Examining the Utility of the Dyadic Parent-Child Interaction Coding System, 3rd Edition (DPICS-III) in the Assessment of Anxious Parent-Child Interactions

by

Jamie Kaitlyn Travis, M.S.

A dissertation submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Auburn, Alabama
August 1, 2015

Keywords: Parent-Child Interaction Therapy (PCIT), Dyadic Parent-Child Interaction Coding System (DPICS), analogue behavior observation (ABO), anxiety, assessment

Approved by

Elizabeth Brestan Knight, Chair, Professor of Psychology
Alejandro Lazarte, Associate Professor of Psychology
Sacha Pence, Assistant Professor of Psychology
Steven Shapiro, Associate Professor of Psychology

Abstract

Current conceptualizations of the etiology and maintenance of specific childhood disorders, including childhood disruptive behavior disorders (DBDs) and anxiety disorders, support the use of parental involvement in treatment. Although preliminary findings indicate that the incorporation of parents into the treatment of childhood anxiety disorders is beneficial, few studies to date have included a measure of parenting behavior to determine if parenting behavior changes as a result of intervention. This study sought to examine the utility of the clinical version of the Dyadic Parent-Child Interaction Coding System (DPICS), which is a comprehensive observational system for families of disruptive behavior disordered children aged 2-7, as a measure of anxious parent-child interactions by determining if the DPICS can distinguish between non-clinical, disruptive-behavior disordered, and anxious children and their parents. Participants included a total of 56 parent-child dyads across the aforementioned diagnostic groups who completed an extended DPICS observation, which is a structured analog behavior observation (ABO). Results showed the current DPICS is not sensitive enough to detect significant differences in parental control and negativity between anxious and non-clinical samples while adding support to the need for the DPICS observation to include a specific anxiety-provoking task. Implications of these findings, limitations, and future directions for research are discussed in relation to further developing appropriate assessment tools to evaluate changes in parenting behaviors that may impact the development and maintenance of childhood anxiety disorders.

Acknowledgements

To say that I could not have completed this project alone is an understatement. This project was a team effort in its truest sense. As such, I would like to express my immense gratitude to my mentor, Dr. Elizabeth Brestan Knight, who not only introduced me to Parent-Child Interaction Therapy, but also allowed me to explore the exciting adaptation of PCIT for anxiety disorders. This project would not have been possible without her openness, flexibility, enthusiasm, and formidable expertise. I am so grateful to have had the opportunity to develop both personally and professionally under her guidance. I am also incredibly lucky to have spent my graduate training years in the good company of the members of the Parent-Child Research Lab, all of whom not only gave graciously of their time, ideas, and energy to assist with this project, but also made my training experience more enjoyable. Additionally, I am forever indebted to the best undergraduate research assistants a person could ask for, as they willingly gave countless hours to the completion of this project. I would also like to thank my outstanding committee members for the time they spent reviewing and contributing to this project. Their input and feedback helped to strengthen this project, enhance my research skills, and make me a more well-rounded clinical psychologist. Lastly, I would be remiss if I failed to thank my family and friends for their unending support and love throughout my life, but particularly during this journey of higher education. I am not exactly sure how I became lucky enough to endear myself to such a wonderful support network, but I know that I would not be where I am today without their consistent encouragement, grounding feedback, and unwavering belief in me.

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List of Abbreviations

AACAP	American Academy of Child and Adolescent Psychiatry
ABO	Analogue Behavior Observation
ADHD	Attention-Deficit Hyperactivity Disorder
ANOVA	Analysis of Variance
APA	American Psychological Association
AUPSC	Auburn University Psychological Services Center
BASC-2 PRS	Behavior Assessment System for Children, 2^{nd} Edition Parent Rating Scale
BDI	Bravery-Directed Interaction
CALM	Coaching Approach Behavior and Leading by Modeling
CDI	Child-Directed Interaction
CLP	Child-Led Play task
CU	Clean-Up task
DADS	Describe, Approach, Direct, State (steps for exposure to feared situations)
DBD	Disruptive Behavior Disorder
DBD NOS	Disruptive Behavior Disorder, Not Otherwise Specified
DPICS	Dyadic Parent-Child Interaction Coding System
DPICS-II-RSAD	Dyadic Parent-Child Interaction Coding System II - Revised for Separation Anxiety Disorder

DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision
EBPP	Evidence-Based Practices in Psychology
EBT	Evidence-Based Treatment
ECBI	Eyberg Child Behavior Inventory
FACS	Family Anxiety Coding Schedule
GAD	Generalized Anxiety Disorder
ICC	Intraclass Correlation
IRB	Institutional Review Board
ODD	Oppositional Defiant Disorder
PCIT	Parent-Child Interaction Therapy
PDI	Parent-Directed Interaction
PLP	Parent-Led Play task
PMT	Parent Management Training
RE	Reunification task
SA	Separation task
SAD	Separation Anxiety Disorder
SA/N	Separation task with Novel adult and child
SA/P	Separation task with Parent and child

Introduction

Over the past two decades, the incorporation of evidence-based practices in psychology (EBPP) has been emphasized as a central tenet in the delivery of mental health care by policymakers, scientists, practitioners, and family advocacy groups. EBPP is described as clinical practice that integrates evidence-based treatments (EBTs), clinical expertise, and knowledge of clients' needs, preferences, and values (Kazdin, 2008; Levant, 2005). In line with these endorsements, the American Psychological Association (APA) specifically recommended the use of EBPP in their 2005 policy statement (APA, 2005). Additionally, following an analysis of the strengths and weakness of the current mental health service system, the President's New Freedom Commission on Mental Health (2003) Subcommittee on Children and Families emphasized the importance of not only informing children and families about EBPP, but also providing families with access to these services in an effort to prevent potential negative developmental trajectories for children. The drive behind the current prominence of EBPP in health care policy is likely a result of the growing evidence base in support of the use of EBTs in children's mental health care. For example, research on the efficacy of EBTs for children and adolescents has demonstrated that EBTs are more efficacious than usual care (Hoagwood, Burns, Kiser, Ringeisen, & Schoenwald, 2001; Spielmans, Gatlin, & McFall, 2010; Weisz, Jensen-Doss, & Hawley, 2006). Therefore, recent research has focused on developing and implementing efficacious prevention and intervention services for various childhood mental health concerns (e.g., Eyberg, Nelson, & Boggs, 2008; Silverman, Pina, & Viswesvaran, 2008; Weisz, Sandler, Durlak, & Anton, 2005).

Not surprisingly, the most common referral problems for which parents seek professional intervention, childhood disruptive behavior disorders (DBDs; Hinshaw & Lee, 2003; Kazdin, Bass, Ayers, & Rodgers, 1990; McMahon, Wells, & Kotler, 2006) and childhood anxiety disorders (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Silverman et al., 2008; Vasey & Dadds, 2001), have been at the forefront of EBT development. Not only are childhood DBDs and anxiety disorders prevalent in children and adolescents, but they frequently co-occur (APA, 2000; Marmorstein, 2007; Russo & Beidel, 1994; Shaw, Keenan, Vondra, Delliquardi, & Giovannelli, 1997) and have been found to be impairing and persistent disorders that have the potential to disrupt a child's developmental trajectory (Biederman et al., 1996; Campbell, 2002; Essau, Conradt, & Petermann, 2002; Ezpeleta, Keeler, Erkanli, Costello, & Angold, 2001; Kessler et al., 2011; Pine, Cohen, Gurley, Brook, & Ma, 1998). Additionally, both disorders can have an early onset and lead to significant disruptions for individuals, families, and society (Bodden, Dirksen, & Bögels, 2008; Costello, Egger, & Angold, 2005; Kennedy, Rapee, & Edwards, 2009). Therefore, recent research has focused on developing EBTs aimed at helping children early in their developmental trajectory in an effort to decrease or avoid additional impairments in functioning (Connolly, Suarez, & Sylvester, 2011; Mash & Barkley, 2006; Shaw, 2013).

Due to the fact that early child development is largely shaped through interactions between a child and his/her environment and parents are a crucial part of a young child's (aged 2–7) environment, treatments for young children that include parent involvement hold a lot of intuitive appeal. In line with this theory, research reflects that the best way to impact a child's development is to work on developing new, adaptive skills with the child while simultaneously addressing family interactions (Bronfenbrenner, 1974; Maccoby & Martin, 1983), and findings indicate that better outcomes are obtained when both the parent and the child participate in services (Dowell & Ogles, 2010; Karver, Handelsman, Fields, & Bickman, 2006; Noser & Bickman, 2000). Not only is the *general* incorporation of parents in the treatment of child mental health disorders supported by the literature, but current conceptualizations of the etiology and maintenance of specific childhood disorders (e.g., childhood DBDs and anxiety) support the use of parental involvement treatment, which has led to the development of a variety of interventions that focus on parent training to improve child outcomes.

Parent Training for Childhood DBDs

One common form of EBT that has been found to be highly efficacious in the treatment of young children with disruptive behaviors is known as behaviorally-based parent management training (PMT) programs (Brestan & Eyberg, 1998; Dretzke et al., 2009; Lundahl, Risser, & Lovejoy, 2006; Piquero, Farrington, Welsh, Tremblay, & Jennings, 2009; Serketich & Dumas, 1996). Parents have been conceptualized to play a large role in the development and maintenance of childhood disruptive behavior disorders (Dodge, Greenberg, & Malone, 2009; McMahon & Forehand, 2003; Moffitt et al., 2008). Specifically, parents of children with disruptive behaviors have been found to be active participants in coercive processes with the child and to lack, or infrequently and inconsistently use, fundamental parenting skills (Patterson, 1982). PMT programs work to alter the coercive process and ultimately improve child disruptive behavior by teaching parents to effectively manage child behavior and increase positive parent behavior. A recent review of EBTs by Chorpita et al. (2011) determined that not only are PMT programs efficacious, as demonstrated by being superior to a placebo or another treatment in randomized controlled trials, but they also possess clinical utility in that they have been shown to be feasible, generalizable, and effective in community settings. As a result, early-intervention PMT programs are becoming the standard of care for childhood disruptive behavior disorders (Eyberg et al., 2008).

Parent-Child Interaction Therapy

Parent-Child Interaction Therapy (PCIT) is one evidence-based PMT program used to treat young children, aged 3-7, with disruptive behaviors by improving the parent-child relationship and correcting maladaptive parent and child behavioral patterns (Eyberg & Boggs, 1989; McNeil & Hembree-Kigin, 2010). To accomplish this goal, parents who participate in PCIT are first taught relationship enhancement skills that emphasize positive parental attention for adaptive child behavior and selective ignoring of minor child misbehaviors during the Child-Directed Interaction (CDI) phase of treatment. Parents are then taught consistent discipline skills to use when the child exhibits defiant or disruptive behavior, including how to give effective commands and how to implement time out successfully during the Parent-Directed Interaction (PDI) phase of treatment. The focus of PCIT and other PMT programs on improving parent-child interactions allows for child behavior to be altered by helping to reshape the primary context in which children develop (e.g., the parent-child relationship), rather than attempting to work directly with children who have not yet developed the cognitive and language abilities necessary to promote change independently, such as metacognition, perspective taking, and advanced expressive and receptive language (Flavell, Miller, & Miller, 2001; Smith & Hudson, 2013; Zhang & Zheng, 1999). PCIT has been shown to reduce the presence of disruptive child behaviors, decrease feelings of parental distress, and increase parental confidence in their ability to handle difficult child behaviors (Hood & Eyberg, 2003; Nixon, Sweeney, Erickson, & Touyz, 2003, 2004).

Like other parent-training programs, PCIT has a strong basis in behavioral principles and developmental psychology and includes didactic components in which parents are taught specific skills to implement when interacting with their child. However, PCIT is unique because parenting skills are taught to parents using direct, *in-vivo* instruction, providing parents with immediate feedback on the use of their skills using a bug-in-the-ear device. This component of PCIT has been found to be a crucial component of effective parent-training programs (Kaminski, Valle, Filene, & Boyle, 2008; Shanley & Niec, 2010). Additionally, PCIT is structured so that treatment is performance-based rather than time-limited, requiring parents to demonstrate the acquisition of skills through frequent skills assessment before progressing to the next stage of treatment or completing the treatment protocol (Kazdin, 2005). The performance-based nature of PCIT allows for the evaluation of parent and child progress and monitoring of client symptomology. This feedback and skills monitoring is provided to parents informally during treatment sessions and is also formalized through the use a PCIT-specific analogue behavior observation (ABO) which utilizes the Dyadic Parent-Child Interaction Coding System (DPICS; Eyberg, Nelson, Duke, & Boggs, 2004) to assess observable parent and child behaviors.

The Dyadic Parent-Child Interaction Coding System

The DPICS is used to code parent and child behaviors during a standardized, 25-minute play situation involving one parent and one child. The observation is divided into 3 primary segments: a Child-Led Play (CLP) segment, a Parent-Led Play (PLP) segment, and a Clean-up (CU) segment. The CLP segments lasts for the first 10 minutes of the observation, during which the parent is instructed to allow the child to lead the play. The first 5 minutes of this segment, called the “warm-up” segment, is intended to allow the parent-child dyad to acclimate to the play situation in order to minimize reactivity and maximize the validity of observed behavior and is not coded. Instead, the last 5 minutes of the CLP segment are coded to assess parent and child behaviors in a low-demand situation. The CLP segment is followed directly by the 10-minute PLP segment, during which the parent is instructed to lead the play. Again, the first 5 minutes of this segment are designated a warm-up segment and not coded while the latter 5 minutes of the PLP are coded in order to assess parent and child behaviors in a moderate-demand situation. The final 5 minutes of the observation consist of the CU segment, during which the parent is instructed to have the child clean up all of the toys by him- or herself. There is no warm-up segment for CU, therefore the entire 5-minute CU segment is coded to assess parent and child behavior during a high-demand situation. Instructions regarding what to do during each segment are given to the parent from a separate observation room using a bug-in-the-ear device in order to limit the obtrusiveness of the therapist during the parent-child interaction.

This standardized ABO, which is typically conducted pre- and post-treatment, and observed parent and child behaviors during treatment sessions are coded using the DPICS. These observations provide parents with quantitative feedback related to specific behaviors and broader behavioral patterns observed between the parent and child that may contribute to the development and maintenance of child behavioral problems. These data also provide therapists with an objective measure of treatment progress and outcome (Brestan-Knight & Salamone, 2011; McMahon & Frick, 2005).

Parent Training for Childhood Anxiety

Just as the involvement of parents in treatment is a core component of effective treatment for childhood DBDs, parental involvement has been hypothesized to be an important component in the treatment of childhood anxiety. The development of anxiety has been found to be highly familial, with genetics accounting for approximately one third of the overall variance in child anxiety (Beidel & Turner, 1997; Eley, 2001), meaning that approximately two-thirds of the overall variance in the development of child anxiety may be accounted for by environmental influences (Bolton et al., 2006; Ogliari et al., 2006). As such, the effect of family interactions on childhood anxiety has received considerable attention in the literature (Barrett, Dadds, & Rapee, 1996; Bögels & Brechman-Toussaint, 2006; Wood, McLeod, Sigman, Hwang, & Chu, 2003). Understanding which family factors contribute to the development of anxiety disorders can help researchers to develop more effective treatment for anxiety.

Research suggests that parent responsiveness plays an important role in the development of a secure attachment (Ainsworth, Blehar, Waters, & Wall, 1978; Belsky, Rovine, & Taylor, 1984) and subsequently affects the child's development of intellectual, academic, and social competency (Beckwith & Cohen, 1989; Coates & Lewis, 1984). Specifically, anxious parent childrearing styles have been demonstrated to be related to anxiety symptomology in children (Muris & Merckelbach, 1998). Relative to parents of non-anxious children, parents of anxious children are typically more critical, display low parental warmth, are discouraging of autonomy, and are more likely to offer approval of children's avoidance strategies (Dadds, Barrett, Rapee, & Ryan, 1996; Ginsburg, Siqueland, Masia-Warner, & Hedtke, 2004; Pahl, Barrett, & Gullo, 2012; van der Bruggen, Stams, & Bögels, 2008; Whaley, Pinto, & Sigman, 1999). Parenting behaviors that discourage autonomy include overprotective, over-involved, and intrusive parenting styles. Intrusive parenting behavior refers to parents who provide disproportionate regulation of the child's emotions and excessive assistance in the child's daily activities. Although parents often participate in these behaviors in an effort to reduce or prevent the child's distress, they may encourage the child to become more dependent on their parent and less autonomous (Wood, McLeod, Sigman, Hwang, & Chu, 2003). Specifically, children with overprotective parents may have fewer opportunities to perform age-appropriate activities and/or participate in new, difficult, or anxiety-provoking tasks than their peers, which may interfere with their ability to learn through trial and error, achieve feelings of control over stress-inducing situations, and obtain experiences to promote self-efficacy (Bögels & Brechman-Toussaint, 2006; Chorpita, 2001; Hudson & Rapee, 2001; Muris & Merckelbach, 1998). In contrast, parenting that is attentive, warm, accepting, stimulating, responsive, and nonrestrictive has been associated with healthy socioemotional development in children (Belsky et al., 1984; Reiss et al., 1995). Therefore, it has been suggested that treatment interventions for childhood anxiety should include a component that targets parent-child interactions (Whaley et al., 1999).

The integration of parents and parent training into the treatment of children with anxiety disorders has received widespread support over the past 10 years (e.g., Becker & Ginsburg, 2011; Burstein & Ginsburg, 2010; Kendall, Hudson, Gosch, Flannery-Schroeder, & Suveg, 2008). However, the goal of incorporating parents and parent training in the treatment of childhood anxiety has taken different forms across interventions. For example, the goal of some interventions is similar to PMT programs for DBDs in that the focus is on altering parenting behaviors in order to lead to change in child symptoms (Comer et al., 2012; Pincus, Santucci, Ehrenreich, & Eyberg, 2008; Puliafico, Comer, & Pincus, 2012; Rapee, Wignall, Spence, Cobham, & Lyneham, 2008). Other interventions conceptualize the parent as a consultant who provides information about the child, a collaborator who helps the child acquire skills, and even a co-client who is working on managing his or her own anxiety (Kendall, Furr, & Podell, 2010).

For those treatments that do focus on changing parenting behaviors and utilizing the parent as the primary agent of change to ameliorate child anxiety symptoms, treatment typically focuses on increasing parental positive attention for appropriate child behavior, exactly as is done in PMT programs (e.g., Barrett, 1998). However, a mixture of strategies related to the construct of parental control has been utilized with internalizing disorders. For example, some interventions utilize the same procedures used in PMT programs for DBDs, focusing on increasing parental control by consistently setting limits and following through with appropriate discipline when the child displays inappropriate behavior, while also incorporating some child coping skills to improve child anxiety (e.g., Cartwright-Hatton et al., 2011). Meanwhile, other interventions for child anxiety disorders focus on *decreasing* parental control and granting the child additional autonomy (e.g., Rapee et al., 2008) as these parenting characteristics have been found to be related to lower levels of child anxiety (McLeod, Wood, & Weisz, 2007). Recent literature has highlighted the importance of following Rapee's model of identifying and targeting parenting behaviors that are more likely to be related to child internalizing symptoms instead of basing parent training for internalizing disorders on what has been used in parent-training for externalizing disorders (McKee et al., 2008; Rakow et al., 2011). Parents may also participate in treatment by providing contingency management (attending to and reinforcing non-anxious behavior and ignoring anxious behavior), assisting the child with exposure-based homework, and/or managing his or her personal anxiety.

Recent literature reviews have concluded the inclusion of parents in the treatment of childhood anxiety is efficacious relative to a control condition, although including parents in a child intervention is not significantly more efficacious than a child-only intervention, at least for children aged 7 – 14 (Breinholst, Esbjorn, Reinholdt-Dunne, & Stallard, 2012; Drake & Ginsburg, 2012; Forehand, Jones, & Parent, 2013; Wei & Kendall, 2014). Despite the fact that the incorporation of parents in the treatment of childhood anxiety does not appear to be more efficacious than child-only interventions, extended findings have suggested that including parents in treatment could be a key part of maintaining long-term treatment gains for children (Cobham, Dadds, Spence, & McDermott, 2010). Furthermore, involving parents in the treatment of young children may be particularly important and produce more salient outcomes because young children spend much of their time with their parents and are considerably more reliant on their parents for emotional support and the development of basic life skills than older children. In fact, research has demonstrated the role of parent-child interactions in the development of childhood psychopathology (Wood et al., 2003) and that anxious parents may inadvertently teach their young children to be anxious or avoidant of particular stimuli based by modeling their own biases toward negative, threat-related stimuli (Cartwright-Hatton, Abeles, Dixon, Holliday, & Hills, 2014; Lester, Field, & Cartwright-Hatton, 2012).

Although more research is needed, initial studies incorporating parents into the treatment of *young* children (aged 2 to 7) with anxiety have also demonstrated efficacy (Cartwright-Hatton et al., 2011; Freeman, 2008; Hirshfeld-Becker et al., 2010; Kennedy et al., 2009; Simpson, Suarez, & Connolly, 2012; Waters, Ford, Wharton, & Cobham, 2009). These treatments involve parents in all treatment sessions, directly target parenting practices that are believed to maintain child anxiety in order to utilize the parent as a primary agent of change, seek to help parents manage their personal anxiety, and emphasize the importance of parental modeling. The majority of these studies are downward extensions of interventions that have been found to work with older children (i.e., Cognitive Behavioral Therapy), meaning that the methods and formats used in the treatment of older children with anxiety have been adapted to be developmentally sensitive to the needs and skill sets of younger children. Another approach to the development of effective treatments is to adapt an EBT for a specific developmental group (e.g., young children) presenting with one disorder (e.g., DBDs) for use with another group of the same developmental level presenting with a different disorder (e.g., anxiety) in a developmentally lateral extension.

PCIT for Childhood Anxiety

Recent research in the area of PCIT explores the clinical utility of employing PCIT, which is a well-established EBT for the treatment young children with DBDs, to treat children who have anxiety disorders (Carpenter, Puliafico, Kurtz, Pincus, & Comer, 2014; Choate, Pincus, Eyberg, & Barlow, 2005; Comer et al., 2012; Pincus et al., 2008; Puliafico, Comer, & Albano, 2012). Specifically, research has examined the effectiveness of PCIT modified for use with Separation Anxiety Disorder (SAD; Choate et al., 2005; Pincus et al., 2010; Pincus, Eyberg, & Choate, 2005; Pincus et al., 2008) and general childhood anxiety (Comer et al., 2012; Puliafico, Comer, & Albano, 2012). Additionally, preliminary research is also being conducted regarding the use of PCIT for behaviorally inhibited children (Chronis-Tuscano et al., under review) and evaluating the use of PCIT skills in children with selective mutism (Kurtz, Comer, Gallagher, Hudson, & Kendall, 2013, April; Masty, Kurtz, Tryon, & Gallagher, 2009, March).

The lateral extension of PCIT to young anxious children makes sense for a variety of reasons. First, because PCIT is formatted to improve child functioning by reshaping parent behavior rather than engaging directly with young children, it avoids the potential pitfall of utilizing interventions which may be beyond the cognitive capacity of young children who have limited executive functioning, attentional resources, organizational skills, metacogitve skills, perspective-taking abilities, and language abilities (Flavell et al., 2001; Kendall & Barmish, 2007; Smith & Hudson, 2013; Zhang & Zheng, 1999). Additionally, research has demonstrated that parents of anxious children typically engage in parenting behaviors that function to limit their child's exposure to and mastery of anxiety-provoking situations (Hudson, Comer, &

Kendall, 2008; Lebowitz et al., 2013; McLeod et al., 2007), making it particularly important that parent behaviors be the target of change in interventions for child anxiety, as they are in PCIT. For example, parents of young children with anxiety disorders have been found to inadvertently reinforce avoidant and withdrawal behaviors (e.g., clinging, crying, whining) in children by giving attention to these inappropriate, attention-seeking behaviors (Settipani, O'Neil, Podell, Beidas, & Kendall, 2013). This is noted to be particularly true when parents experience substantial personal distress due to their child's anxious behaviors and associated negative affect (Creswell, Apetroaia, Murray, & Cooper, 2013; Thompson-Hollands, Kerns, Pincus, & Comer, 2014). Therefore, completing a treatment which focuses on altering negatively reinforcing patterns of parent-child interaction through live coaching allows parents to increase their ability to tolerate their personal feelings of distress while using differential attention to ignore inappropriate child behaviors (i.e., expressed negative emotions) and provide reinforcement for appropriate behaviors. Finally, PCIT promotes improved parent-child relationships, which research suggests are commonly strained between anxious children and their parents due to conflict over the presence of child symptoms of anxiety (Silverman, Kurtines, Jaccard, & Pina, 2009). Therefore, it is not surprising preliminary outcomes research supports the extension of PCIT to young children with anxiety disorders and the adaptions made to the typical PCIT protocol.

The first attempt to use PCIT with an anxious sample focused on assessing the feasibility and efficacy of the standard PCIT protocol for SAD (Choate et al., 2005). The decision to utilize the standard PCIT protocol, without making any adaptations to the protocol initially, is in line with recommendations made by the program developer regarding the appropriate methodological approach to follow when attempting to expand an EBT to a new population (Eyberg, 2005).

Furthermore, due to the high rates of co-morbidity between childhood DBDs and anxiety disorders, it is logical to explore the utility of an EBT for DBDs in young children with a young anxious sample. In this study, Choate and colleagues conducted standard PCIT with three children, aged 4 to 8, with a principal diagnosis of SAD. Following the completion of standard PCIT, there was a clinically significant decrease in child separation anxiety and disruptive behavior, and parents demonstrated a significant increase in the use of praise and a significant decrease in the use of questions and criticisms. These gains were maintained at a 3-month follow-up, indicating that the standard PCIT protocol may be a promising intervention for young children with SAD. The study team then conducted an open trial of standard PCIT with 10 children aged 4 to 8. Results showed that parents had increased their use of the appropriate parenting skills that are taught during CDI and children were experiencing fewer and less severe separation anxiety incidents following the completion of the standard PCIT protocol. However, SAD did not improve to non-clinical levels in the children at posttreatment, and parents reported that their children still had a difficult time approaching developmentally appropriate activities. The findings of this study demonstrated that the standard PCIT protocol is not sufficient to ameliorate the functional impairment associated with SAD in young children, suggesting the need for PCIT to be adapted to meet the needs of this clinical population.

These findings led the study team to collaborate with the developer of PCIT, Dr. Shelia Eyberg, in order to adapt the PCIT protocol to the anxious population (Pincus et al., 2010; Pincus et al., 2005; Pincus et al., 2008). Specifically, PCIT was adapted for use with children with SAD by incorporating a new treatment component entitled Bravery-Directed Interaction (BDI) into the treatment protocol. The BDI component was designed to educate parents on the cycle of anxiety, how to incorporate CDI skills into separation situations, and how to conduct separation exposure practices with their children using a fear hierarchy. The BDI component is implemented following CDI and before PDI in the PCIT protocol and follows a structure similar to CDI and PDI in that parents participate in a teach session about parent-specific skills and then attend sessions with their child in order to get advice on how to help their child during exposure practices. However, the BDI component does not engage parents in live coaching of exposure practices, which means that parents do not benefit from the live feedback process that is an integral part of standard PCIT. Results from a randomized controlled trial that compared PCIT for SAD to a waitlist condition and included 38 young children with a principal diagnosis of SAD demonstrate that children receiving PCIT for SAD showed greater improvement than those in the waitlist condition on measures of separation anxiety, general psychopathology, parent-child interaction, and parenting stress at posttreatment (Puliafico, Comer, & Pincus, 2012). Additionally, 73% of participants that received PCIT for SAD no longer met criteria for SAD while no participants in the waitlist group were diagnosis free at the end of the waitlist period. Results from this study support the efficacy of PCIT for SAD in the treatment of young children with SAD.

In an extension of this work by Pincus and colleagues, recent work has begun to assess the feasibility and efficacy of modifying PCIT for the treatment of a range of early anxiety disorders including Generalized Anxiety Disorder, SAD, Social Phobia, and Specific Phobia (Comer et al., 2012; Puliafico, Comer, & Albano, 2012). This modification of PCIT is called the Coaching Approach Behavior and Leading by Modeling, or CALM, Program and utilizes the structure and format of PCIT in order to train parents to address their child's symptoms of anxiety. In the CALM Program, parents first complete the CDI portion of treatment in which they are taught and coached to use positive attending and active ignoring to encourage developmentally appropriate and brave behaviors during play situations and in graded exposures until the parent meets mastery criteria on the traditional positive attending skills in PCIT. Following the completion of CDI, parents attend another didactic session in which they learn a new set of skills, known as the DADS steps, to help guide their child through exposure practices. They then utilize these skills in session while receiving live coaching and feedback from their therapist on their use of the skills. Parents also work with therapists to identify exposure situations to practice with their child in between sessions as homework. Parents' mastery of the DADS steps, as well as the child's progress in facing feared situations, are used as standards for assessing weekly treatment gains and to determine when treatment should end. The CALM Program does not include the PDI phase of treatment. Results from an open trial of the CALM Program, which included 7 children ages 3 to 8 who met diagnostic criteria for a least one anxiety disorder, demonstrated that all participants experienced improvement in overall functioning and that 85.7% of participants no longer met criteria for any anxiety disorder (Puliafico, Comer, & Pincus, 2012). Of note, based on the independent successes of PCIT for SAD and the CALM Program, current efforts are underway to combine the two interventions into a new program, currently known as the PCIT-CALM Program, which will build on the perceived strengths of each program by incorporating the DADS steps into an expanded BDI module (Carpenter et al., 2014).

All three of the aforementioned trials of PCIT in the treatment of anxiety disorders discussed training parents on the relationship-enhancement skills that are a core component of PCIT, and both of the adaptations of PCIT for anxiety, PCIT for SAD and the CALM Program, discussed training parents to utilize specific parenting skills to encourage approach behavior in children. However, little attention was given to the methods used to examine changes in parenting behavior. The current literature regarding the efficacy of including parents in treatment for child anxiety is limited in that only two randomized controlled studies to date have included a measure of parenting behavior in order to determine if parenting behavior changed as a result of the intervention (Pincus et al., 2010; Silverman et al., 2009). It is, therefore, not possible to determine the extent to which the amelioration of child anxiety is a result of change in parent behavior. Future research needs to focus on discerning whether change in child outcomes is a result of change in parenting behaviors in order to determine whether focusing on parents in an intervention for child anxiety can impact child outcomes (Kendall, Settipani, & Cummings, 2012; Wood, 2006). Furthermore, in order to advance research on the effectiveness of EBTs and services that improve child outcomes, it is growing increasingly important for research to move beyond the simple assessment of child symptoms and functioning to include the assessment of how interventions impact contextual factors that affect children, such as parenting and the parent-child relationship (Hoagwood et al., 2012).

Assessing Anxious Parent-Child Interactions

In order to meet this call for action, it is important that treatment for child anxiety disorders include ongoing assessments of parent-child interactions. Parenting behaviors, including specific kinds of parent interactions with children in specific situations, are not typically measured through the use of written measures (Bailey, 2005; Wood et al., 2003). This may be because, when utilizing paper-pencil measures, clinicians are limited in their understanding of the dynamics in the parent-child interactions based on the information they have been given by their informants. However, it is possible for clinicians to use the information provided to them by informants combined with their own experiences interacting with the parent-child dyad in order to make inferences about the dyads' actual behavior in the target setting. Alternatively, clinicians can conduct a behavioral observation in order to gather information about parent-child interactions while drastically reducing inferences.

Parenting behaviors are typically evaluated through observational measures (Bailey, 2005; Wood et al., 2003), and behavioral observations are currently the primary form of assessment used to examine anxious parent-child interactions (Wood et al., 2003). Direct behavioral observations allow for the collection of objective data related to parent-child interactions, rather than simply gathering the general information about trends in parent-child behaviors that is available through paper-pencil measures, and provide incremental validity over and above pencil-paper measures of parenting behavior (Ginsburg et al., 2004; Hill, Maskowitz, Danis, & Wakschlag, 2008). Observational data collected during ongoing evaluations of parent-child interactions can also be effectively utilized to facilitate and guide treatment (Conoley & Werth, 1995). Specifically, conducting observation sessions aimed at assessing parent-child interactions can actually serve the dual purpose of helping the family engage in treatment and allowing for the collection of information relevant for clinical assessment (Bailey, 2005; Brestan-Knight & Salamone, 2011).

Parent-child observations can facilitate treatment engagement by giving children the opportunity to acclimate to the clinic setting while interacting with their families. Observing children and families during play may be particularly useful as it involves a fun, low-demand task for the child and parent. This allows the clinician to observe the parents' communication style, to determine if parent verbal and non-verbal cues match (which is important in understanding how their child might understand and respond to them), and to assess family cohesion and warmth (Bailey, 2005).

Evaluations of parent-child interactions also allow clinicians to gain a clearer picture of the factors that may be contributing to the child's presenting problems and diagnosis by allowing clinicians to observe specific communication and behavior patterns that may be maintaining child problem behavior (Conoley & Werth, 1995). Parent-child interaction assessments afford clinicians the opportunity to evaluate not just parent behaviors related to levels of parental acceptance and control (Bailey, 2005) and child behaviors (Letourneau, Hungler, & Fisher, 2005), but also how the parent and child respond to one another in a bidirectional nature (Schrock & Woodruff-Borden, 2010). Research in the field of parent-child attachment suggests analyzing the reciprocal relationship using a transactional model between the parent and the child is crucial to assessing the core components of the parent-child attachment relationship (i.e., maternal sensitivity to the needs of the child and the child's level of attachment security to the parent) because both parts of the parent-child dyad bring unique abilities to the attachment relationship, which are constantly influencing one another (Sameroff, 2009). Specifically, children have different ways of signaling their needs to parents and parents are challenged to alter their behaviors to react appropriately to the individualized needs for their child.

The bi-directionality of the parent-child relationship has already been demonstrated in the presentation of childhood disruptive behavior disorders. Namely, the coercive family process theory of childhood aggressive behavior suggests that during situations involving conflict, the aggressive parent-child dyad escalates one another's aversive, in this case aggressive, behaviors, resulting in the parent succumbing to child demands and subsequently reinforcing the child's aggressive behavior (Patterson, DeBaryshe, & Ramsey, 1989; Snyder & Patterson, 1995). Recent theoretical work in the field of anxiety suggests that the interplay between anxious parents and children may function in a similar fashion to maintain anxious child behaviors (Dadds & Roth, 2001; Hudson & Rapee, 2004; Wood et al., 2003). Specifically, the theory suggests that parent and child affect and the modeling of anxious behavior by parents can lead to an escalating pattern of parent-child interaction eventually causing anxious children and adolescents to underestimate their coping abilities and become hyper-vigilant and inhibited. Findings in recent research offer support to this theory, demonstrating the bi-directional relationship in parent-child relationships for anxious children (Schrock & Woodruff-Borden, 2010; Williams, Kertz, Schrock, & Woodruff-Borden, 2012).

Therefore, it is important to assess parent-child interactions prior to beginning treatment and as a regular part of progress monitoring so that clinicians are able to tailor treatment for the parent-child dyad in an effort to capitalize on parent strengths and identify any problematic aspects of the relationship that could be remediated through psychological intervention. For example, information gathered during a parent-child observation can help to identify undesirable behaviors to which the parent is attending (and thus inadvertently reinforcing) and desirable behaviors that the parent is ignoring (and thus inadvertently punishing). Being aware of these interactional patterns will allow the clinician to conduct relevant psychoeducation and intervention with the parent and child.

The main benefit of observational data related to parent-child interactions is that the data are very specific, allowing clinicians to measure changes in specific target behaviors by looking at the absence or presence of the behavior (e.g., praise), the frequency of the behavior, or rating the construct (e.g., overprotection) using a Likert scale (Ginsburg et al., 2004). Having this information allows clinicians to make changes to the interventions being utilized in treatment based on the family's progress in treatment. In fact, all of the goals outlined by the American Academy of Child and Adolescent Psychiatry (AACAP, 2007) in practice parameters regarding the treatment of anxiety disorders, including evaluating the quality of parent-child interactions and communication, monitoring the role of parental anxiety in monitoring behavior, and increasing parent skill in supporting the use of coping skills in treatment, can be evaluated using observational parent-child assessments.

ABOs Assessing Childhood Anxiety

There is a long history of research examining the parent-child attachment relationship in infants through adolescents using behavioral observations, including assessments of anxious parent and child behaviors (see Mesman & Emmen, 2013 for a review). These measures focus on measuring parental sensitivity to their child's needs and child attachment by rating frequency of relevant parent and child behaviors (e.g., acknowledgement of child signals, positive affect, gaze, appropriate vocal quality, consistency of style, resourcefulness, and supportive presence) using Likert-type rating scales rather than objective behavioral frequency counts. Additionally, a variety of studies have been conducted using behavior observations of parent-child interactions in order to assess child and parent behaviors that may play a role in the development and maintenance of anxiety in children (e.g., Dadds et al., 1996; Dumas, LaFreniere, & Serketich, 1995; Greco & Morris, 2002; Hudson & Rapee, 2001; Hummel & Gross, 2001; Moore, Whaley, & Sigman, 2004; Pincus et al., 2005; Siqueland, Kendall, & Steinberg, 1996; Whaley et al., 1999; Woodruff-Borden, Morrow, Bourland, & Cambron, 2002). However, the majority of these studies were conducted with parents and children ages seven and older.

The type of interaction that is frequently observed to assess the parent-child relationship for older children and adolescents is problem-solving tasks. The problem-solving tasks used in studies of parent-child interactions vary; however, they generally involve the parent and the child working together on a specific task for a given amount of time. During the observation, trained observers code the parent-child interactions, typically assessing themes related to the parents' use of skills that display acceptance or control. These interaction tasks are used to determine family-related contextual variables that function to maintain anxiety. For example, in one study conducted by Dadds and colleagues (1996), children were asked to interpret and respond to two ambiguous situations, first alone and then with their parents. After initially meeting with the interviewer, the child met with his/her parent in order to discuss each ambiguous situation for five minutes. At the end of each five-minute period, the interviewer returned to the discussion room, and the child presented his/her response to the ambiguous situations in front of his/her parent and the interviewer. These interactions were then coded using the Family Anxiety Coding Schedule (FACS; Dadds, Ryan, & Barrett, 1993). The FACS organizes parent and child verbalizations as avoidance behaviors, including expressions of threat, avoidance, or negative consequences; and prosocial behaviors, including expression of non-threat descriptions, prosocial responses, or positive consequences. The FACS has demonstrated strong inter-rater reliability (Dadds et al., 1996), although no other psychometric data are available.

In line with the surge in research on the treatment of anxiety in young children, recent efforts have been made to assess parent child-interactions for young children under the age of seven. Some researchers have observed parent-child interactions for young children in a manner that is similar to the observations conducted with older children and adolescents. In particular, Schrock and Woodruff-Borden (2010) created a downward extension of problem-solving tasks related to both social and cognitive problem-solving. The cognitive task for young children involved putting together complex puzzles while older children were instructed to complete unsolvable anagrams. In the social task, young children were asked to tell a story out loud while older children were instructed to prepare a speech about themselves which would be video recorded in the presence of their parents. The interactions were coded and categorized into four categories including productive engagement, negative interaction, withdrawal, and overcontrol. The same observation was used in another, more recent study as well and was coded sequentially in order to look at differences in the quality of parent-child language, contingency responding, and affective interchange (Williams et al., 2012). The coding system demonstrated acceptable reliability. Unfortunately, problem-solving tasks such as these may require cognitive and language abilities that are beyond the developmental level of some young children, making it difficult to analyze the core constructs being examined.

Another way to measure anxious behaviors exhibited by parents and children is to utilize a lateral extension of a well-established ABO for young children such as the DPICS, which is the strategy used by Pincus and colleagues (2005) as part of the lateral extension of using PCIT to treat children with SAD. In the pilot study of PCIT for SAD, researchers conducted an extended version of the play-based ABO used in standard PCIT to assess changes in parenting behavior pre- and posttreatment. This extended DPICS observation included the three traditionally coded segments (CLP, PLP, and CU) along with the addition of a separation task in which the child is separated from an attachment figure (Pincus et al., 2005). As in PCIT for DBDs, the first three scenarios are designed to assess the parent-child interaction through play as increasing demands are placed on the child and allow for the evaluation of parental acceptance and control and the child's responses to the parent's use of these skills. The separation task is designed to specifically assess parent-child interactions during an anxiety-provoking situation. During this segment, called the Bravery Directed Interaction (BDI), the parent is asked to leave the child in the therapy room with a novel adult in order to observe how the child reacts to the presence of a stranger. The segment allows therapists to directly observe child and parent behaviors that occur during separation.

The separation observation was coded using the Dyadic Parent-Child Interaction Coding System II - Revised for Separation Anxiety Disorder (DPICS-II-RSAD; Pincus, Cheron, Santucci, & Eyberg, 2006). Like the standard DPICS, the DPICS-II-RSAD includes codes for both parent and child behaviors. The child behaviors that are coded include crying, clinging, and refusing to separate. The parents are coded for behaviors such as reassuring the child, questioning the child, and ignoring inappropriate behavior. This observation of parent-child interaction is a welcome addition to the current literature on the assessment of parent-child interactions because it fills a gap in the assessment of young children and does so using a developmentally appropriate task. Unfortunately, the DPICS-II-RSAD was developed for use alongside the now outdated DPICS-II, is not currently available for public use, and, although the original DPICS has demonstrated strong reliability and validity (Bessmer, 1996), there are no published studies describing the reliability or validity of the DPICS-II-RSAD, making it impossible to determine the utility of this measure in terms of treatment planning and outcomes assessment.

Study Goals

Because the standard DPICS-III is a well-established, structured coding system which assesses the frequency and quality of various parent and child behaviors (Eyberg et al., 2004) and is often used to assess treatment gains in PCIT, the current study sought to determine the clinical utility of the standard DPICS-III, without adaptations, as a measure of anxious parent-child interactions by determining if the DPICS-III can be used to distinguish between the presence of two distinct childhood disorders. Specifically, this study will:

1. Compare clinic-based DPICS standardization data for a non-clinical, community-based sample to clinic-based DPICS standardization data for clinically significant samples of anxious and disruptive behavior disordered youth using the DPICS-III
2. Explore the utility of extending the standard DPICS observation to include a 5-minute separation situation and a 2-minute reunification situation in order to assist with differential diagnosis between non-clinical, anxious, and disruptive behavior disordered samples

Hypotheses

The specific hypotheses of the current study were as follows:

1. Based on previous observational findings (e.g., Hummel & Gross, 2001), it was hypothesized there would be significant differences between the non-clinical sample DPICS data and the anxious sample DPICS data in the extended DPICS observations regarding frequency of parent verbalizations, child verbalizations, parent touch, child touch, and child vocalizations; specifically:
    a. There would be significantly fewer parent and child verbalizations in the anxious sample.
    b. There would be a significant difference in the amount and type of parent and child touch.
    c. There would be a significant difference in the amount of child vocalizations.
    d. There would be a longer latency to child verbalization during the separation task.
2. Based on results from Hudson and Rapee (2001), showing that mothers of oppositional and anxious children demonstrated more intrusive involvement than

controls and that anxious mothers and children displayed more negative characteristics than controls, it was hypothesized:

a. There would be significantly more parental control in the disruptive behavior disordered and anxious sample than in the non-clinical sample.
b. There would be significantly more parental control in the anxious sample than in the disruptive behavior disordered sample.
c. There would be significantly more critical statements in the anxious sample than in the non-clinical sample.

3. Findings from Whaley, Pinto, and Sigman (1999) suggest that parental behaviors observed during the extended DPICS observation would predict the presence of child anxiety as indicated on a parent-report measure.

Method

Participants

Participants in this study included families with children between the ages of 2 and 8 and parents over the age of 19. Families included represent a non-clinical, community-based sample of children as well as clinically significant samples of anxious and disruptive behavior disordered children.

Community participants. The recruitment of participants for the non-clinical, community-based sample of children and families occurred as a part of a larger, collaborative IRB-approved research project within the Parent-Child Lab. Participants in the non-clinical sample were recruited exclusively from the community. Specifically, local businesses that provided their approval to assist with study recruitment posted and distributed flyers advertising the study. Recruitment sites included local day care facilities, pediatricians' offices, dentists' offices, health and recreation centers, restaurants, libraries, and churches. Advertisements directed interested families to contact study staff in the Parent-Child Lab at Auburn University via telephone or e-mail in order to convey their interest and learn more about the study. Families were screened by phone to ensure the family included a child between the ages of 2 and 8 and that the participating parent was over the age of 19. No families were excluded based on these criteria. Families were reimbursed $20.00 USD and a small child's toy for participating in this study.

A total of 42 families were recruited using the aforementioned procedures. Of families who completed the study, only families with verbal children, English as the family primary language, and no current clinically significant elevations on the Behavior Assessment System for Children, Second Edition Parent Rating Scale (BASC-2 PRS) or Eyberg Child Behavior Inventory (ECBI) were eligible to be included in the non-clinical, community sample. Based on the aforementioned eligibility requirements, one family was excluded from all data analyses because the child was nonverbal and two families were excluded from all data analyses because the primary language spoken in their home and the DPICS observation was not English. One family was also excluded from all data analyses due to a technology failure that led to disrupted video feed as this technological difficulty prevented coders from being able to reliably code all verbal and non-verbal parent-child interactions. Additionally, 15 of the remaining 39 families recruited through community advertising were excluded from the non-clinical, community sample because the children were rated by their parents as having clinically-significant scores on at least one of the BASC-2 PRS or ECBI scales. Thus, the non-clinical, community sample includes data from 23 families.

The 15 families recruited through community advertising who reported clinically significant elevations on the BASC-2 PRS or ECBI scales were reviewed for eligibility for the disruptive behavior disordered and anxious samples. Families who endorsed clinically significant elevations on at least one scale or composite score related to disruptive behavior on the BASC-2 PRS (i.e., t-score ≥ 70 on Aggression, Conduct Problems, Hyperactivity, Attention Problems, and/or Externalizing Problems) and/or the ECBI (i.e., Intensity Scale ≥ 131; Problem Scale ≥15) were included in the disruptive behavior disordered clinically significant sample ($n = 9$). Families who reported clinically significant levels of Anxiety or Anxiety along with Withdrawal, Somatization, and/or Depression on the BASC-2 PRS were included in the anxious clinically significant sample ($n = 2$). Additionally, four families originally recruited through community advertising were excluded from all data analyses due to clinically significant elevations on the BASC-2 PRS and/or ECBI that did not align with criteria for the DBD or anxious samples. Specifically, one family rated their child as clinically significant on *only* the BASC-2 PRS Atypicality scale while three families reported clinically significant elevations on both a BASC-2 PRS internalizing scale (i.e., Depression, Withdrawal) and the ECBI Intensity or Problems scale.

Clinic participants. Other members of the clinically significant samples include families who sought intervention or assessment services for their children at the Auburn University Psychological Services Center (AUPSC). IRB approval was obtained in March of 2015 to utilize de-identified data collected as a part of usual care for clients at AUPSC. Specifically, clients between the ages of 2 and 8 who completed an extended, pre-treatment DPICS observation as a part of their usual care at AUPSC and were given an initial, primary diagnosis of a DBD (e.g., Attention-Deficit Hyperactivity Disorder (ADHD); Oppositional Defiant Disorder (ODD); Disruptive Behavior Disorder Not Otherwise Specified (DBD NOS); Adjustment Disorder with Disturbance of Conduct; Parent-child Relational Problem) or an anxiety disorder (e.g., SAD; Generalized Anxiety Disorder (GAD); Social Phobia; Selective Mutism; Adjustment Disorder with Anxiety) were included in the corresponding clinically significant sample groups. Initial diagnoses were given based on criteria from the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, Text Revision (DSM-IV-TR; APA, 2000) following the completion of a semi-structured intake interview which was conducted by a trained graduate-level clinician and supervised by a licensed clinical psychologist. A total of 26 families with children between the ages of 2 and 8 completed extended, pre-treatment DPICS observations between January 2010 and June 2014. Of those families, 8 had a child with an initial, primary diagnosis of a DBD, while 14 families had a child with an initial, primary diagnosis of an anxiety disorder. The remaining 4 families were excluded from analyses due to the presence of initial, primary diagnoses that did not fall within the aforementioned groups (e.g., Autism Spectrum Disorder, Learning Disability). Of note, families included from AUPSC were not screened for eligibility based on parent-report measures, but may also have clinically significant elevations on the BASC-2 PRS and/or ECBI scales. See Table 1 for a description of group eligibility requirements and Table 2 for a breakdown of the eligible participants recruited in each group.

Sample demographics. Demographic data were obtained for participating families from both the community and AUPSC. Families recruited through the community completed a demographics questionnaire while all families who had children who were clients at AUPSC provided demographic information when filling out history forms at their diagnostic intake appointment as a part of usual care. Demographic data are presented by group in Table 3. Overall, data were collected from 56 families, including 52 (92.9%) female caregivers and 4 (7.1%) male caregivers. Of these caregivers, 48 (85.7%) were biological mothers, 4 (7.1%) were biological fathers, 2 (3.6%) were adoptive mothers, 1 (1.8%) was a step-mother, and 1 (1.8%) was a grandmother. Caregiver ethnicity was predominately Caucasian (n = 48, 85.7%); however, African American (n = 6, 10.7%), Asian (n = 1, 1.8%) and Other (n = 1, 1.8%) minority groups were also represented. Children involved in the parent-child dyads included 25 (44.6%) girls and 31 (55.4%) boys (mean age in months = 60.05, SD = 22.63). Most of the children were described as having Caucasian ethnicities (n = 46, 82.1%), followed by African American (n = 4, 7.1%), Hispanic (n = 2, 3.6%), Multi-racial (n = 2, 3.6%), Asian (n = 1; 1.8%), and Other (n = 1, 1.8%). The majority of families (n = 34, 60.7%) reported their family's annual income as over \$50,000 per year, while 12 (21.4%) families reported earning \$25,000 - \$49,000 per year, and 7 (12.5%)

families reported earning under $25,000 per year. Of note, 3 (5.4%) families did not provide information regarding family annual income.

One-way analysis of variances (ANOVAs) were conducted to determine if there were any differences between diagnostic groups (e.g., non-clinical, DBD, anxious) on the aforementioned demographic variables. No significant differences were found between groups with the exception of child age, $F(2, 53) = 3.73$, $p = .030$. Post hoc comparisons using the Tukey-Kramer test indicated the children in the anxious sample (mean age in months = 72.00, $SD = 25.59$) were statistically significantly ($p = .025$) older than children in the non-clinical sample ($M = 53.00$, $SD = 18.34$), with a mean difference of 19.00, 95% CI [2.1, 35.9], but not statistically significantly ($p = .175$) older than the children in the DBD sample ($M = 58.4$, $SD = 21.6$), with a mean difference of 13.65, 95% CI [-4.5, 31.9]. Please see Table 3 for additional information regarding comparisons across groups by demographic variable.

Measures

Demographics forms. As previously mentioned, caregivers recruited to participate in this study through flyers distributed in the community were asked to complete a demographics questionnaire. This questionnaire included the following information: participating caregiver’s relationship to the target child, gender, and ethnicity; approximate yearly household income; and target child’s date of birth, age, gender, and ethnicity. Basic demographic information for the members of the clinically significant disruptive behavior disorder and anxious samples presenting for services at AUPSC was gathered from client history forms completed during the client intake session and included participating caregiver’s relationship to the target child, gender, and ethnicity; approximate yearly household income; and target child’s date of birth, age, gender, ethnicity, and initial, primary diagnosis.

Behavior Assessment System for Children, Second Edition Parent Rating Scale (BASC-2 PRS). The BASC-2 PRS (Reynolds & Kamphaus, 2004) is a 134-160 item broad-band, parent-report measure of child behavior, which assesses adaptive behaviors as well as child-specific behavioral and emotional problems that occur in the home and community. Items on the BASC-2 PRS contain a description of a behavior, which caregivers are asked to rate according to the frequency with which their child completes each behavior by selecting one of four frequency scores (i.e., 1 = "Never," 2 = "Sometimes," 3 = "Often," and 4 = "Almost Always"). On the BASC-2, item raw scores are converted to *t*-scores. Higher *t*-scores on clinical scales indicate higher levels of problematic behaviors, with *t*-scores at or above 70 indicating a clinically significant disruption in child functioning and *t*-scores between 60 and 69 indicating at-risk difficulties in child functioning as perceived by the parent. In contrast, lower *t*-scores on the adaptive scales indicate more adaptive skills deficits, with *t*-scores at or below 30 indicating a clinically significant disruption in child functioning and *t*-scores between 40 and 31 indicating at-risk difficulties per parent report. The BASC-2 PRS has established internal consistency, reliability, and validity (Reynolds & Kamphaus, 2004). It is also standardized across age and gender, allowing for comparison of parent-reported behavioral/emotional problems with those of clinical and non-referred populations.

The BASC-2 PRS is available for children of three age levels ranging from preschoolers and adolescents. Caregivers participating in this study were asked to complete the Preschool BASC-2 PRS if they participated with a child between the ages of 2 and 5 or the Child BASC-2 PRS if they participated with a child between the ages of 6 and 8. As previously mentioned, BASC-2 PRS reports collected from families recruited through community advertising were used to screen participants for clinically significant levels of problematic behavior. Only families that reported subclinical levels of behavioral/emotional problems (i.e., *t*-scores < 70) on all scale and composite indices were included in the non-clinical sample. Meanwhile, families that reported clinically significant levels of Aggression, Conduct Problems, Hyperactivity, Attention Problems, and/or Externalizing Problems were included in the disruptive behavior disordered clinical sample and families that reported clinically significant levels of Anxiety or Anxiety along with Depression, Somatization, and/or Withdrawal were included in the anxious clinical sample. Families from the community sample that reported *only* clinically significant elevations on any of the other BASC-2 PRS clinical scales alone (i.e., Depression, Somatization, Atypicality, Withdrawal) were excluded from this study.

Eyberg Child Behavior Inventory (ECBI). The ECBI (Eyberg & Pincus, 1999) is a 36-item narrow-band, parent-report measure of child disruptive behavior. Items on the ECBI are designed to relate to behaviors characteristic to DBDs including ODD and ADHD. The ECBI is made up of two scales: the Intensity Scale, which measures the parent's perception of the frequency with which child disruptive behavior occurs, and the Problem Scale, which measures how problematic the child's behavior is for the parent. The Intensity Scale is calculated by adding parent responses regarding the frequency of child behaviors on a 7-point Likert scale where higher scores indicate higher frequencies of behavioral problems. The Problem Scale score is calculated by totaling the number of "yes" responses endorsed by parents in response to whether they identify the frequency with which each child behavior occurs as being problematic for them, reflecting parent tolerance for misbehavior. Higher scores on the ECBI Problem Scale indicate higher frequencies of problematic child behavior. Although raw scores on the two ECBI scales can be converted into *t*-scores, clinical application of the ECBI in PCIT typically uses scale raw scores as clinical cutoffs (i.e., Intensity: 131; Problem: 15) and as a criterion for treatment completion (Intensity ≤ 114 or within ½ a standard deviation of the normative mean; (Eyberg & Bussing, 2010). In an outpatient sample of children aged 2 to 16, the ECBI demonstrated adequate internal consistency for both the Intensity and Problem scales, test-retest reliability, and the ability to discriminate between clinic-referred and non-referred children (Eyberg & Pincus, 1999). The ECBI has also been found to correlate with other measures of child behavior such as the Child Behavior Checklist (Achenbach & Rescorla, 2001; Boggs, Eyberg, & Reynolds, 1990), providing evidence of convergent validity.

All caregivers in this study were asked to complete the ECBI. For families recruited by community advertising, reported scores on ECBI were used to screen families for group eligibility. Specifically, only families that reported subclinical levels of behavior problems (i.e., Intensity ≤ 130; Problem ≤ 14) were included in the non-clinical sample. Families that reported clinically significant scores on the ECBI scales (i.e., Intensity ≥ 131; Problem ≥15) were included in the disruptive behavior disordered clinical sample.

Dyadic Parent-Child Interaction Coding System, 3rd Edition (DPICS-III). The DPICS has been standardized with children ages 3 to 6 for samples exhibiting both normative behaviors and disruptive behaviors (Eyberg et al., 2004; Robinson & Eyberg, 1981). Research has shown the DPICS has adequate inter-observer agreement, test-retest reliability, discriminative validity, convergent validity, and treatment sensitivity (Bessmer, 1996; Bessmer & Eyberg, 1993; Brinkmeyer, 2006; Chaffin et al., 2004; Coursen, 2009; Deskins, 2005; Eyberg et al., 2004; Foote, 2000; McMahon & Frick, 2005; Robinson & Eyberg, 1981; Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998; Thornberry, 2013; Webster-Stratton, 1985). With the relatively recent release of the fourth edition of the DPICS in September 2013, it is important to note the majority of the existing psychometric support for the DPICS has been extrapolated from studies using previous editions. Although it is reasonable to assume that the psychometric support generalizes across assessment editions, more studies are needed to bolster support for the more recent versions of the DPICS.

The most recent version of the DPICS designed for use in clinical settings, the abridged version of the DPICS-III (Chase & Eyberg, 2006), was used to code videotaped DPICS behavioral observations collected as a part of this study. The abridged DPICS-III collects frequency counts of various child and parent behaviors (e.g., Labeled Praise, Direct Command, Negative Talk, Negative Touch). These categories of behaviors can then be combined using formulae set forth by Eyberg et al. (2004) to create composite categories. For this study, the composite categories for parent behavior include parental control, parental warmth, and parent verbalizations while the composite categories for child behavior include child verbalizations and child vocalizations. For a list of child and parent behavior codes, see Table 4. For a list of child and parent composite categories and their formulae, see Table 5.

Semi-structured interview. Information collected during the semi-structured interview typically conducted at AUPSC at the initiation of treatment and/or assessment services is used in combination with parent-, teacher-, and self-report measures to determine whether child clients qualify for a diagnosis of a DBD or anxiety disorder according to the DSM-IV-TR. The interview typically includes both child and parent components and utilizes multi-modal assessment to gather information about the onset, duration, maintenance, and severity of presenting problems as well as the associated functional impairment that the child client experiences as a result of these difficulties.

Procedure

Community recruitment. Families from the community who were interested in participating in this research study contacted study staff via telephone or e-mail and expressed their interest in participating. Upon initial contact by interested families, study staff provided the families with a brief description of the study procedures and reimbursements provided for participants' time and effort during the study. If still interested in participating in the study, families were scheduled for an appointment to come into the clinic. Trained observers were then assigned to meet with families in order to complete the consent process and conduct an extended DPICS-III observation, which includes the traditional segments in a standardized DPICS-III observation (CLP, PLP, CU) with the addition of a separation (SA) and reunification (RE) task.

The SA task was conducted immediately following the CU segment from the standard DPICS-III observation, is five minutes in length, and is divided into two parts based on which adult is present in the room with the child (i.e., SA/P = portion of the SA segment with parent-child dyad; SA/N = portion of the SA segment with a novel adult and child dyad). During the SA segment, the caregiver was told to leave the playroom and to allow a novel adult (male or female) to come into the room in their place when they heard a knock at the door. The SA/P segment includes interactions between the parent and their child as the parent informs the child that separation will occur and then leaves the room. The SA/N segment includes interactions between the novel adult and child from the time the novel adult enters the room to take the place of the parent until the parent returns or 5 minutes has elapsed since the original task prompt was given to the parent. Interactions between the parent and the novel adult were not coded.

Trained undergraduate or graduate observers acted as novel adults used during the SA task. All observers received at least brief training on the relationship enhancement skills taught to caregivers during the CDI phase of PCIT and were told they could utilize these skills with the child during the separation task. At the end of the 5-minute SA task, the caregiver re-entered the playroom and the novel adult left the playroom in order to allow for a 2-minute RE segment between the parent and the child. Unlike the previous tasks in the DPICS-III observation, the caregiver was given no specific instructions regarding what to do with their child during the RE period. Instead, they were told that could do any activity they wished when they returned to the playroom.

These observations were video recorded in order to allow for the coding of the observation by a trained DPICS coder at a later point. Following the completion of the extended, DPICS-III observation, observers administered study measures (e.g., Demographics Questionnaire, BASC-2 PRS, and ECBI) to parents and checked measures for completeness. Finally, observers thanked families for their participation and compensated families for their time. Observers were also trained to provide parents with relevant treatment referrals, if needed, although no referrals were requested.

Clinic families. Families presenting to AUPSC to initiate treatment or assessment services for their young child between the 2 and 8 years of age completed a standard semi-structured intake interview with a graduate-level clinician. All clients/caregivers presenting at AUPSC also signed the standard AUPSC Client Services Agreement at their intake appointment, in which they agreed to allow de-identified information from assessment measures they completed at the beginning and end of treatment to be available for research purposes. As a part of the standard assessment measures completed by clients in this age range, parents of these young children completed the BASC-2 PRS and the ECBI in addition to an extended DPICS observation. Data from these completed assessment measures, along with client demographic information, were then de-identified and entered into a database by clinic staff. Data from this de-identified database were used in conjunction with the data collected from community sample families with significantly elevated levels of child behavioral and emotional problems in order to represent children with clinically significant concerns related to disruptive behavior or anxiety. IRB approval was obtained prior to accessing the de-identified, archival data to determine eligible AUPSC clients.

Observers. In line with previous data collection procedures, undergraduate research assistants were recruited as observers for the community sample participants while child-focused graduate student clinicians conducted all DPICS observations for their clients at AUPSC. Observers were trained by graduate student clinicians in the Parent-Child Lab to conduct extended DPICS-III observations using standardized instructions and practice scripts. These observers were trained on the importance of the standardized set-up and administration of the DPICS-III observation in order to ensure fidelity to the DPICS-III observation procedure. Additionally, observers received at least brief training on the use of skills designed to increase warmth between an adult and a child (e.g., praising child behavior) to facilitate positive interactions between the observer and the child during the SA task. Observers were also taught to administer and score study measures in order to ensure measures were completed correctly by caregivers.

Training of DPICS coders. Undergraduate research assistants who were designated as coders for this project underwent a rigorous training process which included the completion of the DPICS-III workbook (see Eyberg et al., 2005), weekly practice meetings led by a graduate student and/or faculty supervisor, and weekly homework assignments to gain additional practice with coding. Training occurred over a period of approximately 4-6 months and continued participation in weekly coders' meeting was required. Weekly practice meetings consisted of checking coders' progress with the workbook, answering questions related to coding, and coding practice tapes under the supervision of the graduate student and/or faculty supervisor. Upon completion of the workbook, coders were required to demonstrate that they could reliably code each segment of the extended DPICS observation by obtaining at least 80% agreement on coding with the graduate student and/or faculty supervisor on a minimum of two occasions.

Coding procedures. Video-recorded observations were randomly assigned by the primary investigator to be coded by a team of DPICS-III trained coders who were blind to study hypotheses. Only coders who successfully completed the training procedures described above were permitted to code observations for this study. As each recorded coding segment was viewed, coders made tally marks on a coding sheet (see Figure 1) to document each occurrence of specific parent and child behaviors, as defined by the abridged version of the DPICS-III manual (Chase & Eyberg, 2006). Of note, each parent and child behavior is categorized as one specific behavior and cannot be coded in more than one category. All recorded segments were watched four times by coders, once to observe the parent's verbal behaviors, once to observe the parent's physical behaviors, once to observe the child's verbal behaviors, and once to observe the child's physical behaviors. When possible, each coded segment from the DPICS observation was randomly assigned to 3 or 4 distinct coders in order to minimize practice effects. One-third of the collected segments were then coded for parent and child verbal behaviors by the primary investigator as well as for parent and child physical behaviors by the primary investigator or a distinct advanced, reliable coder in order to allow for reliability analyses to be conducted. Frequency count totals were entered into a computer database and compiled into the various composite categories for statistical analyses.

Results

Data presented below were assessed for the presence of outliers and tested for the assumptions of normality and equal variance to determine if the data were suitable for analysis of group differences using one-way ANOVAs. For all subsequent analyses, outliers were examined using visual inspection of boxplots for values greater than 1.5 box-lengths from the edge of the box. If outliers were found to be present, one-way ANOVAs were conducted with and then without the outliers included in the analysis to determine the impact of the outliers on results. Outliers were retained if statistically significant (or non-significant) results were maintained across tests. Alternatively, outliers were removed from relevant analyses if the statistical significance level changed across tests (i.e., from non-significant to significant or from significant to non-significant). The assumption of normality was initially assessed for all analyses using the Shapiro-Wilk Test of Normality. If data were observed to violate the assumption of normality based on the Shapiro-Wilk test ($p < .05$), then additional tests of normality were conducted. Specifically, data were assessed using visual inspection of Normal Q-Q Plots and standardized skewness and kurtosis z-scores, with z-scores falling within ±2.58 ($p = .01$) indicating adequately normally distributed data. If data were observed to meet criteria for a normal distribution based on visual inspection of Normal Q-Q Plots and skewness/kurtosis values (i.e., passing 2 of 3 tests of normality), then ANOVAs were conducted to examine group differences. If not, a non-parametric Kruskal-Wallis H test was completed to account for non-normally distributed data. Finally, the assumption of equal variances was assessed by Levene's Test of Homogeneity of Variances, with $p > .05$ indicating adequate homogeneity of variance between groups. A standard one-way ANOVA was completed for all analyses in which the assumption of equal variances was met, while a Welch ANOVA was conducted for all analyses in which the assumption of equal variances was violated. Corresponding post-hoc and effect size analyses were also conducted to determine specific differences between groups when relevant. Specifically, Tukey-Kramer post-hoc analyses were conducted in response to statistically significant findings on one-way ANOVAs, while Games-Howell post-hoc analyses were completed for statistically significant findings on Welch ANOVAs, and Dunn's procedure with a Bonferri correction was completed for statistically significant results on a Kruskal-Wallis H test. Measures of effect size include eta-squared (η^2) and estimated omega squared (*est.* ω^2) for total variance accounted for by diagnostic group placement. Cohen's d and the rank-biserial correlation (*r*) were utilized to denote specific differences between groups based on post-hoc analyses.

Preliminary Analyses

BASC-2 descriptives. The majority of caregivers completed the age-appropriate BASC-2 PRS form for their child. However, one caregiver completed a screener version of the BASC rather than the full BASC-2 PRS and, therefore, will not be included in these analyses ($N = 55$). Overall, caregivers completed 39 preschool-aged and 16 child-aged forms. All responders had valid measures, as indicated by "Acceptable" scores on the BASC-2 PRS *F*, Response Pattern, and Consistency validity scales. Only one exception to this occurred, with one family scoring in the "Extreme Caution" range on the Consistency scale. However, because this family had acceptable scores on the other two validity scales, their responses were included in these data.

Overall, average parent-reported scores on the BASC-2 PRS composite and subscales fell in the non-clinically significant range (i.e., *t*-scores < 60) for the full sample. On composite scales, average *t*-scores for the full sample were as follows: Externalizing Problems (*M* = 52.56, *SD* = 10.23), Internalizing Problems (*M* = 54.78, *SD* = 13.19), Behavior Symptoms Index (*M* = 53.09, *SD* = 10.97), and Adaptive Skills (*M* = 48.51, *SD* = 10.67). Average BASC-2 PRS *t*-scores for the clinical scales included Hyperactivity (*M* = 54.24, *SD* = 11.53), Aggression (*M* = 51.42, *SD* = 10.21), Conduct Problems (*M* = 50.38, *SD* = 8.92), Anxiety (*M* = 56.75, *SD* = 14.38), Depression (*M* = 54.67, *SD* = 11.90), Somatization (*M* = 50.04, *SD* = 11.13), Atypicality (*M* = 51.51, *SD* = 10.49), Withdrawal (*M* = 49.37, *SD* = 10.98), and Attention Problems (*M* = 52.35, *SD* = 10.43). Finally, on scales of adaptive functioning, average *t*-scores for the full sample were Adaptability (*M* = 46.75, *SD* = 11.25) and Social Skills (*M* = 51.64, *SD* = 11.02).

Of note, BASC-2 PRS *t*-scores on composite, clinical, and adaptive scales were found to vary across diagnostic groups. Group differences for all composite scales as well as scale scores used to determine group eligibility in the DBD and anxious samples for study are described in detail below. Additionally, group differences across all BASC-2 PRS scales are in Table 6. For the majority of BASC-2 PRS scales participants across diagnostic groups included: non-clinical (*n* = 23), disruptive-behavior disordered (*n* = 17), and anxious (*n* = 15). However, one family from the anxious sample did not complete all the items necessary to generate a scale score on the BASC-2 PRS Withdrawal scale, causing only 14 families from the anxious sample to be represented on that scale as well as the related Behavior Symptoms Index composite scale. Additionally, comparisons across groups on the Conduct Problems scale include only families with children age 6 or older, as the Conduct Problem scale is not available on the Preschool version of the BASC-2 PRS. Therefore, group participation for the Conduct Problem scale included a total of 16 families representing the non-clinical (*n* = 2), disruptive-behavior disordered (*n* = 4), and anxious (*n* = 10) samples.

Comparisons of group differences on BASC-2 composite scales. A one-way ANOVA was conducted to determine if statistically significant differences were present between diagnostic groups on the BASC-2 PRS Externalizing Problems composite scale. Results indicated statistically significant differences between diagnostic groups, $F(2, 52) = 19.75$, $p < .001$. Tukey-Kramer post hoc analysis revealed *t*-scores were statistically significantly higher ($p < .001$) for the DBD sample ($M = 62.18$, $SD = 8.81$) than the non-clinical sample ($M = 46.57$, $SD = 6.57$) with a mean increase of 15.61, 95% CI [9.5, 21.7], as well as statistically significantly higher ($p < .001$) than the anxious sample ($M = 50.87$, $SD = 8.55$) with a mean increase of 11.31, 95% CI [4.6, 18.0].

Due to violation of the assumption of homogeneity of variances, a Welch's ANOVA was conducted to interpret results for the BASC-2 PRS Internalizing Problems composite scale across groups and *t*-scores were statistically significantly different between diagnostic groups, Welch's $F(2, 23.856) = 14.156$, $p < .001$. Specifically, *t*-scores on the Internalizing Problems composite scale increased from the non-clinical group ($M = 46.96$, $SD = 4.44$) to the DBD group ($M = 54.24$, $SD = 8.37$) and anxious group ($M = 67.40$, $SD = 16.99$) in that order. Games-Howell post hoc analysis determined the mean increase in *t*-scores between the non-clinical and DBD samples (7.28, 95% CI [1.7, 12.9]) was statistically significant ($p = .009$), as was the increase from the DBD sample to the anxious sample (13.17, 95% CI [0.9, 25.4], $p = .034$). Not surprisingly, the mean difference between the non-clinical and anxious sample (20.44, 95% CI [8.8, 32.1]) was also statistically significant ($p = .001$).

Regarding group differences on the BASC-2 PRS Behavior Symptoms Index composite scale, results from a Welch's ANOVA indicated *t*-scores were statistically significantly different, Welch's $F(2, 25.418) = 25.450$, $p < .001$. Games-Howell post hoc analysis revealed *t*-scores for the DBD sample (*M* = 61.06, *SD* = 9.20) were statistically significantly higher ($p < .001$) than the non-clinical sample (*M* = 44.65, *SD* = 5.57) with a mean difference of 16.41, 95% CI [10.1, 22.7]. Additionally, *t*-scores for the anxious sample (*M* = 57.29, *SD* = 10.31) were also statistically significantly higher ($p = .001$) than the non-clinical sample, with a mean difference of 12.63, 95% CI [5.0, 20.3].

A one-way ANOVA was conducted to compare differences between groups on the BASC-2 PRS Adaptive Skills composite scale. Results indicated BASC-2 PRS Adaptive Skills composite *t*-scores were statistically significantly different between diagnostic groups, $F(2, 52) = 11.19$, $p < .001$. Tukey-Kramer post hoc analysis revealed *t*-scores were statistically significant higher ($p < .001$) for the non-clinical sample (*M* = 55.22, *SD* = 7.75) than the DBD sample (*M* = 42.29, *SD* = 11.09) with a mean increase of 12.92, 95% CI [5.9, 19.9], as well as statistically significantly higher ($p = .005$) than the anxious sample (*M* = 45.27, *SD* = 8.48) with a mean increase of 9.95, 95% CI [2.7, 17.2]. There were no statistically significant differences between the DBD and anxious sample ($p = .628$).

Comparisons of BASC-2 clinical scales related to DBDs. Data related to the BASC-2 PRS Hyperactivity scale were analyzed using a one-way ANOVA. As a result, BASC-2 PRS Hyperactivity scale *t*-scores were found to be statistically significantly different between diagnostic groups, $F(2, 52) = 9.27$, $p < .001$. Tukey-Kramer post hoc analysis revealed *t*-scores were statistically significantly higher ($p < .001$) for the DBD sample (*M* = 62.53, *SD* = 10.98) than the non-clinical sample (*M* = 48.70, *SD* = 8.60) with a mean increase of 13.83, 95% CI [6.1, 21.6], as well as statistically significantly higher ($p = .034$) than the anxious sample (*M* = 53.33, *SD* = 11.13) with a mean increase of 9.20, 95% CI [0.6, 17.8]. There were no statistically significant differences ($p = .356$) between the non-clinical sample and the anxious sample on the BASC-2 PRS Hyperactivity scale.

Results from a one-way ANOVA revealed BASC-2 PRS Aggression *t*-scores were statistically significantly different between diagnostic groups, $F(2, 52) = 18.00$, $p < .001$. Tukey-Kramer post hoc analysis demonstrated *t*-scores were statistically significantly higher ($p < .001$) for the DBD sample ($M = 60.41$, $SD = 10.60$) than the non-clinical sample ($M = 45.09$, $SD = 6.63$) with a mean increase of 15.33, 95% CI [9.2, 21.5]. *T*-scores were also found to be statistically significantly higher ($p < .001$) for the DBD sample than the anxious sample ($M = 50.93$, $SD = 6.32$) with a mean increase of 9.48, 95% CI [2.7, 16.3]. There were no statistically significant differences ($p = .080$) between the non-clinical sample and the anxious sample on the BASC-2 PRS Aggression scale. A one-way ANOVA was also conducted to determine if *t*-scores on the BASC-2 PRS Conduct Problems scale was different across diagnostic groups; however, there were no statistically significant differences between different diagnostic groups, $F(2, 13) = 3.243$, $p = .072$, on the Conduct Problems scale.

Results from a one-way ANOVA revealed BASC-2 PRS Attention Problem *t*-scores were statistically significantly different between diagnostic groups, $F(2, 52) = 16.26$, $p < .001$. Tukey-Kramer post hoc analysis suggested *t*-scores were statistically significantly higher ($p < .001$) for the DBD sample ($M = 61.65$, $SD = 9.67$) than the non-clinical sample ($M = 46.70$, $SD = 7.10$) with a mean increase of 14.95, 95% CI [8.5, 21.4]. Additionally, *t*-scores were found to be statistically significantly higher ($p = .001$) for the DBD sample than the anxious sample ($M = 50.47$, $SD = 8.48$) with a mean increase of 11.18, 95% CI [4.1, 18.3]. There were no statistically significant differences ($p = .367$) between the non-clinical sample and the anxious sample on the BASC-2 PRS Attention Problems scale.

Comparisons of BASC-2 clinical scales related to anxiety. Due to non-normal distribution of data for the BASC-2 PRS Anxiety scale, a Kruskal-Wallis H test was run to determine if there were differences in the BASC-2 PRS Anxiety *t*-scores among diagnostic groups. Distributions of the BASC-2 PRS Anxiety scale scores were similar for all groups, as assessed by visual inspection of a boxplot. Median *t*-scores were statistically significantly different across groups, $\chi^2(2) = 15.361$, $p < .001$. Subsequently, pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons. Adjusted *p*-values are presented. This post hoc analysis identified statistically significant differences in BASC-2 PRS Anxiety scale *t*-scores between the anxious (*Mdn* = 76.00) and non-clinical sample (*Mdn* = 48.00) ($p = .001$) as well as between the anxious and DBD (*Mdn* = 49.00) ($p = .003$) samples. No significant differences were found between the DBD and non-clinical samples ($p = .913$).

Because homogeneity of variances was violated for the BASC-2 PRS Depression scale, the Welch ANOVA was utilized to interpret results across groups. BASC-2 PRS Depression *t*-scores were statistically significantly different across diagnostic groups, Welch's $F(2, 26.172) = 14.328$, $p < .001$. Results from the Games-Howell post hoc test revealed BASC-2 PRS Depression scores were higher for the anxious sample ($M = 61.27$, $SD = 14.74$) than the non-clinical sample ($M = 47.04$, $SD = 6.26$), with a mean increase of 14.22, 95% CI [3.9, 24.5], which was a statistically significant difference ($p = .007$). Additionally, BASC-2 PRS Depression scores were noted to be higher for the DBD sample ($M = 59.18$, $SD = 9.38$) than the non-clinical sample, with a mean increase of 12.13, 95% CI [5.6, 18.7], which was also a statistically significant difference ($p < .001$). No statistically significant differences were present between the anxious and DBD groups on the BASC-2 PRS Depression scale.

A Welch ANOVA was conducted to determine if *t*-scores on the BASC-2 PRS Somatization scale were different across diagnostic groups. Results revealed BASC-2 PRS Somatization *t*-scores were statistically significantly different across diagnostic groups, Welch's $F(2, 27.670) = 5.252$, $p = .012$. Specifically, Games-Howell post hoc test analyses revealed BASC-2 PRS Somatization *t*-scores were statistically significantly higher ($p = .013$) for the anxious sample ($M = 58.53$, $SD = 14.64$) than the non-clinical sample ($M = 45.52$, $SD = 6.86$), with a mean increase of 13.01, 95% CI [2.7, 23.3]. There were no statistically significant differences between the DBD sample ($M = 48.65$, $SD = 8.16$) and the anxious ($p = .075$) or non-clinical sample ($p = .417$).

Finally, the Welch ANOVA was utilized to interpret results for the BASC-2 PRS Withdrawal scale across diagnostic groups. Results indicate BASC-2 PRS Withdrawal *t*-scores were statistically significantly different across diagnostic groups, Welch's $F(2, 23.817) = 11.198$, $p < .001$. Further analyses using the Games-Howell post hoc test demonstrated BASC-2 PRS Withdrawal *t*-scores were higher for the anxious sample ($M = 59.07$, $SD = 12.41$) than the non-clinical sample ($M = 43.39$, $SD = 5.27$), a mean increase of 15.68, 95% CI [6.7, 24.7], which was a statistically significant difference ($p = .001$). Statistically significant differences were not present between the anxious and DBD ($M = 49.47$, $SD = 10.13$) samples ($p = .070$) or the DBD and non-clinical samples ($p = .083$).

ECBI descriptives. All caregivers completed the ECBI, the results of which are summarized in Table 7. ECBI Intensity scores ranged from 42 to 195 across groups, and the average ECBI Intensity score for the entire sample was 110.46 ($SD = 30.11$), which updated normative data indicates falls in the non-clinically significant range (i.e., below the 80^{th} percentile) for children aged 2-9 (Burns & Patterson, 2001). Furthermore, the range of the

Problem scale scores was from 0 to 33, and the average Problem score was 9.48 (*SD* = 7.77), also falling in the non-clinically significant range.

A one-way ANOVA was conducted and ECBI Intensity scores were found to be statistically significantly different among diagnostic groups, $F(2, 53) = 17.47$, $p < .001$. Tukey-Kramer post hoc analysis revealed scores were statistically significantly higher ($p < .001$) for the DBD sample (*M* = 135.59, *SD* = 26.22) than the non-clinical sample (*M* = 90.65, *SD* = 22.86) with a mean increase of 44.94, 95% CI [26.6, 63.3], as well as statistically significantly higher ($p = .019$) than the anxious sample (*M* = 110.46, *SD* = 30.11) with a mean increase of 23.34, 95% CI [3.3, 43.3]. Additionally, scores for the anxious sample were statistically significantly higher ($p = .020$) than scores for the non-clinical sample with a mean increase of 21.60, 95% CI [2.9, 40.3].

ECBI Problem scale scores were statistically significantly different across diagnostic groups, Welch's $F(2, 27.551) = 12.166$, $p < .001$. Further analyses using the Games-Howell post hoc test indicated ECBI Problem scores were higher for the DBD sample (*M* = 15.35, *SD* = 8.63) than the non-clinical sample (*M* = 4.87, *SD* = 4.16), a mean increase of 10.48, 95% CI [4.8, 16.2], which was a statistically significant difference ($p < .001$). Additionally, ECBI Problem scale scores were noted to be higher for the anxious sample (*M* = 9.88, *SD* = 6.67) than the non-clinical sample, a mean increase of 5.01, 95% CI [0.3, 9.7], which was also a statistically significant difference ($p = .036$).

DPICS segment length. Preliminary analyses were also conducted to assess for potential differences in observation and segment length across diagnostic groups to ensure any differences found in the frequency of DPICS codes and composites for Hypothesis 1 and 2 were not impacted by differences in observation/segment length. First, the length of all segments from the extended DPICS observation that include parent-child interactions (CLP, PLP. CU, SA/P, and RE) were summed together to create an overall parent-child observation length for each family. Participants included in parent-child observation length analysis ($N = 55$) comprised of 23 families from the non-clinical sample, 16 families from the DBD sample, and 16 families from the anxious sample. Of note, one family from the DBD group was excluded from analyses due not completing an RE segment. A Kruskal-Wallis H test was run to determine if there were differences in observation length for parent-child interactions among diagnostic groups. Distributions of observation length were similar for all groups, as assessed by visual inspection of a boxplot. There was no statistically significant difference among diagnostic groups on observation length, $\chi^2(2) = 2.002$, $p = .368$. Median observation length across groups, represented as minutes:seconds, included 17:55 for the non-clinical group, 17:46 for the DBD group, and 17:47 for the anxious group.

Fifty-five families were included in SA/N segment length analysis, including 23 families from the non-clinical sample, 16 families from the DBD sample, and 16 families from the anxious sample. Of note, a different family from the DBD sample was excluded from this analysis due the child refusing to separate from the parent to allow for the assessment of child interactions with a novel adult. Results from a Kruskal-Wallis H test demonstrated distributions of SA/N segment length were not similar for all groups, as assessed by visual inspection of a boxplot. There was no statistically significant difference among diagnostic groups on observation length, $\chi^2(2) = 3.294$, $p = .193$ and median SA/N segment lengths were found to be similar across diagnostic groups with the SA/N segment lasting 4 minutes and 24 seconds for the anxious sample and 4 minutes and 26 seconds for both the non-clinical and DBD samples. Results for segment length analyses can be found in Table 8.

DPICS reliability analyses. DPICS inter-rater reliability was assessed on a random sampling of at least 33% of video-recorded observation segments. Segments were randomly assigned to be coded for reliability across diagnostic groups (i.e., non-clinical, disruptive behavior disordered, anxious) and video segments (e.g., CLP, PLP. CU, SA/P, SA/N, and RE). Thus, inter-rater reliabilities equally represent all DPICS segments across all three diagnostic groups. While 35.8% of the overall sample was coded for reliability, the percentage of video segments coded for reliability varied slightly across diagnostic groups due to differing group sizes. Specifically, 36% of observation segments were coded for reliability in the non-clinical sample compared to 34.1% of segments in the disruptive-behavior disordered sample and 37.5% of segments in the anxious sample. The primary investigator acted as the reliability coder to assess inter-rater reliability for all parent and child verbalizations and vocalizations across segments and diagnostic groups. Reliability coding for parent and child physical touch was randomly assigned to either an advanced undergraduate coder or the primary investigator. Inter-rater reliability was calculated using intraclass correlations (ICCs) with one-way, random effects models and average measurement reliability by comparing frequency counts of a given DPICS code obtained by DPICS coders with those obtained by the reliability coder. Results of these analyses are summarized in Table 9.

ICC values were calculated for each diagnostic group as well as for the entire combined sample of 56 families. Of note, ICCs were calculated only for segments including the parent and the child (i.e., CLP, PLP, CU, SA/P, and RE), as these are the segments being analyzed to address the majority of study hypotheses. For parent DPICS codes, ICCs for the entire sample ranged from .12 to .98, with the ICC value for the Behavior Description code (.12) being a notable outlier. Parent ICCs ranged from .45 to .99 for the observations from the non-clinical sample, .03 to .99 for the disruptive behavior disordered sample, and .48 to .99 for the anxious sample. For child codes, ICC values for the entire sample ranged between .09 and .99, with the ICC value for the Yell code (.09) being an outlier. For non-clinical sample observations ICC values ranged from .00 to .99 while ICC values ranged from .07 to .99 for the disruptive behavior disordered sample and .77 to .99 for the anxious sample. According to criteria by Shrout and Fleiss (1979), ICC coefficients are described as acceptable when they equal or exceed .75. Based on these criteria, 25 of the 27 codes used in this study were considered satisfactory for the full sample with Behavior Description and Yell being the only codes below this cutoff. For the non-clinical sample observations, 24 of the 27 codes exceeded Shrout and Fleiss's (1979) .75 cutoff. Codes below this value included Behavioral Description, Yell, and Whine. Twenty-five of 27 codes met or exceeded an ICC coefficient of .75 in the disruptive behavior disordered sample observations, with Behavioral Descriptions and Yell being the only two codes categorized as unacceptable. Finally, for anxious sample observations, 26 of the 27 codes suggested acceptable inter-rater reliability (i.e., ICC > .75) as only Behavioral Descriptions fell below this value.

Fisher r-to-Z transformations were conducted to compare ICCs for the various DPICS codes between the non-clinical and anxious samples (see Table 9). Significant differences emerged for some parent and child DPICS codes. Specifically, Parent Negative Talk $Z(39) = 3.14$, $p < .001$, Unlabeled Praise $Z(39) = 1.97$, $p = .05$, Information Question $Z(39) = 1.97$, $p = .05$, Parent Negative Touch $Z(39) = 3.14$, $p < .001$, and Parent Positive Touch $Z(39) = 3.30$, $p < .001$ were coded significantly more reliably in the non-clinical sample observations as opposed to the anxious sample observations. In contrast, Direct Command was significantly more-reliably coded in the anxious sample observations, $Z(39) = 1.99$, $p = .05$. For child codes, both Child

Negative Talk ($Z(39) = 4.27$, $p < .001$) and Child No Answer ($Z(39) = 2.01$, $p = .04$) were coded significantly more reliably in the non-clinical sample observations than the anxious sample observations while Child Yell ($Z(39) = 4.13$, $p < .001$) and Child Whine ($Z(39) = 3.30$, $p < .001$) were coded significantly more reliably in the anxious sample than the non-clinical sample.

DPICS behavioral composite calculation. DPICS behavior composite scores were calculated using the appropriate formula (see Eyberg et al., 2005 or Table 5 for composite formulae). These behavioral composite scores were then utilized to assess relevant study hypotheses.

Analysis of Study Hypotheses

Comparisons of DPICS codes across groups during parent-child interactions. To answer the first part of Hypothesis 1 and the second part of Hypothesis 2, a series of tests were conducted to compare DPICS-coded parent and child behavioral frequency count means and/or medians obtained in this study between diagnostic groups, depending on the distribution of data for each analysis. Specifically, comparisons were made between the non-clinical ($n = 23$), DBD ($n = 16$), and anxious ($n = 16$) samples for relevant parent and child behaviors including parent and child verbalizations, parent and child Negative Talk, parent and child Positive Touch and Negative Touch, and child vocalizations. These analyses were conducted using data summed across all DPICS observation segments that included the parent and child (i.e., CLP + PLP + CU + SA/P + RE). Effect sizes were also calculated when possible. Of note, one family from the DBD group did not complete a RE segment and was, therefore, removed from the aforementioned analyses. Please see Table 10 for full results and Figures 2-14 for a visual representation of the data across diagnostic groups and hypotheses.

One-way ANOVAs were run to determine if there were differences between the non-clinical, disruptive behavior disordered, and anxious samples regarding the overall number of parent and child verbalizations. Results revealed there was no statistically significant difference in the number of parent verbalizations, $F(2, 52) = 1.05$, $p = .356$, $\eta^2 = 0.039$, or child verbalizations $F(2, 52) = 0.48$, $p = .623$, $\eta^2 = 0.018$, between groups. Looking more specifically at critical parent and child verbalizations, a Kruskal-Wallis H test was conducted to determine if there were differences in parent Negative Talk among diagnostic groups. Median parent Negative Talk frequencies increased from 0.00 in the anxious sample to 1.00 in the non-clinical sample and to 3.50 in the DBD sample, but the differences were not statistically significantly different, $\chi^2(2) = 1.356$, $p = .508$. To assess whether mean frequency of child critical statements (i.e., child Negative Talk) differed across diagnostic groups, a Welch ANOVA was conducted on the remaining participants once outliers were removed (i.e., non-clinical ($n = 21$), DBD ($n = 16$), anxious ($n = 14$)). Results indicated child Negative Talk frequencies were statistically significantly different across diagnostic groups, Welch's $F(2, 27.998) = 8.388$, $p = .001$, and diagnostic group placement accounted for 22.5% of the total variance in child Negative Talk (*est.* $\omega^2 = .225$**)**. Further analyses using the Games-Howell post hoc test determined child Negative Talk frequencies were statistically significantly higher ($p = .005$; $d = 1.304$) for the DBD sample ($M = 7.94$, $SD = 6.18$) than the non-clinical sample ($M = 2.00$, $SD = 1.82$), a mean increase of 5.94, 95% CI [1.9, 10.0]. Children in the DBD sample were also observed to use statistically significantly more critical statements ($p = .002$; $d = 1.459$) than children in the anxious sample ($M = 1.43$, $SD = 1.28$) with a mean increase of 6.51, 95% CI [2.4, 10.6]. No statistically significant differences existed between the non-clinical and anxious samples ($p = .527$).

Due to non-normal distribution of data related to the frequency of parent and child touch, Kruskal-Wallis H tests were run to determine if there were significant differences in amount and type of touch. Adjusted *p*-values are presented. Median frequencies of Parent Negative Touch were statistically significantly different across groups, $\chi^2(2) = 11.787$, $p = .003$. Subsequently, pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons. This post hoc analysis revealed statistically significant differences in parent Negative ToucP between the DBD (*Mdn* = 3.50) and non-clinical sample (*Mdn* = 1.00) ($p = .004$; $r = -.521$) as well as between the DBD and anxious (*Mdn* = 0.00) ($p = .019$; $r = -.457$) samples, demonstrating parents in the DBD sample displayed significantly more Negative Touch than parents in the non-clinical and anxious groups. No significant differences were found between the anxious and non-clinical samples related to Parent Negative Touch. Frequency of Child Negative Touch was also found to be statistically significantly different across groups, $\chi^2(2) = 6.287$, $p = .033$. Pairwise comparisons performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons revealed statistically significant differences in Child Negative Touch between the DBD (*Mdn* = 1.00) and non-clinical (*Mdn* = 0.00) samples ($p = .031$; $r = -.405$). No significant differences were found between the DBD and anxious (*Mdn* = 0.00) samples ($p = .991$) or between the anxious and non-clinical samples ($p = .395$). Median Parent Positive Touch frequencies increased from 3.00 in the anxious group to 4.00 in the non-clinical group to 4.50 in the DBD group; however, increases were not statistically significantly different between groups, $\chi^2(2) = 0.800$, $p = .670$. Similarly, there was no statistically significant difference between groups on the amount of Child Positive Touch, $\chi^2(2) = 0.010$, $p = .995$.

The assessment of differences in the frequency of child vocalizations (i.e., Child Yell + Child Whine) across the parent-child observation segments was conducted using a Kruskal-Wallis H test. A total of 50 participants were included in this specific analysis due to the necessary removal of outliers from each diagnostic group. Specifically, analyses include 20 participants form the non-clinical sample, 15 participants from the DBD sample, and 15 participants from the anxious sample. Median child vocalization frequencies increased from 0.00 in the non-clinical sample to 2.00 in the anxious sample and then to 4.00 in the DBD sample. There was a statistically significant difference in child vocalization frequencies between diagnostic groups, $\chi^2(2) = 7.214$, $p = .027$; however, results of pairwise comparisons performed using Dunn's (1964) procedure with a Bonferroni correction indicated no statistically significant pairwise comparisons.

Comparisons of DPICS codes across groups during novel adult-child interactions. Child behaviors occurring during the novel SA/N task were analyzed separately for relevant differences in child behavior between groups, including number of child verbalizations directed toward a novel adult and latency to child verbalization following being spoken to by a novel adult. All families who completed the SA/N task during the extended DPICS observation (i.e., non-clinical ($n = 23$), DBD ($n = 16$), anxious ($n = 16$)) were included in the following analyses. Results for these group comparisons and as well as means and standard deviations for all child DPICS codes across groups are presented in Table 11.

The one-way Welch ANOVA of children’s average number of verbalizations during the SA/N segment revealed a statistically significant main effect, Welch’s $F(2, 33.448) = 6.809$, $p = .003$, indicating a difference in the average number of child verbalizations among diagnostic groups. The estimated omega squared (*est.* $\omega^2 = .174$) indicated approximately 17.4% of the total variation in average number of child verbalizations during the SA/N segment is attributable to differences between the three diagnostic groups. Post hoc comparisons, using the Games-Howell post hoc procedure, were conducted to determine which pairs of the three diagnostic group means differed significantly. These results demonstrated children in the non-clinical sample (M = 34.70, SD = 24.70) had a statistically significantly higher (p = .038) number of average verbalizations than children in the anxious sample (M = 18.75, SD = 13.97), a mean increase of 15.95, 95% CI [0.7, 31.2]. Child verbalization frequencies were also statistically significantly higher (p = .006) in the DBD sample (M = 39.38, SD = 19.95) than the anxious sample with a mean increase of 20.63, 95% CI [5.5, 35.7]. Effect sizes for these two significant effects were d = 0.795 and 1.198, respectively. No statistically significant differences existed between the non-clinical and DBD samples (p = .792).

Results from a non-parametric Kruskal Wallis H test were assessed to determine if there were differences in child latency to verbalization in the SA/N segment among diagnostic groups. Median child latency to verbalization was 6 seconds for the non-clinical sample, 7 seconds for the DBD sample, and 8 seconds for the anxious sample. There was no statistically significant difference between groups, $\chi^2(2) = 0.926$, $p = .629$.

Comparisons of composite DPICS variable across groups. To address the remaining portion of Hypothesis 2, DPICS-coded behaviors associated with parental control (i.e., Parent Negative Talk + Direct Command + Indirect Command + Parent Negative Touch) were summed, and then behavioral frequency count medians obtained in this study were compared across diagnostic groups using the non-parametric Kruskal Wallis H test. Specifically, comparisons were made across groups for the parental control composite score across DPICS coding segments including both the parent and child (i.e., CLP, PLP, CU, SA/P, and RE). Although median parental control frequencies increased from 39.00 in the non-clinical sample to 41.00 in the anxious sample and to 70.50 in the DBD sample, there was no statistically significant difference between groups on parental control as measured by the DPICS, $\chi^2(2) = 5.525$, $p = .063$. Additional information can be found in Table 10.

Regression of DPICS parent composite categories on BASC-2 PRS Anxiety scale. Finally, to investigate Hypothesis 3, a hierarchical multiple regression was run to determine if the addition of parent verbalizations, parental control, and then parental warmth obtained from combined parent-child DPICS segments improved the prediction of BASC-2 PRS Anxiety scale *t*-scores over and above parent/family demographic variables (i.e., parent gender, parent relationship to child, parent ethnicity, and yearly family income) alone. The assumptions of linearity, independence of errors, homoscedasticity, unusual points, and normality of residuals were met. The full model of parent/family demographic variables, number of parent verbalizations, amount of parental control, and amount of parental warmth to predict BASC-2 Anxiety scale *t*-scores (Model 4) was not statistically significant, $R^2 = .063$, $F(7, 44) = .425$, $p = .881$; adjusted $R^2 = -.086$. Additionally, none of the other sets of predictors resulted in statistically significant incremental variance in the prediction of BASC-2 PRS Anxiety scale scores. See Table 12 for full details on each regression model.

Discussion

As the field of clinical psychology moves forward in developing, adapting, and refining EBTs, it becomes increasingly important for researchers to maintain steady progress toward improving evidence-based assessment techniques to evaluate relevant treatment outcomes (Jensen-Doss, 2011). The development of evidence-based assessments is particularly important given the growing evidence that monitoring treatment progress is associated with better overall treatment outcomes for patients (Lambert et al., 2003). Guidelines for the competent assessment of internalizing disorders in children and adolescents require that assessments utilize a multi-method and multi-informant approach (Hudson, Newall, Schneider, & Morris, 2014). The use of multiple methods of assessment (e.g., interviews, questionnaires, observations) and various informants involved in assessment (e.g., self, parent, teacher, observer) is particularly salient for young children who may have limited expressive language skills to express their emotions and related functional impairment. Additionally, there is an important call for research related to treatment outcomes for children and adolescents to move beyond simply assessing *child* symptoms and functioning and to begin to include the assessment of parenting and the parent-child relationship to determine how interventions impact critical contextual factors affecting children (Hoagwood et al., 2012).

To date, the majority of studies examining the lateral extension of PCIT for the treatment of child anxiety disorders examine treatment efficacy by assessing changes in child symptoms and functioning through the use of diagnostic interviews and parent-reported symptoms of child behaviors but fail to assess for changes in parenting behavior or parent-child interactions

(Carpenter et al., 2014). Therefore, although the current state of the literature presents an innovative and seemingly efficacious manner of involving parents in the treatment of anxiety disorders in young children, it does not provide information about whether changing parenting behaviors is effective in reducing child anxiety because current studies lack measures of parental behavior change. As a result, a significant gap in the literature exists regarding the use of behavioral observations to comprehensively evaluate treatment efficacy in adaptations of PCIT for anxiety, especially given the target of treatment is parental behavior change.

The primary goal for this study was to extend the literature related to assessing anxious parent-child interactions for young children by examining the clinical utility of the standard DPICS-III, which is a well-established coding system that measures the frequency and quality of various parent and child behaviors, as a measure of anxious parent-child interactions. Specifically, this study is the first of its kind to compare clinic-based DPICS standardization data for a non-clinical, community-based sample to clinic-based DPICS standardization data for clinically significant samples of anxious and disruptive behavior disordered youth using the DPICS-III. Additionally, this study sought to assess the utility of an extended version of the standard DPICS observation, which includes a 5-minute separation situation and a 2-minute reunification situation, in identifying differences between groups of children from non-clinical, DBD, and anxious samples. Lastly, this study attempted to predict variance in parent-rated scores of child anxiety using frequency counts of parent behaviors on the DPICS.

The Utility of the DPICS-III for Assessing Anxious Parent-Child Interactions

Collecting normative DPICS data for an anxious sample is vital to determining the clinical utility of the DPICS in assessing change in parent and child behaviors for families presenting for treatment for child anxiety. The current study found important differences in

DPCIS data collected across diagnostic groups. Notably, although inter-rater reliability was generally found to be adequate across diagnostic groups and DPICS-III codes during tasks including the parent and the child, it was also found to vary significantly between the non-clinical and anxious sample observations for some codes. Overall, codes were found to have higher reliability in the non-clinical sample than the anxious sample. Specifically, parent verbalization codes that were coded more reliably in the non-clinical sample included Parent Negative Talk, Unlabeled Praise, and Information Question, while Direct Command was coded more reliably in the anxious sample. Regarding child verbalizations, both Child Negative Talk and Child No Answer were coded more reliably in the anxious than non-clinical sample. One possible explanation for the differences in reliability between groups is that some codes may have occurred less often (i.e., had a lower base rate) in one sample than another, therefore making them more difficult to code. However, this hypothesis does not appear to hold true for the aforementioned parent verbalization codes as the results of a Welch ANOVA revealed no significant differences in the mean number of Parent Negative Talks between the non-clinical and anxious sample. Additionally, counter to the aforementioned hypothesis, visual inspection of group means and standard deviations for the Direct Command code on Table 10 suggests Direct Commands occurred more frequently in the non-clinical sample than the anxious sample. A strength of the current study is that it compared various DPICS codes which were suspected to be related to anxious parent-child interactions (e.g., Negative Talk, Negative Touch, Positive Touch) across diagnostic groups. Future research would benefit from assessing potential differences in parent and child verbalizations and composite scores across *all* DPICS codes.

Interestingly, although there was no statistically significant difference in the inter-rater reliability coding of Child Negative Touch or Child Positive Touch across groups, both Parent

Negative Touch and Parent Positive Touch were coded more reliably in the non-clinical sample than the anxious sample. It is possible this difference between groups is a result of varying participant variables (e.g., amount and type of codable behaviors occurring across participants, segments, and groups). For example, it may be that less complicated touch patterns (i.e., single touches rather than a sequence of multiple touches) were present in the non-clinical sample compared to the anxious sample. Coding observations with participants who use more frequent, diverse, rapid and/or complex sequences of codable behaviors may decrease coding reliability due to the need for quick thinking and decision-making by coders. Specifically, it is reasonable to believe coders would be able to live-code single instances of behaviors more easily than complex interactions, thereby increasing their reliability for groups with less complex parent-child interaction patterns. The idea of considering complexity of parent-child interactions during coding sequences could also explain the higher overall reliability for the non-clinical sample. Although direct comparisons of inter-rater reliability were not made between the DBD sample and non-clinical sample in this study, visual inspection of ICCs on Table 9 suggests a general trend toward slightly lower reliability scores for the DBD sample compared to the non-clinical groups and that coders had slightly more difficulty coding parent-child interactions reliably for clinical samples than non-clinical samples. Alternatively, it is possible participants who engage in a large number of codable behaviors may increase coder reliability by increasing coder interest, attention, and engagement in the parent-child interaction. Furthermore, although the use of the clinical version of the DPICS used in this study allowed for coding to be completed in real time, which is importantly clinically, future research may benefit from utilizing the second-by-second research version of the DPICS to improve reliability. The aforementioned variables warrant further study to allow for improved DPICS coding accuracy and training.

Of note, both child verbalization codes (i.e., Child Yell and Child Whine) were coded significantly more reliably in anxious sample observations than in non-clinical sample observations. Contrary to other group differences in inter-rater reliability, this difference in inter-rater reliability between diagnostic groups may be a result of the child vocalization codes occurring at a low base rate in the non-clinical sample. It is also important to keep in mind that overall reliability for the Yell and Whine codes was low, a finding that is consistent with previous data regarding the reliability of the DPICS (Bessmer, 1996; Bessmer & Eyberg, 1993). Although efforts have been made to clarify the definitions for Yell and Whine codes as the DPICS has developed, current explanations of the supplemental Yell and Whine child codes continue to be overly subjective. The current subjectivity of these codes makes it difficult for coders to determine whether a Yell or Whine code is needed at all, how to distinguish a Yell from a While, and how to decide when one vocalization ends and another begins. Therefore, it is not surprising that inter-rater reliability is lower for these codes than other DPICS codes. Developing training videos with examples of what is a whine/yell and what is not would reduce variability in coding Yell and Whine. Alternatively, future research could consider collapsing the Yell and Whine categories into an overall vocalization category as this would allow for an assessment of dysregulated or attention-seeking child verbal behavior without including the nuance of intensity of emotional dysregulation.

In line with the aforementioned difficulties related to low frequency or low base-rate codes, the Behavior Description code was found to have low reliability overall and across all diagnostic groups. This finding is also consistent with previous reliability data from Bessmer's (1996) assessment of the second version of the DPICS. Low base-rate codes pose challenges for coders as they have less experience coding these behaviors during live coding tasks due to their low frequency of occurrence. Thus, it can be argued that coders may be less well prepared for coding low base-rate behaviors such as Behavior Descriptions. This finding has implications for training future DPICS coders and suggests that their training should emphasize practice coding behaviors that occur at a low base rate in an effort to increase coder preparedness.

Two such low base-rate behaviors that received additional attention in the training of DPICS coders for this study were the physical touch categories (i.e., Negative Touch and Positive Touch). Specifically, coders were given a full hour of didactic training regarding each of the two physical touch categories and subsequently completed various coding practices focused on coding the specific type of physical touch being discussed to allow for coding recalibration and feedback to occur during DPICS training meetings. Although all parent and child verbalization codes were discussed with DPICS coders during DPICS training meetings and then coded during meetings to allow for questions and feedback, these codes were reviewed as categories (e.g., parent verbalizations, child verbalizations, child response codes) rather than individually. Additionally, all observations in this study were coded separately for Parent Touch and then Child Touch, which allowed coders to focus their attention on the physical behaviors of the parent and then the child during live coding, drastically reducing the number of behaviors on which coders had to focus during each round of coding. Potentially, as a result of this specialized training and specific coding strategy, the low incidence of physical touch codes (both child and parent) did not appear to impact coding reliability in the current study, despite physical touch being difficult to code reliably in past studies (Bessmer, 1996). Higher inter-rater reliability for physical touch codes in this study may also be a result of improvement in the operational definition of the codes from DPICS-II to DPICS-III or may be due to the frequent incidence of touch not being present during DPICS observation segments (i.e., no instances of physical touch occurring), artificially increasing inter-reliability. Taken together, these findings demonstrate the DPICS can be used reliably to analyze differences in certain parent and child behaviors across diagnostic groups, setting the stage for the expansion of the DPICS to assess behaviors relevant to anxious clinical child populations.

In addition to demonstrating the expanded reliability of the DPICS to a new diagnostic group, the results of this pilot project revealed key differences in specific parent and child behaviors across diagnostic groups. Namely, the present study demonstrated support for behavioral differences between groups in the amount of child vocalizations present; however, it was not possible to determine where specific group differences occurred due to the presence of non-significant pairwise comparisons. Analysis of means and standard deviations for Total Vocalization and Child Yell and Whine respectively on Table 10 suggests child vocalizations tended to occur more often in the two clinical samples compared to the non-clinical sample. Of note, children in the anxious sample exhibited more yelling behaviors compared to other diagnostic groups, while children in the DBD sample exhibited more whine behaviors than their peers. However, it is unknown whether these differences are statistically significant. It is possible the child vocalization rate and type were impacted by the various task demands throughout the DPICS in combination with child diagnostic group membership. For example, children in the DBD group may have whined more as a result of increasing task demands in the CU segment while children in the anxious group may have yelled more in the SA/P segment as a result of separation. These findings should be considered tentative given the small sample size and should not be assumed to generalize to all clinical or cultural populations. Additionally, future analyses should compare differences in DPICS code frequency across diagnostic groups by segment to evaluate the impact of task demands on relevant DPICS codes.

Contrary to study hypotheses, no significant differences were found between the anxious and non-clinical samples regarding the number of parent verbalizations, Parent Negative Touch, or Parent Positive Touch present across parent-child interaction segments. Although not included in a priori hypotheses, the results of the current study show parents in the DBD group demonstrated significantly more Parent Negative Touch than parents in the non-clinical or anxious groups. Similarly, in contrast to study hypotheses that there would be fewer child verbalizations in the anxious sample than the non-clinical sample and a significant difference in the amount and type of child touch, no statistically significant differences were found between these two diagnostic groups. Yet, as with parents, children in the DBD sample exhibited higher instances of Child Negative Touch than children in the non-clinical sample; however, no statistically significant difference was found between the two clinical groups on Child Negative Touch. Of note, the Negative Touch code seems to represent a proxy for both overcontrol (e.g., physically directing or restricting the behavior of another) and negativity/criticism (e.g., physically reprimanding or inflicting pain on another to demonstrate disapproval). Therefore, the finding that both parents and children in the DBD sample participated in significantly more Negative Touch behaviors than parents and children from other diagnostic samples is consistent with previous research denoting the presence of increased controlling and rejecting parenting behaviors being exhibited by parents of children with behavior disorders (Bloomquist, August, Brombach, Anderson, & Skare, 1996) and supports the presence of coercive parent-child interactional patterns for children with disruptive behavior and their parents (Patterson et al., 1989; Snyder & Patterson, 1995). The fact that group differences in Negative Touch did not emerge between the anxious and non-clinical sample may indicate anxious parents and children are less likely to display control and/or negativity in a physical manner.

Results from the current study also refuted the initial study hypothesis regarding parents of anxious children using more critical statements (i.e., Negative Talk) in their parent-child interactions than parents in the non-clinical group, as no statistically significant difference was found between groups. The original study hypothesis was based on previous research by Hudson & Rapee (2001) which found parents of anxious children demonstrated increased levels of negativity (i.e., criticism) compared to controls. However, the aforementioned finding from Hudson & Rapee (2001) was actually contrary to previous findings, which failed to show a relationship between maternal criticism and anxiety (Hirshfeld, Biederman, Brody, Faraone, & Rosenbaum, 1997; Stubbe, Zahner, Goldstein, & Leckman, 1993). Therefore, current findings are in line with previous research. The differences in outcomes between the current study and outcomes from Hudson and Rapee (2001) could be due, at least in part, to differences in the diagnostic make-up of the anxious samples. Specifically, a larger percentage (i.e., 44%) of the participants in the Hudson and Rapee (2001) study presented with SAD compared to only 25% of participants in the anxious sample of the current study. This difference in sample participants is notable because children presenting with SAD likely exhibit more overt distress and related disruptive behaviors (e.g., screaming, crying, whining, clinging) as a result of their fear than children with other anxiety disorders, which may lead parents to utilize more critical comments in an effort to manage disruptive child behaviors. As such, future research exploring differences in specific parent and child behaviors between specific anxiety disorder diagnoses (e.g., SAD, GAD, Social Anxiety, Selective Mutism) rather than between different diagnostic groups would be of interest.

Additionally, rather than explicitly looking at parent negativity or critical comments (e.g., Parent Negative Talk), future research using the DPICS would benefit from looking at differences in the level of expressed parental warmth (e.g., Labeled Praise + Unlabeled Praise + Reflection + Behavioral Description + Parent Positive Touch), as previous research with young children has found parents of anxious children exhibit less parental warmth or positive affect than parents of children in control groups (see DiBartolo & Helt, 2007). Exploratory analyses regarding differences in parental warmth between diagnostic groups in the current study revealed there was a statistically significant difference in the amount of parental warmth between groups $F(2, 49) = 3.484$, $p = .038$, $\eta^2 = 0.124$; however, Tukey-Kramer post hoc analysis indicated no statistically significant differences were present between the nonclinical and DBD samples, the DBD and anxious samples, or the nonclinical and anxious samples. Of note, previous research looking at parental warmth in parent-child observations utilized Likert rating scales to evaluate the amount of parental warmth present between groups rather than a behavioral coding system that utilized frequency counts. Therefore, this preliminary finding is broadly in line with previous research confirming the difference in the amount of parental warmth between diagnostic groups but suggests a larger sample may be needed to determine specific group differences when using behavioral frequency counts.

Finally, regarding group differences in the number of child critical statements, results indicated statistically and clinically significant differences were present between the DBD and non-clinical samples as well as between the DBD and anxious sample. Specifically, children in the DBD sample utilized significantly more critical statements than children in either the non-clinical or anxious samples. Therefore, diagnostic group membership accounts for much of the variability of child negative talk overall. However, the initial hypothesis that there would be more child critical comments in the anxious sample than the non-clinical sample was not supported. Although research has shown parents and their anxious children can co-present with irritability leading to negative reinforcement cycles (Storch, Lewin, Geffken, Morgan, & Murphy, 2010), the current findings do not endorse a reciprocal relationship between parent and child negativity in anxious children when the number of critical statements used by parents and children are used as a proxy for negativity. Future research into this relationship would benefit from exploring aspects of child control (e.g., number of child commands given to parent, percentage of child compliance) and/or amount of child warmth toward the parent (e.g., ratio of Child Prosocial Talk compared to ratio of Child Command + Child Negative Talk).

Results from hypotheses examining group differences on composite parent and child behaviors were also notable. Specifically, despite substantial evidence in the literature for differences in the amount of control used by parents of anxious and disruptive-behavior disordered youth, there were no significant differences in the amount of parental control used across diagnostic groups as assessed by the DPICS parental control composite. This result is particularly surprising due to the observed differences between the median numbers of controlling behaviors observed across the non-clinical (*Mdn* = 39.00), DBD (*Mdn* = 70.00), and anxious (*Mdn* = 41.00) samples. The difference between groups approached, but did not meet, statistical significance. Additionally, findings from the current study suggest any differences in parental control that do exist using the DPICS-III are present only between the DBD sample and other groups rather than between the anxious and non-clinical sample. As this is the first study assessing the presence of parental control and using this specific composite category to assess parental control (i.e., Parent Negative Talk + Direct Command + Indirect Command + Parent Negative Touch), it is possible the parental control composite used in the current study may not adequately represent differences in parental control observed between anxious and non-clinical samples, thereby making it difficult to detect group differences. Future studies could consider adding other parenting behaviors from the DPICS-III that indicate parents taking control of the parent-child interactions (e.g., Descriptive Question + Information Question) or looking at ratios of parental control or "Negative Leading" (e.g., Descriptive Question + Information Question + Indirect Command + Parent Negative Talk)/Total Parent Verbalizations). Alternative, future analyses could look at specific differences between groups on each code or alternative composite codes (e.g., Positive Leading (e.g., Direct Command + Behavioral Description + Reflection + Labeled Praise + Unlabeled Praise)/Total Parent Verbalizations) to determine whether the DPICS differentiates between groups in unexpected ways apart from the aforementioned hypotheses.

In sum, the first goal of the current study examined behavioral differences in various parent behaviors that may impact child anxiety (e.g., amount of parental control) as well as child behaviors that may indicate the presence of child anxiety (e.g., number of child vocalizations). Despite looking across a variety of parent and child DPICS codes and composites, no statistically significant differences were found between the non-clinical and anxious groups across DPICS segments including the parent interacting with the child (i.e., CLP + PLP + CU + SA/P + RE). Taken together, these findings indicate the current DPICS coding system is not adequate for assessing relevant differences in parental control and negativity between anxious and non-clinical samples, as it was not designed to assess group differences and/or change in parenting behaviors for an anxious population.

The Clinical Utility of Adding a Separation Segment to DPICS Observations

As hypothesized, the present study found children in both the non-clinical and DBD samples directed more verbalizations towards the novel adult throughout the separation segment than their peers in the anxious sample. In fact, diagnostic group placement accounted for 17.4%

of the total variation in average number of child verbalizations during the SA/N segment, indicating the difference between groups was both statistically and clinically significant. This finding makes sense theoretically, as anxiety is characterized by participating in more avoidant behaviors in the presence of potentially anxiety-provoking stimuli. Therefore, the inclusion of a separation segment provides valuable information regarding group differences in anxious samples when using behavioral frequency counts. However, it is important to note that the utility of a specific separation task in eliciting anxious or avoidant behavior may vary based on the specific child anxiety diagnosis. As such, future research should analyze the effectiveness of the DPICS or other behavioral coding systems using other forms of anxiety-provoking tasks.

It was also hypothesized there would be a longer latency to child verbalization during the separation task for children in the anxious sample than children in the non-clinical sample. The current study assessed child latency to respond verbally following the initial verbalization made by a novel adult. Results found no differences in child latency to verbalization across the three diagnostic groups. This finding is surprising given that behavioral inhibition is a common feature in children with anxiety disorders but not in DBD or non-clinical samples. However, the lack of difference between groups may be indicative of the fact that it is developmentally typical for the majority of children in this age range to demonstrate some hesitancy (e.g., delayed responding) to novel adults. Additionally, this analysis may have been impacted by the interactional complexity of the current separation task. Namely, the parent is also present when the novel adult enters the room initially, which could lead to confusion regarding to whom the novel adult is directing verbalizations and who should respond to the novel adult. The analysis was also confounded by the fact that children sometimes initiated conversation with the novel adult prior to being addressed, yet the latency to response time was calculated based on how long it took the child to first speak *in response* to a novel adult, which means the latency to verbalizations for children who initiated interactions was not based on their initial interaction with the novel adult, which may have reduced group differences. Therefore, future research should consider who initiates interactions between the child and a novel adult. Furthermore, because verbal responding indicates more active approach behavior and engagement than nonverbal responding, this analysis was also specific in its requirement of a verbal response from the child to the novel adult. Future research could assess latency to any form of child response (e.g., verbal or nonverbal) or could assess differences in frequency of nonverbal versus verbal responses across the segments.

Predictive Value of the DPICS for Child Anxiety

Contrary to predictions made in Hypothesis 3, parental behaviors observed during the extended DPICS observation were not found to predict the presence of child anxiety as indicated on parent-report measures. The DPICS may have demonstrated improved predictive validity of child anxiety had the study utilized parent-report measure results from a full narrow-band measure of anxiety rather than a single scale from a broad-band measure of child functioning (i.e., the BASC-2 PRS Anxiety scale). However, anxiety in young children is typically assessed as a part of broad-band measures of functioning such as the BASC-2 PRS, because, unfortunately, there is currently a dearth of psychometrically established measures to evaluate symptoms of worry, fear, and anxiety in young children (Edwards, Rapee, Kennedy, & Spence, 2010). In fact, the only narrow-band measure currently available to assess anxiety in preschool-aged children is the Spence Preschool Anxiety Scale (Edwards et al., 2010). Never the less, making these predictions with a narrow-band measure would be important in future research.

Overall, the results of the current study demonstrate the current DPICS is not a sensitive measure for assessing relevant differences between anxious and non-clinical samples of young children. Study findings emphasize the need for a different or improved coding system to allow for the examination of anxious parent-child interactions. Results also highlight the importance of extending the standard DPICS observation to include a novel task that is designed to place demands on the parent-child dyad that increase the likelihood of anxious behaviors and allow for the evaluation of child and parental tolerance of anxiety-related distress. These findings should be interpreted in light of the limitations identified in the current study and serve to guide future directions for research.

Limitations

Several limitations in the current study necessitate consideration when interpreting study results. First, the sample size in this pilot study was small, which limited the statistical power to detect differences between groups. Additionally, the sample included various outliers across groups (see Figures 2-14), which can increase error variance and is a threat to the power of the statistical tests. Furthermore, data were frequently non-normally distributed, requiring the use of nonparametric tests to avoid increasing Type I and Type II error rates. Although steps were taken to reduce the impact of outliers on study results, analyses in which outliers were removed may be less accurate and reliable. Therefore, future research should consider replicating and extending the current findings in a larger sample. Doing so would allow for exploration of cultural and/or gender differences in parenting behaviors, which have been gaining considerable support in the literature (Möller, Majdandžić, & Bögels, 2014; Pereira, Barros, Mendonça, & Muris, 2013; Raudino et al., 2013; Teetsel, Ginsburg, & Drake, 2014; van der Sluis, van Steensel, & Bögels, 2015; Varela, Niditch, Hensley-Maloney, Moore, & Creveling, 2013).

One notable difference in sample demographics for this study is that children included in the anxious sample were significantly older than children in the non-clinical sample. This finding is consistent with previous research (Hudson & Rapee, 2001) and is also in line with the general clinical presentation of child anxiety disorders as children are often not diagnosed with anxiety disorders until middle or late childhood (Costello, Egger, Copeland, Erkanli, & Angold, 2011). Later diagnosis for child anxiety disorders may be due to the fact that it is generally considered developmentally typical for a child to display some anxious behaviors (e.g., separation fears, specific phobias) up until a particular age; however, when problems persist past a certain age, parents are more likely to notice functional impairment and seek treatment. As such, the age discrepancy in the current sample may be linked to study recruitment methods. Namely, participants in the anxious sample primarily included families who presented to a university-based clinic expressing interest in receiving treatment for their child with an anxiety disorder. In contrast, families in the non-clinical sample were recruited from the community for research purposes on a voluntary basis. Community families self-selecting to participate in the current research study may have participated with younger children who were not yet in formal schooling because they had increased flexibility in scheduling participation. Therefore, it is important to be aware that differences in child and/or parent behaviors between groups may be representative of cohort effects on parent-child interactions based on child age. Future research should ensure age-matched samples are used when possible. Additionally, data were unavailable in this study on some potentially relevant parent demographic variables (e.g., mental health/treatment history, age, marital status, education), which may have impacted parent and child behaviors during the extended DPICS observation. Future studies are needed to further investigate the impact of parent and child demographic factors on behaviors observed during parent-child ABOs across diagnostic groups.

An additional limitation of this study is the strength of the clinical groups. Notably, this study utilized varying eligibility criteria to allow for inclusion in the clinically significant samples of DBD and anxious children based on recruitment method. Specifically, families presenting to the university-based clinic for treatment met criteria for group inclusion based on the results of a semi-structured clinical interview while families presenting from the community for research participation met group inclusion criteria based on elevated scores on a parent-report measure. The differences in group eligibility requirements across recruitment methodology likely led to differences in the intensity of psychopathology across group members, potentially leading to lower levels of symptomology in each group overall, which may have ultimately led to less robust findings regarding differences across groups.

Notably, of the participants who met criteria based on clinically significant elevations on parent-report measures, elevations were only required to be present on one subscale from either a broad-band, parent-report measure (i.e., the BASC-2 PRS) or a narrow-band, parent-report measure of DBD (i.e., the ECBI). As a result, 52.94% of the families in the DBD sample for this study qualified for inclusion in the DBD sample based solely on elevated scores on a parent-report measure (i.e., BASC-2-PRS and/or the ECBI) rather than a diagnostic interview. In addition, the majority (77.78%) of the families who met study-entry criteria for the DBD group solely based on elevated parent-report measures demonstrated elevations on just one scale from one measure (see Table 2), while the remaining families (22.22%) qualified for the DBD sample by having clinically significant elevations across scales on one measure (i.e., elevations on the ECBI Intensity and Problem Scale), but not across measures (i.e., the BASC and the ECBI).

Although the clinical scales on the BASC-2 PRS and ECBI generally demonstrate adequate reliability and validity as measures of child psychopathology (Boggs et al., 1990; Eyberg & Pincus, 1999; Reynolds & Kamphaus, 2004), the categorization of families into clinical samples based on the single elevation of one scale on one measure constitutes a weakness in the current study because a single elevation on a parent-report measure may not be representative of true child psychopathology and may have caused some families who were included to be "false positives." For example, including families in the DBD group who reported clinically significant elevations on the ECBI Problem scale, but not the ECBI Intensity scale, might indicate the parent is significantly bothered by a child who does not necessarily have clinically elevated behavior problems. This discrepancy may reflect more about the parent's level of stress or tolerance for child misbehavior and less about the child's psychopathology. In fact, although previous research on the concurrent validity of the ECBI revealed the ECBI Problem scale scores were statistically significantly correlated with the Externalizing Scales on a broad-band measure of child functioning (i.e., the Child Behavior Checklist), findings also demonstrated the ECBI Problem score was higher for children in single-parent families than two parent-families, suggesting the ECBI Problem scale may be measuring parent distress (Boggs et al., 1990), as opposed to child psychopathology. Unfortunately, it was not possible to calculate internal reliability on the ECBI or BASC-2 PRS for the current sample, as only scale scores were available in the archival data set that included information from the clinic-based participants. Therefore, including participants with elevations on this single clinical scale may have weakened the DBD clinical sample overall.

On the other hand, the majority (87.50%) of families included in the anxious clinical sample in this study were included based on an initial, primary diagnosis of an anxiety disorder following the completion of a semi-structured clinical interview. The current literature on evidence-based assessment suggests families seeking treatment and meeting eligibility criteria following a clinical interview are more likely to have true elevations in psychopathology compared to peers. However, while an unstructured clinical interview is the most common assessment tool used by clinicians, research has shown such interviews demonstrate low agreement in diagnosis when compared to structured diagnostic interviews (Rettew, Lynch, Achenbach, Dumenci, & Ivanova, 2009), leaving room for improvement in the methodology used for diagnosis in future research. Additionally, the current study sample represented children with a variety of anxiety diagnoses (see Table 2), indicating potential variability in symptom severity across group members, the presence of different triggers for child anxiety, and potential differences in the presentation of child anxiety symptoms and parent responses to child anxiety. These differences in symptom severity and diagnoses likely impacted resultant DPICS codes. Specifically, results from the BASC-2 PRS indicate families from the anxious sample demonstrated greater variability in parent-reported child symptomology (see Table 6), which may have made it difficult for the DPICS to be sensitive enough to detect differences between groups due to the presence of children with less severe anxiety symptoms. Overall, the diversity in child anxiety diagnoses has implications for conducting behavior observations with parents and children with varying types of anxiety diagnoses and illustrates the importance of considering diagnostic presentation when assessing parent-child relationships and changes in parenting behaviors in the future.

Despite the use of various recruitment methods and study-entry criteria to determine group placement in the current sample, differences in demonstrated areas of strength and weakness on the BASC-2 PRS across diagnostic groups were consistent with expectations given their clinical profiles. For example, the non-clinical group had significantly higher elevations on the BASC-2 PRS adaptive scales as compared to both the DBD and anxious samples. Additionally, scores on the majority of scales assessing externalizing behaviors (i.e., Externalizing Symptoms Composite, Hyperactivity, Aggression, and Attention Problems) were statistically significantly higher for the DBD sample than the non-clinical or anxious samples while scores on the majority of the internalizing scales (i.e., Internalizing Composite, Anxiety, Somatization, Withdrawal) were significantly higher for the anxious sample than the non-clinical or DBD samples. See Table 6 for a more detailed examination of these differences. Additionally, the fact that 87.50% of the anxious sample in the current study held a clinical diagnosis of an anxiety disorder is a significant strength because previous research on parent-child interactions with young children includes the analysis of children who have not been diagnosed with an anxiety disorder but have instead been classified as high in trait anxiety, shy, or behaviorally inhibited based on parent report (DiBartolo & Helt, 2007).

Importantly, study results may also be impacted by the presence of comorbid clinically significant elevations in some members of the clinical samples. Specifically, 5.88% of the DBD sample had clinically significant scores on the Anxiety scale on the BASC-2 PRS, while 37.50% of the anxious sample also exhibited some clinically significant symptoms of DBDs, indicating the possible presence of comorbid symptomatology. As such, 21.21% of the overall clinical sample demonstrated comorbidity in symptoms elevation across DBDs and anxiety disorders. Potentially as a result of the sample comorbidity, the anxious sample was found to have somewhat elevated scores on the ECBI Intensity and Problem scales. However, previous research has found ECBI scores may reflect the co-occurrence of both internalizing and conduct problem-behaviors in some children, as ECBI scales were found to be statistically significantly correlated with both externalizing and internalizing scales on the CBCL (Boggs et al., 1990).

Preliminary research also suggested the ECBI may not discriminate between internalizing and externalizing symptomology as well in young, preschool-aged children as it does in school-aged children (Boggs et al., 1990). Furthermore, half of the 37.50% of participants in the anxious sample who demonstrated elevations on externalizing scales had an elevation on only the ECBI Problem scale, which, as previously mentioned, may suggest the presence of an anxious or stressed parent rather than a child with behavior problems (Butler, Brestan, Eyberg, 2006). Therefore, the presence of comorbid elevations in the current clinical sample may be closer to 12.12%.

The elevated rates of sample comorbidity are not surprising given comorbid internalizing and externalizing diagnoses occur among 30-40% of child clinical samples (Tannock, 2009) and commonly co-occur in preschoolers (APA, 2000; Marmorstein, 2007; Russo & Beidel, 1994; Shaw et al., 1997). Furthermore, previous research has demonstrated similar rates of comorbidity between children with ODD and anxiety disorders (i.e., 23.33% in Chase & Eyberg, 2008; Hudson & Rapee, 2001) and shown children with comorbid ODD and SAD demonstrate significant reduction in symptoms of both ODD and SAD following intervention with PCIT, even when SAD is a secondary diagnosis and anxiety symptom reduction is not specifically targeted during treatment (Chase, 2005). This finding makes sense given recent research discussing the presence of underlying processes linking anxiety and oppositional behaviors, including emotion regulation difficulties, information processing biases, and specific parenting practices (Bubier & Drabick, 2009; Fraire & Ollendick, 2013). Additionally, research has highlighted the importance of including participants who present with comorbid diagnoses of lower clinical severity than the primary diagnosis in research to maximize external validity (Comer et al., 2012). Therefore, children who demonstrated comorbid symptomology in the current study were retained to allow for larger sample sizes and increase the external validity of this research.

However, the presence of symptom comorbidity may have impacted results in group differences across parent-child interactions in the current study. As such, future research investigating ABOs and related parent-child interaction coding systems would benefit from ensuring future analyses are conducted with groups that are clearly delineated based on diagnostic characteristics by either eliminating participants with clinically significant comorbidities or including a separate group for children presenting with comorbid symptomology. Specifically, future studies could improve group eligibility criteria by following guidelines for evidence-based assessments and conducting a thorough evaluation of patient symptomology and impairment by looking for consistent elevations on both broad- and narrow-band measures, conducting thorough and standardized clinical interviews with all participants and families (e.g., ADIS-IV), and looking for elevations across multiple reporters.

Future Directions

The findings of this pilot study highlight important avenues for future research related to the assessment of anxious parent-child interactions using ABOs. A primary goal for future research is to develop an effective behavioral coding system that can be used to assess initial parent-child interactions for young children and to monitor progress in interventions designed to change parental behaviors as a mechanism of change in child behaviors (i.e., parent training programs such as PCIT for anxiety disorders). Of note, target parent and child behaviors may vary somewhat based on diagnosis-specific features. Therefore, future researchers should aim to develop a behavioral coding system that is broad enough to assess for the presence of anxious parent and child behaviors across diagnostic categories and is grounded in evidenced-based theory and research regarding patterns of parent-child interactions that develop and maintain child anxiety. For example, previous research suggests clinicians would hope to observe the following changes in parenting behaviors as a result of family-based intervention for child anxiety: (a) a decrease in parental psychological control; (b) a decrease in parental negativity (e.g., rejection or criticism); (c) an increase in parental emotional warmth, particularly related to child approach behaviors; (d) an increase in parental granting of child autonomy; (e) a decrease in parental reassurance for anxious child behaviors; (f) a decrease in parent accommodation (e.g., parents allowing child to avoid uncomfortable situations) and parental "rescuing" of child (e.g., parents speaking for children who have selective mutism or are socially anxious) ; and (g) a decrease in parental modeling of anxious and avoidant behaviors (Fraire & Ollendick, 2013; Garcia-Lopez, Díaz-Castela, Muela-Martinez, & Espinosa-Fernandez, 2014; Lebowitz, Shic, Campbell, MacLeod, & Silverman, 2015; Lebowitz et al., 2013; Moore, Whaley, & Sigman, 2004; Simpson, Suarez, & Connolly, 2012; Thompson-Hollands, Kerns, Pincus, & Comer, 2014; Wood, McLeod, Sigman, Hwang, & Chu, 2003; Woodruff-Borden, Morrow, Bourland, & Cambron, 2002).

One way to develop a potentially age-appropriate behavioral coding system is to modify the current DPICS to better assess for the presence of anxious parent-child interaction patterns. Ideally, this adaptation would occur without changing the fundamental codes from the DPICS. For example, modifying the standard version of the DPICS for anxiety could include adding examples to current DPICS codes of potential statements, questions, commands that are likely to be present when utilizing the DPICS with an anxious sample. It could also be useful to divide current DPICS codes to assess for child reassurance-seeking behaviors and parent accommodation by dividing the parent neutral talk category to separate out reassurance statements (e.g., “I’ll be right back”) and identifying child questions related to reassurance seeking (e.g., “When will you be back?,” “Where are you going?”). The DPICS could also be modified to distinguish child negative talk statements which may be indicative of anxiety (e.g., “Don’t leave me”). Additional modifications could include expanding upon current definitions and examples of relevant supplemental codes (e.g., vocalization and physical touch codes) or adding additional nonverbal codes (e.g., assessing changes in physical distance from anxiety-provoking stimuli to assess approach and/or avoidance, denoting whether a parent behavior served to accommodate the child’s anxiety).

Of note, various researchers who have adapted PCIT for young children with specific anxiety disorders (i.e., SAD, Selective Mutism, Obsessive-Compulsive Disorder) have developed anxiety-focused adaptations of the DPICS (Kurtz, Comer, & Masty, 2007; Lopez, 2011; Pincus, Cheron, Santucci, & Eyberg, 2006). However, detailed information about these adaptations is not currently widely available because the coding manuals developed have not been made public. Additionally, it is not possible to determine the utility of these measures in assessing baseline parent-child interactions to assist or to monitor changes in parent or child behavior during treatment or as outcome measures because, to date, there are no published studies describing the reliability or validity of these measures. Of note, the information that is currently available regarding these coding systems indicates a focus on assessing various key behavioral aspects of the cycle of anxiety (i.e., avoidance, accommodation, providing reassurance) but tend to be overly specific to a particular anxiety disorder and not innately generalizable to other anxious groups. Future research assessing the reliability and validity of previously developed anxiety-focused adaptations of the DPICS or combining elements of the various symptoms to create a broad anxiety coding system would provide valuable information regarding the use of an adapted

DPICS to facilitate treatment planning, monitor treatment gains, and assess treatment outcomes based on direct behavior observations.

Additionally, the findings from the current study suggest it would be beneficial for future studies to assess the sequence of parent-child interactions in addition to gathering frequency counts regarding different parent and child behaviors. Measuring parental responses to child behaviors and vice versa, as is possible with the sequential analyses of parent-child interactions, would allow for the assessment of the transactional process and bi-directional nature of parent-child interactions and is in line with current trends in research related to parent-child interactions (Hakman, Chaffin, Funderburk, & Silovsky, 2009; Hurrell, Hudson, & Schniering, 2015). For example, including sequential analyses of parent and child behaviors during anxiety-provoking tasks would allow for the assessment of whether children are more likely to respond verbally or approach anxiety-provoking stimuli in response to direct or indirect commands from an adult. It could also allow for the evaluation of whether children increase the use of reassurance-seeking questions or statements following reassurance by an adult and whether children decrease approach behaviors in response to parental accommodation. Furthermore, sequential analyses could provide novel information regarding child latency to verbalization with their caregiver and/or a novel adult and would allow for the opportunity to assess parent latency to respond to a child's needs (Aschenbrand & Kendall, 2012). In general, evaluating parent-child interactions using a sequential analysis approach would allow for the identification of additional information regarding present parent-child interaction patterns, which would provide important information to clinicians and families regarding how to best effect change during treatment.

Furthermore, to continue assessing the clinical utility of the standard DPICS or an anxiety-focused adaptation of the DPICS for anxious samples, the influence of observation-specific variables (e.g., length of observation, type of tasks included) on inter-rater reliability and parent and child behaviors should be considered. Ideally, future analyses conducted with a larger sample of participants should assess ICCs for DPICS codes across different segments of the ABO to determine if ICCs vary across task. Conducting such analyses could provide additional insight into the clinical utility of the separation task procedure used in this study. Of note, the number of parent and child verbalizations present during the SA/P task is lower than the number of verbalizations present during the standard DPICS tasks (CLP, PLP, CU) and the SA/N task. The lower number of verbalizations present in the SA/P task is a result of the current task structure because the parent and child only interact at the beginning of the overall separation task. Specifically, the coding of parent and child behaviors in the SA/P task began immediately after the parent received the prompt that separation would occur and ended when the parent left the playroom. As a result, the SA/P segment typically only lasted approximately 30-35 seconds while the average SA/N segment was 4 minutes and 22 seconds (see Table 7). Analyzing the reliability of DPICS codes across novel observation segments (e.g., SA/P, SA/N and RE) could suggest ways in which the SA task should be improved in order to enhance the clinical utility of DPICS observations in assessing anxious parent-child interactions.

For example, future researchers choosing to use an extended DPICS observation would benefit from refining the structure of the separation segment. Specifically, it would be beneficial to include a longer period for coding interactions between the parent and child during separation (e.g., a full 5 minutes from the time the prompt is given indicating separation will occur to the time parent leaves the room) to allow for anxious behaviors related to anticipated separation to be observed. It may be easier to code parent and child behaviors if the child is left alone in the playroom briefly prior to having the novel adult enter the room. This would allow future studies to avoid the overlap between the novel adult entering while the caregiver is exiting, which may lead to additional coding complexity. Although the current study did not propose specific hypotheses related to potential group differences in the RE segment, it would also be interesting to examine whether having the RE segments adds to the clinical utility of the extended DPICS or could be eliminated. For example, analyses could be conducted between the RE segment and the other low-demand parent-child segment (i.e., CLP) to determine if differences exist between the two segments regarding frequency or type of parent and child behaviors before and after separation. This would allow researchers to assess whether parent and child behaviors return to baseline following the separation task. At a more basic level, future research should consider whether parent and child behaviors differ across diagnostic groups as a function of the varying task demands present during the three standard DPICS observation segments (i.e., CLP, PLP, and CU) to assess whether there is a need for additional, novel segments to be added to the DPICS at all.

It will also be important for future researchers to consider the order in which they place the anxiety-provoking task. In order to preserve the integrity of the standard DPICS observation, the majority (98.2%) of the DPICS observations utilized in the current study included the SA/P, SA/N, and RE segments immediately following the CU task. However, the placement of the novel tasks following the completion of the CU task created some challenges to task engagement during the SA and RE tasks. Specifically, some children were observed to continue cleaning up the toys while alone with the novel adult, as a result of either their personal desires or in response to an unscripted prompt from their parent, rather than engaging in play with the novel adult. Therefore, differences in child behavior during the SA/N task may reflect differences in the task in which each child chose to engage when the novel adult was present. More broadly, it is important to consider that the separation task used in this study may not have been salient enough to produce various significant group differences, particularly given that it is developmentally appropriate for some participants in the study age range to express separation anxiety.

As a result, future research should consider altering the type of analog task used to prompt anxious parent-child behaviors beyond a simple strange-situation task. In particular, future researchers would likely benefit from expanding the anxiety-provoking task to allow for increased opportunity for anxious parent or child behaviors to occur, particularly given the variety of anxiety diagnoses present in young children. Previous research supports the use of structured over unstructured tasks when evaluating the nature of the parent-child interaction used in observational research because structured tasks are more likely to elicit relevant behaviors (Ginsburg, Grover, Cord, & Ialongo, 2006; van der Bruggen, Stams, & Bögels, 2008). Therefore, future studies should use structured tasks that allow for the assessment of parent-child interactions with a variety of potential triggers for child anxiety (e.g., separation, meeting a novel adult, social performance, problem-solving). The development of an improved anxiety-provoking task should be guided by previous research using observational paradigms to assess parent and child behaviors in families with an anxious parent or child (see Gonzalez, Moore, Garcia, Thienemann, & Huffman, 2011). Overall, the goal of a broad behavioral observation task and related coding system should be two-fold: (a) to assess initial parent and child behaviors and (b) to monitor treatment gains and assess for readiness for termination and relapse prevention.

Conclusion

In sum, the results of this pilot project represent a next step in the effort to develop evidence-based assessments alongside advances in EBT development. Specifically, this is the first study to evaluate the clinical utility of the standard DPICS-III, without adaptations, as a measure of anxious parent-child interactions. Importantly, study findings address a significant gap in the literature related to the adaptation of PCIT for anxious children and their families by considering how behavioral observations could be developed to evaluate parent-child interactions and monitor change in parent-child interaction patterns throughout treatment. The results of the current study show the standard DPICS is not a sufficiently sensitive measure of anxious parent-child interactions and highlight the need for a modified or alternate coding system to be developed to allow for the examination of anxious parent-child interactions. Current findings also underscore the value of extending the standard DPICS observation to include a novel, anxiety-provoking task which will illicit anxious parent and child behaviors. The results of the current study serve to provide a foundation for additional work in the field to develop evidence-based assessments to assess for change in anxious parent-child interactions.

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Appendix

Tables

Table 1

Description of Non-clinical and Clinically Significant Group Eligibility (N = 56)

Group Name (# in group)	Recruitment Method (#)	Group Eligibility Requirements
Non-clinical (n = 23)	Community (n = 23)	No current clinically significant elevations on BASC-2-PRS No current clinically significant elevations on ECBI
Clinically Significant		
DBD (n = 17)	Community (n = 9)	Current clinically significant elevation on BASC-2-PRS scale of Hyperactivity, Aggression, Conduct Problems, Attention Problems, and/or Externalizing Problems scales Current clinically significant elevation on ECBI Intensity or Problem scale Does not meet eligibility criteria for Clinically Significant – Anxious group on measures
	AUPSC (n = 8)	Initial diagnosis of a DBD (e.g., ADHD, ODD, DBD NOS; Adjustment Disorder with Disturbance of Conduct; Parent-child Relational Problem)
Anxious (n = 16)	Community (n = 2)	Current clinically significant elevation on BASC-2-PRS scale of Anxiety or Anxiety and Depression, Somatization, and/or Withdrawal Does not meet eligibility criteria for Clinically Significant – DBD group on measures
	AUPSC (n = 14)	Initial diagnosis of an anxiety disorder (e.g., SAD, GAD, Social Phobia, Selective Mutism, Adjustment Disorder with Anxiety, Adjustment Disorder with Anxiety and Depressed Mood)

Table 2

Make-up of Clinically Significant Groups (N = 33)

Variable	DBD Sample			Anxious Sample		
	Total DBD (n = 17)	Community (n = 9)	AUPSC (n = 8)	Total Anxious (n = 16)[†]	Community (n = 2)	AUPSC (n = 14)[†]
BASC Scales	Frequency (%)					
Externalizing Problems	4 (23.53%)	0 (0.00%)	4 (50.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Hyperactivity	6 (35.29%)	0 (0.00%)	6 (75.00%)	1 (6.67%)	0 (0.00%)	1 (7.69%)[a]
Aggression	4 (23.53%)	1 (11.11%)	3 (37.50%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Conduct Problems	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Attention Problems	4 (23.53%)	2 (22.22%)	2 (25.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Internalizing Problems	1 (5.88%)	0 (0.00%)	1 (12.5%)	6 (40.00%)	1 (50.00%)	5 (38.46%)
Anxiety	1 (5.88%)	0 (0.00%)	1 (12.5%)	9 (60.00%)	2 (100.00%)	7 (53.85%)
Depression	2 (11.77%)	0 (0.00%)	2 (25.00%)	2 (13.33%)	0 (0.00%)	2 (15.38%)
Somatization	0 (0.00%)	0 (0.00%)	0 (0.00%)	4 (26.67%)	0 (0.00%)	4 (30.77%)
Withdrawal	0 (0.00%)	0 (0.00%)	0 (0.00%)	3 (21.43%)[†]	0 (0.00%)	3 (25.00%)[†]
Elevation on Single DBD Scale	4 (23.53%)	3 (33.33%)	1 (12.5%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Elevations on Multiple DBD Scales	5 (29.41%)	0 (0.00%)	5 (62.5%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Elevation on Single Anxious Scale	0 (0.00%)	0 (0.00%)	0 (0.00%)	3 (20.00%)	1 (50.00%)	2 (15.38%)
Elevations on Multiple Anxious Scales	0 (0.00%)	0 (0.00%)	0 (0.00%)	7 (46.67%)	1 (50.00%)	6 (46.15%)

Elevations on DBD & Anxious Scales	11 (5.88%)	0 (0.00%)	1 (12.5%)	1 (6.67%)	0 (0.00%)	1 (7.69%)
Multiple Elevations on BASC-2	6 (35.29%)	0 (0.00%)	6 (75.00%)	8 (53.33%)	1 (50.00%)	7 (53.85%)
No Elevations on BASC-2	7 (41.18%)	6 (66.67%)	1 (12.5%)	5 (33.33%)	0 (0.00%)	5 (38.46%)
ECBI Scales			Frequency (%)			
Intensity Scale Only	3 (17.63%)	2 (22.22%)	1 (12.5%)	2 (12.50%)	0 (0.00%)	2 (14.29%)[a]
Problem Scale Only	4 (23.53%)	2 (22.22%)	2 (25.00%)	3 (18.75%)	0 (0.00%)	3 (21.43%)
Both ECBI Scales	6 (35.29%)	2 (22.22%)	4 (50.00%)	1 (6.25%)	0 (0.00%)	1 (7.14%)
No Elevations on ECBI	4 (23.53%)	3 (33.33%)	1 (12.5%)	10 (62.50%)	2 (100.00%)	8 (57.14%)
Primary Initial Diagnosis			Frequency (%)			
No Diagnosis	9 (52.94%)	9 (100.00%)	0 (0.00%)	2 (12.50%)	2 (100.00%)	0 (0.00%)
ADHD	5 (29.41%)	0 (0.00%)	5 (62.50%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
DBD NOS	2 (11.77%)	0 (0.00%)	2 (25.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Parent-child Relational Problem	1 (5.88%)	0 (0.00%)	1 (12.50%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Adjustment Disorder with Anxiety	0 (0.00%)	0 (0.00%)	0 (0.00%)	4 (25.00%)	0 (0.00%)	4 (28.57%)
GAD	0 (0.00%)	0 (0.00%)	0 (0.00%)	3 (18.75%)	0 (0.00%)	3 (21.43%)
SAD	0 (0.00%)	0 (0.00%)	0 (0.00%)	4 (25.00%)	0 (0.00%)	4 (28.57%)
Selective Mutism	0 (0.00%)	0 (0.00%)	0 (0.00%)	3 (18.75%)	0 (0.00%)	3 (21.43%)

Note. Total *n* and percentages may equal more than 100% of sample on BASC-2 PRS scales as individual participants may have had more than one clinically significant elevation on the BASC-2 PRS.

[†]Indicates sample is missing one participant for the BASC-2 PRS scales. [a]One participant had elevated scores on both the ECBI and the BASC-2.

Table 3

Demographic Information by Diagnostic Group (N = 56)

Variable	Non-clinical (*n* = 23)	DBD (*n* = 17)	Anxious (*n* = 16)	*F*	df_b, df_w	*p*
Continuous Variable		Mean (*SD*)				
Child age in months	53.00 (18.34)	58.35 (21.61)	72.00 (25.59)	3.731	2, 53	**.030**
Categorical Variables		Frequency (%)				
Child gender:				.424	2, 53	.657
Female	11 (47.8%)	6 (35.3%)	8 (50.0%)			
Male	12 (52.2%)	11 (64.7%)	8 (50.0%)			
Child ethnicity:				1.26	2, 53	.291
African American	3 (13.0%)	1 (5.9%)	0 (0.0%)			
Asian	0 (0.0%)	0 (0.0%)	1 (6.3%)			
Caucasian	19 (82.6%)	13 (76.5%)	14 (87.5%)			
Hispanic	0 (0.0%)	1 (5.9%)	1 (6.3%)			
Multi-racial	1 (4.3%)	1 (5.9%)	0 (0.0%)			
Other	0 (0.0%)	1 (5.9%)	0 (0.0%)			
Parent gender:				.402	2, 53	.671
Female	22 (95.7%)	15 (88.2%)	15 (93.8%)			

Male	1 (4.3%)	2 (11.8%)	1 (6.3%)			
Parent ethnicity:				.298	2, 53	.743
Asian	0 (0.0%)	0 (0.0%)	1 (6.3%)			
African American	3 (13.0%)	3 (17.6%)	0 (0.0%)			
Caucasian	20 (87.0%)	13 (76.5%)	15 (93.8%)			
Other	0 (0.0%)	1 (5.9%)	0 (0.0%)			
Parent relationship to child:				1.65	2, 53	.202
Adoptive mother	0 (0.0%)	1 (5.9%)	1 (6.3%)			
Biological mother	22 (95.7%)	13 (76.5%)	13 (81.3%)			
Biological father	1 (4.3%)	2 (11.8%)	1 (6.3%)			
Grandmother	0 (0.0%)	0 (0.0%)	1 (6.3%)			
Step-mother	0 (0.0%)	1 (5.9%)	0 (0.0%)			
Family annual income:				2.40	2, 50	.102
Under $25,000	2 (8.7%)	3 (17.6%)	2 (12.5%)			
$25,000 – 49,999	2 (8.7%)	6 (35.3%)	4 (25.0%)			
Over $50,000	19 (82.6%)	7 (41.2%)	8 (50.0%)			
Missing	0 (0.0%)	1 (5.9%)	2 (12.5%)			

Note. Statistically significant ($p < .05$) are listed in bold.

Table 4

Parent and Child Behaviors and Respective DPICS-III Codes

Parent Behavior (Code)	Child Behavior (Code)
Negative Talk (NTA)	Negative Talk (NTA)
Direct Command (DC)	Command (CM)
Indirect Command (IC)	Question (QU)
Labeled Praise (LP)	Prosocial Talk (PRO)
Unlabeled Praise (UP)	Yell (YE)
Information Question (IQ)	Whine (WH)
Descriptive/Reflective Question (DQ)	Answer (AN)
Reflective Statement (RF)	No Answer (NA)
Behavioral Description (BD)	No Opportunity for Answer (NOA)
Neutral Talk (TA)	Comply (CO)
Negative Touch (NTO)	Noncomply (NC)
Positive Touch (PTO)	No Opportunity for Compliance (NOC)
	Negative Touch (NTO)
	Positive Touch (PTO)

Table 5

DPICS-III Parent and Child Composite Categories and Respective Formulae

Composite Category	Formula
Parental Control	${}_{p}NTA + {}_{p}DC + {}_{p}IC + {}_{p}NTO$
Parental Warmth	${}_{p}LP + {}_{p}UP + {}_{p}RF + {}_{p}BD + {}_{p}PTO$
Parent Verbalizations	${}_{p}LP + {}_{p}UP + {}_{p}RF + {}_{p}BD + {}_{p}TA + {}_{p}NTA + {}_{p}DC + {}_{p}IC + {}_{p}DQ + {}_{p}IQ$
Child Verbalizations	${}_{c}PRO + {}_{c}QU + {}_{c}CM + {}_{c}NTA$
Child Vocalizations	${}_{c}YE + {}_{c}WH$

Note. The subscripts $_{c}$ and $_{p}$ denote child and parent categories, respectively. Adapted from *Manual for the Dyadic Parent-Child Interaction Coding System (3rd Ed.)*, by S. Eyberg, M. M. Nelson, M. Duke, and S. R. Boggs, 2004, p. 249-250. Copyright 2004 by Sheila Eyberg.

Table 6

BASC-2 Scores by Diagnostic Group (N = 55)[†]

Scale	Non-clinical (n = 23)	DBD (n = 17)	Anxious (n = 15)[†]	F	df_b, df_w	p
BASC-2 Composites (T scores)		Mean (SD)				
Externalizing Symptoms	46.57 (6.57)	62.18 (8.81)	50.87 (8.55)	19.75	2, 52	<.001
Internalizing Symptoms	46.96 (4.44)	54.24 (8.37)	67.40 (16.99)	14.16[a]	2, 23.87	<.001
Behavior Symptoms Index	44.65 (5.57)	61.06 (9.20)	57.29 (10.31)[†]	25.45[a]	2, 25.42[†]	<.001
Adaptive Skills	55.22 (7.75)	42.29 (11.09)	45.27 (8.48)	11.19	2, 52	<.001
BASC-2 Subscales (T scores)		Mean (SD)				
Hyperactivity	48.70 (8.60)	62.53 (10.98)	53.33 (11.13)	9.27	2, 52	<.001
Aggression	45.09 (6.63)	60.41 (10.60)	50.93 (6.32)	18.00	2, 52	<.001
Conduct Problems[††]	48.00 (11.31)[††]	59.00 (4.24)[††]	47.40 (8.26)[††]	3.24	2, 13[††]	.072
Anxiety	50.70 (7.50)	52.06 (10.65)	71.33 (16.29)	15.36[b]	2[b]	<.001
Depression	47.04 (6.26)	59.18 (9.38)	61.27 (14.74)	14.33[a]	2, 26.17	<.001
Somatization	45.52 (6.86)	48.65 (8.16)	58.53 (14.64)	5.25[a]	2, 27.67	.012
Atypicality	45.35 (6.42)	57.12 (10.75)	54.60 (10.82)			
Withdrawal	43.39 (5.27)	49.47 (10.13)	59.07 (12.41)[†]	11.20	2, 23.82[†]	<.001
Attention Problems	46.70 (7.10)	61.65 (9.67)	50.47 (8.48)	16.26	2, 52	<.001

Adaptability	54.04 (8.58)	41.47 (10.63)	41.53 (9.62)
Social Skills	58.87 (9.05)	44.06 (9.53)	49.13 (8.60)

Note. The Conduct Problems Scale has a different number of participants (i.e., *n* = 2 for the non-clinical sample, *n* = 4 for the DBD sample, and *n* = 10 for the anxious sample based).

[†]Indicates sample is missing one participant. [††]Indicates sample has a different number of participants than the other groups. [a]Indicates a Welch's ANOVA was conducted in place of a one-way ANOVA. [b]Indicates a Kruskal-Wallis H test was done in place of a one-way ANOVA.

Table 7

ECBI Scores by Diagnostic Group (N = 56)

Scale	Non-clinical (n = 23)	DBD (n = 17)	Anxious (n = 16)	F	df_b, df_w	p
ECBI (Raw scores)		Mean (SD)				
Intensity	90.65 (22.86)	135.50 (27.22)	112.25 (21.15)	17.47	2, 53	<.001**
Problem	4.87 (4.16)	15.35 (8.63)	9.87 (6.67)	12.17[a]	2, 27.55	<.001**

Note. [a]Indicates a Welch ANOVA was conducted in place of a one-way ANOVA.

Table 8

Parent-child Observation and SA/N Segment Length by Diagnostic Group

Segments	Full Sample (N = 55)†	Non-clinical (*n* = 23)	DBD (*n* = 16)†	Anxious (*n* = 16)	χ^2	*p*
Length (minutes:seconds)		Mean (SD)				
Parent-child	17:46 (00:41)	17:52 (00:14)	17:47 (00:42)	17:38 (01:03)	2.00	.368
SA/N	04:22 (00:16)	04:24 (00:09)	04:24 (00:20)	04:17 (00:20)	3.29	.193

Note. †Indicates sample is missing one participant.

Table 9

DPICS Inter-rater Reliability for Combined Parent-Child Segments by Diagnostic Group

	Intraclass Correlation				Fisher r-to-Z	*p* (two-tailed)
Code	Full sample (*N*=55)†	Non-clinical (*n*=23)	DBD (*n*=16)†	Anxious (*n*=16)	Non-clinical vs. Anxious	
Parent Codes						
NTA	.87	.99	.81	.91	3.14	<.001
DC	.91	.92	.84	.98	-1.99	0.05
IC	.95	.97	.91	.96	0.41	0.68
LP	.91	.97	.80	.95	0.73	0.47
UP	.98	.99	.97	.96	1.97	0.05
IQ	.97	.99	.96	.96	1.97	0.05
DQ	.98	.99	.94	.99	0.00	1.0
RF	.87	.89	.91	.79	0.98	0.33
BD	.12	.45	.03	.48	-0.11	0.91
TA	.97	.99	.92	.99	0.00	1.0
NTO	.97	.99	1.0	.91	3.14	<.001
PTO	.98	.99	.99	.90	3.30	<.001

Child Codes						
NTA	.96	.99	.96	.81	4.27	<.001
CM	.94	.94	.99	.80	1.79	0.07
QU	.98	.97	.96	.99	-1.56	0.12
PRO	.99	.99	.99	.97	1.56	0.12
YE	.09	.00	.07	.90	-4.13	<.001
WH	.76	.51	.92	.94	-3.30	<.001
CO	.97	.98	.98	.93	1.79	0.07
NC	.95	.89	.97	.92	-0.47	0.64
NOC	.92	.98	.87	.98	0.00	1.00
AN	.94	.98	.84	.98	0.00	1.00
NA	.90	.94	.96	.77	2.01	0.04
NOA	.91	.85	.95	.89	-0.47	0.64
NTO	.93	.97	.86	.99	-1.56	0.12
PTO	.97	.99	.94	.98	0.98	0.33

Note. Reliability scores based on a stratified random sampling of 55 DPICS observation such that each DPICS segment where a parent was present (CLP, PLP, CU, SA/P, and RE) and diagnostic group (non-clinical, disruptive behavior disordered, anxious) are equally represented.
--ICC is incalculable because this code did not occur during the segments selected for reliability analysis.

Table 10

DPICS Means and Standard Deviations for Parent and Child Behaviors Summed across Parent-Child Segments by Diagnostic Group.

Code	Full sample (N=55)[†]	Non-clinical (n=23)	DBD (n=16)[†]	Anxious (n=16)	F	η^2
<u>*Parent Codes*</u>			Mean (SD)			
NTA	5.18 (6.00)	4.39 (4.55)	7.31 (8.80)	4.19 (3.89)	1.36[b]	----
DC	26.60 (18.41)	24.83 (13.85)	36.88 (26.12)	18.88 (8.67)		
IC	20.49 (11.55)	18.96 (9.70)	22.50 (12.68)	20.69 (13.16)		
LP	1.40 (1.70)	1.70 (2.01)	1.00 (1.16)	1.38 (1.67)		
UP	10.91 (7.50)	11.87 (7.33)	10.75 (8.57)	9.69 (6.87)		
IQ	20.18 (10.89)	21.83 (12.29)	20.38 (10.46)	17.63 (9.22)		
DQ	37.93 (16.16)	38.00 (18.32)	40.88 (16.90)	34.88 (11.98)		
RF	5.20 (3.73)	5.87 (4.24)	4.56 (2.92)	4.88 (3.76)		
BD	1.55 (4.61)	1.83 (4.75)	2.13 (6.41)	0.56 (0.81)		
TA	117.95 (29.96)	117.83 (27.21)	118.13 (33.27)	117.94 (32.23)		
NTO	1.96 (3.23)	0.47 (0.61)	4.67 (4.62)	1.13 (1.51)	11.79*[b]	----
PTO	5.60 (6.69)	5.22 (5.01)	7.75 (10.07)	4.00 (3.88)	0.80[b]	----
Total Verbalizations	247.38 (65.94)	247.09 (64.28)	264.50 (74.35)	230.69 (58.76)	1.05	0.039
Parental Control	54.22 (29.31)	46.27 (18.04)	74.00 (39.13)	45.38 (21.34)	5.53[b]	----
Parental Warmth[†]	22.00 (11.45)[†]	26.48 (12.47)	18.86 (9.16)[†]	18.07 (9.77)[†]	3.48*	0.124

Child Codes		Mean (SD)				
NTA†	3.71 (4.65)†	2.00 (1.82)†	7.94 (6.18)	1.43 (1.28)†	8.39*[a]	0.225[a]
CM	12.67 (9.12)	12.17 (8.60)	13.81 (9.59)	12.25 (9.84)		
QU	20.22 (12.34)	24.17 (11.31)	16.19 (10.29)	18.56 (14.50)		
PRO	99.93 (36.75)	104.22 (36.89)	94.75 (41.64)	98.94 (32.79)		
YE	2.60 (7.65)	1.43 (5.40)	1.56 (1.90)	5.31 (12.37)		
WH	2.95 (5.18)	1.91 (3.50)	4.81 (7.69)	2.56 (3.76)		
CO	17.95 (10.98)	19.35 (12.08)	17.69 (11.04)	16.19 (9.57)		
NC	5.55 (00.00)	3.91 (3.34)	10.13 (7.95)	3.31 (2.65)		
NOC	23.80 (13.65)	20.65 (10.49)	32.13 (18.09)	20.00 (8.81)		
AN	11.04 (6.96)	12.61 (7.84)	9.88 (5.76)	9.94 (6.68)		
NA	3.65 (3.41)	3.57 (3.41)	4.31 (4.03)	3.13 (2.78)		
NOA	5.58 (4.04)	5.57 (3.22)	6.44 (5.84)	4.75 (2.82)		
NTO	1.49 (2.98)	0.39 (0.94)	3.19 (4.65)	1.38 (2.03)	6.29*[b]	----
PTO	2.95 (3.30)	2.83 (3.11)	3.44 (4.27)	2.63 (2.53)	0.01[b]	----
Total Verbalizations	137.69 (45.99)	144.91 (43.26)	132.69 (51.66)	132.31 (45.44)	0.48	0.018
Total Vocalizations†	3.50 (4.82)†	1.30 (2.06)†	4.87 (5.03)†	5.07 (6.42)†	7.21*[b]	----

Note. One family was excluded from the DBD sample due to missing a SA/N segment.
†outliers removed from group. [a]Welch's *F* ANOVA and *est.* ω^2 used as measures of group differences and effect size, respectively.
[b]Kruskal-Wallis H test (χ^2) used as measure of group differences. ----unable to calculate effect size.
* $p < .05$. ** $p < .001$.

Table 11

DPICS Means and Standard Deviations of Child Behaviors in the SA/N Segment by Diagnostic Group

Code	Full sample (N=55)	Non-clinical (n=23)	DBD (n=16)	Anxious (n=16)	F	η^2
Child Codes			Mean (SD)			
NTA	0.20 (0.59)	0.17 (0.49)	0.31 (0.79)	0.13 (0.50)		
CM	2.51 (3.88)	3.52 (5.24)	3.13 (2.47)	0.44 (1.09)		
QU	1.98 (2.38)	2.30 (2.72)	2.63 (2.28)	0.88 (1.59)		
PRO	26.73 (18.64)	28.70 (20.63)	33.31 (17.35)	17.31 (13.39)		
YE	0.21 (0.97)	0.17 (0.83)	0.06 (0.25)	0.38 (1.50)		
WH	0.09 (0.40)	0.00 (0.00)	0.06 (0.25)	0.25 (0.68)		
CO	0.82 (1.06)	1.04 (1.19)	0.88 (1.09)	0.44 (0.73)		
NC	0.29 (0.71)	0.30 (0.70)	0.25 (0.68)	0.31 (0.79)		
NOC	2.64 (3.74)	3.52 (4.82)	1.75 (3.07)	2.25 (2.15)		
AN	2.47 (2.54)	3.09 (2.64)	2.31 (2.85)	1.75 (1.92)		
NA	0.93 (1.48)	1.09 (1.47)	0.44 (0.73)	1.19 (1.94)		
NOA	0.96 (1.39)	0.96 (1.26)	0.94 (1.44)	1.00 (1.59)		
NTO	0.05 (0.23)	0.04 (0.21)	0.13 (0.34)	0.00 (0.00)		
PTO	0.18 (0.55)	0.09 (0.29)	0.50 (0.89)	0.00 (0.00)		
Total Verbalizations	31.42 (22.00)	34.70 (24.70)	39.38 (19.95)	18.75 (13.97)	6.81*[a]	.174[a]

Total Vocalizations	0.29 (1.23)	0.17 (0.83)	0.13 (0.34)	0.63 (2.03)		
Latency to Child Verb	00:36 (01:15)	00:21 (00:56)	00:30 (01:00)	01:04 (01:44)	0.93[b]	----

Note. One family was excluded from the DBD sample due to missing a SA/N segment.
[†]outliers removed from group. [a]Welch's *F* ANOVA and *est.* ω^2 used as measures of group differences and effect size, respectively.
[b]Kruskal-Wallis H test (χ^2) used as measure of group differences. ----unable to calculate effect size
* $p < .05$. ** $p < .001$.

Table 12

Hierarchical Multiple Regression Predicting BASC-2 Anxiety scale Scores from Parent Variables.

	BASC-2 Anxiety Scale Score							
	Model 1		Model 2		Model 3		Model 4	
Variable	B	β	B	β	B	β	B	β
Constant	46.70*		59.20*		59.10*		59.20*	
Parent Gender	2.44	0.05	-0.49	-0.01	-0.45	-0.01	-0.36	-0.01
Parent Relationship	-1.34	-0.09	-0.49	-0.03	-0.49	-0.03	-0.52	-0.04
Parent Ethnicity	1.89	0.13	1.55	0.11	1.56	0.11	1.56	0.11
Family Income	1.46	0.74	1.78	0.09	1.82	0.09	1.79	0.09
Parent Verbalizations			-0.04	-0.19	-0.04	-0.20	-0.43	-0.20
Parental Control					0.00	0.01	0.00	0.01
Parental Warmth							0.01	0.01
R^2	0.03		0.06		0.06		0.06	
F	0.41		0.62		0.51		0.43	
ΔR^2	0.03		0.03		0.00		0.00	
ΔF	0.41		1.47		0.00		0.00	

Note. $N = 52$.
* $p < .05$. ** $p < .001$.

Figures

JT Dissertation Coding Sheet

Tape #: ______________ Caregiver: ___________________ Date of Observation: __________________

Coder: ___________________ Primary or Reliability (Circle One) Date Coded: ____________________

Circle DPICS Segment: WCLP CLP WPLP PLP CU SA/P SA/N RE

Segment Start/End Time: __________________ First statement: _________________________________

*Time of 1st Adult Verbalization: ___________ * Latency to Child Verbalization: __________________

Parent Code	Frequency Count		Totals
NTA			
DC	CO:		
	NC:		
	NOC:		
IC	CO:		
	NC:		
	NOC:		
LP			
UP			
IQ	AN:		
	NA:		
	NOA:		
DQ			
RF			
BD			
TA			
Coder: ___________________ Primary or Reliability (Circle One) Date Coded: __________________			
Parent NTO			
Parent PTO			

Coder: ___________________ Primary or Reliability (Circle One) Date Coded: ____________________

Child Code	Frequency Count	Totals
NTA		
CM		
QU		
PRO		
YE		

WH		
Coder: ___________________ Primary or Reliability (Circle One) Date Coded: __________________		
Child NTO		
Child PTO		

Figure 1. Coding sheet used by trained coders to code observed parent-child interactions using the DPICS-III clinical version in real time.

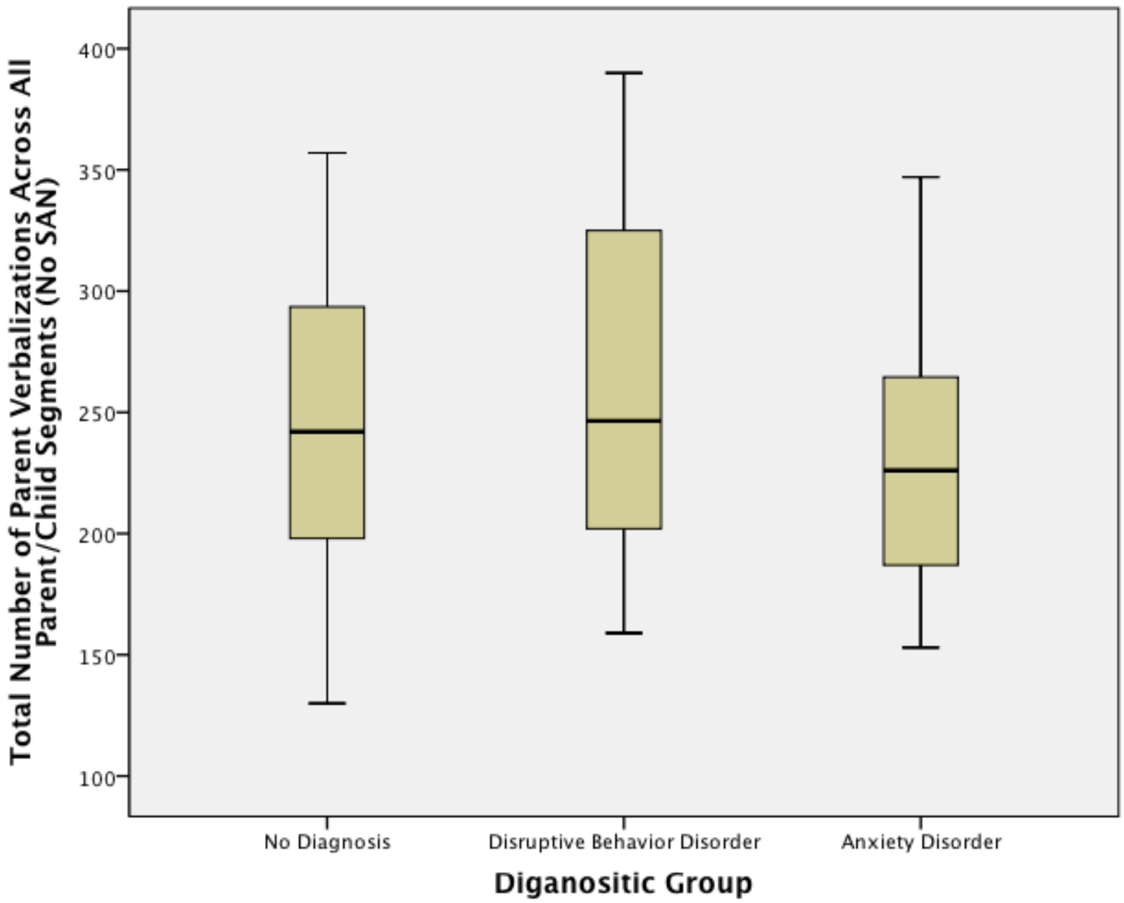

Figure 2. Box-plot demonstrating differences across diagnostic groups in the dispersion and skewness of data for the total number of parent verbalizations present across segments which included parent-child interactions (i.e., CLP, PLP, CU, SA/P, and RE).

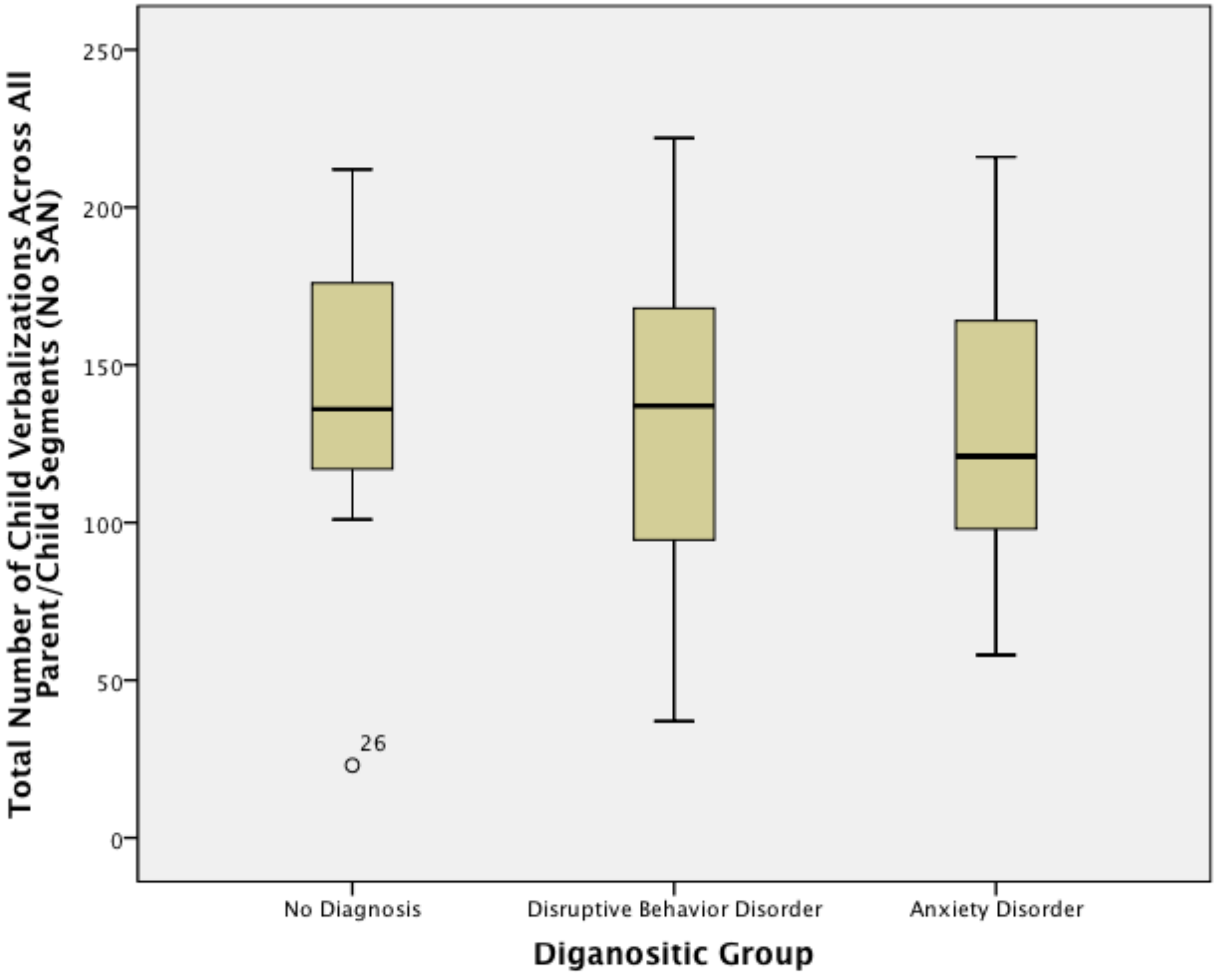

Figure 3. Box-plot demonstrating differences across diagnostic groups in the dispersion and skewness of data as well as the presence of outliers for the total number of child verbalizations present across segments which included parent-child interactions (i.e., CLP, PLP, CU, SA/P, and RE).

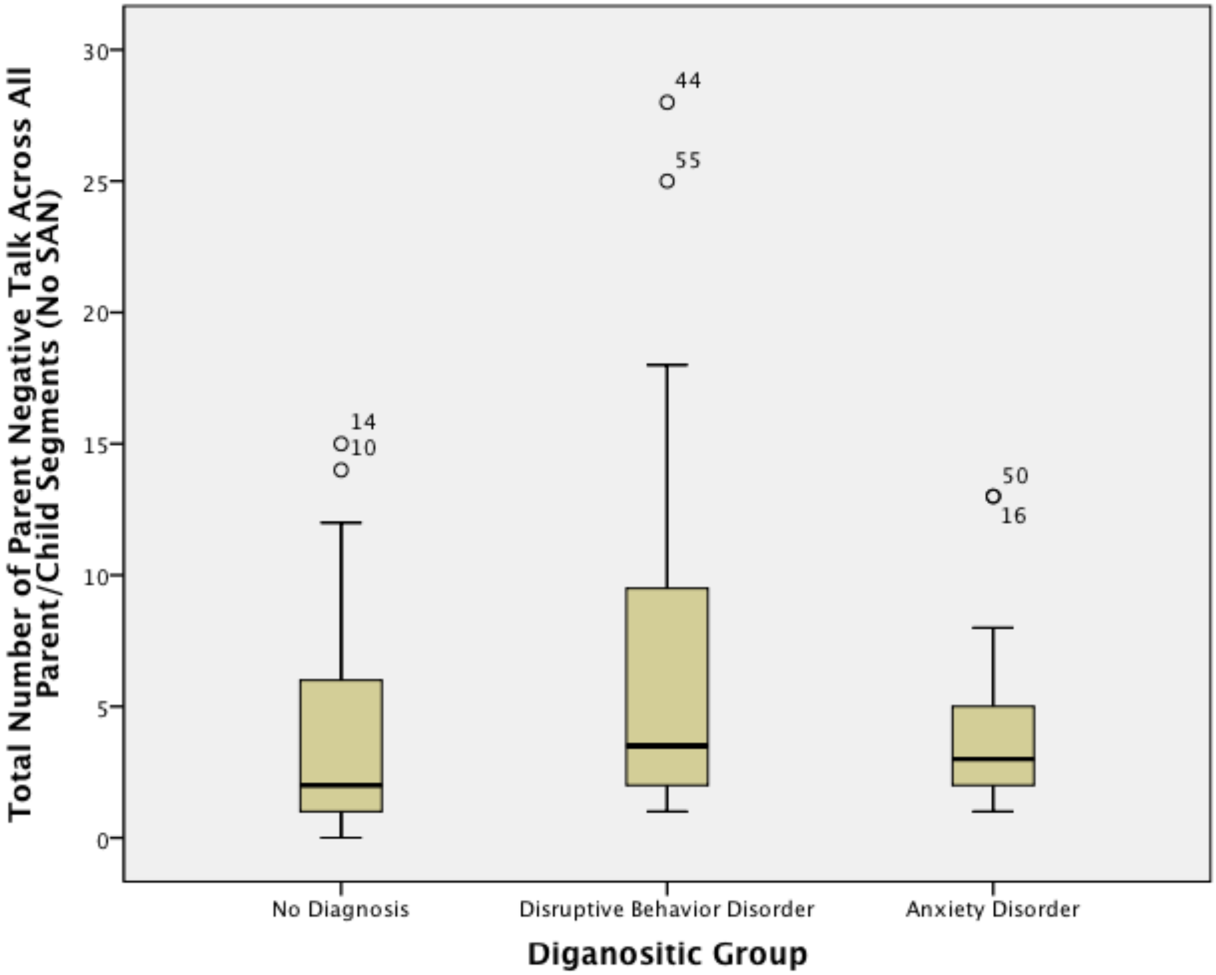

Figure 4. Box-plot demonstrating differences across diagnostic groups in the dispersion and skewness of data as well as the presence of outliers for the total number of Parent Negative Talk present across segments which included parent-child interactions (i.e., CLP, PLP, CU, SA/P, and RE).

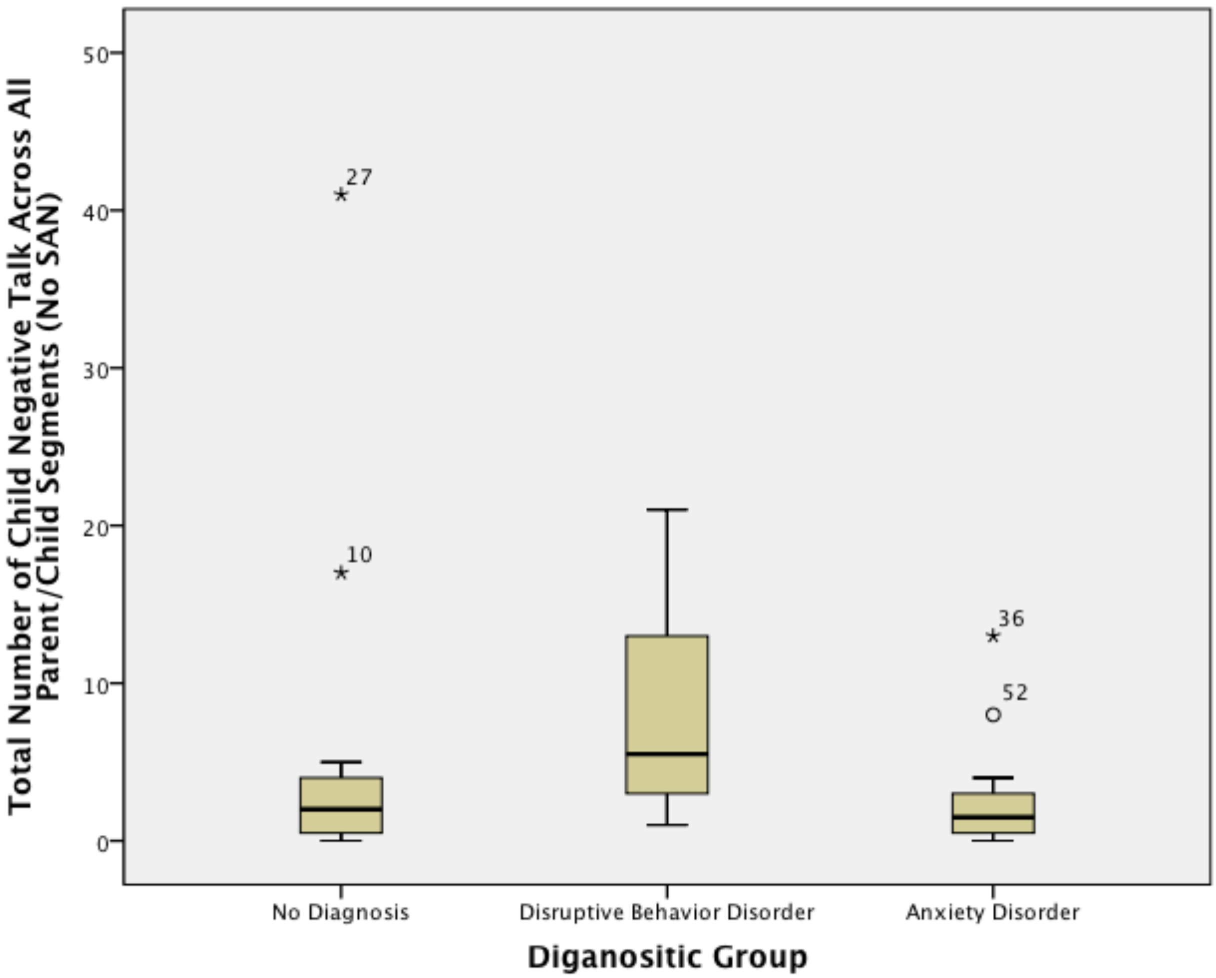

Figure 5. Box-plot demonstrating differences across diagnostic groups in the dispersion and skewness of data as well as the presence of outliers for the total number of Child Negative Talk present across segments which included parent-child interactions (i.e., CLP, PLP, CU, SA/P, and RE).

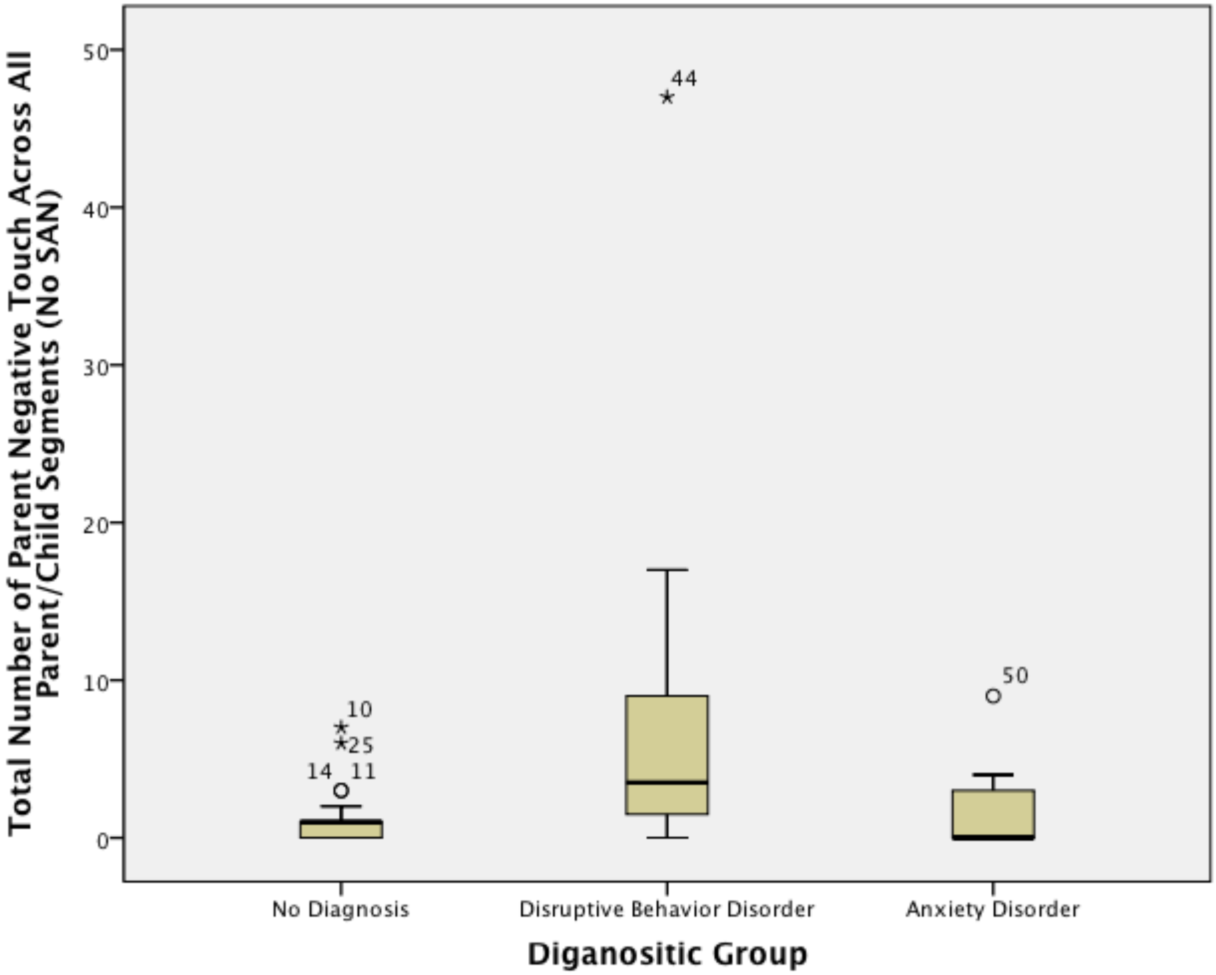

Figure 6. Box-plot demonstrating differences across diagnostic groups in the dispersion and skewness of data as well as the presence of outliers for the total number of Parent Negative Touch present across segments which included parent-child interactions (i.e., CLP, PLP, CU, SA/P, and RE).

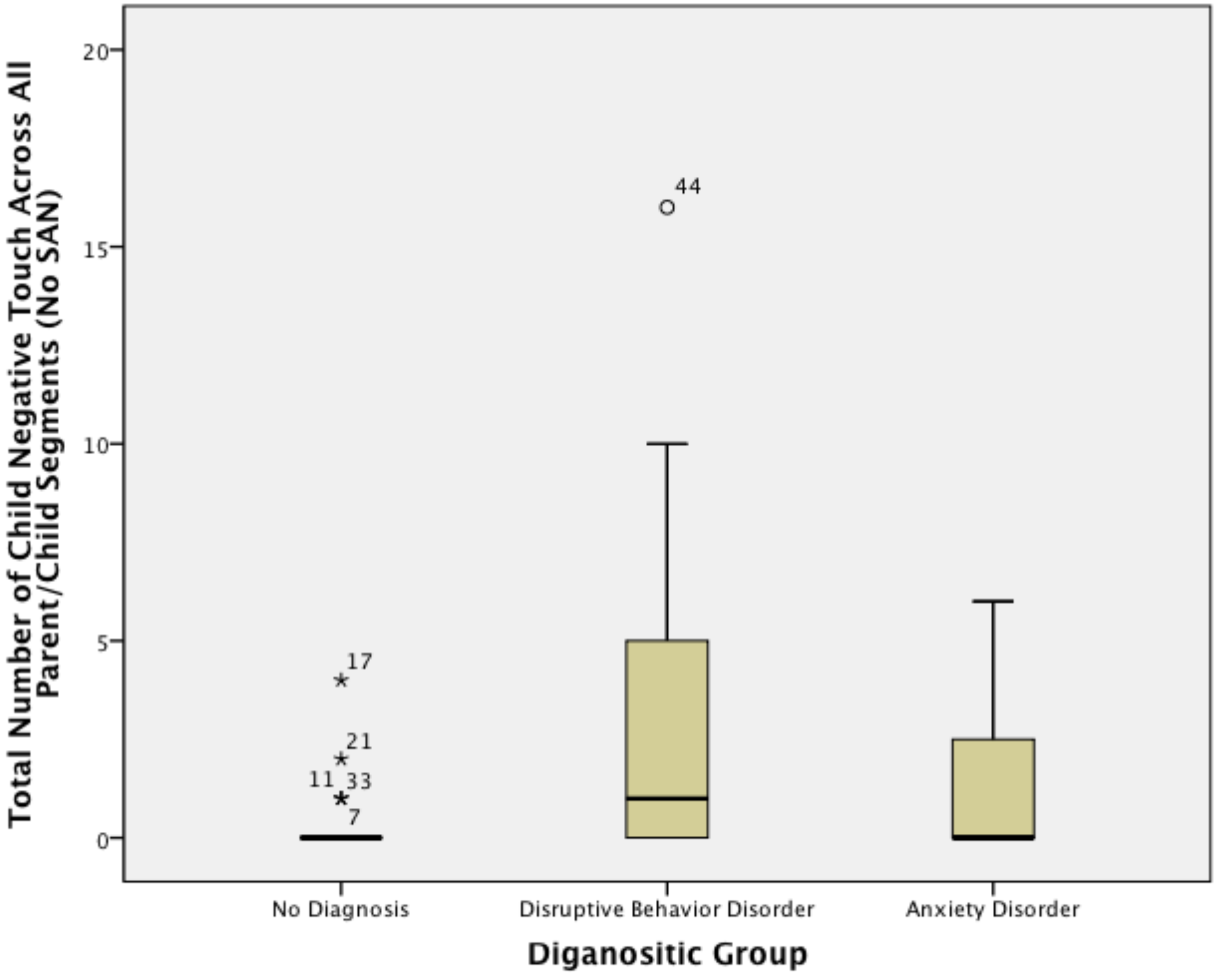

Figure 7. Box-plot demonstrating differences across diagnostic groups in the dispersion and skewness of data as well as the presence of outliers for the total number of Child Negative Touch present across segments which included parent-child interactions (i.e., CLP, PLP, CU, SA/P, and RE).

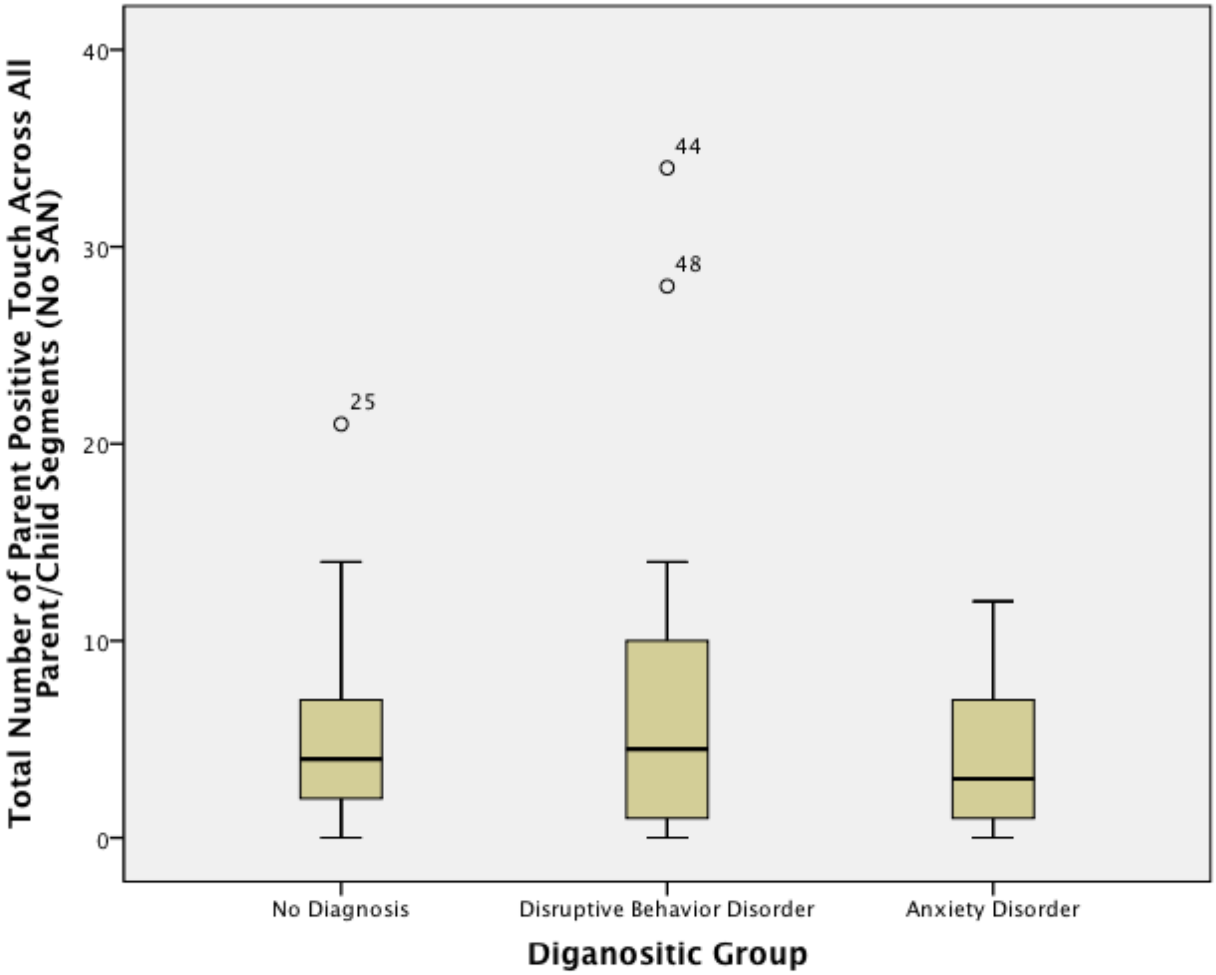

Figure 8. Box-plot demonstrating differences across diagnostic groups in the dispersion and skewness of data as well as the presence of outliers for the total number of Parent Positive Touch present across segments which included parent-child interactions (i.e., CLP, PLP, CU, SA/P, and RE).

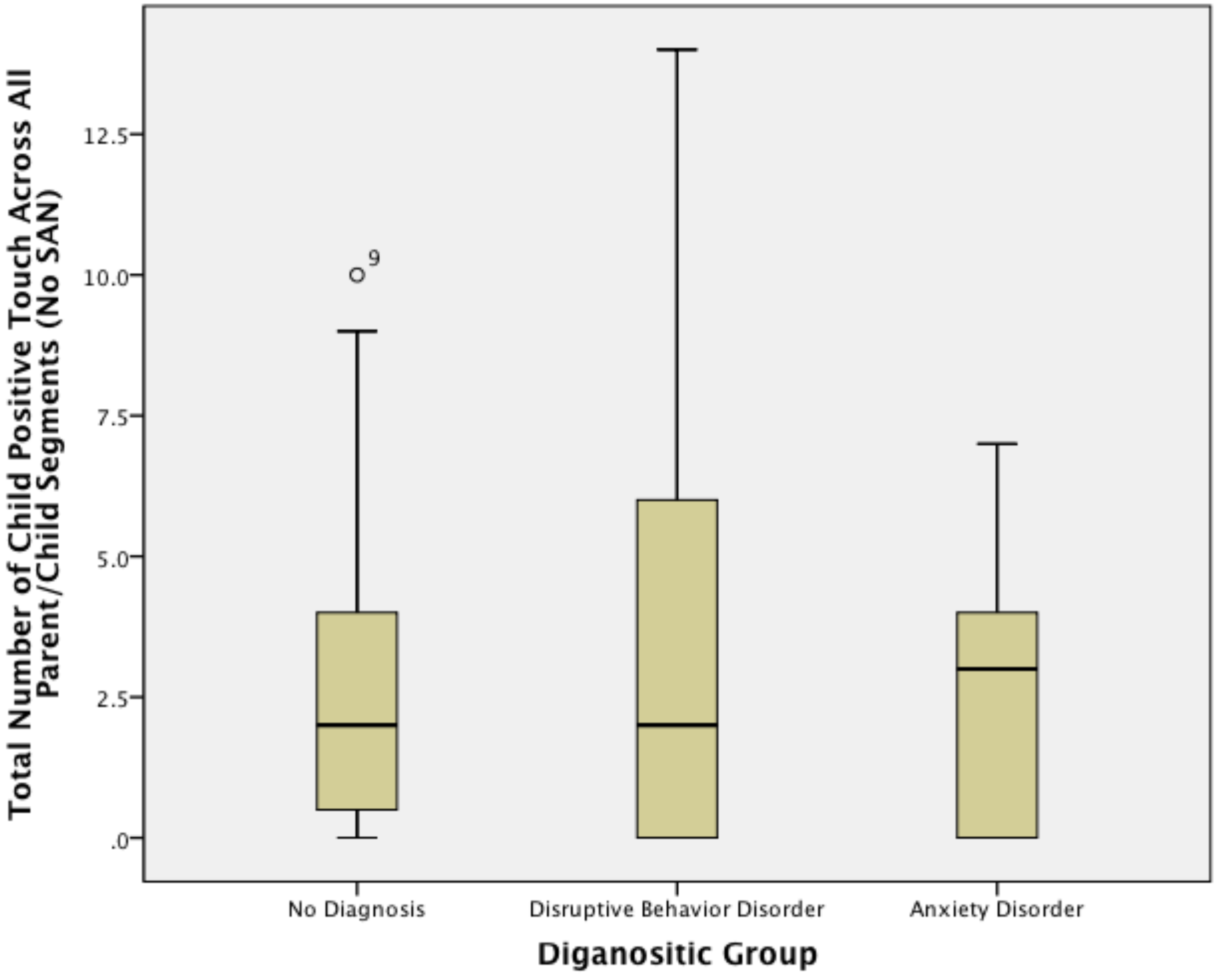

Figure 9. Box-plot demonstrating differences across diagnostic groups in the dispersion and skewness of data as well as the presence of outliers for the total number of Child Positive Touch present across segments which included parent-child interactions (i.e., CLP, PLP, CU, SA/P, and RE).

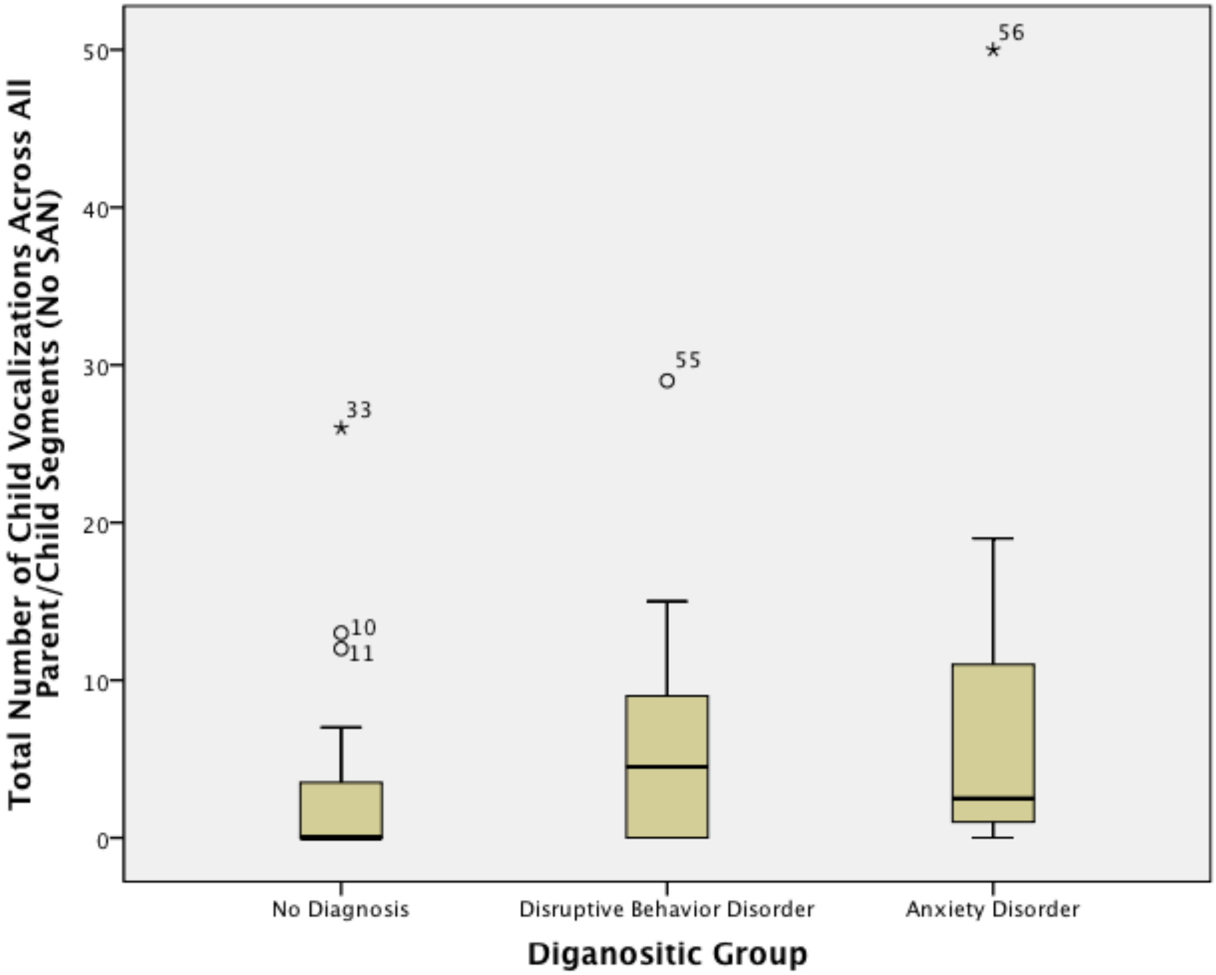

Figure 10. Box-plot demonstrating differences across diagnostic groups in the dispersion and skewness of data as well as the presence of outliers for the total number of child vocalizations present across segments which included parent-child interactions (i.e., CLP, PLP, CU, SA/P, and RE).

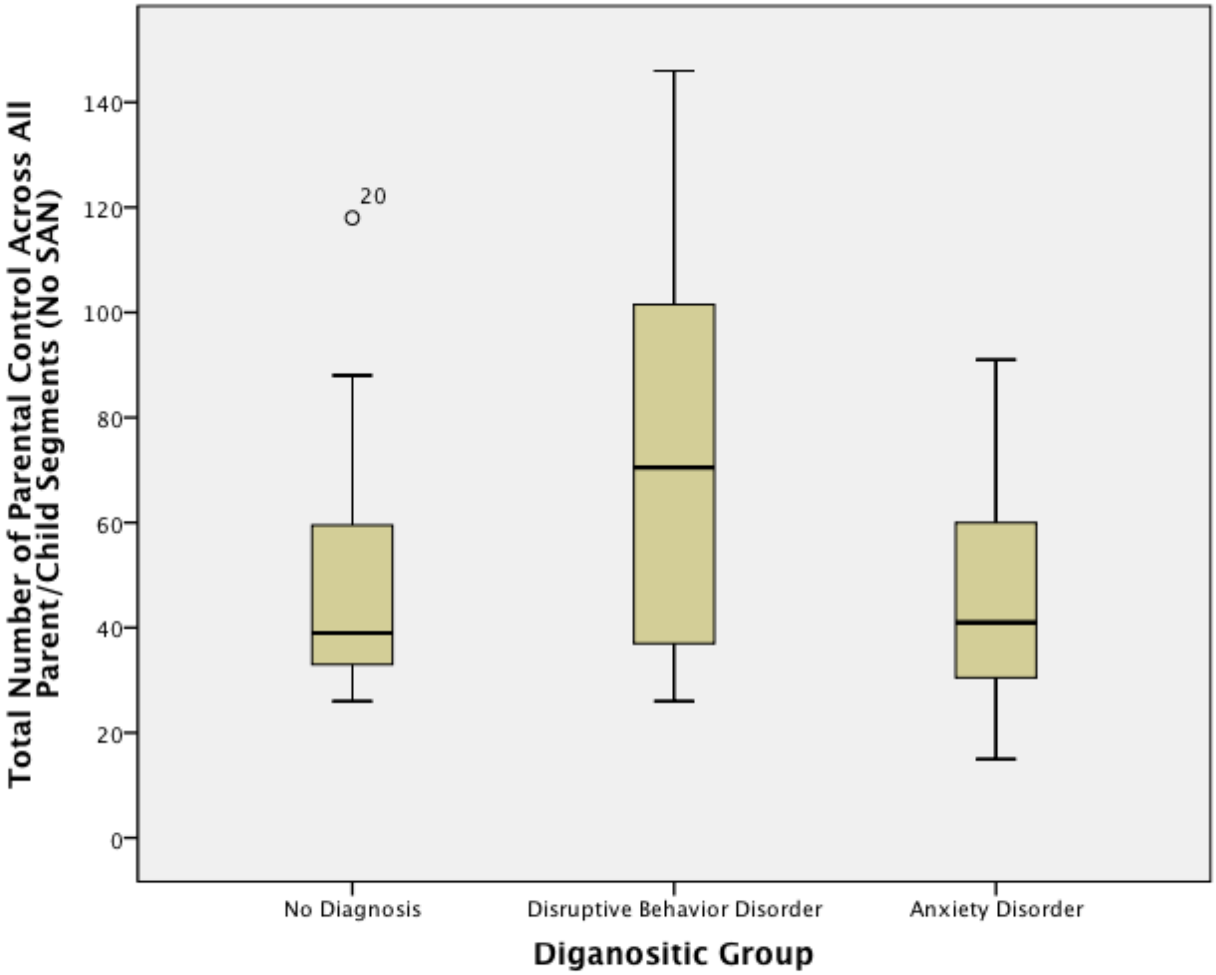

Figure 11. Box-plot demonstrating differences across diagnostic groups in the dispersion and skewness of data as well as the presence of outliers for the total amount of parental control present across segments which included parent-child interactions (i.e., CLP, PLP, CU, SA/P, and RE).

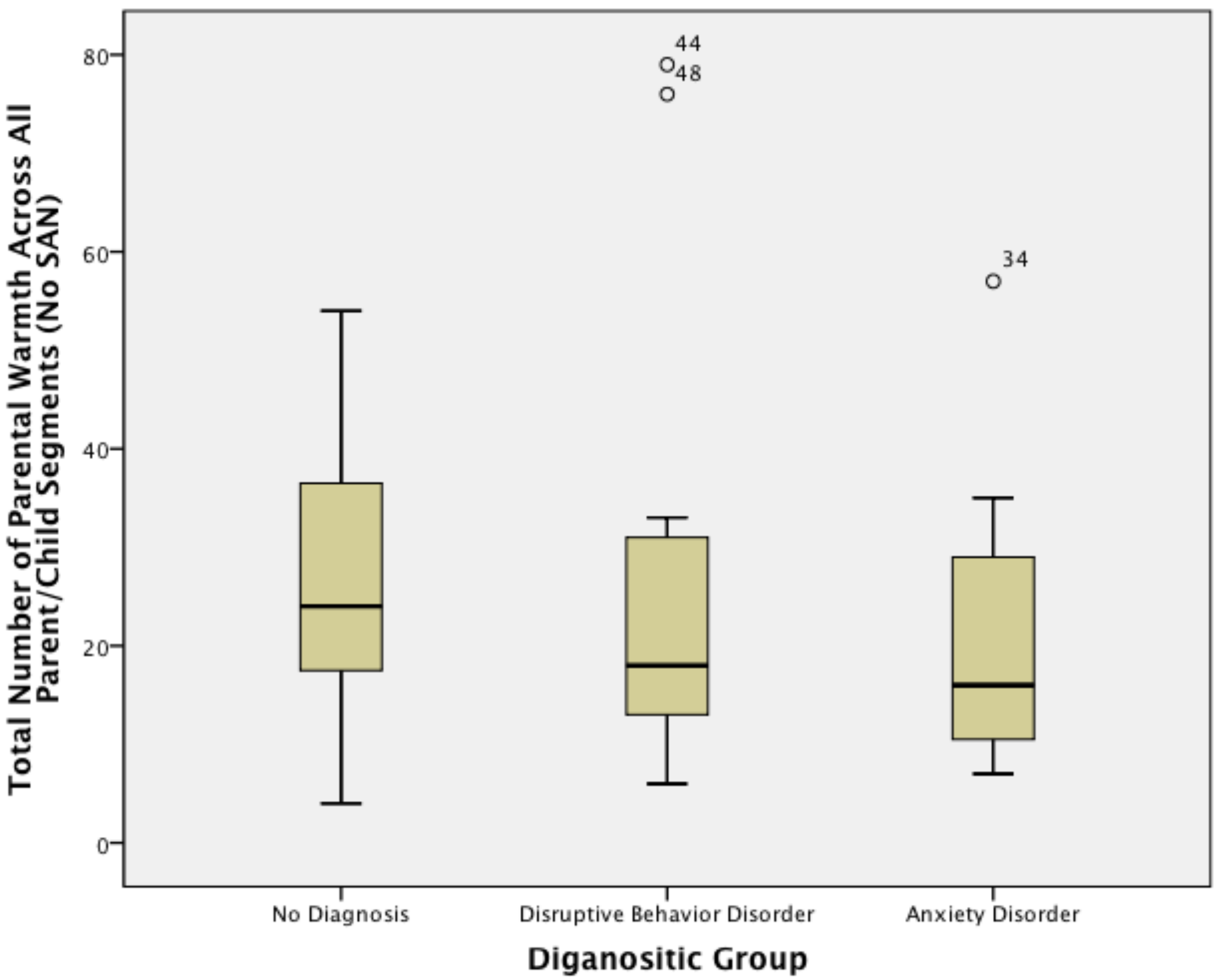

Figure 12. Box-plot demonstrating differences across diagnostic groups in the dispersion and skewness of data as well as the presence of outliers for the total amount of parental warmth present across segments which included parent-child interactions (i.e., CLP, PLP, CU, SA/P, and RE).

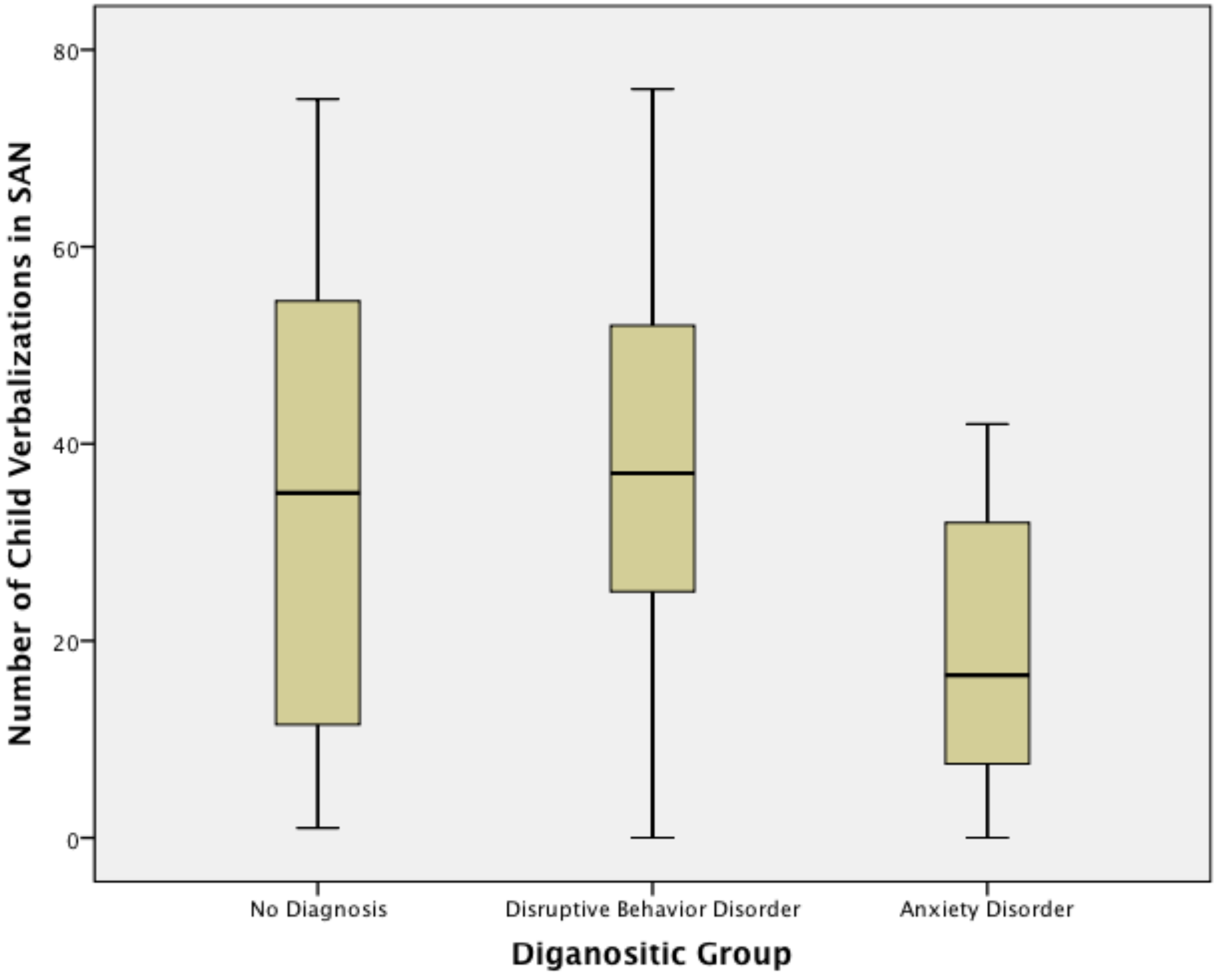

Figure 13. Box-plot demonstrating differences across diagnostic groups in the dispersion and skewness of data for the total number of child verbalizations present during the SA/N segment, which included the child interacting with a novel adult.

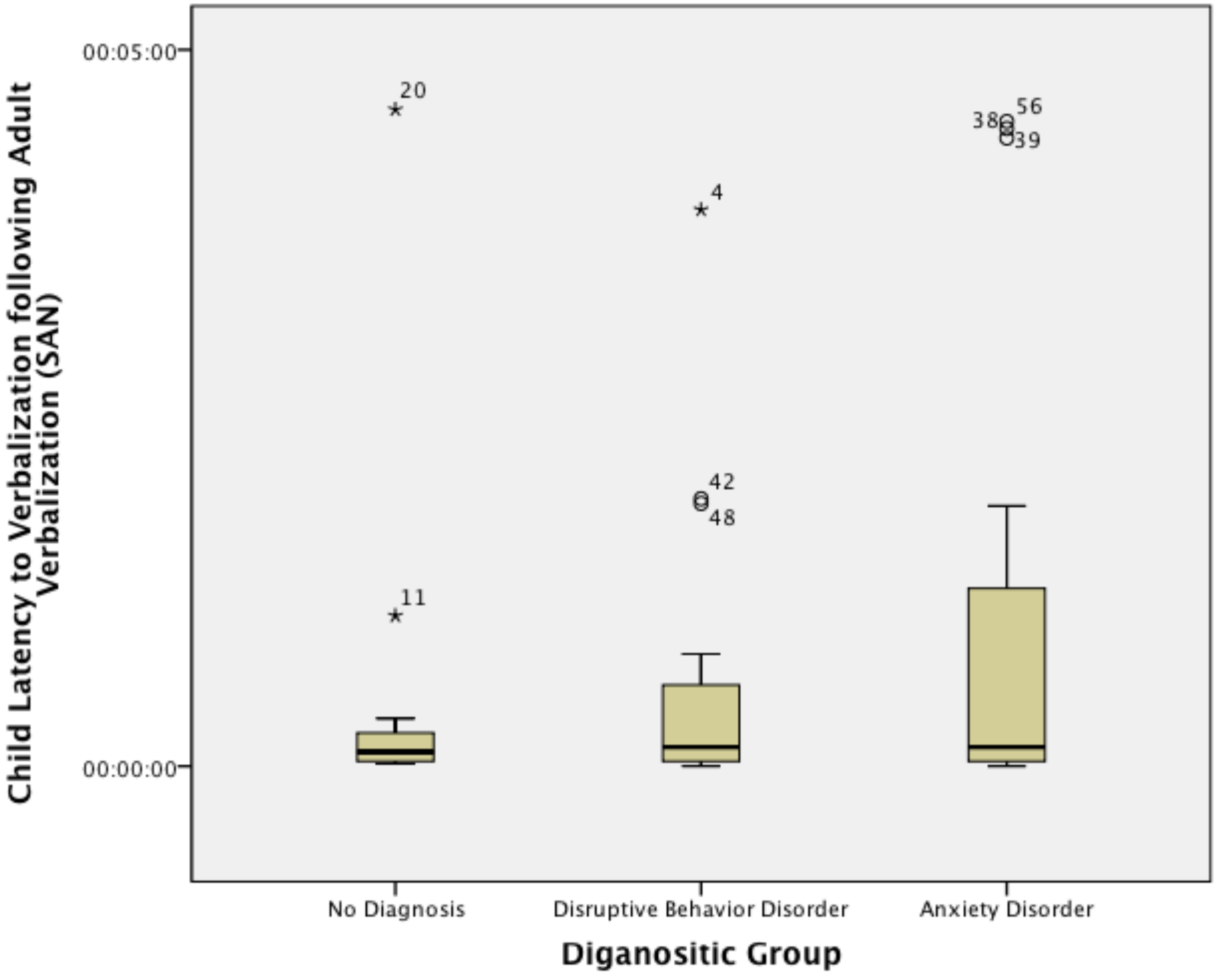

Figure 14. Box-plot demonstrating differences across diagnostic groups in the dispersion and skewness of data as well as the presence of outliers for the amount of time it took children to respond to a verbalization from a novel adult during the SA/N segment.