated moderately with the criticism scale of the Camberwell Family Interview (the gold standard in EE assessment; $r = .66$ for mothers & $r = .38$). The FAS was included in this study both to assess if PCIT will have an impact on EE, and to provide a more dynamic description of the parent-child relationship.

Parenting Practices Questionnaire (PPQ; Strayhorn & Weidman, 1988). The PPQ is a 34-item multiple choice questionnaire completed by the mother to assess how she interacts with her child. The PPQ measures parenting practices associated with child behavior problems. Sample questions include, "How often is your child able to get his or her way by having a tantrum?" and "How often do you tell your child to do something with an irritated or angry tone of voice?" Strayhorn and Weidman (1988) reported convergent validity with observational measures of parent-child interaction and a six-month interval test-retest reliability coefficient of .79. Adequate internal consistency ($r = .75$) for the PPQ was also documented by Harwood and

Eyberg (2006). The PPQ was included in this study to assess the mothers' use of ineffective parenting practices.

Assessment: Treatment. Per manualized procedures (Eyberg & Child Study Lab, 1999), the following measures were administered during every session. During the probe condition, these measures are intended to give a stable baseline against which to evaluate treatment effects. The DPICS-III was used to assess mastery of therapeutic goals required to move from CDI to PDI and to graduate from treatment.

Dyadic Parent-Child Interaction Coding System-III (DPICS-III; Eyberg, McDiarmid Nelson, Duke & Boggs, 2005). The DPICS-III (Eyberg et al., 2005) behavioral coding system was employed across all conditions of the study in order to measure the quality of parent-child social interactions. The DPICS-III is a free operant event recording system where the observer obtains a frequency count for each category of child and parent verbalizations. Data are presented as number of occurrences. Every verbalization emitted by the parent and child during the observation session is recorded. The DPICS-III provides an observational measure of parent-child behaviors during three 5-minute standard situations that vary in degree of required parental control (i.e., child led play, parent-led play, and clean-up). Identical categories (verbalizations, vocalizations, and physical behaviors) are coded for parent and child verbalizations. Sequences of behavior, such as compliance to commands, are also coded during the interaction. Definitions of each coding category are operationalized in the DPICS-III manual (Eyberg et al., 2005) and are presented in Table 4. For example, the frequency of "Do" and "Don't" skills, as well as compliance (i.e., % of times a child complies with parent requests) was compared to both baseline and previous sessions. The researcher engaged in live coding during the observation

session. Sessions were videotaped to enable the researcher to review tapes after the session and reconcile codes.

Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999). The ECBI is a 36-item parent report measure that assesses conduct problem behavior in children between the ages of 2 and 16. The scale measures both the frequency of the child's disruptive behavior (Intensity Scale) and how problematic the behavior is for the parent (Problem Scale). Mean split-half correlations of $r = .95$ and $r = .94$ were reported for the Intensity and Problem scales respectively in the standardization sample (Robinson, Eyberg, & Ross, 1980). Internal consistency coefficients of $r = .98$ were also reported for both scales of the ECBI. Boggs, Eyberg, and Reynolds (1990) reported statistically significant correlations between ECBI scores and CBCL scores in a sample of 159 children ages 4 to 16 years. As predicted, the ECBI showed a stronger correlation with CBCL Externalizing scale scores than Internalizing scale scores ($r = .75$ vs. $r = .41$; Boggs et al., 1990).

Assessment: Post-treatment. The post-treatment assessment involved two sessions with 15-minute DPICS-III observations (5 minutes of Child-led play, 5 minutes of Parent-led play, 5 minutes of Clean-up), and completion of post-treatment measures. The same measures completed during the baseline probe session were administered after PCIT completion in order to enable pre- and post-treatment score comparison. In order to assess maintenance, an additional DPICS-III coding session was conducted approximately one-month after treatment completion.

Therapy Attitude Inventory (TAI; Eyberg, 1993). The TAI was administered post-treatment to assess parental satisfaction with the process and outcome of therapy. The TAI consists of 10 multiple-choice questions regarding perceived impact of the intervention on quality of the parent-child interaction, the child's behavior, the parent's confidence in discipline skills, and overall family adjustment. TAI items were rationally-derived to reflect the treatment

goals of PCIT (Eyberg, 1993). Eisenstadt et al. (1993) reported good internal consistency ($r = .88$). Test-retest reliability over a 4-month period has been demonstrated ($r = .85$), as well as sensitivity to treatment change (Brestan, Jacobs, Rayfield, & Eyberg, 1999).

Intervention Protocol

The primary investigator served as therapist for all PCIT sessions. PCIT was implemented according to manualized procedures (Eyberg & Child Study Lab, 1999). PCIT includes two distinct phases of treatment, Child Directed Interaction (CDI) and Parent Directed Interaction (PDI). At the beginning of each session, an ECBI and the DPICS-III coding segment were conducted. DPICS-III coding decisions were based on operational definitions and decision criteria delineated in the DPICS-III Manual (Eyberg, McDiarmid-Nelson, Duke, & Boggs, 2005). Table 3 provides a description of the DPICS-III codes utilized in this study. Graduation from the PCIT program involved meeting individual CDI and PDI mastery requirements (see below), along with an ECBI score of 114 or less.

CDI Phase. The first session of the CDI phase of treatment is a parent teaching session regarding the skills and principles of CDI. Parents are taught to follow the child's lead and utilize PRIDE skills in practicing differential social attention. The PRIDE skills include: Praising the child's behavior, Reflecting the child's statements, Imitating and Describing the child's play, and using Enthusiasm (Eyberg & Child Study Lab, 1999). During subsequent sessions of CDI, parents practice following the child's play by using non-directive attending skills; i.e. "Do Skills" such as, praising the child (LP/UP). Parents are taught to change their child's behavior by utilizing the "Do" skills when the child is engaged in appropriate play and by consistently ignoring inappropriate behaviors. Parents are taught to avoid using questions (QU), commands (CO), and criticisms (NT; i.e. "Don't Skills"). The CDI coach portion of the session

lasts for approximately 45 minutes and is conducted after the initial coding session. The remaining time in session is spent debriefing and talking with the parent about treatment goals and progress. During CDI coaching sessions, therapists coach parents in their use of “Do” skills from the observation room through a bug-in-the-ear device while the parent is playing with her child. Families continue in the CDI phase of treatment until mastery criteria (10 LP, 10 RF, 10 BD) are met during the initial 5-minute coding session.

PDI Phase. After graduating from CDI, the family moves into the PDI phase of treatment. The first session of PDI is an individual didactic session which teaches the parent the skills and principles of PDI. Subsequent PDI sessions begin with the parent completing an ECBI and the 5-minute DPICS-III coding observation, then move into 45 minutes of PDI coaching, and close with 10 minutes of feedback with the parent. During PDI, parents are taught to use effective commands and specific consequences for compliance and noncompliance when directing the child’s behavior. Parents are asked to practice PDI skills at home in brief five-minute practice sessions after the daily CDI play session. After the parent becomes more confident with her PDI skills, she is instructed to only employ the PDI procedure at home when it is important that the child obey a specific command. In later sessions of PDI, parents are taught variations of the PDI procedure to deal with aggressive behavior and public misbehavior so they can creatively apply PDI principles as new situations arise. Mastery of PDI skills (75% of parental commands are direct commands with 100% correct follow-through) is an indicator of the parent’s consistency in directing their child’s behavior.

Reliability

Treatment Fidelity. All therapy sessions were conducted by the primary investigator and videotaped to allow independent observation of treatment integrity. Fifty percent of session

tapes from each family were randomly selected and checked for integrity by another investigator using the PCIT manual checklists. Accuracy was 99.3% with the treatment protocol.

DPICS-III Interrater reliability. Two research assistants were trained on DPICS-III coding to 80% agreement with a criterion tape before coding mother-child interactions. Reliability data was collected for one-third of each family's sessions. Interrater reliability was calculated using a total agreement method (Page & Iwata, 1986). For each DPICS-III behavioral category the percent agreement was averaged across 14 sessions (see Table 12). Average percent agreement between the primary investigator and the research assistants was 81% (84% with coder 1 and 78% with coder 2). Agreement between reliability coders was 83%.

Generalization. Generalization, or the ability to transfer skills learned in the clinic to real-world situations, is an essential component of treatment (Tawney & Gast, 1984; Lord et al., 2005). With this in mind, once families approached mastery with CDI and PDI techniques inside the clinic, portions of each session were conducted outside the clinic. Per PCIT protocol, coaching outside the clinic environment is conducted in order to promote generalization of learned skills to new situations. Parents were coached in these settings to increase their confidence in implementing their newly learned skills in public places and to demonstrate consistency of expectations across settings to the child. These sessions were geared to individualized family problem areas. For example, one mother reported significant child noncompliance when getting into the car seat, so the therapist coached the parent during the walk to the car and the seatbelt buckling process. In order to assess the parent's ability to practice effective discipline techniques in different settings, generalization data was coded during a campus bus ride situation. Generalization data is presented as child compliance to parental

commands (see Figure 2). Ideally, campus bus ride data would have been taken during baseline to enable a comparison of child compliance in a generalization situation pre- and post-treatment.

Results

SSRD does not require tests of significance or statistical analysis. Instead, visual analysis of graphically displayed data is the standard practice in SSRD (Tawney & Gast, 1984). Data from two measures, DPICS-III and ECBI, were collected at every observation point, displayed graphically (see Figures 1-4), and examined using visual analysis. In order to gain additional information regarding treatment effects, several measures were administered at the pre- and post-treatment data points and were analyzed with paired samples *t* tests to test for significant pre-post treatment differences (criteria set at $p < .05$).

Parent Functioning: Parenting Competence. The data presented in Figure 1 demonstrate that the introduction of PCIT to families in this study effected a positive change in the number of “Do” and “Don’t” parenting skills employed. Intersubject replication was demonstrated as all four families maintained an increase in positive parenting skills post-treatment and at one-month follow-up.

“Do skills” (LP + BD + RF). Family 1 and 4’s trend was decelerating, family 2’s trend was zero-celerating, and family 3’s trend was accelerating. Families’ 2, 3, and 4 evidenced a therapeutic, accelerating trend in the number of “Do skills” mothers’ employed upon introduction of the CDI (B phase) portion of the intervention. The average percentage of overlap in “Do skills” between baseline and CDI intervention for all families was 11.25%. Families’ 1 and 2 experienced 0% overlap, while families’ 3 and 4 each had 1 data point in the CDI condition that fell in the range of the baseline condition. In the CDI phase of the treatment condition, all four families experienced a positive relative level change in the direction of the

intervention objective. Three of four families demonstrated a dramatic absolute level change in the number of “Do skills” exhibited during the first intervention coding session when compared to the last session of the baseline condition (+36, +21, +18 number of “Do skills”). However, despite a median level increase throughout the intervention, family three’s initial number of “Do” skills during intervention was functionally equivalent to their last datapoint in baseline. Family three did show an immediate, positive impact in the “Do” skill ratio (number of “do” skills divided by total number “do” and “don’t” skills) upon introduction of the intervention indicating more efficient utilization of parenting behaviors.

Upon introduction of the PDI phase of the intervention (C phase), three of four families maintained an accelerating or zero-celerating trend in the number of “Do skills” demonstrated. Family 2 experienced a change in trend in a contra-therapeutic direction with the implementation of PDI that maintained at post-treatment. However, this family’s trend change from post-treatment to one month follow-up was positive and therapeutic. Families 2 and 3 evidenced a positive absolute level change with the introduction of PDI, while families 1 and 4 experienced a negative absolute level change. Reduction in the number of demonstrated “Do skills” at this point of the intervention is frequently observed in PCIT as parents have overlearned “Do skills” in CDI and are being taught to focus on discipline skills during PDI (Eyberg & Child Study Lab, 1999). Both families that experienced the reduction in the number of “Do skills” exhibited a positive absolute level change post-assessment and exhibited far higher “Do skills” median values post-treatment than baseline (62 vs. 7; 40 vs. 4). As both CDI and PDI are components of the same intervention, percentage of overlap between conditions B and C was greater than between conditions A and B (67% vs. 11.25%).

“Don’t skills” ($CM + QU + NTA$). The data presented in Figure 1 show a positive change in the number of “Don’t skills” exhibited by the parent after the introduction of the intervention across all four families. All families demonstrated a positive absolute and relative level change in the number of “Don’t skills” demonstrated by the parent after CDI was introduced. Percentage of overlap between baseline and CDI intervention was 0% for all families in the study. Trend either remained stable, or changed from variable to stable, when CDI was introduced. Trend level changed from contra-therapeutic to therapeutic for Family 4, while families 1, 2, 3 continued the therapeutic trend direction exhibited in baseline. The number of “Don’t skills” exhibited by the parents continued to reduce in the intended direction after the introduction of PDI, post-assessment, and at follow-up. 3 of 4 families demonstrated a zero-celerating trend during PDI and post-assessment because the median number of “Don’t skills” reached the lowest possible point, zero. As both CDI and PDI are components of the same intervention, percentage of overlap from C to B was greater than from B to A (77% vs. 0%).

Total Praise ($TP = LP + UP$). Total praise statements spoken by the parent increased with the introduction of the intervention (B; see Figure 2). The introduction of CDI skills resulted in a variable, improving trend in the number of praises delivered by mothers in this study to their children. A therapeutic relative level change in the number of praises was documented in all four families. During the first CDI intervention data point, three out of four families demonstrated an increase in the number of praise statements when compared to the last probe session. Family 3 exhibited a negative absolute level change of one point, but improved again at the second intervention session and demonstrated an intervention median of 13 praise

statements versus a baseline median of 2 praise statements. Percentage of overlap between CDI intervention and probe condition was 0% for three families and 40% for family 3 ($M = 10\%$).

Families 1, 2, and 3 maintained a therapeutic, increasing trend in number of praise statements after PDI was introduced. Family 4 experienced a negative, contra-therapeutic change in trend. All four families experienced an absolute negative level change when the PDI portion of the intervention was introduced. As discussed earlier regarding “Do skills”, an immediate decrease in positive parenting skills is frequently experienced in PCIT once the PDI intervention segment is initiated (Eyberg & Child Study Lab, 1999). Parents initially concentrate on generating commands and following the discipline sequence during PDI, while the child often tests the new limits being set during session. As the parent feels more comfortable delivering effective commands, their positive parenting skills re-emerge. This phenomenon is demonstrated in Figure 4. Despite the negative absolute level change, the PDI median level is higher than the CDI median level in half of the families and three of four families maintained an increasing, therapeutic trend during PDI. As expected, a much higher degree of overlap existed between the two intervention components (C: B; $M = 95\%$) than between the probe condition and the initial intervention (B: A; $M = 10\%$). Increased praise skills were demonstrated post-treatment as well. Post-treatment praise median levels were higher than both the treatment and probe median levels for all four families. At one-month follow-up, the number of praise statements decreased from post-treatment levels, but remained within the range of treatment levels and higher than probe levels.

SPSS data analysis revealed significant pre-post intervention differences on the PPS, a measure that assesses parenting practices associated with child behavior problems ($t(3) = 4.48, p = .021$). This finding indicates that mothers’ reported a decreased use of ineffective parenting

practices after participating in PCIT (see Table 9). Despite a 24.75-point average mean decrease on the PLOC-SF from pre- to post-intervention, statistical analysis was not significant. Three of four mothers reported a higher perceived locus of control in their ability to manage the behavior of their child. As the PLOC-SF is frequently utilized in PCIT research and the majority of mothers of children with ASDs in this study reported changes in locus of control, inclusion of this measure in future ASD parenting interventions is recommended to allow further investigation (see Table 10).

Parent Functioning: Parent Affect. While no PSI scale within-subject pre-post differences were statistically significant, the average group mean improved by one standard deviation or greater on four scales (see Table 8). Post-treatment Total Stress (sum of Parent and Child Domain) group mean scores declined by 15.5 points from the pre-treatment average indicating a reduction in general parental stress after participating in PCIT. The Distractibility/Hyperactivity (DI) post-treatment group mean was two standard deviations (34.5 points) lower than the pre-treatment group mean. Post-treatment group means decreased by 19.5 and increased by 17, respectively, on the Role Restriction (RO) and Health (HE) scales. According to the PSI manual, (Abidin, 1995) the RO and HE scales were included on the parent domain because they were seen as major contributors to parental stress level. In line with hypotheses, the reduction on the RO scale shows that parents viewed their parental role as less frustrating and less restrictive of their freedom after participating in PCIT. The HE subscale assesses the impact of the parent's current physical health in terms of her ability to meet the demands of parenting. The unexpected increase on the HE scale is suggestive of deterioration in parent health due to either parenting stress or independent stressors in the parent-child system at the completion of PCIT. Closer examination of individual parent changes on the HE scale

showed one parent's self-rating on the HE scale increased from the 50th percentile to the 98th percentile over the course of treatment and a second parent's HE rating increased from 75th pre-treatment to 95th percentile post-treatment. As both of these parents reported experiencing physical illnesses during the last few weeks of treatment, these changes in HE ratings are most likely explained by outside factors rather than the intervention.

Consistent with PSI results, changes in parent perception of stress related to parenting, as measured by the PDH, and changes in stress level associated with autism symptomatology, as measured by the CARS-P, were not statistically significant. However, the group average mean declined on both measures after participating in PCIT (see Tables 9 and 10). Combined with the aforementioned reductions on several PSI scales, this information provides incentive to include at least one measure of parental stress in future PCIT trials with families of children with ASDs.

As changes within the family can impact the perceived results of the intervention, the MSPSS was administered pre- and post-treatment to assess for changes in social support throughout the intervention that could contribute to parental affect and parental perception of the child (see Table 11). Statistical analysis of within-subject pre- and post-intervention MSPSS scores was not significant indicating parents' pre-PCIT perception of social support received from family, friends, and significant others was unchanged, and therefore not hypothesized to impact the results of treatment.

A decrease in maternal depression was hypothesized for clinically depressed mothers after PCIT. This hypothesis could not be tested, as none of the mothers' self-reported depressive symptomatology in the clinical range on the BDI. In fact, pre-treatment BDI scores fell in the minimal range (*M* raw score = 9.0; see Table 10), thus greatly reducing the probability that a significant reduction could be achieved. As increased rates of depression for parents of children

with ASDs has been widely documented, the author recommends including a parental depression screener, such as the BDI, in future efficacy studies of PCIT with this population. No significant pre- and post-treatment changes were found on mothers' BDI scores indicating PCIT did not significantly reduce maternal depression in the sample.

Child Functioning: Compliance. The data presented in Figure 2 show a positive change in child compliance after the introduction of the intervention. An abrupt, positive change in level was replicated across all four families after PCIT was introduced. The magnitude of this abrupt level change in child compliance is further reflected in the 0% overlap in compliance between the probe and intervention condition in all four families. Increased compliance was maintained at the one month follow-up data point. Families 1 and 3 achieved 100% beta compliance to parental commands at follow-up, while families 2 and 4 demonstrated 72.73% and 78.57% compliance at follow-up, an improvement from median probe compliance of 16.05% and 7.31% respectively.

Compliance generalization data is also presented in Figure 2. Well-designed investigations of treatment effects should promote generalization beyond the treatment setting and should include measures of cross-setting generalization (Brown & Odom, 1994). A DPICS-III coding session was conducted post-treatment during a campus bus ride to assess each family's ability to transfer skills learned and demonstrated in the clinic to real-life situations. Child compliance to parental commands successfully generalized to the campus bus ride in all four families as each child demonstrated 100% beta compliance to parental commands.

Per PCIT protocol (Eyberg & Child Study Lab, 1999), compliance data was collected in a high demand, clean-up situation during two probe and two post-treatment sessions. Table 6 presents child compliance in clean-up situations calculated as alpha compliance, beta

compliance, and opportunity to comply command compliance. In order to be consistent with the type of compliance for each session presented in graph format, beta compliance will be discussed for clean-up sessions. Unlike alpha compliance, beta compliance does not account for ineffective parental commands (see Table 4 for compliance formulas), thus it is more representative of typical situations and it gives a more accurate picture of how often the child complies. Mean beta compliance improved dramatically from probe condition to post-PCIT. Average clean-up compliance during probe condition of 16.25% and 17.13% respectively for families 1 and 2 increased to 100% average clean-up compliance post-PCIT. Family 3's average compliance improved from 50% during probe condition to 95.84% post-intervention. Family 4's average clean-up compliance was 9.02% during probe and their post-treatment clean-up compliance data point was 66.67%. These data implicate that demonstrated in-session PCIT skills also generalized to higher-demand situations within the clinic.

Child Functioning: Externalizing Behaviors. The ECBI was included in this research to be consistent with PCIT protocol (Eyberg & Child Study Lab, 1999) and to monitor any changes in externalizing behaviors throughout the intervention. As traditional PCIT research includes participants with externalizing disorders, an ECBI score within the clinical range during pre-assessment is a prerequisite for participation in the program and an ECBI score within the normal range is included in program graduation criteria. The current study did not include comorbid externalizing problems as an entry requirement; consequently, none of the participants scored within the clinical range on the ECBI during the probe condition. Figure 3 presents ECBI Intensity and Problem scale scores. Through visual analysis of ECBI data, the author can conclusively state that the externalizing behavior of children with ASDs, as measured by the ECBI, did not worsen during PCIT. ECBI score trend was either zero-accelerating or decelerating

throughout the intervention for all families. The ECBI scores for all families remained subclinical throughout the intervention and ECBI Intensity and Problem scores for all families were lower at post-treatment than pre-treatment.

The CBCL was administered during the probe condition and post-treatment to measure pre-post intervention differences in child behavior. Standard scores for all CBCL scales are presented in Table 13. All four families scored in the clinical range or the borderline clinical range on six to seven CBCL scales pre-treatment. While pre-post treatment differences were not statistically significant for the group, three of four parents rated their children in the normal range on all scales of the CBCL post-treatment. The CBCL contains a DSM-oriented scale entitled Pervasive Developmental Disorders (PDD) which is comprised of items consistent with DSM-IV diagnostic criteria. Children scoring in the borderline or clinical ranges on this scale exhibit higher degrees of PDD symptomatology than same-age peers. All four children were rated in the borderline or clinical range on the PDD scale by their parents pre-treatment, and three of four children were rated in the normal range on the PDD scale by parents post-PCIT.

Child Functioning: Autism Symptomatology. Six PDDBI scales demonstrated statistically significant improvement in parental report of autism symptomatology and associated behaviors after completion of PCIT. PDDBI domain scores are divided into two sections, Approach/Withdrawal Problems and Receptive-Expressive Social Communication Abilities. Higher scores on Approach/Withdrawal Problems domains indicate increasing levels of severity, thus improvement is indicated when scores decline. Receptive-Expressive Social Communication Abilities domains are scored in the opposite direction; hence lower scores are considered more problematic and an increase in score is indicative of increasing competence. Domain scores are combined to form five composites. The PDDBI is designed to be a dependent

measure in the assessment of intervention as it allows the interpreter to disentangle changes due to treatment from changes from age-related effects (Cohen & Suddhalter, 2005). Participant PDDBI scores are reported in Table 7.

Of the seven Approach/Withdrawal Problems domains, two demonstrated statistically significant pre- and post-intervention improvements. Parental report of Semantic/Pragmatic Problems (SEMPP) significantly decreased after participation in PCIT ($t(3) = 3.44, p = .041$). The SEMPP domain assesses the degree of difficulty children with autism have in using spoken language to indicate comprehension, communicate meaning, respond to the interests of others, and sustain a conversation. Parental report of Specific Fears (FEARS) also significantly reduced after PCIT ($t(3) = 3.25, p = .048$). The FEARS domain measures behaviors that communicate anxieties and fears associated with withdrawal from social stimuli, such as sadness or anxiety when in a new situation or away from a caregiver or auditory withdrawal behaviors.

Statistically significant post-intervention improvements were reported by parents on all three Receptive/Expressive Social Communication Abilities domains. Improvement in parent reported child Social Approach Behaviors (SOCAPP) post-intervention was statistically significant ($t(3) = 4.92, p = .016$). The SOCAPP assesses social communication skills that are generally difficult for children with autism; visual social approach behaviors, positive affect behaviors, gestural approach behaviors, responsiveness to social inhibition cues, social play behaviors, imaginative play behaviors, empathy behaviors, social interaction behaviors, and social imitative behaviors. Parents also reported significant improvement in child Expressive Language (EXPRESS; $t(3) = 3.43, p = .042$) and Learning, Memory, and Receptive Language (LMRL; $t(3) = 3.39, p = .043$). The EXPRESS domain assesses the child's ability to speak sounds associated with the English language and use words and sentences that demonstrate

his/her competence with grammar and the pragmatic aspects of communication. The LMRL domain measures the child's memory ability and receptive language skills.

Parents reported statistically significant post-intervention changes on one PDDBI composite, Expressive Social Communication Abilities Composite (EXSCA/C; $t(3) = 8.22, p = .004$). The EXSCA/C is the sum of the SOCAPP and EXPRESS domains. While pre-post intervention changes on the Autism Composite (AUTISM) were not statistically significant, the AUTISM mean declined by 1 standard deviation after the completion of PCIT. The lower score suggests that parents reported less severity in overall behaviors associated with autism after receiving the intervention. While changes in autism symptomatology from pre- to post-treatment were endorsed by mothers on the PDDBI and the CBCL, pre-post treatment changes in autism symptomatology using the CARS-P were not statistically significant (see Table 9).

Parent-Child Relationship. On the PRQ, significant differences between pre- and post-treatment scores were found on four of the five scales indicating PCIT had a positive effect on parental perception of the parent-child relationship (see Table 10). The Attachment (AT) scale measures the affective, cognitive, and behavioral relationship between parent and child. On the AT scale, mothers reported a stronger bond with their respective child after PCIT as reflected by their feelings of empathy, closeness, and understanding of their child ($t(3) = 3.6, p = .036$). Pre- and post-treatment differences on the Discipline (DP) scale indicated that mothers' reported a greater tendency to consistently apply consequences to their child's misbehavior and greater support of the establishment and adherence of rules post-PCIT ($t(3) = 3.4, p = .042$). The Involvement (IN) scale measures the extent parent and child participate together in common activities, along with parental knowledge of the child's activities. Mothers reported significantly greater involvement with their children after participating in PCIT ($t(3) = 5.2, p = .014$).

Mothers reported greater feelings of comfort, control, and confidence when making parenting decisions after participating in PCIT as evidenced by their scores on the Parent Confidence (PC) scale ($t(3) = 5.4, p = .013$). The Relational Frustration (RF) scale, which measures a parent's stress level associated with managing their child's behavior and affect and their tendency to overreact in parenting situations, was the only PRQ scale that did not demonstrate significant pre-post treatment differences. Despite a group mean decrease of eight points, significant pre-post intervention differences were not found on a measure of expressed emotion (EE), the FAS. EE reflects the presence of hostile, critical, or emotionally involved attitudes that the parent possesses to the child.

Consumer Satisfaction. The TAI was administered to all families post-treatment (see Table 12). TAI scores ranged from 46 to 49 ($M = 47.75, Mdn = 48$) indicating families were highly satisfied with treatment.

Discussion

This study provides initial empirical support for the use of PCIT with preschool children with autism spectrum disorders. Post-treatment, mothers demonstrated more positive and effective parenting behavior and reported enhancements in the parent-child relationship. Children were more compliant to parental commands and exhibited improvements in social and behavioral functioning after participating in PCIT. Increases in positive parenting behaviors and child compliance to parental requests were maintained one month after treatment and outside the clinic setting during generalization sessions. Further, parents of children with ASDs reported a high degree of satisfaction with PCIT.

Parent Functioning. The hypothesis that mothers would demonstrate more positive and effective parenting behavior after participating in PCIT was supported. Mothers demonstrated

and reported more effective parenting practices after participating in PCIT. Mothers employed a greater number of positive parenting skills (i.e. “Do skills” and total praise) upon introduction of PCIT and maintained this increase in positive parenting skills throughout the intervention and at one-month post-treatment. Further, mothers demonstrated an immediate reduction in the utilization of negative parenting practices (i.e. “Don’t skills”) upon introduction of PCIT. The decrease in negative parenting practice continued throughout the intervention and was maintained post-treatment and at one-month follow-up. These findings support the premise that parent training techniques developed for mothers of children with other clinical disorders can be effective in teaching parents of children with ASDs.

Support for the hypothesis that mothers would report greater competence and confidence in their parenting ability was mixed (see Tables 9 & 10). Mothers reported significant improvement post-intervention in utilizing effective parenting practices associated with child behavior problems on the PPQ and reported significantly more confidence in their ability to parent on the PRQ post-intervention. While significant results were obtained on the PPQ and the PRQ, two other self-report measures typically employed with PCIT (PLOC-SF and PDH) showed trend improvements in a therapeutic direction, but did not evidence statistically significant improvements.

The hypothesis that PCIT would significantly improve parental stress was not confirmed (see Table 8). The finding is consistent with Solomon et al. (2008) who found that mothers of school-age children with ASDs did not demonstrate significant reductions in parental stress after participating in PCIT. Both studies utilized the PSI as the primary outcome variable to measure parental stress. In the event the PSI did not capture differences in parental stress, the current study included the CARS-P to investigate if PCIT affected parental stress directly associated

with autism symptomatology. Again, significant differences were not obtained (see Table 9). Consistent with PSI and CARS-P results, the Relational Frustration (RF) scale on the PRQ did not show significant post-treatment change in the parent's stress level associated with managing their child (see Table 10).

PCIT has significantly reduced parental stress in parents of children with other clinical disorders, perhaps implementing PCIT as delineated in the manual is insufficient to address the heightened stress levels and the specific stress patterns experienced by parents of children with ASDs. Literature in the field has documented that parents of children with ASDs experience a unique pattern of stressors that differs from the stress experienced by parents of children with other clinical problems. Further, ASD literature has also documented that parents of children with ASDs experience greater stress than parents of children with other developmental delays and clinical disorders. Findings from the current research, and from Solomon et al. (2008), suggest successful adaptation of PCIT to ASD may necessitate additional attention to mediating the unique stressors parents of children with ASD experience. As no mothers in the current study reported clinical levels of depression during the baseline condition, the hypothesis that PCIT would significantly reduce parental report of elevated depressive symptomatology was not testable.

Child Functioning. The hypothesis that child compliance would improve after PCIT was supported. An immediate, abrupt positive level change in beta compliance was demonstrated across all four families with the introduction of PDI (see Figure 2). Improved beta compliance was maintained at one-month follow-up and in settings outside the clinic. All children demonstrated 100% beta compliance during generalization data collection. Further, improved

compliance was demonstrated post-treatment during high demand clean-up sessions in the clinic (see Table 6).

Encouraging support was found for the hypothesis that PCIT would reduce disruptive child behavior (see Table 13). Three of four children were rated in the normal range of functioning by their parents on all scales of the CBCL post-treatment and the scores of all four children remained below the clinical range on the ECBI post-treatment (see Figure 3). However, pre-post treatment differences on the CBCL were not statistically significant. As clinically significant scores on the ECBI were not required for participation in treatment and all families scored within the normal range on the ECBI pre-treatment, reduction in disruptive behavior as measured by the ECBI was not a good test of the hypothesis. In fact, one could argue that, unlike most participants in PCIT efficacy studies, disruptive behavior was not the most relevant treatment target area for the families that participated in this study.

Support for the hypothesis that PCIT would increase child prosocial behavior was confirmed (see Table 7). Parents reported significant improvement in child social approach behaviors and receptive-expressive language communication skills on the PDDBI post-treatment. While hypotheses did not include predictions in other specific areas of ASD-related symptomatology, improvement on PDDBI scales and composites post-treatment provides initial evidence that PCIT may impact ASD symptoms. Parents endorsed statistically significant post-PCIT improvement on social communication skills, including positive affect behaviors, gestural approach behaviors, responsiveness to social inhibition cues, social play behaviors, imaginative play behaviors, empathy behaviors, and social imitative behaviors on the PDDBI. Parents also reported statistically significant reductions in withdrawal behaviors and anxiety and fears associated with withdrawal from social stimuli on the PDDBI. Statistically significant

improvement post-PCIT was also reported on the PDDBI in the child's pragmatic aspects of expressive communication, ability to speak sounds in the English language, ability to comprehend spoken language, ability to respond to the interests of others, and ability to sustain a conversation. While not statistically significant, the post-treatment group mean on the Autism composite decreased by more than one standard deviation from the pre-treatment mean, indicating parents perceived less severity in overall behaviors associated with ASDs post-PCIT. As the PDDBI has demonstrated adequate reliability and validity and is designed to account for developmental changes in the child due to time and maturity (Cohen & Sudhalter, 2005) and was sensitive to the effects of treatment in the current study, the authors recommend inclusion of the PDDBI in future PCIT research with families of children with ASDs.

Parent-Child Relationship. The hypothesis that PCIT would result in more favorable attitudes toward family functioning and improve the relationship between parent and child by demonstrating increased attachment, closeness, involvement, and understanding of the child was supported (see Table 10). The PRQ was included in this study as the primary outcome variable to measure parental perception of PCIT. Significant pre-post differences were obtained on four of five PRQ scales; Attachment (AT), Discipline (DP), Involvement (IN), and Parent Confidence (PC). Significant increases on the AT scale are reflective of a stronger parent-child bond after PCIT and increased understanding of child. Greater empathy and closeness with the child are also indicated with the AT scale. Improvement on the IN scale indicates increased time parent and child spend participating together in common activities and increased parental knowledge of child activities after participating in PCIT. Current study results warrant inclusion of the PRQ in future PCIT efficacy studies with ASD populations and further study of the utility of additional

measures which may greater depth to the examination of the effect of PCIT on the parent-child relationship.

Parental rating of expressed emotion (EE), the presence of critical or emotionally involved attitudes the parent possess toward the child, on the FAS did not significantly change after completion of PCIT (see Table 10). While PCIT positively affects parental attitudes of family functioning, it is possible that the construct of EE is not specifically addressed or affected by PCIT and does not warrant further inclusion in PCIT research.

In an effort to refine measurement techniques in the application of PCIT to families with ASDs, the author of this study is currently conducting post-hoc analyses on the video recordings of the five minute parent-child interaction observation segments from each session to determine the utility of additional outcome measures. Psychosocial intervention literature documents the need for intervention outcome measures that are sensitive to treatment goals, provide essential information regarding the effects of treatment, and address high priority areas, such as parent-child interactions and core features of ASDs (Lord et al., 2005; Smith et al., 2007). Measures should represent multiple informants and, in order to limit redundancy and increase efficiency, only the most relevant and sensitive measures should be included in the assessment protocol (Williams-White, Koenig, & Scahill, 2007). As previously mentioned, the results of this study demonstrate strong support for the inclusion of standard DPICS-III codification, the PRQ, and the PDDBI into future investigations of the effects of PCIT for families of children with ASDs. The author is currently investigating whether DPICS-III supplemental codes (Eyberg, et al., 2005) and/or the Emotional Availability Scales-Third Edition (Biringen, Robinson, & Emde, 2000) may provide additional insight into the effects of PCIT on the quality of the parent-child relationship, attachment between parent and child, and social/emotional reciprocity.

Implications

SSRD studies in the field of ASDs have documented the efficacy of specific behavioral techniques that are commonly used in parent training programs in other fields (Johnson, Handen, Butter, Wagner, Mulick, & Sukhodolsky, 2007). Literature in the field of ASDs also cites parents as active participants in many comprehensive training programs (Johnson et al., 2007; Rogers & Vismara, 2008; Marcus et al., 2005; Harris, 1994). Review of ASD research shows no large scale studies of parent training interventions with children with ASDs. Only a handful of small group design studies have examined parent training interventions for families of children with ASDs. Hence, despite evidence that parent mediated interventions are effective with children with ASDs, dissemination of parent training programs has been minimal and the evaluation of exportable parent training programs from other fields has largely been ignored (Johnson et al., 2007).

Likewise, the negative impact socialization deficits have on the development of kids with ASDs is well-documented, yet little is known about effective psychosocial interventions to improve socialization problems (Williams-White, Koenig, & Scahill, 2007). This is not surprising as the unique characteristics of ASDs versus other childhood disorders (i.e. uneven developmental profile, varying presentation, age of onset) make treatment design a complex process (Lord, Wagner, Rogers, Szatmari, Aman, Charman, et al., 2005). In order to address the paucity of psychosocial intervention with ASDs knowledge, several national organizations, such as the National Institute for Mental Health (NIMH) and the National Institute for Health (NIH), have convened special working groups dedicated to developing guidelines for psychosocial interventions for ASDs (Smith et al., 2007; Lord et al., 2005).

Lord et al. (2005) summarizes the NIH meeting addressing the challenges of conducting psychosocial intervention research with ASDs. While the group deemed randomized, clinical trials of comprehensive autism interventions as the highest priority for psychosocial interventions, several other priorities emerged, including applying design ideas from other research fields to create psychosocial interventions for ASDs. Other priority areas included the creation of new outcome measures and the modification of existing outcome measures so treatment goals can be better documented. Specific areas of need mentioned were measures of parent-child interaction, family satisfaction, negative effects of treatment, and semi-structured observations or probes for targeted areas of change. The group recommended multiple baseline research techniques as a viable approach to addressing major questions of treatment effects in ASD psychosocial interventions (Lord et al., 2005).

Smith et al. (2007) published a sequential model for validating and disseminating ASD psychosocial intervention research based on the conclusions of a NIMH supported work group. The first step in this model involves conducting initial efficacy studies to establish interventions as promising. The goal at this step is to provide “proof of concept” (i.e., demonstrate the intervention may have therapeutic benefit). SSRD and between-group designs are recommended at this step in order to begin testing a new intervention or conduct refinement tests of existing interventions. At the second step, promising interventions are assembled into a manual which is subsequently pilot tested. Feasibility testing that involves implementing the manual and assessment protocol with 2-3 subjects at multiple treatment sites is recommended during stage 2. The third step employs effectiveness studies to evaluate intervention outcomes in community settings. This step involves randomized clinical trials (RCTs) to determine if the intervention yields consistent effects across sites. The work group lists developing manuals for interventions

that have demonstrated initial efficacy and focusing interventions on core features of ASD are the highest priorities for ASD research (Smith et al., 2007).

When viewed within the context of the NIMH model, the current study falls under the first step as it is an initial study that establishes PCIT as a promising intervention for families of children with ASDs. Further, as delineated below, the current research also meets several guidelines for psychosocial intervention research set forth by the NIH and NIMH working groups. The current study employed a multiple probe across participants single-subject research design. The NIH and NIMH working groups both supported SSRD as a valid technique that yields evidence that a specific intervention technique has a clear, replicable effect on a specific behavior (Lord et al., 2005; Smith et al., 2007). The current research incorporated measures of generalization outside the clinic setting, as well as assessments of treatment fidelity and reliability. Lord et al. (2005) documented measures of treatment fidelity and reliability as expensive and time-consuming, but vital to a well-designed psychosocial treatment study. The necessity of adapting successful psychosocial interventions from other fields into the ASD field has been documented (Johnson et al., 2007; Smith et al., 2007; Lord et al., 2005). The current research takes a well-established efficacious treatment for families of children with disruptive behavior disorders and applies it to families of children with ASDs. Lord et al. (2005) identified inclusion of measures of parent-child interaction, family satisfaction, and semi-structured observations as a high priority in ASD psychosocial intervention research. The current study meets this need by including the DPICS-III coding observation system and the Parenting Relationship Questionnaire (PRQ), as well as reliable measures of treatment change specific to autism symptomatology (PDDBI). Assessment of treatment change from multiple perspectives was also deemed important in ASD intervention research (Smith et al., 2007; Lord et al., 2005).

In addition to parent report, the current research also utilizes clinician observations of both parent and child behavior to measure dependent variables. Johnson et al. (2007), Lord et al. (2005), and Smith et al. (2007) identified psychosocial interventions that address core features of ASDs as high priority. The intervention model employed in the current research addresses social reciprocity, social communication, and developmentally-appropriate play skills.

Limitations

The current research has several notable limitations. In addition to small sample size, the participants in this study lacked diversity and were not fully representative of the population of families with children with ASDs. All participants were Caucasian, all caregivers were female, and all children in the study were all high functioning. In reality, both mothers and fathers care for children with ASDs, individuals of all races are affected by ASDs, and a minority of individuals with ASD demonstrates average or greater intellectual functioning. Therefore, the results of this study may not generalize to the majority of individuals with ASDs. As well as, the obtained effects of PCIT may have differed if fathers, individuals with a broader range of intellectual functioning, or individuals from other ethnic backgrounds participated in the study. Individuals with co-morbid externalizing disorders were not recruited for this research. As PCIT was designed to treat families of children with disruptive behavior disorders, and subsequent efficacy trials with new populations have included co-morbid diagnosis with externalizing disorders, perhaps the inclusion of co-morbid diagnoses would have changed the results of this study. The only other published study applying PCIT to the ASD population retained co-morbid clinical levels of externalizing behavior in the inclusion criteria. It could be argued that the first step in testing PCIT efficacy with preschoolers with ASDs could have been to utilize participants with co-morbid ASD and disruptive behavior disorder diagnoses and then conduct a follow-up

study of the effects of PCIT on individuals with an ASD diagnosis only. The author of the study considered this point during the planning phase, but due to the participant recruiting difficulties a low incidence disorder entails, the author decided that the high occurrence of associated behavioral problems in individuals with ASDs did not necessitate co-morbid diagnosis of a disruptive behavior disorder as inclusion criteria.

Future Directions

As this is the second published study to demonstrate the feasibility of applying PCIT to families of children with ASD, further replication of this line of research by additional investigators is recommended. Replication of the current research at multiple sites and with a larger, more diverse ASD sample is needed to inform protocol development. Next steps for this line of research include refining the application of PCIT technique to the ASD population, creating a version of the PCIT manual with protocol specific to the needs of families with ASDs, and testing the feasibility of the manual by conducting a series of small, pilot tests at multiple locations that implement the manualized procedures and assessment protocol (i.e., phase 2 of psychosocial intervention development as delineated by the NIMH working group; Smith et al., 2007). These feasibility tests would provide information about the acceptability of the manual by clinicians and demonstrate whether the intervention could be implemented according to manualized procedures at varying locations.

Short-term research goals in this area would be to develop a manual that standardizes the application of PCIT to families of children with ASDs, yet allows for individualization by incorporating decision rules to modify the intervention plan by selecting from a list of alternative modules based on the family's response to the intervention. The creation of a manual that delineates acceptable variations in delivering PCIT with families of PCIT based on participant

characteristics or participant response to the intervention would be optimal. The principle of “constrained flexibility” addresses the need to balance uniformity with the need for individualization and maintains that limited variation in intervention is acceptable provided suggested alternate courses of action are delineated in the manual (Smith et al., 2007). Due to the heterogeneous presentation across individuals with ASDs, any psychosocial intervention manual must allow for “constrained flexibility” so clinicians can meet the individual needs of participants while still employing evidence-based techniques. For example, as part of CDI graduation criteria in PCIT, the parent must deliver at least 10 Reflections (RF; paraphrasing words/sentences spoken by the child) during the five minute DPICS-III observation segment. However, if conducting PCIT with a nonverbal or minimally verbal child with autism, the child may not speak at least 10 words for the parent to reflect. Therefore, a properly designed manual should contain alternate modules or graduation guidelines for use with nonverbal or minimally verbal children. Future research with PCIT and ASDs should be conducted with children across the range of functioning to ensure manual and assessment protocol will be appropriate and effective for the greatest percentage of the ASD population.

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CHAPTER 4

DISSERTATION SUMMARY

Autism Spectrum Disorders (ASDs) are neurodevelopmental disorders characterized by ritualistic/repetitive behaviors and impairments in reciprocal social interaction and communication. ASDs are a class of disorders that includes Autism, Asperger's Disorder, and Pervasive Developmental Disorder—Not Otherwise Specified. Autism is the most prevalent ASD (American Psychiatric Association, 2000). Along with the core symptoms of autism, behavior problems, such as self-injurious behavior (SIB), aggression toward others, and temper tantrums, are present in the majority of individuals diagnosed with ASD (Hastings, 2003). Associated behavior problems are considered the most significant stressors to the family (Roberts, Mazzucchelli, Taylor, & Reid, 2003). ASD literature describes the negative impact of behavior problems on family functioning, such as increased parental stress, depression, anxiety, and marital discord, and decreased family adjustment, cohesion, emotional expression, attachment, and well-being (Harris, 1994; Marcus, Kunc, & Schopler, 2005; Plant & Sanders, 2007; Roberts et al., 2003).

In light of research documenting impaired family functioning associated with ASDs, some authors have argued that ASD-related problems should be conceptualized as family problems rather than problems pertaining only to the individual with autism (Kazdin & Whitley, 2003; Harris, 1994). While the child's behavior problems can negatively impact family functioning, family problems can also significantly impact the child's functional and behavioral adjustment. Given the bi-directional influences between family functioning and child behavioral

functioning, positive outcomes for members of the family must be a focus of treatment in order for the post-treatment reduction in associated behavior problems to continue over time (Brookman-Frazee, Stahmer, Baker-Ericzen & Tsai, 2006; Marcus et al., 2005). Family involvement in treatment is associated with improvement in family functioning. Barriers to family participation are reduced and greater therapeutic change is evidenced in children with ASDs when parent factors are directly incorporated into the intervention (Kazdin & Whitley, 2003). Further, the employment of parents as therapists in the intervention of their children has been successful in both autism literature and parent training research with other clinical and typically developing populations (Eyberg, Nelson & Boggs, 2008; Brinkmeyer & Eyberg, 2003; Schreibman, 2000).

Single-subject research design (SSRD) studies in the field of ASDs have documented the efficacy of specific behavioral techniques that are commonly used in parent training programs in other fields (Johnson, Handen, Butter, Wagner, Mulick, & Sukhodolsky, 2007). Literature in the field of ASDs also cites parents as active participants in many comprehensive training programs (Johnson et al., 2007; Rogers & Vismara, 2008; Marcus et al., 2005; Harris, 1994). Review of ASD research shows no large scale studies of parent training interventions with children with ASDs. Only a handful of small group design studies have examined parent training interventions for families of children with ASDs. Hence, despite evidence that parent mediated interventions are effective with children with ASDs, dissemination of parent training programs has been minimal and the evaluation of exportable parent training programs from other fields has largely been ignored (Johnson et al., 2007).

Likewise, the negative impact socialization deficits have on the development of kids with ASDs is well-documented, yet little is known about effective psychosocial interventions

(Williams-White, Koenig, & Scahill, 2007). This is not surprising as the unique characteristics of ASDs versus other childhood disorders (i.e. uneven developmental profile, varying presentation, age of onset) make treatment design a complex process (Lord, Wagner, Rogers, Szatmari, Aman, Charman, et al., 2005). In order to address the paucity of psychosocial intervention with ASDs knowledge, several national organizations, such as the National Institute for Mental Health (NIMH) and the National Institute for Health (NIH), have convened special working groups dedicated to developing guidelines for psychosocial interventions for ASDs (Smith et al., 2007; Lord et al., 2005). Among other recommendations, these guidelines suggest adapting successful psychosocial intervention from other fields to fit the needs of families and individuals with ASDs.

A recently published meta-analysis of Parent-Child Interaction Therapy (PCIT) and Positive Parenting Program (Triple P; Sanders, Markie-Dadds, & Turner, 1998) outcome research supported the efficacy of PCIT across 13 studies conducted by multiple research teams and concluded that PCIT meets criteria for a “well-established treatment” (Thomas & Zimmer-Gembeck, 2007; Chambless & Hollon, 1998). The effectiveness of PCIT in treating children with disruptive behavior has been documented in studies comparing the effects of PCIT to wait-list controls (Bagner & Eyberg, 2007; McNeil, Capage, Bahl, & Blanc, 1999; Schuhmann et al., 1998), classroom controls (McNeil, Eyberg, Eisenstadt, Newcomb, & Funderburk, 1991; Funderburk et al., 1998), group parent training (Eyberg & Matarazzo, 1980), and modified PCIT (Nixon, Sweeney, Erickson, & Touyz, 2003). Along with decreasing disruptive behavior in children, PCIT efficacy studies have shown key changes in parents’ behaviors toward their children, such as increased prosocial verbalization, physical proximity, and reflective listening. Research on the effectiveness of PCIT has demonstrated improvement in parents’ self report

measures of personal distress, parenting locus of control, and psychopathology (Schuhmann et al., 1998). PCIT treatment effects have also been found to generalize to untreated siblings, to the school setting, and across time (Edwardes, Eyberg, Rayfield, Jacobs, Bagner, & Hood, 2002; Eyberg, Funderburk, Hembree-Kigin, McNeil, Querido, & Hood, 2001; Funderburk et al., 1998; McNeil et al, 1991).

PCIT appears to address many of the clinical needs of families of children with ASDs since it incorporates general principles essential to autism intervention and utilizes several of established identified approaches to autism intervention (Marcus et al., 2005). In a review of autism intervention research, Roberts et al. (2003) found that interventions based upon either ABA or social learning theory showed the most promise for children with ASD. PCIT utilizes both social learning theory and behavioral management techniques. Other successful components of intervention identified by Roberts et al. (2003) were the inclusion of modeling, role playing, and active skill training; as well as pivotal response training and approaches tailored to the specific family's needs. PCIT includes modeling, role playing, active skills training, and flexibility to focus the intervention around specific needs of the family (Eyberg & Child Study Lab, 1999).

It is reasonable to conclude that an intervention, such as PCIT, that contains principles similar to successful autism interventions, will be successful in improving other target behaviors in children with autism as well. A recently published preliminary study conducted by Solomon, Ono, Timmer and Goodlin-Jones (2008) provides encouraging evidence of PCIT's utility for families of children with ASDs. Reductions in parents' perceptions of child atypicality and child problem behaviors, increases in parents' perceptions of child adaptability, and increases in shared positive affect in parent-child dyads were found post-PCIT in families of school-age

males diagnosed with comorbid high functioning autism and externalizing problems (Solomon et al., 2008).

The current research employed an evidence-based psychosocial intervention for families of children with disruptive behavior disorders, Parent-Child Interaction Therapy (PCIT), with families of preschool-age children with ASDs. A multiple probe single subject design was employed to investigate the efficacy of PCIT with four families with children with ASDs (2 with Autistic Disorder, 2 with PDD-NOS) between the ages of two and four years old ($M = 40$ months). Families participated in weekly PCIT sessions over a four-month period ($M = 14.25$ sessions). Results demonstrated that PCIT was effective in increasing positive parenting behavior, decreasing negative parenting behavior, and increasing child compliance to parental commands. Parents reported greater confidence in their parenting abilities post-treatment, but did not report significantly reduced stress. Significant improvement in core areas of autism symptomatology, including social approach behaviors and receptive-expressive language communication abilities, was reported by parents post-treatment on the PDDBI. Further, parents endorsed significant improvement in aspects of the parent-child relationship, such as attachment and involvement, post-treatment on the PRQ.

The current research introduces PCIT as a promising intervention for families of preschool-age children with ASDs. As this is the second published study to demonstrate the feasibility of applying PCIT to families of children with ASDs, further replication of this line of research by additional investigators is recommended. Replication of the current research at multiple sites and with a larger, more diverse ASD sample is needed to inform protocol development. Next steps for this line of research include refining the application of PCIT technique to the ASD population, creating a version of the PCIT manual with protocol specific to

the needs of families with ASDs, and testing the feasibility of the manual by conducting a series of small, pilot tests at multiple locations that implement the manualized procedures and assessment protocol (i.e. phase 2 of psychosocial intervention development as delineated by the NIMH working group; Smith et al., 2007). These feasibility tests would provide information about the acceptability of the manual by clinicians and demonstrate whether the intervention could be implemented according to manualized procedures at varying locations.

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Table 1

Comparison of PCIT against Marcus, Kuncze, and Schopler's (2005) Guidelines for Autism Intervention Programs

<u>Suggested Principles and Approaches to Autism Intervention</u>	<u>PCIT</u>
Individualization to Family's Needs	Incorporates family's specific needs into session content and goals
Emphasis on collaborative family relationships	Collaborative P-C relationship is essential component
Family relationship viewed as transactional over time	PCIT recognizes transactional dynamic of family relationships
Parents as therapists or co-therapists	PCIT trains parent in therapeutic techniques
Relationship Enhancement	Improving the quality of P-C relationship primary goal of PCIT
Behavioral Approach	PCIT is a behaviorally-based intervention
Emotional Support	Time for emotional support of parent included in PCIT protocol
Cognitive Support	Not Included
Education about Autism	Not Included
Instrumental Support	Not Included
Advocacy Training	Not Included

Table 2*Participant Descriptions*

<u>Participant</u>	<u>Age</u>	<u>Gender/ Ethnicity</u>	<u>Parent Involved</u>	<u>Receptive Vocabulary</u>	<u>Entry Autism Information</u>	<u>School</u>
Elise	3 yrs 5mths	Female/Caucasian	Mother 34 yrs old Caucasian Married	PPVT-IV: 85 Low Average Range	ADOS classification: Autistic Range CARS: 25 Non- autistic range PDDBI Autism Composite: 40 Dx: Autism	Attends preschool for 3 hrs. per day, 3 days a week OT 1 x/wk Speech 3 x/wk
Peyton	3 yrs 1 mth	Female/Caucasian	Mother 37 yrs old Caucasian Married	PPVT-IV: 102 Average Range	ADOS classification: Autistic Range CARS – 40 Severe range PDDBI Autism Composite: 67 Dx: Autism	Attends self- contained preschool for 3 hrs. per day, 5 days per week Speech 1 x/wk OT 2 x/wk
Charles	4 yrs 1 mth	Male/Caucasian	Mother 36 yrs old Caucasian Married	PPVT-IV: 115 High Average Range	ADOS Classification: Autistic Range CARS – 28.5 Non- autistic range PDDBI Autism Composite: 41 Dx: PDD-NOS	Attends preschool 3 hours per day, 5 days per week Speech 3 x/wk OT 1 x/wk
Thomas	2 yrs, 8 mths	Male/Caucasian	Mother 38 yrs old Caucasian Married	PPVT-IV: Unscorable	ADOS Classification: Autism Spectrum Range (04/07) CARS: Non- autistic range (04/07) PDDBI Autism Composite: 67 Dx: PDD-NOS	Attends full day Montessori preschool, 5 days per week

Note: PPVT-IV = Peabody Picture Vocabulary Test-Fourth Edition; ADOS = Autism Diagnostic Observation Schedule; CARS = Childhood Autism Rating Scale; PDDBI = Pervasive Developmental Disorders Behavior Inventory; OT = Occupational Therapy

Table 3*Measures Utilized at each Condition*

Descriptive/ Intake	Baseline	Intervention & Repeated Measures Across Conditions	Post-treatment
Peabody Picture Vocabulary Test – 4 th ed. (PPVT-IV)	Parenting Daily Hassles (PDH)	Eyberg Child Behavior Inventory (ECBI)	Parenting Daily Hassles (PDH)
Childhood Autism Rating Scale (CARS)	Parenting Relationship Questionnaire (PRQ)	Dyadic Parent Child Interaction Coding System (DPICS-III)	Parenting Relationship Questionnaire (PRQ)
Demographic questionnaire	Childhood Behavior Checklist (CBCL)		Childhood Behavior Checklist (CBCL)
Multidimensional Scale of Perceived Social Support (MSPSS)	Parenting Stress Index (PSI)		Parenting Stress Index (PSI)
Structured Interview	Beck Depression Inventory-2 nd ed. (BDI-II)		Beck Depression Inventory-2 nd ed. (BDI-II)
Autism Diagnostic Observation Schedule (ADOS)	Parenting Locus of Control-Short Form (PLOC-SF)		Parenting Locus of Control-Short Form (PLOC-SF)
	Childhood Autism Rating Scale-Parent version (CARS-P)		Childhood Autism Rating Scale-Parent version (CARS-P)
	Family Attitude Scale (FAS)		Family Attitude Scale (FAS)
	Pervasive Developmental Disorders Behavior Inventory (PDDBI)		Pervasive Developmental Disorders Behavior Inventory (PDDBI)
	Parent Practices Scale (PPS)		Parent Practices Scale (PPS)
			Therapy Attitude Inventory (TAI)

Table 4*DPICS-III Parent and Child Categories*

Parent Category	Code	Operational Definition
Labeled Praise “Do” Skill	LP	Positive evaluation of a specific behavior, activity, or product of the child
Unlabeled Praise	UP	Positive evaluation of the child, an attribute of the child, or a nonspecific activity, behavior, or product of the child
Behavior Description “Do” Skill	BD	Non-evaluative, declarative sentences or phrases in which the subject is the other person and the verb describes that person’s ongoing or immediately completed (< 5 sec.) observable verbal or nonverbal behavior
Reflection “Do” Skill	RF	Declarative phrase or statement that has the same meaning as the child verbalization. May paraphrase or elaborate upon the child’s verbalization but may not change the meaning of the child’s statement or interpret unstated ideas.
Direct Command “Don’t” Skill	DC	Declarative statements that contain an order or direction for a vocal or motor behavior to be performed and indicate the child is to perform this behavior
Indirect Command “Don’t” Skill	IC	Suggestion for a vocal or motor behavior to be performed that is implied or stated in question form.
Neutral Talk	TA	Statements that introduce information about people, objects, events, or activities, or indicate attention to the child, but do not clearly describe or evaluate the child’s current or immediately completed behavior
Question “Don’t” Skill	QU	Descriptive or reflective comment or statement expressed in question form which requires no more than a brief affirmative or negative response, even if the child gives additional information in response or does not respond
Negative Talk “Don’t” Skill	NTA	Verbal expression of disapproval of the child or the child’s attributes, activities, products, or choices. NTA also includes sassy, sarcastic, rude, or impudent speech
Child Category	Code	Operational Definition
Compliance	CP	Coded when the command is obeyed or beginning to be obeyed with a 5-second interval of the parent issuing the command
Noncompliance	NCP	Coded when the command is not obeyed or attempted within 5-seconds or when a behavior incompatible with the command is performed
No Opportunity for Compliance	NOC	Coded when an adequate chance to comply with the command has not been given by the parent

Table 5*Dependent Variables with Corresponding Measures*

Measure	Child Functioning	Parent Affect	Parent Comp- etence	Parent- Child Relation- ship	Treatment Satisfaction
Parenting Stress Index (PSI)		X		X	
Parenting Daily Hassles (PDH)		X	X		
Parent Practices Scale (PPS)			X		
Parenting Relationship Questionnaire (PRQ)		X		X	
Dyadic Parent-Child Interaction Coding System— 3 rd ed. (DPICS-III)	X		X	X	
Beck Depression Inventory - 2 nd ed. (BDI-II)		X			
Parenting Locus Of Control- Short Form (PLOC-SF)			X		
Childhood Behavior Checklist (CBCL)	X				
Eyberg Child Behavior Inventory (ECBI)	X				
Childhood Autism Rating Scale – Parent Version (CARS-P)	X	X			
Family Attitude Scale (FAS)				X	
Therapy Attitude Inventory (TAI)					X
Pervasive Developmental Disorders Behavior Inventory (PDDBI)	X				

Table 6*Child Compliance in Clean-up Situation***Clean-up Alpha Compliance (CUACP)**

Family	Baseline 1	Baseline 2	Post 1	Post 2
1	21.21%	36.36%	100%	100%
2	26.47%	33.33%	100%	100%
3	100%	25%	100%	91.67%
4	16.39%	9.09%	85.71%	----

Note: $CUACP = CP / [(DC + IC) - NOC]$

Clean-up Beta Compliance (CUBCCP)

Family	Baseline 1	Baseline 2	Post 1	Post 2
1	12.5%	20.0%	100%	100%
2	16.07%	18.18%	100%	100%
3	83.33%	16.67%	100%	91.67%
4	10.99%	7.14%	66.67%	----

Note: $CUBCCP = CP / (DC + IC)$

Clean-up Opportunity Commands (CUCOC)

Family	Baseline 1	Baseline 2	Post 1	Post 2
1	58.93%	55.0%	100%	100%
2	60.71%	54.55%	100%	100%
3	83.33%	66.67%	100%	100%
4	67.03%	78.57%	77.78%	----

Note: $CUCOC = (CP + NC) / (CP + NC + NOC)$

Table 7*Pervasive Developmental Disorders Behavior Inventory (PDDBI) Scores*

Baseline and Post-Treatment Domain Scores										
Family	Sens- ory Pre	Sens- ory Post	Rit- ual Pre	Rit- ual Post	SOC- PP Pre	SOC- PP Post	SEM- PP Pre	SEM- PP Post	AR Pre	AR Post
1	34	34	47	36	49	36	57	45	41	26
2	55	43	56	41	65	40	77	57	58	41
3	38	35	43	38	42	39	61	48	37	34
4	52	53	71	72	57	58	78	75	61	58
Mean	44.75	41.25	54.25	46.75	53.25	43.25	68.25	56.25	49.25	39.75

Baseline and Post-Treatment Domain Scores										
Family	Fears Pre	Fears Post	AGG Pre	AGG Post	SOC- APP Pre	SOC- APP Post	Ex- press Pre	Ex- press Post	LMRL Pre	LMRL Post
1	58	47	50	36	65	75	56	67	65	69
2	66	43	52	43	53	71	52	63	51	63
3	53	40	49	46	65	74	50	66	43	66
4	62	58	56	67	46	54	58	60	46	68
Mean	59.75	47	51.75	48	57.25	68.5	54	64	51.25	66.5

Baseline and Post-treatment Composite Scores						
Family	REP- RIT/C Pre	REP- RIT/C Post	AWP/ C Pre	AWP/ C Post	AUT- ISM Pre	AUT- ISM Post
1	42	31	46	31	40	22
2	71	43	69	44	67	34
3	44	35	50	37	28	25
4	69	77	67	100	67	64
Mean	56.5	46.5	58	53	50.5	36.25

Baseline and Post-treatment Composite Scores				
Family	EXCSCA/C Pre	EXCSCA/C Post	REXSC/C Pre	REXSC/C Post
1	62	73	63	73
2	53	70	53	44
3	61	75	56	71
4	52	62	51	62
Mean	57	70	55.75	62.5

Note: SOCPP = Social Pragmatic Problems; SEMPP = Semantic/Pragmatic Problems; AGG = Aggressiveness; SOCAPP = Social Approach Behaviors; AR = Arouse LMRL = Learning, Memory, and Receptive Language; REPRIT/C = Repetitive, Ritualistic, and Pragmatic Problems Composite; AWP/C = Approach/Withdrawal Problems Composite; EXCSA/C = Expressive Social Communication Abilities Composite; REXSC/A = Receptive/Expressive Social Communication Abilities Composite

Table 8*Parenting Stress Index (PSI) Scores*

Baseline and Post-Treatment Child Domain Scores										
	DI Pre	DI Post	AD Pre	AD Post	RE Pre	RE Post	Mood Pre	Mood Post	DE Pre	DE Post
1	99%	92%	85%	97%	15%	55%	96%	96%	96%	99%
2	99%	25%	65%	40%	87%	30%	85%	75%	98%	90%
3	45%	15%	95%	92%	45%	65%	50%	90%	70%	75%
4	87%	60%	98%	98%	87%	80%	98%	98%	90%	96%
Avg.	82.5	48	85.75	81.75	58.5	57.5	82.25	89.75	88.5	90

Baseline and Post-treatment Child and Parent Domain Scores								
	AC Pre	AC Post	Child Domain Total Pre	Child Domain Total Post	Parent Domain Total Pre	Parent Domain Total Post	Total Stress Pre	Total Stress Post
1	90%	95%	95%	98%	88%	97%	97%	98%
2	99%	85%	98%	60%	44%	15%	86%	30%
3	10%	50%	98%	68%	84%	65%	77%	67%
4	99%	96%	98%	96%	56%	79%	89%	92%
Avg.	74.5	81.5	86.5	80.5	68	64	87.25	71.75

Baseline and Post-Treatment Parent Domain Scores								
Family	CO Pre	CO Post	IS Pre	IS Post	AT Pre	AT Post	HE Pre	HE Post
1	87%	85%	80%	98%	65%	80%	75%	95%
2	60%	20%	85%	70%	15%	10%	65%	75%
3	75%	40%	60%	60%	80%	25%	90%	80%
4	15%	40%	70%	92%	35%	65%	50%	98%
Avg.	59.25	46.25	73.75	80	48.75	45	70	87

Baseline and Post-treatment Parent Domain Scores								
Family	RO Pre	RO Post	DP Pre	DP Post	SP Pre	SP Post	Life Stress Pre	Life Stress Post
1	96%	99%	80%	96%	65%	91%	65%	65%
2	65%	25%	12%	4%	40%	35%	65%	75%
3	65%	30%	84%	70%	91%	95%	99%	82%
4	70%	65%	90%	70%	65%	65%	35%	75%
Avg.	74	54.75	66.5	60	65.25	71.5	66	57

Note: DI = Distractibility/Hyperactivity; AD = Adaptability; RE = Reinforces Parent; DE = Demandingness; AC = Acceptability; CO = Competence; IS = Isolation; AT = Attachment; HE = Health; RO = Role Restriction; DP = Depression; SP = Spouse

Table 9*Child Behavior and Parenting Competence Measure Scores*

Family	Baseline and Post-Treatment Scores					
	CARS-P Symptoms Pre	CARS-P Symptoms Post	PDH Frequency Pre	PDH Frequency Post	PDH Intensity Pre	PDH Intensity Post
1	24	25	51	43	23	42
2	44	29	51	27	63	38
3	25	17	32	20	21	33
4	24	23	31	36	40	44
Mean	29.25	23.5	41	32	37	39

Family	Baseline and Post-Treatment Scores					
	PPS Pre	PPS Post	PDH Challenging Behavior Pre	PDH Challenging Behavior Post	PDH Parenting Tasks Pre	PDH Parenting Tasks Post
1	46	23	14	16	21	15
2	61	34	23	19	20	17
3	57	32	16	13	9	8
4	42	35	11	14	9	12
Mean	52	31	16	16	14.75	13

Note: CARS-P = Childhood Autism Rating Scale-Parent Version; PPS = Parent Practices Scale; PDH = Parenting Daily Hassles

Table 10*Parent-Child Relationship and Parenting Affect/Competence Measure Scores*

Family	Baseline and Post-Treatment Scores									
	PRQ AT Pre	PRQ AT Post	PRQ IN Pre	PRQ IN Post	PRQ RF Pre	PRQ RF Post	BDI- II Pre	BDI- II Post	FAS Pre	FAS Post
1	42	57	61	68	60	57	12	24	26	26
2	25	50	39	51	60	53	1	2	26	18
3	33	48	39	58	57	50	13	13	31	13
4	31	33	37	51	57	60	10	12	28	22
Mean	32.75	47	44	57	58.5	55	9	12.8	28	20

Family	Baseline and Post-Treatment Scores							
	PRQ DP Pre	PRQ DP Post	PRQ PC Pre	PRQ PC Post	PLOC- SF Pre	PLOC- SF Post	CARS- P Stress Pre	CARS- P Stress Post
1	61	63	68	52	67	44	25	22
2	48	59	51	46	84	96	42	27
3	56	65	58	58	92	89	20	17
4	31	46	51	43	95	93	19	20
Mean	49	58.25	57	49.75	85	60.25	26.5	21.5

Note: PRQ = Parenting Relationship Questionnaire; AT = Attachment; DP = Discipline Practices; IN = Involvement; PC = Parenting Confidence; RF = Relational Frustration; PLOC-SF = Parenting Locus of Control-Short Form; BDI-II – Beck Depression Inventory, 2nd Edition; CARS-P = Childhood Autism Rating Scales-Parent Version; FAS = Family Attitude Scale

Table 11*Multidimensional Scale of Perceived Social Support (MSPSS) Scores*

Family	Pre Significant Other	Post Significant Other	Pre Friends	Post Friends	Pre Family	Post Family	Pre Total	Post Total
1	6.00	6.00	5.75	4.25	4.25	5.00	5.33	5.16
2	3.50	6.75	2.25	4.75	4.00	6.25	3.25	5.91
3	4.00	3.25	5.25	5.00	5.75	4.75	4.92	4.33
4	6.25	6.75	4.75	5.50	3.25	4.25	4.83	5.50
Mean	4.94	5.69	4.50	4.88	4.31	5.06	4.58	5.23

Table 12*Therapy Attitude Inventory (TAI) Scores*

Family	TAI Score
1	49
2	46
3	48
4	48
Mean	47.75

Table 13*DPICS-III Reliability Data—Percent Agreement*

Code Category	PI & Coder 1	PI & Coder 2	Coder 1 & Coder 2
Behavior	84%	89%	84%
Description			
Reflection	77%	82%	80%
Labeled Praise	83%	76%	90%
Unlabelled Praise	72%	70%	69%
Talk	81%	83%	94%
Command	73%	67%	70%
Question	77%	68%	73%
Negative Talk	82%	83%	100%
Indirect Command	98%		
Direct Command	67%		
No opportunity to comply	89%		
Obey	72%		
Disobey	69%		
Praise (after compliance)	100%		
Chair Warn (CW)	100%		
Obey (post CW)	100%		
Disobey (post CW)	100%		
% Agreement Mean	84%	78%	83%
PI & Reliability	81%		
Coder Overall % Agreement Mean			

Table 14*Child Behavior Checklist (CBCL) Scores*

Baseline and Post-Treatment Syndrome and Problem Scores										
Family	ER Pre	ER Post	S/C Pre	S/C Post	SP Pre	SP Post	AB Pre	AB Post	EP Pre	EP Post
1	62	50	58	50	50	50	55	50	58	35
2	62	50	50	50	56	53	62	51	63-B	51
3	55	55	62	62	62	62	59	59	63-B	58
4	69-B	69-B	65-B	58	53	62	64	60	62-B	62-B
Mean	62	55	58.75	52.75	55.25	57.25	60	55	60.25	50.5

Baseline and Post-Treatment Syndrome and Problem Scores										
Family	A/D Pre	A/D Post	WD Pre	WD Post	AP Pre	AP Post	IP Pre	IP Post	TP Pre	TP Post
1	56	51	67-B	51	67-B	50	63-B	45	61-B	39
2	51	51	67-B	51	67-B	57	59	43	64-C	50
3	59	59	56	56	53	53	59	60-B	64-C	62-B
4	56	59	73-C	76-C	53	57	69-C	69-C	69-C	69-C
Mean	55.5	54.25	65.75	58.5	60	53.5	62.75	53	64	53.75

Baseline and Post-Treatment DSM-Oriented Scores						
Family	Affective Problems Pre	Affective Problems Post	PDD Pre	PDD Post	ODD Pre	ODD Post
1	60	52	72-C	52	51	50
2	52	52	68-B	51	59	55
3	60	56	68-B	63	67-B	59
4	63	63	79-C	81-C	55	55
Mean	58.75	55.75	71.75	61.75	58	54.75

Baseline and Post-treatment DSM-Oriented Scores				
Family	Anxiety Problems Pre	Anxiety Problems Post	ADHD Pre	ADHD Post
1	57	51	67-B	50
2	54	51	76-C	54
3	63	51	50	51
4	67-B	67-B	57	57
Mean	60.25	55	62.5	53

Note: ER = Emotionally Reactive; A/D = Anxious/Depressed; S/C = Somatic Complaints; WD = Withdrawn; SP = Sleep Problems; AB = Aggressive Behavior; AP = Attention Problems; EP = Externalizing Problems; IP = Internalizing Problems; PDD = Pervasive Developmental Problems; ADHD = Attention Deficit/Hyperactivity Disorders; ODD = Oppositional Defiant Problems; B = Borderline Clinical Range; C = Clinical Range

Figure 1 *Mother “Do” and “Don’t” Skills.* Number of DPICS-III “Do” (LP + RF + BD) and “Don’t” (NTA + CM + QU) skills demonstrated by four mothers during the Child-Led Interaction (CDI) coding segment across the phases of Parent-Child Interaction Therapy (PCIT).

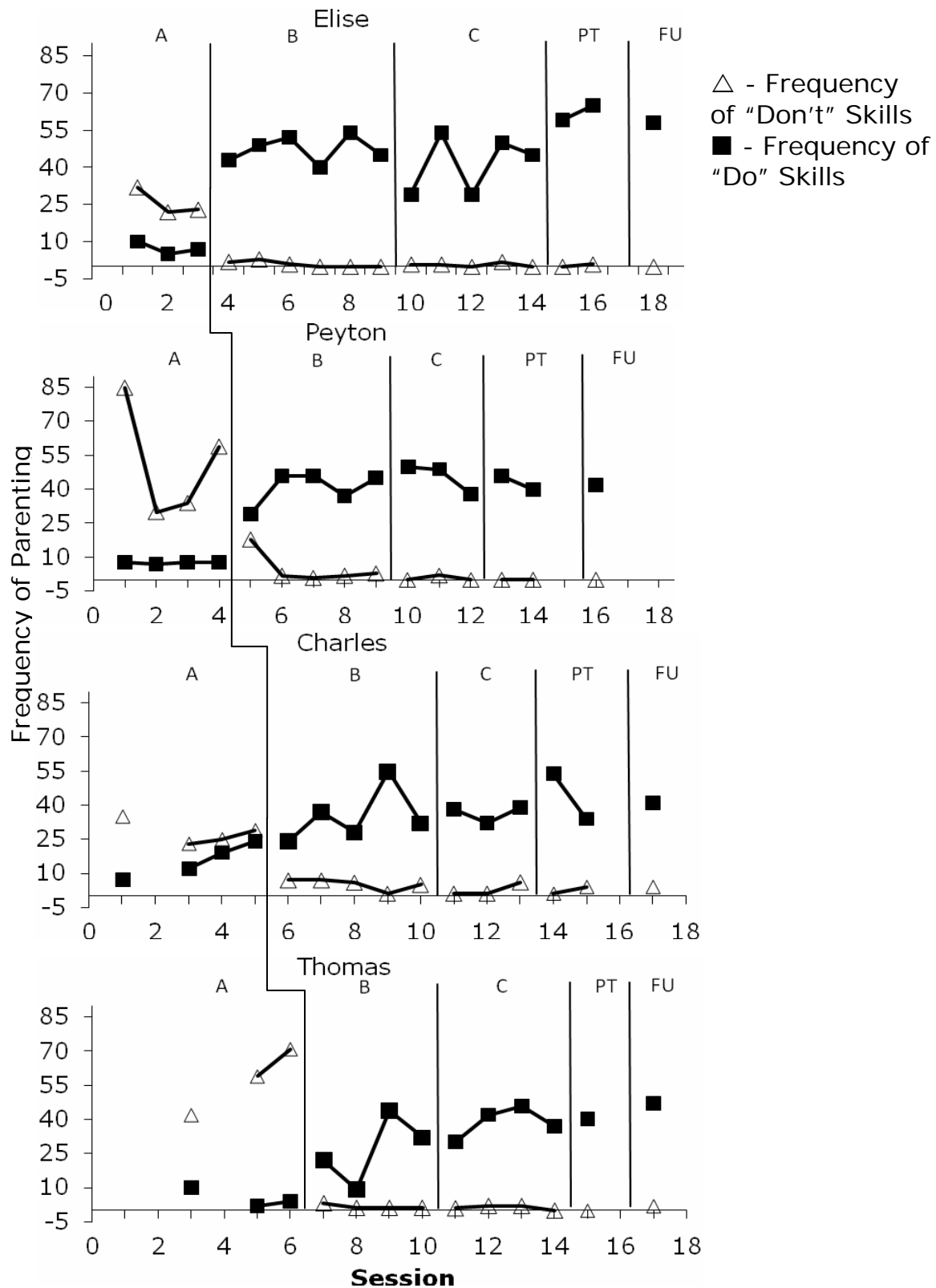


Figure 2 *Percentage of Beta Compliance during Parent-Led Play.* The number of times the child complied with parental commands divided by the total number of commands delivered by the mother during the Parent-Led Play (PLP) DPICS-III Coding Segments for four parent-child dyads.

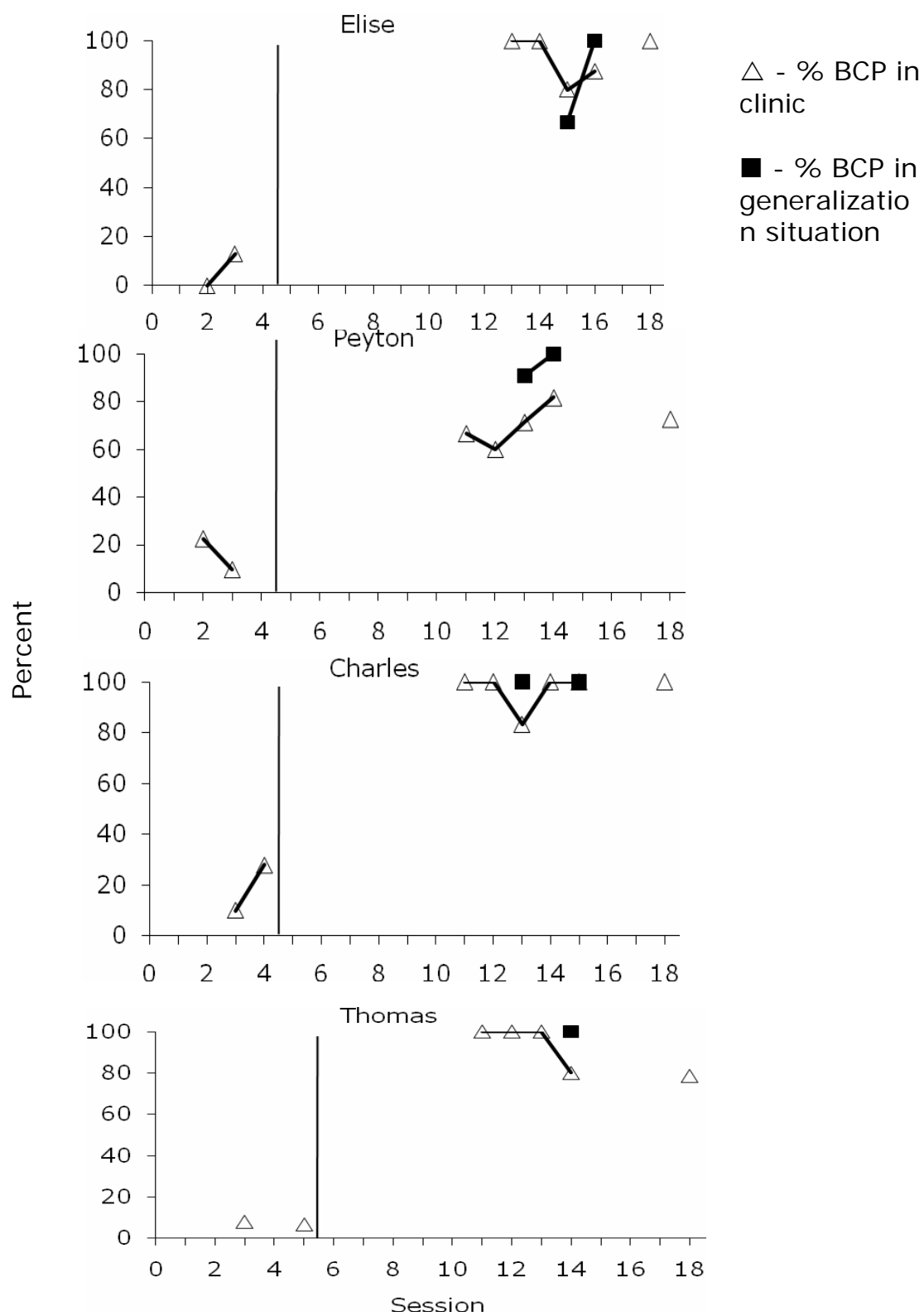


Figure 3 *Eyberg Child Behavior Inventory (ECBI) Scores.* Problem and Intensity Score for four children across all phases of Parent-Child Interaction Therapy (PCIT).

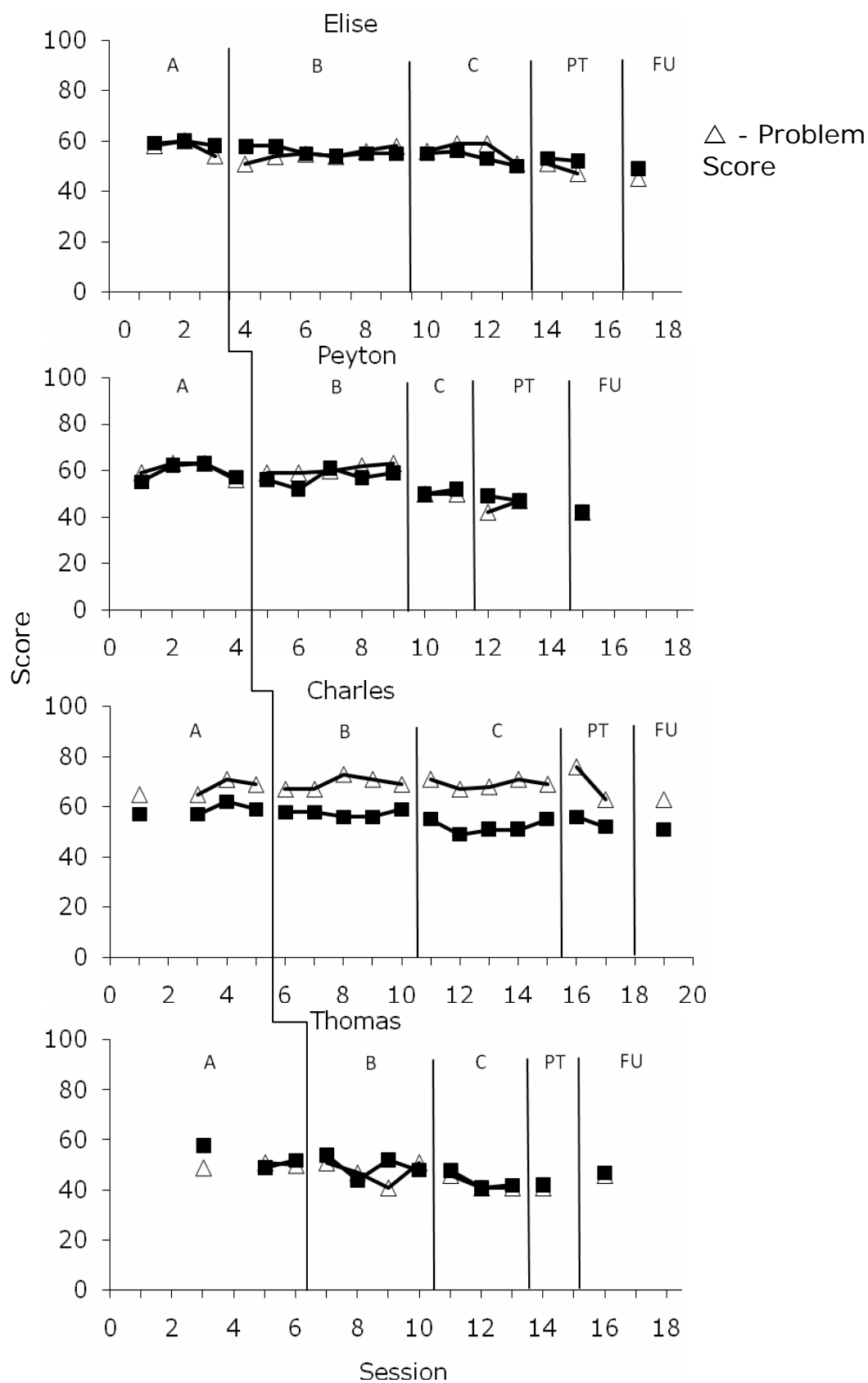


Figure 4 *Total Praise (TP)*. Number of Total Praise ($TP = LP + UP$) statements made by four mothers during Child-Led Play (CLP) DPICS-III coding segments across the phases of Parent-Child Interaction Therapy (PCIT).

