IMPROVEMENTS IN PARENTING STRESS AND SELF-EFFICACY FOLLOWING BEHAVIORAL PARENT TRAINING FOR CHILDREN WITH ADHD

A Dissertation Presented to the
Faculty of the College of Education
University of Houston

In Partial Fulfillment
of the Requirements for the Degree

Doctor of Philosophy

by

Corey L. Heath

May, 2014

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Abstract

Attention-Deficit/Hyperactivity Disorder (ADHD) is a chronic disorder, and its symptoms are often treated with stimulant medication or behavioral intervention. Research has shown that parents of children with chronic conditions may experience increased stress or decreased self-efficacy related to the parenting role, making them less likely to be effective in managing their child's behavior problems. Behavioral parent training interventions for ADHD, while focusing primarily on improving child behaviors, have demonstrated positive treatment outcomes both for children and parents. The current study examined parenting stress and self-efficacy outcomes following participation in a behavioral parent training approach for ADHD.

Participants consisted of 43 primary caregivers of children ages seven to twelve who were referred to an outpatient hospital setting for behavioral intervention to address ADHD-related behavioral concerns. Participants completed the Parenting Stress Index, Self-Efficacy for Parenting Tasks Index, and the Behavior Assessment System for Children – Second Edition at two time points: prior to beginning a 10-week behavioral parent training program and upon completion of the intervention. The intervention employed BPT procedures specific to improving ADHD-related behavior management skills. Parent sessions focused on two main content areas: increasing awareness and knowledge of ADHD and developing effective behavioral skills for managing their child's ADHD-related problems.

This study employed a quasi-experimental design that examined changes in parenting after participation in their child's behavior therapy. A single group, within-subjects model was applied to evaluate parents' pre-post treatment effects. Further examination was conducted to determine if changes in parenting outcomes were related to children's treatment response. A descriptive study was first conducted to gain a better understanding of families who participated in BPT. Primary analyses were conducted using General Linear Modeling (GLM) techniques. Multivariate Analysis of Variance (MANOVA) was used to examine changes in parents' ratings of parenting stress and parenting self-efficacy from baseline to post-treatment. The independent variable was time, and dependent variables included parenting stress (PST) and parenting self-efficacy (PSE). Secondary analyses utilized paired-samples t-tests to explore PSE differences across the domains of Nurturance and Discipline. Ratings at baseline and post-treatment were compared to determine whether participation in BPT was associated with greater balance across these two self-efficacy domains. Finally, independent-samples t-tests were conducted in order to examine differences in parenting outcomes based on different child treatment responses (higher or lower responses).

Results of primary analysis demonstrated a significant interaction between PST and PSE over time. When these dependent variables were considered separately, main effects suggested statistically significant changes from baseline to post-treatment for both PST and PSE. When considering parent outcomes based upon gender, notable differences emerged between mothers' and fathers' post-treatment ratings of PST and PSE. Mothers evidenced significant differences across the PSE domains of nurturance and discipline, first at baseline and again at post-treatment. However, mothers reported statistically

significant and clinically meaningful improvements across both domains in response to BPT. No significant differences were observed between nurturance and discipline for fathers and change in PST and PSE was also unremarkable in response to BPT. With regard to parent outcomes based upon child treatment response, parents of children whose ADHD symptoms were reduced to become within the normal range at post-treatment reported significantly lower stress and higher self efficacy than those of children with continued impairments.

These results demonstrated distinct benefits for parents who participated in BPT for their children with ADHD. In general, parents reported greater improvements in PSE compared to PST. These changes varied by parent gender, with statistically significant and clinically meaningful differences for mothers, but not for fathers. Finally, parents of children whose ADHD symptoms were reduced below a level of impairment showed the best outcomes regarding PST and PSE. Clinical implications for these results include possible changes to the duration of BPT and treatment objectives endeavored. Extending treatments to provide more time for symptom amelioration is recommended. Including treatment modules specifically providing strategies for stress management may result in even greater reductions in parents' stress as well as better child outcomes from better parent implementation of behavioral methods. Additionally, these findings support flexibility regarding the duration of treatment in order to achieve ADHD symptom reduction to a level that is within normal limits, and thereby achieving greater BPT outcomes for both children and parents.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Figure Page

Chapter I:

Introduction and Literature Review

Attention-Deficit/Hyperactivity Disorder (ADHD) is often thought of as a childhood disorder, yet it affects the entire family system of children diagnosed. ADHD is unique in that the best practices for psychosocial intervention target caregivers as the agents of change rather than focusing on direct child therapy (Pelham & Fabiano, 2008). Thus, it is important to understand characteristics of parents that may facilitate or hinder progress in behavior therapy. This study seeks to examine parenting outcomes following participation in a behavioral parent training program (BPT) to address child ADHD-related impairments. This study also seeks to examine how child treatment outcomes may influence treatment outcomes related to parent functioning. Understanding how parent functioning is influenced by participation in behavioral parent training (BPT) will provide valuable information about other beneficial effects of BPT for family members who are not the focus of treatment.

Attention-Deficit/Hyperactivity Disorder

In the United States, ADHD reportedly affects 8.7% of children ages eight to fifteen, which is equivalent to an estimated 2.4 million children (Froehlich et al., 2007). Symptoms are viewed as existing on a continuum in which children generally exhibit extreme forms of "normal" behavior, such as inattention, impulsiveness, or overactivity (Barkley, 2006). In order to meet diagnostic criteria for ADHD, symptoms must be impairing, pervasive, and persisting for at least six months. In addition, symptoms must be present by age seven. Three primary subtypes of ADHD are identified by the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV-TR*; American

Psychiatric Association, 2000): 314.00 - Predominantly Inattentive Type, 314.01- Predominantly Hyperactive/Impulsive Type, and 314.01 - Combined Type. The Inattentive subtype is characterized by the presence of at least six of nine symptoms of inattention, including poor concentration, forgetfulness, disorganization, and difficulty in task completion. The Hyperactive/Impulsive subtype is characterized by the presence of at least six of nine symptoms of hyperactivity and impulsivity, such as difficulty awaiting his or her turn, difficulty engaging quietly in tasks, and difficulty remaining seated when this behavior is expected, such as during school. Children with the Combined type of ADHD exhibit problems associated with both the Inattentive and Hyperactive/Impulsive subtypes. Approximately 4.4% of children meet criteria for the Inattentive subtype, while the Combined and Hyperactive/Impulsive subtypes accounts for 2.2% and 2.0% of ADHD diagnoses, respectively (Froehlich et al., 2007).

Researchers have linked ADHD symptoms to deficits or dysfunction in several areas of the brain, including the prefrontal cortex, corpus callosum, cerebellum, and basal ganglia. It is believed that the interactions, or circuits, between these brain structures and associated neurotransmitters contribute to the manifestation of ADHD symptoms (Nigg, 2005). Nigg noted that ADHD is thought to be a heterogeneous disorder; the various potential causal pathways that lead to ADHD may result in varying manifestations of symptoms and impairment. One area of the brain that has received much attention in the literature is the prefrontal cortex, which is responsible for planning, organization, sense of time, impulse control, and attention. Barkley (2006) likened impairments associated with the prefrontal cortex to a 30% delay in response inhibition. These delays may be as large as three to five years, which means that a twelve-year-old child with ADHD may

show normal brain development in other areas, but exhibit impaired levels of self-regulation and attention commensurate with the developmental expectations of a nine-year-old child.

ADHD is associated with numerous impairments in functioning, including social skill deficits and difficulties with compliance at home and at school (Johnston, Murray, & Ng, 2007). Impairment in social skills has been associated with peer rejection among children (Stormont, 2001). Individuals with ADHD are also more likely to experience problems in academic settings than individuals without ADHD, such as underachievement, poor school performance, failing grades, and slower processing speed (DeShazo Barry, Lyman, & Klinger, 2002; Rapport, Scanlan, & Denney, 1999; Shanahan et al., 2006). Many children who suffer from ADHD may also exhibit symptoms of aggression and conduct problems, including defiant, threatening, or destructive behavior (Podolski & Nigg, 2001).

Researchers previously posited that children diagnosed with ADHD would eventually outgrow it as they entered adulthood; however, one recent study showed that 78% of individuals diagnosed with ADHD experienced some degree of persistence in impairment at a ten-year follow-up (Biederman, Petty, Evans, Small, & Faraone, 2010). Furthermore, 35% of participants continued to meet DSM-IV diagnostic criteria for ADHD at follow-up (Biederman et al., 2010). ADHD is considered by the American Academy of Pediatrics (2011) to be a chronic behavioral health condition. As such, there is no "cure," and the need for effective management of symptoms is paramount.

Treatment Modalities

Overview

For the past 50 years, researchers have been devoted to the development of effective interventions to treat the impairments associated with ADHD. In line with these efforts, a task force created by Division 12 of the American Psychological Association has established guidelines to differentiate between treatments that have received varying levels of empirical support. According to these guidelines, treatments that have received the highest level of empirical support are distinguished as "well-established," while treatments that have received less empirical support than well-established treatments are identified as "probably efficacious" (Chambless & Hollon, 1998). There are currently four well-established treatments for ADHD: psychostimulant medication, behavioral parent training, classroom behavioral contingency management, and summer treatment programs (Fabiano et al., 2009; Pelham & Fabiano, 2008).

Medication management

The most widely supported and frequently utilized form of treatment for ADHD is stimulant medication (Barkley, 2006). Medication is often highly efficacious for short-term amelioration of ADHD symptoms (Greenhill & Ford, 2002). Due in part to an increase in the diagnosis of ADHD in primary care settings and increased focus on ADHD in the mass media, the number of children taking psychotropic medication has also increased within the last two decades (Zito et al., 2003). Current data suggests that approximately 39% of children meeting DSM-IV diagnostic criteria for ADHD have received medication to treat ADHD symptoms within a one-year period (Froehlich et al., 2007).

IMPROVEMENTS IN PARENT FUNCTIONING

It is estimated that nearly 3% of all school-age children have been prescribed stimulant medication for management of behavioral symptoms (Zito et al., 2003). The majority of children with ADHD (60 to 80%) experience decreases in behavioral symptoms, as well as improvements in sustained attention, response inhibition, and consistency of performance while taking stimulant medication (Pelham & Fabiano, 2008; Spencer et al., 1996; Swanson, McBurnett, Christian, & Wigal, 1995). However, negative side effects have been associated with stimulant medication, the most common being appetite suppression and decreased sleep (Efron, Jarmon, & Baker, 1997; Galland, Tripp, & Taylor, 2010; Swanson et al., 2002). In rare instances, studies have found that stimulant use for ADHD was associated with increased heart rate and blood pressure (Samuels, Franco, Wan, & Sorof, 2006) and a host of other potential problems. Furthermore, beneficial effects of stimulant medication dissipate once the medication has been metabolized (Loe & Feldman, 2007; Swanson et al., 1995). Medication management of ADHD symptoms also fails to improve coping skills (Loe & Feldman, 2007). Pharmacological treatment has been shown to have no effect on adaptive skills, such as organization, achievement, and assignment completion at school (Epstein et al., 2010). Adverse side effects and temporary symptom relief may make pharmacological management of ADHD symptoms an undesirable "front line" treatment for many families. Alternatively, a need exists to manage ADHD symptoms in a way that teaches individuals how to cope with the ADHD symptoms that they may experience. In this vein, behavior modification programs targeting children with ADHD as well as parents have received substantial empirical support over the last two decades (Barkley et al., 2000; Bor, Sanders, & Markie-Dadds, 2002; MTA Cooperative Group, 1999; Pfiffner et

al., 2007; Sonuga-Barke, Daley, Thompson, Laver-Bradbury, & Weeks, 2001). In fact, current best practice guidelines support the efficacy of behavioral therapy and combined approaches to treatment that utilize medication management in conjunction with behavioral management of symptoms (American Academy of Pediatrics, 2011; Pelham, Wheeler, & Chronis, 1998).

Behavioral intervention

Behavioral interventions for ADHD target management of ADHD symptoms through parent and teacher training programs with either indirect or direct child behavioral intervention (Pelham & Fabiano, 2008). There are three types of behavioral interventions that are considered best practices for ADHD: behavioral parent training (BPT), classroom behavioral contingency management (CBCM), and summer treatment programs (STP; Pelham & Fabiano, 2008). While studies have yet to demonstrate changes in neurobiological responses for children with ADHD, behavioral approaches provide strategies for caregivers and children to cope with and adapt to ADHD deficits in a more effective way. Behavioral interventions emphasize three main areas. First, these interventions attempt to increase parents' and teachers' knowledge and understanding of ADHD and its associated symptoms. The second focus is on increasing caregiver awareness of ADHD's impact on the child's life and differentiating ADHD symptoms from other problem behaviors. Finally, behavioral interventions promote skill development to help parents, teachers, and children manage ADHD symptoms (Fabiano et al., 2009; Pelham & Fabiano, 2008). Although there are common behavioral principles underlying these interventions, each behavioral approach is designed to target a separate environment for the child. Classroom behavioral contingency management

(CBCM) employs strategies such as classroom reward systems, point systems, daily report cards, and time-outs in order to change behavior (Pelham & Fabiano, 2008). Summer treatment programs are behavioral peer interventions that utilize social skills training, coached group play interactions, and contingency management systems similar to those in classroom and parent training interventions (Coles et al., 2005; Pelham & Fabiano, 2008). Behavioral parent training applies contingency management strategies to the home setting.

Behavioral Parent Training (BPT)

Behavioral Parent Training (BPT) interventions for ADHD are based on fundamental principles of behaviorism and social learning theory. These theoretical underpinnings emphasize changing the factors that are posited to trigger, strengthen, or maintain problematic behavior (Antony & Roemer, 2005). Behavioral parent training teaches parents how to alter the antecedents and consequences of target behaviors in order to change the frequency of these behaviors (Curtis, 2010; Fabiano et al., 2009). The skills that are often targeted include providing structure and routine in a child's day-to-day life, implementing positive and negative reinforcement and punishment systems, and generalization of skills. Common techniques utilized in this approach include goal setting for target behaviors, overlearning and rehearsal of desired behaviors, teaching problem-solving skills, and environmental restructuring (Curtis, 2010). Overlearning requires frequent practice of a high-frequency behavioral demand in order to make this desired behavior more “automatic” for the child. These techniques involve consequences for behavior, including reinforcement and punishment. Reinforcement, which can be either positive or negative, will increase the likelihood of continuous performance of the

behavior. Conversely, punishment is a consequence that makes a particular behavior less likely to occur (Antony & Roemer, 2005).

Research has shown that parents who use ineffective or inconsistent parenting strategies often struggle with effective management of child problem behaviors (Granic & Patterson, 2006). Therefore, educating parents about their reactions and effective ways to change their child's behavior is an integral aspect of such interventions in order to promote positive parenting outcomes. In behavioral interventions, parents and teachers are taught how to give effective instructions and commands (Pelham, Wheeler, & Chronis, 1998). Response-cost, a form of negative reinforcement, and shaping are used to decrease the frequency of problem behavior and increase the frequency of desirable behaviors. These techniques often require overcorrection to develop reflex-like positive responses to common environmental prompts for direction and redirection.

Behavioral parent training has been shown to be effective in improving child behavior (Fabiano et al., 2009). However, research suggests that behavioral interventions such as BPT are not equally effective for all participants, and that outcomes may depend on child, parent, and treatment factors (Chronis, Chacko, Fabiano, Wymbs, & Pelham, 2004). Child factors include comorbidity and developmental stage. Treatment factors consist of setting and length of treatment (Chronis et al., 2004). Parent factors include parent psychopathology, marital problems, parent substance abuse, and characteristics such as stress and self-efficacy (Hoza et al., 2000; Sonuga-Barke, Daley, & Thompson, 2002). Parent factors may be particularly salient in outcome studies of BPT as parents are targeted as the agents of change in BPT. A number of specific behavioral parent training interventions have been developed to address these needs. For example, the Triple-P

Positive Parenting Program (Sanders, 1999) is a multilevel behavioral intervention that has received extensive empirical support. It was designed to support parents in raising their children through improved competence and skills for effective parenting (Sanders, 1999). The highest level of intervention, Enhanced Triple P, was designed to provide counseling for parents to address personal distress in conjunction with behavioral parent training.

The Triple-P program, while it has been used to treat ADHD, is not specific to ADHD-related concerns, and is instead used to address a wide range of problems. Studies examining the efficacy of BPT interventions which include counseling intervention for parents have yielded reductions in child problem behaviors and parental distress as well as increased parenting competence (Bor, Sanders, & Markie-Dadds, 2002; Sanders, Markie-Dadds, Tully, & Bor, 2000; Sanders & McFarland, 2000; Singer, Ethridge, & Aldana, 2007). Thus, behavioral parent training programs that contain an added component to address parents' distress may be valuable in the improvement of family functioning as well as parent and child well-being.

There are a number of moderators of BPT outcomes that have been identified in the literature, though support for these moderators has been mixed (e.g., socioeconomic status, child age, child comorbid diagnoses; Lundahl, Risser, & Lovejoy, 2006; Van den Hoofdakker et al., 2007). For instance, some researchers have observed that parental psychopathology does not moderate BPT outcomes for ADHD symptoms (Owens et al., 2003), while others have found a significant moderation effect (Sonuga-Barke et al., 2002). Specifically, mothers who rated their own ADHD symptoms as severe did not report a reduction in child behavior problems after participating in a parent training

program (Sonuga-Barke et al., 2002). Stress and self-efficacy are two dimensions of the parenting experience that have been linked to treatment outcomes, and therefore BPT programs may benefit from a greater understanding of how these characteristics function in families of children with ADHD.

Parenting Stress

Stress may be conceptualized as a process in which "environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological and biological changes" (Cohen, Kessler, & Gordon, 1995, p. 3). Stress may induce positive or negative outcomes. Selye (1974) identified "eustress" as stress that enhances motivation and functioning in some area of life. Conversely, "distress" is conceptualized as damaging or unpleasant stress. It is typically persistent in nature and difficult to resolve through coping; unresolved stressors may compound, and the inability to cope with these stressors may lead to distress (Selye, 1974). Distress can lead to impairment in functioning, and impaired functioning may have adverse consequences. Parenting stress may have adverse effects on the parent, child, and larger family unit (Anthony et al., 2005; Semke, Garbacz, Kwon, Sheridan, & Woods, 2010).

Individuals may experience stress in any number of life roles, and the role of parent is no exception. Parenting stress refers to an individual's experience of stress related to the parenting role. According to Abidin (1992), parenting stress involves behavioral, cognitive, and affective components of child, parent, and environment characteristics; it is the complex interactions between these components that result in feelings of distress. Researchers have identified parenting stress as involving "situations in which parents and/or children create difficult or challenging circumstances through

their behavior, expectations, or needs" (e.g., demandingness, adaptability, low reinforcement, social isolation; Crnic, Gaze, & Hoffman, 2005, p. 128). It has been shown that parents of children with disabilities or chronic medical conditions report higher levels of stress than parents who are not faced with these additional stressors (Boyd, 2002). Studies have found that parents of children with cerebral palsy or diabetes report greater stress associated with their child's condition (Raina et al., 2005; Streisand, Swift, Wickmark, Chen, & Holmes, 2005). For example, chronic medical conditions in children may negatively influence parents' readiness to learn and implement strategies to manage their child's illness (Streisand et al., 2005). Stress related to parenting has also been implicated in poor mental health outcomes for the parents and maladaptive coping styles (Dabrowska & Pisula, 2010; Kwok & Wong, 2000). Parenting stress has been related to decreased satisfaction in the parenting role (Streisand et al., 2005; Wanamaker & Glenwick, 1998) and has also been linked to higher levels of child behavior problems (Anthony et al., 2005). Parenting stress has also been related to more controlling parenting behaviors, which is associated with lower child achievement (Rogers, Wiener, Marton, & Tannock, 2009). Evidence also suggests that families have less favorable outcomes when participating in behavioral interventions when the parents report distress (Osborne, McHugh, Saunders, & Reed, 2008). Since ADHD is a similarly chronic condition, it is reasonable to conclude that parents of children with ADHD may have similar experiences with stress in the parenting role. Therefore, parenting stress may be an important construct to examine and target when working with this population. Intervention specifically targeting high parenting stress has been reported to be beneficial for families of children with ADHD. Specifically, these interventions have resulted in

lower parenting stress and improvements in parenting style (Treacy, Tripp, & Baird, 2005). However, this intervention specifically targeted parenting stress rather than child behavior problems.

In addition to creating problems in the parent's functioning, parenting stress may indirectly affect the child as well. Stress influences a parent's attitudes and behaviors, which indirectly influences a child's behavior and well-being (Crnic & Low, 2002). Parenting stress among parents of children with chronic illnesses is associated with problems in child self-management of chronic illness (Auslander, Thompson, Dreitzer, & Santiago, 1997). Parents of ADHD may report similar levels of stress as those of children with chronic illnesses, given the chronic nature of the disorder as well as the high need for management of behavior. Baker and colleagues (2003) found that high parenting stress is associated with an increase in reported child behavior problems over time. Parenting stress has also been associated with insecure attachment styles in children (Crnic & Low, 2002). Podolski and Nigg (2001) examined the relation between parental distress, coping, and severity of ADHD-associated symptoms. Consistent with studies of parents of children with chronic illness, the authors found that parents of children with the Combined Type of ADHD report higher stress than a control group in a cross-sectional pre-treatment study. Symptoms of inattention, aggression, and conduct problems were also positively associated with parental distress; however, hyperactivity was not significantly related to parenting distress. Regression models found that oppositional and aggressive child externalizing symptoms explained a significant amount of variance in parental distress above and beyond children's ADHD symptoms. Similarly, Joyner, Silver, and Stavinoha (2009) reported a significant relationship

between severity of child symptoms and parenting stress. Recent studies have reported that the relationship between parenting stress and child behavior problems is bi-directional, in which parenting stress predicts later child behavior problems, and child behavior problems also predict parenting stress (Neece, Green, & Baker, 2012). It is therefore important to consider the relationship between parent and child outcomes as they relate to child-focused treatment for ADHD.

Parenting Self-Efficacy

Self-efficacy refers to a person's beliefs about their personal effectiveness and competence to carry out tasks and attain certain outcomes (Bandura, 2000). According to Bandura, individuals with high self-efficacy "show greater cognitive resourcefulness and strategic flexibility" (Bandura, 2000, p. 19). Bandura also highlighted the combined importance of experience, efficacy beliefs, and goals: individuals with low self-efficacy who have experienced failure may be less likely to persist in an unrewarding task. Conversely, individuals with high self-efficacy may be more likely to persist in difficult tasks. This is particularly relevant to the discussion of parenting, which is in itself a difficult task.

Parenting self-efficacy (PSE) is conceptualized as parents' beliefs about their confidence and competence to carry out tasks related to the behavior and development of their child (Coleman & Karraker, 1997; Hess, Teti, & Hussey-Gardner, 2004). Parenting self-efficacy is an important construct to consider both for the well-being of parents and that of their children (Kuhn & Carter, 2006). Parenting self-efficacy has been identified as an important correlate to parenting behavior throughout the literature (Coleman & Karraker, 2003). Parents with high PSE in this domain have demonstrated the capacity

"to provide an adaptive, stimulating, and nurturing child-rearing environment" (Coleman & Karraker, 2000, p. 13). Thus, parents who exhibit high self-efficacy may have the skills to provide the structure and support needed for children exhibiting ADHD symptoms. In contrast, low PSE has been associated with parent depression, role dissatisfaction, and greater child behavior problems (Coleman & Karraker, 2000; Coleman & Karraker, 2003). Low PSE has also been associated with increased use of less effective parenting practices (e.g., yelling at child, inappropriate punishment) and less reliance on positive parenting strategies (McLaughlin & Harrison, 2006). High parenting self-efficacy has been associated with child adjustment, including improved social skills and fewer behavior problems (Bogenschneider, Small, & Tsay, 1997; Coleman & Karraker, 2000; Sanders, Montgomery, & Brechman-Touissaint, 2000; Sofronoff & Farbotko, 2002). This suggests the importance of examining PSE as a contributor to the improvement of child behavioral symptoms.

Self-efficacy has been linked to specific parenting practices, such as parental limit setting and discipline, warmth, and responsiveness (Dumka et al., 1996; MacPhee et al., 1996). Research suggests that parents who have low PSE will be less likely to attempt difficult tasks when they do not feel they will be successful (deMontigny & Lacharite, 2005). Conversely, parents with high PSE report more positive mental health and a feeling of empowerment related to their parenting tasks, which has been associated with positive outcomes for the parent and child (Kwok & Wong, 2000; Sofronoff & Farbotko, 2002). Thus, targeting PSE may improve parents' confidence in parenting their children, which may in turn promote more desirable treatment outcomes for families. Day, Factor, and Szkiba-Day (1994) found PSE to be a mediator of the relationship between child

behavior problems and discipline. Specifically, parents who reported low PSE endorsed more behavior problems for their children and also the use of more severe discipline styles. Conversely, mothers who reported higher PSE were more likely to use positive parenting practices than those with lower PSE (Ardelt & Eccles, 2001). Thus, it is important to address PSE in this context in order to increase parents' familiarity and comfort in the use of positive discipline practices associated with more favorable outcomes in changing child behavior.

In the literature, increased PSE has been associated with decreased levels of parenting stress (Kwok & Wong, 2000). Parenting self-efficacy has been found to moderate the relationship between parenting stress and parents' mental health. Therefore, parents who have higher self-efficacy with regard to parenting may be less likely to be affected by mental health concerns such as depression, even if they are experiencing high parenting stress (Kwok & Wong, 2000). Similar to chronic medical conditions in which parents must provide routine care to manage their child's illness, parents of children with ADHD are instrumental in helping to manage their child's condition. Therefore, increasing knowledge about these parenting characteristics and the relationships among them may provide a foundation to improve parents' well-being in addition to children's well-being.

Parenting Style

Children with ADHD often exhibit a pattern of hyperactivity, inattention, and impulsivity that presents challenges to parents. Parents of children with ADHD must assume a greater role in managing child behavior than parents of children without ADHD, given the deficits in self-regulation that are characteristic of ADHD (Modesto-

Lowe, Danforth, & Brooks, 2008). As a result of this greater need for behavior management, parents of children with ADHD may demonstrate more prominent reliance upon discipline and corrective parenting strategies. Research has demonstrated that parents of children with ADHD use more controlling behaviors and less affectionate behaviors towards their child (Finzi-Dottan, Manor, & Tyano, 2006; Gau, 2007). Additionally, mothers of children with ADHD have been found to be more directive, more focused upon negative behavior, and less rewarding of child behavior (Danforth, Barkley, & Stokes, 1991; DuPaul et al., 2001). These findings suggest that parents of children with ADHD may approach parenting with greater emphasis on discipline and less emphasis on warmth and responsiveness.

Behavioral parent training emphasizes increasing positive parent-child interactions while providing effective discipline strategies to manage behavior. Research has demonstrated that BPT has beneficial effects on child behavior as well as on parenting practices (Danforth, Harvey, Ulaszek, & McKee, 2006). Parents who complete BPT have demonstrated an increase in use of positive parenting practices, including praise and positive attention, as well as a decrease in dysfunctional parenting practices, such as harsh discipline and physical punishment (Bor, Sanders, & Markie-Dadds, 2002; Webster-Stratton, Reid, & Beauchaine, 2011). Thus, BPT appears to improve the balance between parents' use of discipline and positive parenting skills. The current study seeks to evaluate this relationship between parenting self-efficacy for discipline and nurturance to understand how parents' sense of competence is related to participation in BPT.

Parenting Stress, Self-Efficacy, and Child Behavior

A strong body of empirical literature suggests complex associations between parenting stress, parenting self-efficacy, and child behavior. Podolski and Nigg (2001) have also found inattentive behavior to be predictive of parenting distress. Parenting stress is also associated with an increase in child behavior problems over time (Baker et al., 2003). However, it is unclear whether problem behaviors actually increase or whether high parenting stress may lead to perceiving child behavior problems as more disruptive, severe, or more frequent over time. Parenting stress has been found to predict parenting self-efficacy, suggesting that these characteristics are inversely related (Heath & Curtis, 2011; Kuhn & Carter, 2006; Kwok & Wong, 2000). Duchovic, Gerkensmeyer and Wu (2009) studied parenting distress and reported a positive association with externalizing behaviors.

Preliminary pre-treatment findings with this study sample demonstrated an inverse relationship between parenting stress and parenting self-efficacy, suggesting that these variables may influence one another (Heath & Curtis, 2011). The severity of child inattentive and hyperactive/impulsive symptoms did not predict parents' stress or self-efficacy. This finding was in contrast to results presented by Podolski and Nigg (2001), and it suggests that other factors may be more relevant to stress and self-efficacy related to the parenting role. The current study will build upon preliminary findings to explore different characteristics that may influence parenting stress or self-efficacy. Specifically, this study will examine how parenting characteristics may change in response to participation in a behavioral parent training intervention for ADHD.

Behavioral Parent Training and Parenting Outcomes

The literature on treatment outcomes includes conflicting findings about the impact of BPT on parenting dimensions. There are many studies that evaluate the efficacy of BPT for improving child behavioral outcomes, yet relatively few studies have examined parenting outcomes. Anastopoulos, Shelton, DuPaul, and Guevremont (1993) observed a reduction in parenting stress following participation in parent training for ADHD. The authors also noted an increase in parenting self-esteem. Other studies have also identified positive changes in parenting stress for caregivers participating in BPT (Chacko et al., 2008; Gerdes, Haack, & Schneider, 2010; Pisterman et al., 1992). For instance, participation in the Triple-P Enhanced program has evidenced increased parenting self-efficacy following treatment as well as use of more adaptive parenting practices; however, Triple-P Enhanced includes a module specifically promoting personal coping strategies for parents (Hoath & Sanders, 2002). On the contrary, other studies have failed to detect significant differences in parenting stress for BPT when compared to a group receiving routine clinical care (Van den Hoofdakker et al., 2007). The current study will seek to determine changes in parents' stress and self-efficacy in response to BPT and explore other variables that may affect parent outcomes.

Purpose of the Study

The purpose of this study is to examine treatment outcomes for parents following their participation in a behavioral parent training (BPT) intervention for their child's ADHD. Specifically, changes in parenting stress (PST) and parenting self-efficacy (PSE) associated with parents' participation in their child's treatment are examined. Parenting outcomes associated child treatment response are also examined.

Specific Aim #1.

The first aim is to conduct a descriptive study examining characteristics of the sample, including caregiver and child age, ethnicity, family income, education level, previous utilization of mental health services, and a number of other relevant characteristics that may be related to parenting stress and self-efficacy. Additional characteristics include number of children in the family, parents' own mental health concerns, and educational supports available to the child within the school setting. Demographic characteristics and treatment experiences are examined to see how they may relate to parents' ratings of PST and PSE. This will help improve our understanding of the family characteristics for those who present for outpatient, child ADHD-related behavioral intervention. This aim is not intended to generate testable hypotheses; rather, the knowledge gained from this aim will provide a better understanding of an outpatient, clinic-based treatment sample indicative of a pediatric hospital setting.

Specific Aim #2.

The second aim of this study is to examine changes in parent functioning following participation in BPT. Changes in parents' ratings of parenting stress (PST) and self-efficacy (PSE) at treatment outcome will be compared to parents' ratings at baseline. Three hypotheses will be tested.

H_1: Parent ratings of PST and PSE will improve following participation in BPT.

H_2: PSE ratings within the parenting domains of nurturance and discipline will differ significantly from one another at pre-treatment.

H_3: PSE ratings of nurturance and discipline will not differ significantly from one another at post-treatment.

Justification for specific aim #2. Participation in BPT provides parents with specific skills, supports, and resources for effectively managing child behaviors associated with ADHD. By improving their success and perception of improved efficacy within this domain, parenting stress is expected to decline. This hypothesis is supported by evidence that parenting stress and parenting self-efficacy are inversely related (Heath & Curtis, 2011; Kuhn & Carter, 2006; Kwok & Wong, 2000). Higher ratings of parenting self-efficacy following BPT are predicted since treatment objectives specifically focus on improving knowledge and competence in parenting practices (Curtis, 2010). Specifically, parents' self-efficacy domains of nurturance and discipline are expected to improve following participation in BPT, since treatment focuses on the combined goals for increasing positive parent-child interactions and improving behavior management skills and corrective strategies (Barkley, 2006). Prior research has demonstrated that parents of children with ADHD may rely more on the use of discipline in managing problematic child behavior (Danforth, Barkley, & Stokes, 1991; DuPaul et al., 2001). However, the frequency of use does not necessarily translate to parental competency or even satisfaction in applying these methods. Instead, this proclivity may simply be indicative of the limited behavioral skills in parents' repertoires. Therefore, predictions are not be made about parents' dominant competencies at pre-treatment. Notable differences are instead predicted for these domains, based upon the belief that

parents' repertoires will be limited and favor one dominant approach. Strategies for improving both nurturance and discipline are directly addressed in BPT interventions, and therefore it is believed that parents will report greater balance in these parenting skills following participation in BPT.

Specific Aim #3. This aim purports to examine whether changes in child ADHD symptoms are associated with different treatment outcomes for parents. Child treatment responses will be evaluated in two ways. The first will consider the magnitude, or amount of symptom change in response to treatment. The second will consider the quality of child treatment response as determined by clinical cutoff scores. The following hypotheses will examine parent outcomes based upon both of these types of child treatment responses.

H_4: Significant differences in PST and PSE are predicted for parents of "higher treatment responders" compared to "lower treatment responders" at post-treatment. Specifically, parents of children with greater magnitude of ADHD symptom reduction will report greater parenting self-efficacy and less parenting stress than parents of children with a smaller magnitude of symptom change.

H_5: At post-treatment, significant differences in PST and PSE are predicted for parents of children whose post-treatment symptoms decline to a level considered to be "within normal limits" compared to parents of children with continued impairment. Specifically, parents of children who demonstrate a reduction in ADHD symptoms to within the normal range

will report greater parenting self-efficacy and less parenting stress than parents of children with persistent impairment.

Justification for specific aim #3. There is a notable gap in the literature concerning BPT parenting outcomes in relation to child outcomes. Studies to date have yet to identify how child treatment responses following BPT affect parenting outcomes for this population. Thus, these hypotheses are intended to expand current understanding by examining factors that may contribute to different parenting outcomes in BPT. Parents of children whose ADHD symptoms respond most favorably are predicted to report greater improvements in parent functioning, as severity of child behavior problems has been associated with parenting distress (Duchovic, Gerkensmeyer, & Wu, 2009; Podolski & Nigg, 2001).

Chapter II

Methods

Participants

This study took place within a hospital-based, outpatient psychology service within a pediatric hospital setting. Participants consisted of 43 primary caregivers of children ages 7-12 who were diagnosed with ADHD-Combined Type. All participating families were initially referred to the Disruptive Behavior Disorders Treatment Program for ADHD intervention. Diagnostic procedures were conducted by a licensed child psychologist, and determinations of ADHD-C were established by clinical consensus derived from data from structured clinical interviews, reviews of developmental and medical histories, and parent and teacher ratings on standardized behavioral rating scales. Study participation was not advertised to the public and was only offered to those who were referred for behavioral treatment for ADHD. Therefore, participants in this investigation truly reflect a clinical sample, rather than a study trial sample.

Female caregivers were selected for the primary analyses for two reasons. First, they were the majority of participants (offering a larger sample size) and, anecdotally, they participated more regularly in BPT sessions than male caregivers. The research literature also indicates that mothers are most often the primary participants in BPT and that they typically spend more time than father in direct caregiving roles (Fabiano, 2007).

Eligibility criteria included evidence of impaired attention and hyperactivity/impulsivity as indicated by T-scores of 65 or greater on the Behavior Assessment System for Children – Second Edition (BASC-2; Reynolds & Kamphaus, 2004). Children with co-morbid symptoms were included as long as these concerns were

less severe than the ADHD symptoms, as indicated by comparably lower ratings on the BASC-2. Caregivers were required to have legal guardianship of the child in order to participate and no current involvement in legal, custody, or child protective services at the time of their enrollment. Families of children receiving pharmacological intervention were also included since ADHD-related impairment served as the primary eligibility criterion. A large majority of participants were parents; thus, future references will be simplified, collectively referring to participants as "parents."

Exclusion criteria were also established for this study. Families were excluded if the child presented another behavioral health diagnosis other that required intervention priority, such as an anxiety disorder, mood disorder, or trauma related condition. Children were also excluded if presenting diminished cognitive abilities including borderline intelligence, mental retardation, or receptive language disorders. Finally, those in need of immediate family or individual stabilization were excluded, including those with a high level of risk to harm themselves or others as assessed by reported history of self-harm or violent behavior, current suicidal ideation or homicidal ideation, current or recent substance abuse, or evidence of extreme ratings on the Aggression subscale of the BASC-2.

Measures

Background Information Questionnaire. This demographic form is a one-page questionnaire (developed specifically for use within the Family STARS program) completed by parents to provide information about their child's family context. Information is also gained related to the child's school experiences and treatment history such as medication use, prior participation in psychotherapy, etc.

Parenting Stress Index-Short Form. The Parenting Stress Index-Short Form (PSI-SF; Abidin, 1995) was used to assess parents' level of stress associated with caring for their child, including items to assess lack of social support, depression, and feelings of incompetence in the parenting role. The scale includes 36 items and requires 5-10 minutes to complete. The PSI-SF is comprised of three subscales: Parenting Distress, Difficult Child, and Parent-Child Dysfunctional Interaction. Parenting Distress refers to general distress related to parenting factors, such as the parent's own mental health or conflict with a partner. The Difficult Child subscale assesses parents' beliefs about their child's ability to self-regulate. The Parent-Child Dysfunctional Interaction subscale measures parents' feelings about their interactions with their child. A Defensive Responding scale is also included, which measures the extent to which a parent may be underreporting or denying problems (Abidin, 1995). There is also a full scale score which measures Total Stress.

For the purpose of this study, parents' Full Scale score of Total Stress was used in analyses. This scale provides a more global marker of parent coping. The items in the PSI-SF are 5-point Likert-type rating scales, where high scores represent high levels of parenting stress. Scores between 15 and 80 are considered to be within the "normal" range for stress. Scores of between 85 and 89 represent a high level of stress and scores greater than or equal to 90 indicate clinically significant/severe parenting stress (Abidin, 1995). Internal consistencies for the PSI-SF have been reported to be high as follows: Parent Distress (α = .87), Parent-Child Dysfunctional Interaction (α = .80), Difficult Child (α = .85), and Total Stress (α = .91) (Abidin, 1995). The PSI-SF Total Stress index has been found to have test-retest reliability of r = .84 (Abidin, 1995). Items on the PSI-

SF were derived using factor analysis of the long form of the Parenting Stress Index. Overall the PSI-SF displays adequate concurrent validity with the long-form Parenting Stress Index, (r = .95; Abidin, 1995). Studies examining the concurrent validity of the PSI-SF have also indicated concurrent validity between the Difficult Child subscale and measures of child oppositional behavior, as well as correlations between the Parental Distress subscale and parent self-report of psychological symptoms and low income (Reitman, Currier, & Stickle, 2002).

Self-Efficacy for Parenting Tasks Index. The Self-Efficacy for Parenting Tasks Index (SEPTI; Coleman & Karraker, 2000) was used to measure parents' self-efficacy beliefs with regard to parenting tasks across the domains of nurturance, health, discipline, achievement, and recreation. The SEPTI consists of 36 items and requires 5 -10 minutes to complete. This measure requires parents to rate their perceived competence on a 6-point Likert-type rating scale. High scores represent high parenting self-efficacy. Cronbach's alpha levels for the domains have been reported as follows: Recreation (α = .82), Achievement (α = .74), Discipline (α = .86) Nurturance (α = .77), and Health (α = .73) (Coleman & Karraker, 2000). Cronbach's alpha for the full scale, which will be used in this study, has been reported as α =.91 (Coleman & Karraker, 2000). Though there have been few studies evaluating the validity of this scale, it has displayed moderate concurrent validity with the Parenting Sense of Competence Scale (Gibaud-Wallston & Wandersman, 1978, cited in Johnston & Mash, 1989).

Behavior Assessment System for Children - Second Edition. The Behavior Assessment System for Children - Second Edition, (BASC-2; Reynolds & Kamphaus, 2004) was used to evaluate child behavioral symptoms. The BASC-2 is intended to

assess severity of child behavior in relation to same age peers and consists of parent, teacher, and self-report versions of the scale, each including three validity scales. The Parent Report Scale was used as a measure of child symptom severity in this study. The decision to use parent ratings in this study is based on findings that suggest parent ratings adequately correspond with teacher ratings in clinical trial research examining outcomes for children with ADHD (Biederman, Faraone, Monuteaux, & Grossbard, 2004; Kolko & Kazdin, 1993). The Attention Problems and Hyperactivity scales were used in the primary analyses, as these domains represent core symptoms of ADHD. The Attention Problems scale of the BASC-2 measures the degree to which parents believe the child pays attention, listens to directions, and displays on-task behavior. The Hyperactivity scale assesses a parent's perception of the child's activity level and ability to self-regulate and control impulses. Internal consistencies for the PRS range from .80 to .95 (Reynolds & Kamphaus, 2004). Cronbach's alpha coefficients for the two subscales that will be utilized in this study have been reported as high for Attention Problems (α =.89) and high for Hyperactivity (α =.86). Test-retest reliability for the PRS ranges from .65 to .92. Subscales on the BASC-2 PRS have been found to correlate highly with the original BASC (r = .76 - .96; Reynolds & Kamphaus, 2004). It has also demonstrated strong construct validity, observed by its correlations with other measures including the Conners' Parent Rating Scale – Revised (Conners, 2001) and Achenbach System of Empirically Based Assessment – Parent Report Form (ASEBA-PRF; Achenbach & Rescorla, 2001). Correlations between the BASC-2 PRS and Conners' Parent Rating Scale were reported as r =.77 for the Hyperactivity scale and r = .71 for the Attention Problems scale (Reynolds & Kamphaus, 2004). Correlations between the BASC-2 PRS

and ASEBA PRF range from r = .65 for the Attention Problems scale to r = .68 for the Hyperactivity scale (Reynolds & Kamphaus, 2004).

Procedures

Parents received a pre-treatment consultation prior to their participation in this study. Pre-treatment consultation served to identify specific treatment needs, to discuss best practices for the child's presenting problems, and to inform families about the study and alternative treatments available. Once consented, families were enrolled to participate in Family Skills Training for ADHD-Related Symptoms (Family STARS) Intervention. Family STARS provided a manualized behavior therapy program that combined behavioral parent training (BPT) with a separate child-focused self-regulation training component. The course of the Family STARS intervention consisted of 10, 1-hour appointments with concurrent child and parent sessions during the first 45-minutes. The final 10-15 minutes of each session was dedicated to whole family discussion, behavioral rehearsal of session materials, and planning of weekly home therapy assignments.

Parent sessions employed BPT procedures specific to improving ADHD-related behavior management skills. Parent sessions focused on two main content areas: increasing awareness and knowledge of ADHD and developing effective behavioral skills for managing their child's ADHD-related problems. While this study aimed to evaluate parenting stress, there were no specific parent training topics that focused on stress management and the intervention was not designed to treat parenting stress. Session objectives emphasized parenting skills for promoting desirable behavior through use of behavioral routines, positive and negative reinforcement, and punishment strategies.

Numerous skills were covered in parent sessions, including the use of differential attention, effective commands, behavioral goal setting, and use of effective routines and logical consequences. Methods for correcting problem behaviors were later introduced; however, a continued emphasis was maintained for promoting success and child mastery of desirable behaviors. The parent session curriculum utilized materials adapted from well-established BPT programs to focus more specifically upon ADHD-related behavioral needs (e.g., Barkley, 1997; Cunningham, 2005, 2007; McMahon & Forehand, 2005; Sanders, 1999). Child session objectives emphasized the introduction and frequent rehearsal of commonly used/needed self-regulation skills.

Therapy services were provided by clinicians in the clinic with training backgrounds ranging from advanced graduate students to postdoctoral and clinical faculty. All clinicians received individualized training regarding the treatment protocol and were required to demonstrate clinical competency by successfully completing a standardized ‘‘check out’’ on all session activities prior to participating in the delivery of treatment services. Live supervision and treatment fidelity checks were also conducted by the principle investigator and other members of the research team. Four families who consented and began BPT dropped out during treatment, reflecting a 9% attrition rate.

Design

This study employed a quasi-experimental design that examined changes in parenting after participation in their child’s behavior therapy. A single group, within-subjects model was applied to evaluate parents’ pre-post treatment effects. Further examination was conducted to determine if changes in parenting outcomes were related to children’s treatment response. General linear modeling (GLM) was used to examine

changes in parenting stress and self-efficacy over the course of the BPT intervention. The GLM approach allows for linear combinations of dependent variables to be examined in a single repeated-measures design. This allows for examination of within-subjects differences over time (Tabachnick & Fidell, 2001).

This study analyzed data collected from a larger program of research examining the efficacy of a behavioral intervention for ADHD. This study was approved by the University of Houston Committee for the Protection of Human Subjects (Protocol 12269-EX). The larger research program was approved by the Baylor College of Medicine institutional review board (BCM #H-18958).

Analysis

Specific Aim #1.

The first aim of this investigation was to conduct a descriptive study to examine characteristics of families who present for behavioral parent training services within a specialized hospital-based setting. Medication management and psychosocial treatment for ADHD are often available within easily accessed community settings. Thus, descriptive analyses were carried out to gain a better understanding of family characteristics and how they are associated with children's ADHD-related treatment needs. Descriptive statistics were calculated for all variables of interest, including frequency counts, means, and standard deviations. Examples of characteristics studied were demographics, treatment history, current family/child supports, and parents' interaction with school staff.

Specific Aim #2.

The second aim of the study was to examine changes in parenting stress (PST) and parenting self-efficacy (PSE) in response to BPT participation. This aim addressed the impact of BPT on two domains of parent functioning. A single group pretest-posttest design was utilized to examine these changes following participation in a 10-week BPT program. Post-hoc analyses were also conducted to better understand parenting outcomes. A one-way repeated measures Multivariate Analysis of Variance (MANOVA) was utilized to evaluate changes in PST and PSE. The two dependent variables in this analysis were parenting stress (PST) and parenting self-efficacy (PSE), and the independent variable "time" consisted of two levels: pre-treatment and post-treatment.

The MANOVA model allowed for examination of individual dependent variables while also accounting for the interaction between dependent variables, making it a preferable analysis in the present study. Preliminary studies with this sample identified a moderate, negative correlation between the variables parenting stress and parenting self-efficacy (Heath & Curtis, 2011). MANOVA was selected for this analysis given a number of factors. Since multiple outcome variables were assessed, a MANOVA allows these variables to be considered within a single test. Use of more than one ANOVA was not feasible due to the potential to increase the probability of Type I errors. Post-hoc analyses with univariate ANOVAs were then conducted separately on each dependent variable to determine the locus of multivariate main effects as well as the direction of change. Post-hoc analyses were used to illustrate the variables that demonstrated the greatest change from pre-treatment to post-treatment. The magnitude of statistically

significant effects was measured using Cohen's *d* to represent pre-post difference scores (Cohen, 1988).

Additionally, paired-samples t-tests were conducted to evaluate whether parents' self-efficacy ratings of nurturance and discipline differed significantly. The first t-test compared ratings of nurturance and discipline prior to engaging in behavioral parent training (BPT). It was expected that parents' ratings on these domains of self-efficacy would significantly differ from one another at pre-treatment. The second t-test evaluated whether parents' ratings of nurturance and discipline were significantly different from one another at post-treatment. Self-efficacy of parenting tasks was predicted to be more balanced at post-treatment. Therefore, no significant differences were expected in parents' self-efficacy for nurturance and discipline following participation in BPT. This is supported by previous research demonstrating an increase in positive parenting practices following participation in BPT (Bor, Sanders, & Markie-Dadds, 2002; Webster-Stratton, Reid, & Beauchaine, 2011).

Specific Aim #3.

This aim examined differences in pre-and post-treatment reports of PST and PSE based on child treatment response. Child treatment responses were categorized in two different ways, (1) based upon the magnitude of change, and (2) based upon the clinical meaningfulness of behavior change. Magnitude of change was dichotomized into categories for higher treatment responders (one or more standard deviations of change in ADHD symptoms) and lower treatment responders (less than one standard deviation of ADHD symptom change). Independent-samples t-tests were conducted to determine whether parents of children whose ADHD symptoms greatly improved (Higher

Treatment Responders) differed from parents of children with less ADHD symptom improvement (Lower Treatment Responders).

Rating scale cutoffs were used to determine the clinical significance of post-treatment child symptoms (i.e., clinically significant, at risk, within normal limits). Independent-samples t-tests were conducted to determine whether parents of children whose ADHD symptoms returned to the normal range differed from parents of children whose symptoms remained above the normal range following completion of the BPT intervention. Outcomes for parents of children whose symptoms returned to the normal range were compared to outcomes for parents whose children's symptoms continued to be in the "At Risk" or "Clinically Significant Range."

Sample Size Justification

Power analyses were conducted to determine the appropriate sample size for this study. For the present study, a power level of .80 was selected, making the likelihood of finding a true effect (and correctly rejecting the null) four times as likely as failing to find such an effect. This level of power is also consistent with the standards of practice in conducting behavioral research (Meyers, Gamst, & Guarino, 2006; Murphy & Myors, 2004). The statistical software G*Power was used to calculate the power analyses (Faul, Erdfelder, Buchner, & Lang, 2009). Estimations of sample size and statistical power are presented in Table 1. Effect size refers to the impact of independent variables on the outcome dependent variables. Thus, knowledge of effect size will provide an understanding of how much of an effect the behavioral parent training intervention has on reports of parenting stress and self-efficacy.

A medium effect size was selected for this study since moderate changes in parenting stress and self-efficacy are expected to result from participation in the BPT program. This expectation was based on the brief nature of the intervention as well as support for moderate treatment effect sizes for BPT (Pelham & Fabiano, 2008). While BPT was expected to have a moderate effect on parenting outcomes, it was also recognized that there are other factors that may influence these outcomes. A moderate effect was chosen for this study because this size of effect can be detected statistically and observed clinically. This was particularly important for this study because it involved a clinical sample, where meaningful differences in parenting characteristics would reflect clinically significant improvement. An alpha level of .05 was be used to determine significance of the analyses, so there was a low likelihood of achieving a significant result by chance (Meyers et al., 2006). Based upon power analyses, a sample size of 42 allowed for detection of a moderate effect.

Table 1
Estimated Sample Sizes Needed to Achieve Statistical Power by Effect Size

n	Power	Alpha level	Effect Size (*f*)
100	.80	.05	.10
42	.80	.05	.25
28	.80	.05	.40

Missing Values

Analyses were conducted to determine the amount of missing data for the variables of interest. Missing data were observed for pre-treatment variables only: all

post-treatment variables contained complete data. The amount of missing pre-treatment data was: 5 cases for parenting stress (11% of the total cases), 3 cases for total parenting self-efficacy (7% of the sample), and two cases each for pre-treatment reports of nurturance and discipline (4.7% of the sample). These missing values did not reside systematically within the same subjects. Little's MCAR test was conducted as part of the EM procedure to determine the nature of missing data. Results indicated the data were missing completely at random, $X^2 = 14.92$ ($df = 18$, $p = .67$). Therefore, the EM procedure was identified as an appropriate method of dealing with missing data in this sample.

Utilizing the SPSS Missing Values program, Expectation Maximization was conducted to impute missing data. This procedure was based on the EM algorithm outlined by Dempster, Laird, and Rubin (1977). The EM algorithm consists of two steps: an "E" step that involves estimation of missing values using regression, and an "M" step that estimates parameters using the values that were imputed (Meyers et al., 2006). These two steps were repeated until the estimates converged. This method of imputation was selected given its advantages over listwise and pairwise deletion, including the ability to uphold adequate statistical power and avoid possible systematic bias in missing data (Allison, 2002). The maximum number of iterations for EM imputation was set to 25.

Assumptions of Statistical Procedures

Prior to executing the analyses, the data were first analyzed to assess whether they met the assumptions of parametric tests to be used in this study. Both statistical and graphical analyses were utilized to examine assumptions. The Shapiro-Wilk test was

selected to examine univariate normality. This test was chosen for its greater capability to detect non-normality of data (Stevens, 2002). Results of this test are presented in Table 2. Pre-treatment PSE for Discipline did not achieve the normality assumption, $W(43) = .93$, $p<.05$. Post-treatment PSE for Nurturance also failed to achieve normality, $W(43) = .87$, $p<.05$. Data for these variables were transformed using the logarithm function on SPSS in order to understand the effect of this non-normality. Following this transformation, analyses were conducted using the transformed data. Outcomes of the MANOVA using transformed data were highly consistent with results using the original (nontransformed) data. Given this consistency of statistical outcomes, the original values were utilized for these analyses to best represent the data.

Table 2
Tests of Univariate Normality

	Shapiro-Wilk test					
	Pre-treatment			Post-treatment		
Variable	Statistic	*df*	Sig	Statistic	*df*	Sig
Parenting Stress (PST)	.97	43	.42	.97	43	.36
Parenting Self-Efficacy (PSE)	.97	43	.31	.97	43	.49
PSE Nurturance	.97	43	.36	.87	43	.00
PSE Discipline	.93	43	.01	.97	43	.23
Hyperactivity PRS	.96	43	.19	.95	43	.05
Attention Problems PRS	.97	43	.28	.97	43	.42

Multivariate normality was assessed by examining Mahalanobis Distances. After comparing the computed Mahalanobis Distances to a critical value of 13.82, no multivariate outliers were identified, and therefore multivariate normality of parenting stress and parenting self-efficacy was assumed. Linearity of data was assessed by

examining scatterplots of the dependent variables. The plots suggested no obvious sign of potential non-linearity. Thus, the relationships between the dependent variables of PST and PSE were assumed to be linear.

Next, the data were evaluated for extreme values that might interfere with the analyses. An examination of the boxplot for each variable suggested the possibility of outliers for multiple variables. The data were checked to ensure these scores were not errors during data entry and outlier analyses were conducted. The results of outlier analyses indicated that none of the standardized values were greater than 3.29 standard deviations above the mean. Thus, data transformation or removal of outliers was not indicated, and data for these cases were included in the analyses (Tabachnick & Fidell, 2001). Next, the assumption of sphericity, or equality of the covariance matrices between levels of the independent variable, was evaluated. Since the independent variable ("time") consisted of two levels, there was only one covariance measured. Therefore, sphericity was assumed. Pearson product-moment correlations were also examined to determine the presence of multicollinearity, which is typically defined by a correlation of .80 or higher, a Tolerance score of .01 or less, or a Variance Inflation Factor score of 10 or greater (Meyers et al., 2006). None of the variables included in the analyses were highly correlated, indicating that multicollinearity was not a concern (Heath & Curtis, 2011).

Chapter III

Results

Participant Characteristics

The first aim of this study was to examine specific family characteristics for this treatment sample. Descriptive analyses were conducted in order to understand how certain parent and child characteristics may have related to the outcomes for those seeking behavioral parent training (BPT) within an outpatient, pediatric hospital setting. Information on caregiver demographics is presented in Table 3, and characteristics of child participants are presented in Table 4.

Participants included 43 female caregivers and 35 male caregivers (57% and 43%, respectively), most of whom were married (84%). Participants represented a relatively diverse background with regard to age, ethnicity, and family size. There was a broad range in caregiver ages, ranging from 26 to over 65. The majority of parents were between 36 and 45 years old (49%). Most self-identified as non-white (57%) distributed across 4 racial categories, but the most prominent single group of parents was white (43%). Families predominantly included multiple children, with 74% reporting at least 2 or more children living within the home. Parents were also diverse with regard to educational attainment with 21% receiving a high school diploma or less, 19% receiving specialized trade-related training, and 60% completing college or an advanced degree. Parents also reported generally high annual incomes with 56% earning over $80,000 per year. Thus this clinical sample was diverse, while representing a relatively high socioeconomic status. Finally, nearly one quarter of parents endorsed having their own formally diagnosed mental health concerns.

Table 3
Caregiver Descriptives (n=43)

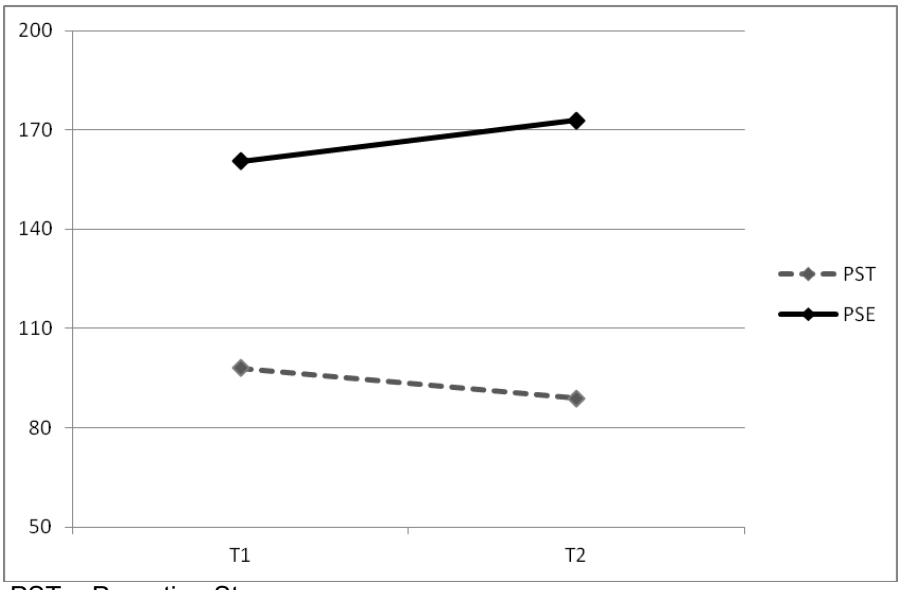
Caregiver Characteristics	*n*	%
Caregiver Role		
Biological Parent	35	81.39
Adoptive Parent	6	13.95
Custodial Grandparent	1	2.32
Not Reported	1	2.32
Marital Status		
Married	36	83.72
Divorced/Separated	2	4.65
Never Married	4	9.30
Other	1	2.32
Caregiver Ethnicity		
Asian	2	4.65
Black/African American	7	16.28
Caucasian	19	44.18
Latino/Hispanic	10	23.25
Biracial	5	11.63
Caregiver Age		
25-35	16	37.21
36-45	21	48.83
46-55	4	9.30
Not Reported	2	4.65
Highest Education Completed		
High School Diploma or less	9	20.93
Specialized Trade/Technical Degree	8	18.60
Undergraduate Degree	16	37.21
Advanced Degree	10	23.25
Annual Household Income		
Less than $40K	6	13.95
$41K - $80K	9	20.92
Over $80K	24	55.81
Not Reported	4	9.30
Caregiver Mental Health History		
Current or Past Mental Health Diagnosis	10	23.25
No Mental Health Diagnosis	31	72.09
Not Reported	2	4.65
Number of Children in Family		
1 child	10	23.25
2 children	23	53.49
3 children	8	18.60
Not Reported	2	4.65

The majority of children who participated in the BPT program were male (77%) and ranged in age from seven to twelve years old. Over half (51%) of child participants reportedly received some form of mental health services in the past, with 23% previously receiving some form of psychotherapy. Furthermore, 13% of these children had received multiple types of mental health services. Psychotropic medications were prescribed for the majority of child participants (74%) and stimulants were most common (58%). With regard to education, the vast majority of children were placed in mainstream education classrooms (80%). Less than one-third (28%) of children were currently receiving educational support through an Individualized Education Plan (IEP) or 504 Plan accommodations. Only one child (2%) was placed in a self-contained special education setting.

Table 4
Child Descriptives (n=43)

Child Characteristics	*n*	%
Child Gender		
Male	34	79.07
Female	9	20.93
Child Age		
7 years	17	39.53
8 years	14	32.55
9 years	9	20.93
10 years	2	4.65
12 years	1	2.32
Current Medications		
None	11	25.58
Stimulant	20	46.51
Atypical ADHD Medications	4	9.30
Stimulant + other medications	5	11.63
Other	3	6.97
Current Educational Placement		
Regular Education	34	79.07
Mainstream Classroom with Resource Support	8	18.60
Mostly Separate Special Education Classes	1	2.32
IEP/504 Accommodations		
Yes	12	27.91
No	27	62.79
Not Reported	4	9.30
Retention		
History of Grade Retention	2	4.65
Never Retained	41	95.34
Type of Previous Mental Health Treatment		
Psychotherapy	4	9.29
Diagnostic Evaluation	4	9.30
Psychiatric Medication	5	11.63
Other	2	4.65
Multiple Services Received	6	13.95
No Services	21	48.84
Not Reported	1	2.32

The second aim of this study was to examine possible changes in PST and PSE in response to parents' participation in behavioral parent training (BPT). It was hypothesized that parents' functioning would significantly improve in response to participation in their children's BPT (as defined by higher PSE and lower PST). A repeated measures multivariate analysis of variance (MANOVA) was conducted to evaluate changes in parent functioning from baseline to post-treatment. Change was evaluated for two primary dependent variables: parenting stress (PST) and parenting self-efficacy (PSE). A significant interaction was observed between these two variables over time (PST x PSE x Time), F (2, 41) = 15.89, p<.001; Wilks' λ = .56, partial η^2 = 0.44 (see Figure 1.)



PST = Parenting Stress
PSE= Parenting Self-Efficacy
Note: The length of time between T1 and T2 was 10 weeks participation in BPT.

Figure 1. Change in Parents' PST and PSE Over Time

When these dependent variables were considered separately, main effects suggested statistically significant changes from baseline to post-treatment for both PST, $F(1) = 12.74$, $p<.001$, $d = 0.54$; and PSE, $F(1) = 28.65$, $p<.001$, $d = 0.76$. The direction of change observed in the mean for PST indicated a significant decrease in stress related to treatment participation ($M_{T1} = 97.97$, $SD_{T1} = 15.18$; $M_{T2} = 88.88$, $SD_{T2} = 18.51$). Similarly, the direction of change in the mean for PSE evidenced an increase in self-efficacy in conjunction with BPT ($M_{T1} = 160.6$, $SD_{T1} = 14.34$; $M_{T2} = 172.8$, $SD_{T2} = 17.66$; see Table 5). These results supported Hypothesis #1 and confirmed significant improvements for parents in response to their participation in their children's treatment.

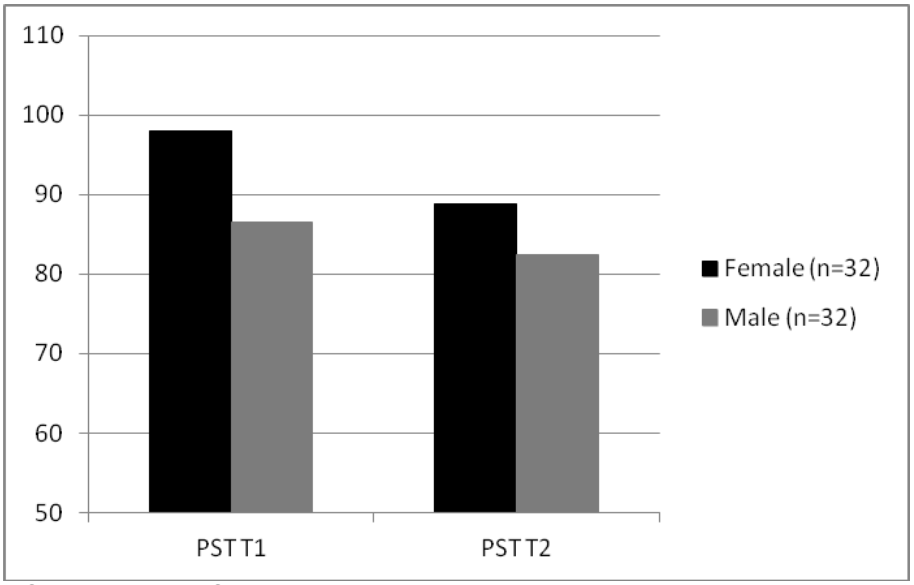
Table 5
Sample Descriptives (n = 43)

	Pre-treatment (T1)			Post-treatment (T2)			
Variable	*M*	*SD*	Range	*M*	*SD*	Range	Difference Score (Cohen's *d*)
PST[a]	97.97	15.18	72-136	88.88	18.51	38-121	.54
PSE[b]	160.60	14.34	131-205	172.81	17.66	132-204	.76
Child Hyperactivity Symptoms[c]	77.56	8.61	64-101	66.21	11.96	43-92	1.09
Child Attention Symptoms[c]	70.47	5.57	55-82	65.02	7.84	46-82	.80

[a] measured using the Parenting Stress Index – Short Form (Abidin, 1995)
[b] measured using the Self-Efficacy for Parenting Tasks Index (Coleman & Karraker, 2000)
[c] measured using the Behavior Assessment System for Children – Second Edition, Parent Rating Scale (Reynolds & Kamphaus, 2004)

Even though mothers' reports were used for primary data for these analyses, there was a sizable number of fathers who participated in the study (n = 35, 43% of all parent participants). Therefore, the same MANOVA model was tested to evaluate fathers' BPT outcomes to see if their outcomes differed from mothers'. No significant interaction

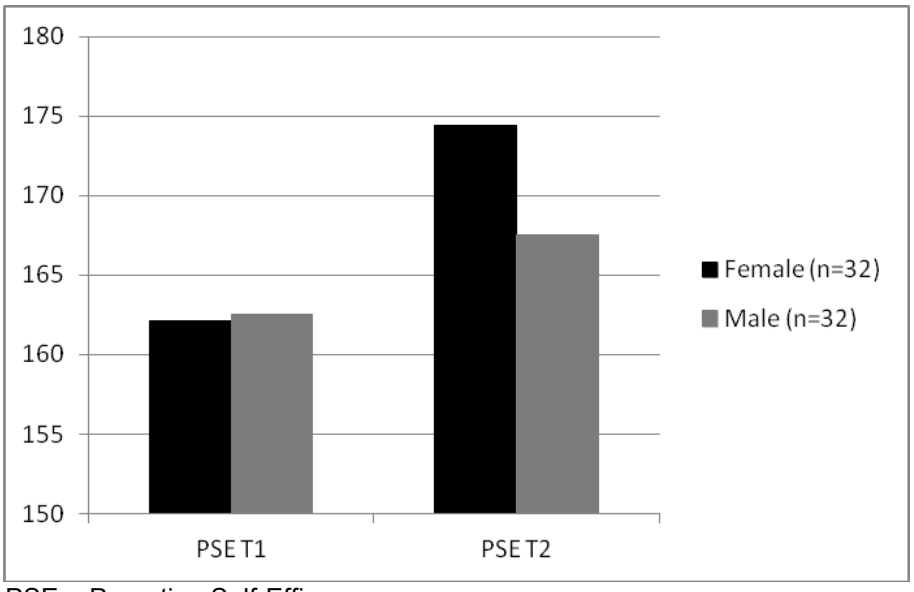
effect was observed between PST and PSE over time, $F(2,30)=2.35$, $p = .113$; Wilks' $\lambda = .86$, partial $\eta^2 = 0.14$. Additionally, no significant differences were observed for male caregivers within the independent domains of PST and PSE between pre- and post-treatment. Based on these results, post-hoc analyses were conducted separately for mothers and fathers in order to further examine differences based upon parent gender. Independent-samples t-tests were conducted to compare mothers' and fathers' ratings of PST and PSE at both baseline and post-treatment. There was a statistically significant difference in baseline PST between mothers and fathers, $t(31) = 3.93$, $p < .001$, $d = 0.66$, with mothers ($M = 99.13$, $SD = 15.87$) reporting greater parenting stress than fathers ($M = 86.60$, $SD = 21.79$). However, post-treatment analyses of PST revealed no significant differences between mothers ($M = 88.13$, $SD = 19.38$) and fathers ($M = 82.59$, $SD = 20.09$), $t(34) = 1.81$, $p > .05$, $d = 0.28$. (see Figure 2.)



PST = Parenting Stress
Note: The length of time between T1 and T2 was 10 weeks participation in BPT.

Figure 2. Mean PST Ratings at Baseline and Post-Treatment by Gender

Analysis of PSE revealed no statistically significant differences between mothers and fathers at either baseline or post-treatment endpoints (see Figure 3). Thus, mothers and fathers reported similar levels of PSE at baseline ($M_{Mothers}$ = 162.09, *SD* = 15.46; $M_{Fathers}$ = 162.50, *SD* = 19.67), *d* = .02. Slightly greater variability between female and male caregivers was observed for post-treatment PSE ($M_{Mothers}$ = 174.38, *SD* = 18.67; $M_{Fathers}$ = 167.56, *SD* = 18.94), *d* = .36; however, these differences did not represent a statistically significant difference. Consequently, a separate model was not carried out to evaluate these changes in PSE for fathers.



PSE = Parenting Self-Efficacy
Note: The length of time between T1 and T2 was 10 weeks participation in BPT.

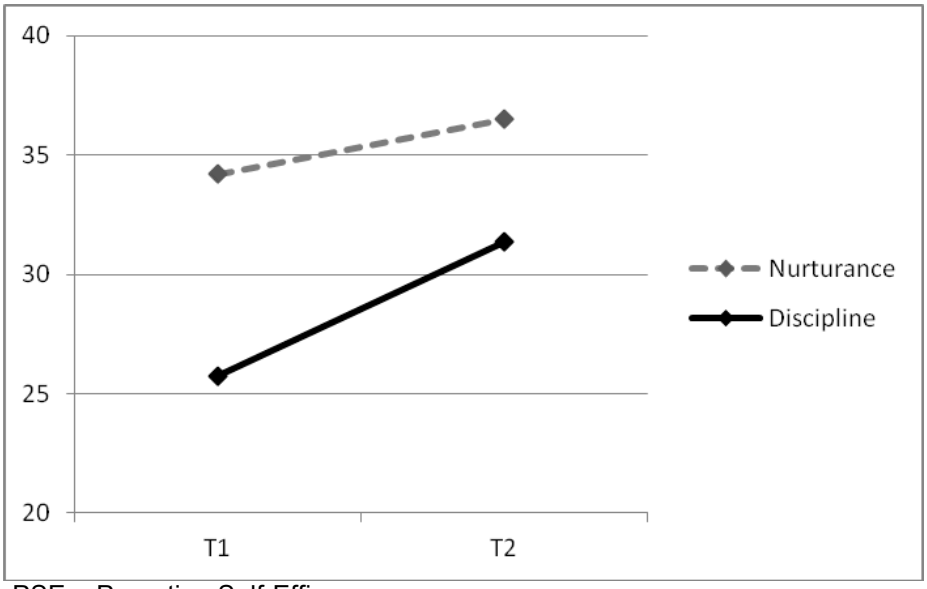
Figure 3. Mean PSE Ratings at Baseline and Post-Treatment by Gender

Regarding Hypotheses #2 and #3, it was expected that parents would report differences in parenting self-efficacy within the domains of nurturance and discipline at baseline, but would not report differences at post-treatment, respectively. At baseline, there was a statistically significant difference $t(42) = 7.78$, $p<.001$, $d = 1.43$, indicating that parents did not feel equally competent with parenting tasks requiring nurturance compared to those emphasizing disciplinary tasks. At baseline, parents reported greater competence for nurturance ($M_{T1} = 34.19$, $SD_{T1} = 4.76$) compared to discipline ($M_{T1} = 25.74$, $SD_{T1} = 6.82$). These statistically significant differences were maintained at post-treatment, $t(42) = 4.81$, $p<.001$, $d = .81$. The direction of change from baseline to post-treatment indicated that mean ratings of self-efficacy continued to be significantly higher for nurturance ($M_{T2} = 36.49$, $SD_{T2} = 5.20$) compared to discipline tasks ($M_{T2} = 31.35$, $SD_{T2} = 7.33$). These data supported Hypothesis 2, but failed to support Hypothesis 3 since parents' self-efficacy continued to differ significantly between these two domains at post-treatment.

Though statistical differences between nurturance and discipline were maintained at post-treatment, self-efficacy for these domains was more balanced compared to pre-treatment reports. Additionally, means for both PSE variables increased from pre-treatment to post-treatment, indicating improved self efficacy overall. Thus, it was concluded that it may be more informative to examine the magnitude of change for these variables over time rather than looking at outcomes at two discrete time points.

Since this study intended to measure outcomes in response to treatment over time, a multivariate model was utilized to further examine changes in PSE for nurturance and

discipline over time. Accordingly, a repeated-measures MANOVA was conducted to examine changes in these variables over time. As in the full MANOVA model for PST and PSE, this model utilized time as the independent variable and baseline and post-treatment reports of nurturance and discipline as dependent variables. A significant interaction was observed for time, $F(2, 41) = 15.87$, $p<.001$; Wilks' $\lambda = .56$, partial $\eta^2 = 0.44$. Results of univariate tests indicated that both of these components of PSE significant increased at post-treatment, Nurturance $F(1) = 11.83$, $p<.001$, $d = 0.46$; Discipline $F(1) = 25.78$, $p<.001$, $d = 0.79$ (see Figure 4).



PSE = Parenting Self-Efficacy
Note: The length of time between T1 and T2 was 10 weeks participation in BPT.

Figure 4. Changes in Parents' PSE for Nurturance and Discipline

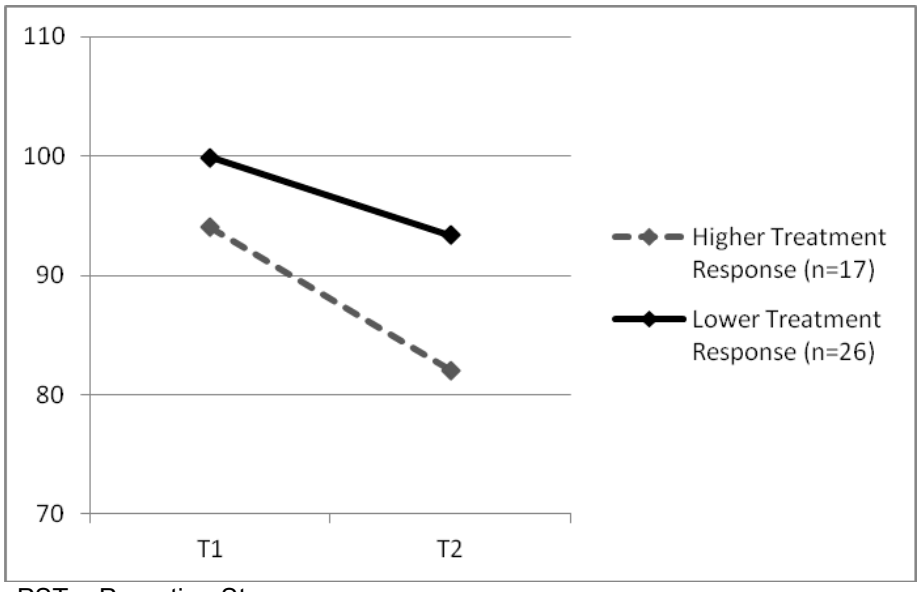
The third aim of this study was to examine the relationship between child treatment response and parent BPT outcomes. Child treatment responses were organized in two different ways, (1) based upon the magnitude of change, and (2) based upon the

clinical meaningfulness of behavior change. This categorization resulted in unequal group sizes, potentially limiting the reliability of inferences to be drawn from parametric tests. Therefore, a nonparametric alternative was first employed followed by the parametric tests originally planned. However, the results of the Mann-Whitney U tests were observed to be no different than those achieved using independent samples t-tests. Therefore the results of parametric analyses are presented.

For the fourth hypothesis, it was predicted that parents of "higher treatment responders" would demonstrate significantly greater improvements in PST and PSE than those of "lower treatment responders." Higher treatment responders were defined as children whose ADHD symptoms improved with one or more standard deviations of change. Lower treatment responders were children whose ADHD symptoms improved with less than one standard deviation.

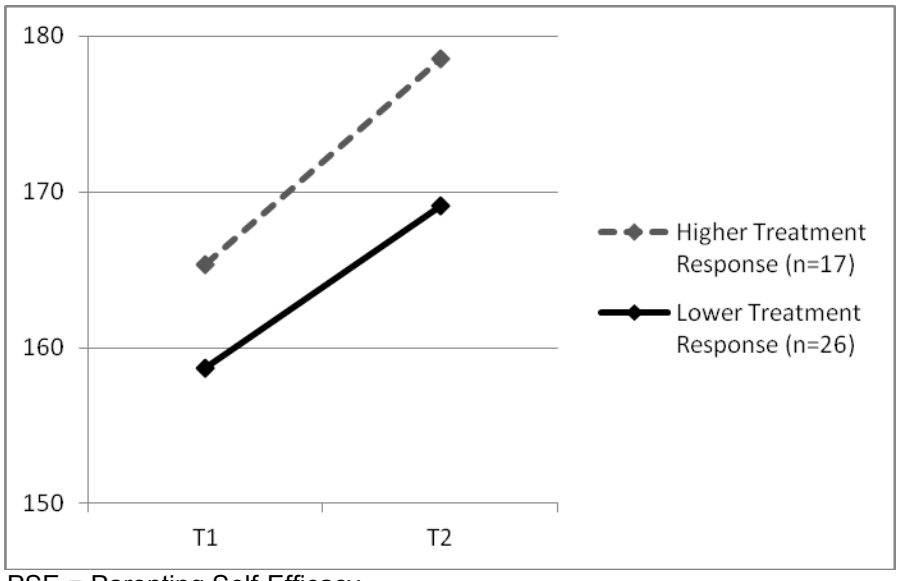
Independent-samples t-tests were conducted to evaluate whether parents of higher and lower treatment responders differed with regard to PST and PSE at post-treatment. Parents' BASC-2 ratings of Attention Problems and Hyperactive/Impulsive symptoms were averaged to create a composite ADHD symptom index for measuring both baseline and post-treatment symptom severity. Finally, a difference score was then calculated to determine the change in ADHD symptoms from baseline to post-treatment. No significant differences between parents of "higher treatment responders" and "lower treatment responders" emerged for PST, $t(41) = 2.03$, $p=.05$, $d = 0.64$ (see Figure 5). Similarly, no differences were observed between parents of high and low treatment responders on PSE, $t(41)= -1.56$, $p=.09$, $d = 0.57$ (see Figure 6). Despite differences in

the magnitude of child symptom changes, PST and PSE improved for both groups of parents. Consequently, these data did not support Hypothesis 4.



PST = Parenting Stress
Higher Treatment Response = ≥ 1sd change in child ADHD symptoms
Lower Treatment Response = < 1sd change in child ADHD symptoms
Note: The length of time between T1 and T2 was 10 weeks participation in BPT.

Figure 5. Differences in PST Based on Magnitude of Child Treatment Response



PSE = Parenting Self-Efficacy
Higher Treatment Response = ≥ 1sd change in child ADHD symptoms
Lower Treatment Response = < 1sd change in child ADHD symptoms

Note: The length of time between T1 and T2 was 10 weeks participation in BPT.

Figure 6. Differences in PSE Based on Magnitude of Child Treatment Response

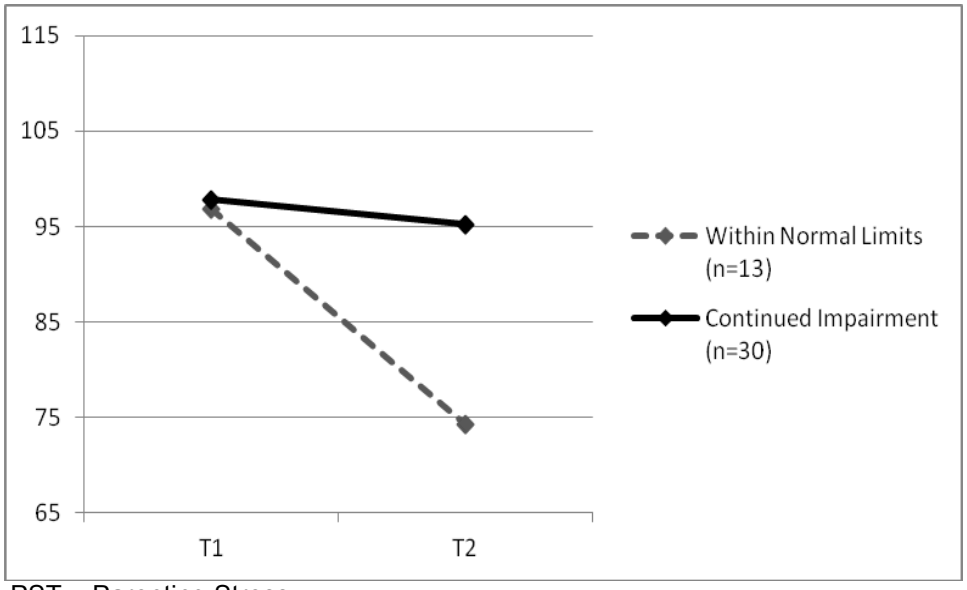
Further analyses were conducted to address Hypothesis #5, which predicted improved PST and PSE for parents of children whose ADHD symptoms evidenced changes to within the range of normal functioning. "Within Normal Limits" change was defined as post-treatment child ADHD symptom severity that was within the normal/non-ADHD symptom range (BASC-2 T-score < 60; Reynolds & Kamphaus, 1994). "Continued Impairment" change was defined by continued ADHD symptoms showing any level of impairment (BASC-2 T-score ≥ 60). It was predicted that parents of children with more clinically meaningful changes would demonstrate greater PST and PSE improvements compared to their counterparts with continued impairments. Descriptive statistics for each category of child treatment response are provided in Table 5. While the two groups that emerged differed in size, examination of treatment outcomes using the BASC-2 descriptors [e.g., "Within Normal Limits" (n = 13), "At Risk" (n = 17), and "Clinically Significant" (n = 13)] resulted in roughly equal distribution across groups.

Table 5.
Descriptive Statistics for Parenting Outcomes by Child Treatment Response

	Within Normal Limits (n = 13)		Continued Impairment (n = 30)		Difference Score
Time 2 Parent Characteristics	*M*	*(SD)*	*M*	*(SD)*	Cohen's *d*
Parenting Stress	74.31	(15.23)	95.49	(16.40)	*-1.34
Parenting Self-Efficacy	184.77	(13.58)	167.42	(17.18)	*1.12

Within Normal Limits = T<60; Continued Impairment = T ≥60
Note: The length of time between T1 and T2 was represented by 10 weeks of participation in BPT.

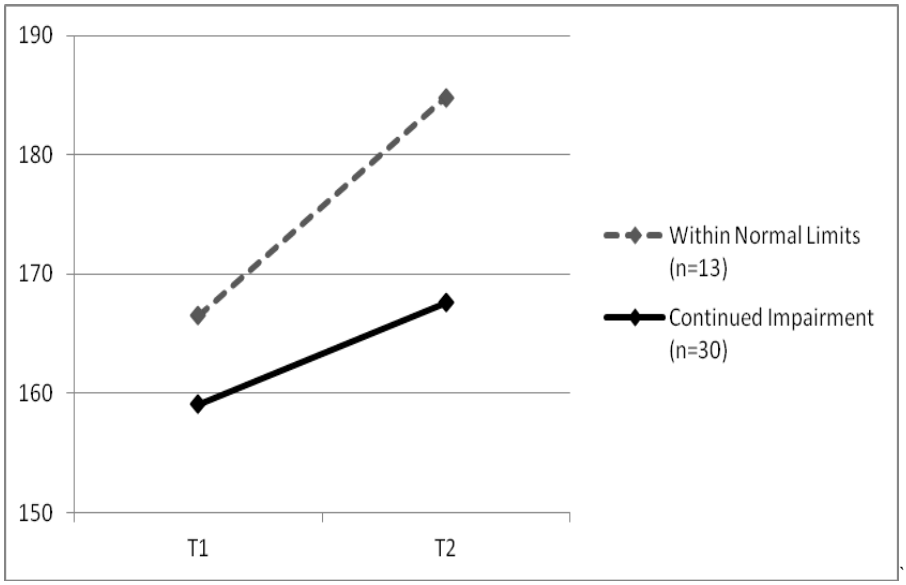
An independent-samples t-test was used to examine differences between groups of parents of "Within Normal Limits" vs. "Continued Impairment" treatment responders. Statistically significant differences in PST were noted between these two groups at post-treatment, $t(41) = -3.95$, $p<.001$, $d = 1.34$. Parents of children whose ADHD symptoms improved to within the normal range reported significantly less stress following BPT compared to those of children with continued impairment ($M_{WNL} = 74.31$, $SD = 15.23$; $M_{NWNL} = 95.2$, $SD = 16.23$).



PST = Parenting Stress
Within Normal Limits = BASC-2 Post-Treatment ADHD Composite T<60
Continued Impairment = BASC-2 Post-Treatment ADHD Composite T ≥60
Note: The length of time between T1 and T2 was 10 weeks participation in BPT.

Figure 7. PST Outcomes Based on Categorical Child Treatment Response

Significant differences in post-treatment PSE were also noted, $t(41) = 3.23$, $p<.001$, $d = 1.12$. Parents of children whose changes at post-treatment symptoms were within the normal range also reported much higher PSE at than those of children with continued impairment ($M_{WNL} = 184.77$, $SD = 13.58$; $M_{NWNL} = 167.63$, $SD = 16.84$).



PSE = Parenting Self-Efficacy
Within Normal Limits = BASC-2 Post-Treatment ADHD Composite T<60
Continued Impairment = BASC-2 Post-Treatment ADHD Composite T ≥60
Note: The length of time between T1 and T2 was 10 weeks participation in BPT.

Figure 8. PSE Outcomes Based on Categorical Child Treatment Response

Chapter IV

Discussion

This study examined parenting outcomes associated with behavioral parent training (BPT) participation for children with ADHD. Parents are targeted as the agents of change in BPT, and yet relatively little has been determined about possible parent benefits related to their BPT participation. The current study examined parent outcomes associated with participation in this type of child treatment. In addition, this study compared how parenting outcomes may vary based on different types of child treatment responses. Five research hypotheses were investigated to address these questions.

Specific Aim #1

The first aim of this study was to gain a greater understanding of characteristics among families who present for BPT within an outpatient, pediatric hospital setting. Most families in this study were of relatively high socioeconomic status, diverse with regard to race and ethnicity, and lived in multiple child households. Approximately one-fourth of the adult caregivers endorsed having a current or prior mental health diagnosis. These sample characteristics may be related to parents' experience of stress in the caregiving role. For example, research has demonstrated that maternal psychopathology predicts elevated parenting stress (Anastopoulos et al., 1992; Sonuga-Barke et al., 2002). Number of children in the home may also be related to parenting stress, as parents with only one child do not have to manage the needs of multiple children and conflict among siblings. This is particularly relevant given possible difficulties in sibling relationships among children with ADHD (Mikami & Pfiffner, 2008). Having multiple children, when

at least one requires a high level of behavior management, may also contribute to greater parenting stress.

The majority of child participants were male, which is consistent with the higher incidence of ADHD diagnosed for boys compared to girls (Barkley, 2006). Most child participants were placed within regular education classrooms, and most did not have an Individualized Education Plan (IEP) or 504 Plan accommodations at school. Seventy-four percent of children who participated in BPT were taking psychotropic medication to manage ADHD symptoms at the time they presented for intervention. Further, over half of the children who participated in the BPT intervention had previously received various other mental health services, including individual psychotherapy, family therapy, school counseling, or a combination of multiple mental health services. Given that this study's inclusion criteria required significant ADHD symptom impairment, it would appear that prior therapy and medication treatments for children in this clinical sample were insufficient for managing their ADHD symptoms. This clinical sample may therefore represent a group of children considered to be "hard to treat" or "minimally responsive" to prior intervention. The lack of school-based supports and the treatment-resistant characteristics for these children with ADHD may have ultimately contributed to the high degree of parenting stress reported at baseline.

Parents reported a high level of stress prior to participation in BPT, including perceptions that their children were particularly difficult and that parent-child interactions had become strained. Most of these parents had already sought mental health services for their children, and these prior efforts were not adequate for managing the ADHD symptoms. These parents may have experienced a greater amount of parenting stress

than parents of children who had not received previous services. Further, having a child with ADHD who requires a high degree of support and management from parents may contribute to parenting stress. Ongoing challenging child behaviors may also prompt parents to assume more predominantly corrective roles, thus negatively affecting the quality of their relationship with their children. This could ultimately add to parents' stress due to their lack of fulfillment or satisfaction with their typical parenting roles.

These sample characteristics may also be indicative of parents whose perceptions of self-efficacy are high enough to overcome the typical barriers that exist when accessing BPT services within a hospital-based setting. For example, these services were provided during afternoon business hours within a pediatric hospital residing within a busy, urban medical center. Accessing these services often required parents to leave work early, request early school dismissal for their child, overcome traffic problems, pay for parking, and then navigate a large hospital campus. Parents who reported low parenting self-efficacy may not have felt confident in their ability to address these logistical challenges associated with attending BPT in a hospital setting. Low parenting self-efficacy may in fact serve as a barrier to treatment, as parents who report low self-efficacy may not attempt or persist in the tasks of accessing care within this setting.

Specific Aim #2

The second aim of this study examined the effects of participation in BPT upon parenting outcomes. Parents' functioning significantly improved following their participation in BPT, particularly related to their perceptions of stress and self-efficacy. An interaction was observed, suggesting that these variables represent a combined parenting effect that is associated with BPT. While main effects were also significant for

both PSE and PST, the interaction illustrates a degree of overlap in these two constructs that is not completely explained by the individual outcomes for each variable. Forty-four percent of the variance in parenting functioning (PSE x PST) was associated with participation in the BPT intervention. Parenting stress (PST) decreased considerably from baseline to post-treatment, with 23% of the variance in PST associated with the intervention. This suggests that participation in BPT alone was associated with a moderate amount of parents' stress reduction. Parents also reported a significant increase in their sense of parenting self-efficacy (PSE) following their 10-week BPT participation. This effect was also observed to be moderate, with 41% of the variance associated with participation in BPT. These outcomes are consistent with previous findings that participation in behavioral parent training is associated with improvements in parenting self-efficacy (Anastopoulos et al., 1993; Hoath & Sanders et al., 2002).

Parents reported a statistically significant and clinically meaningful increase in overall PSE from baseline to post-treatment. This suggests that, regardless of how children respond to the BPT intervention, parents experience benefits related to their own self-efficacy for carrying out parenting tasks. Since self-efficacy is associated with task initiation and persistence, parents who participate in BPT may experience improvements in their motivation to persist in difficult parenting tasks.

While improvements in parenting self-efficacy were primary treatment targets for BPT, improvements in parenting stress were not the result of core treatment objectives. This is particularly notable, since BPT strictly aimed to increase child behavior management skills without providing any targeted intervention for stress management or personal coping. Still, participation in BPT resulted in a clinically meaningful change in

parents' level of distress. Prior research has demonstrated a strong association between the presence of child externalizing behaviors and parenting stress (Podolski & Nigg, 2001). Preliminary results from this sample demonstrated clinically significant improvements in child ADHD symptoms (Curtis, 2010). Thus, parenting stress improved along with an improvement in child ADHD symptoms. The direction of change within this relationship is unclear. It may be that child ADHD symptoms decrease due to improved parent coping and management of stress. Alternately, the removal of a stressor (child disruptive behaviors) may be responsible for the reduction in PST. The improvement in PST likely results from some combination of these factors.

Parents reported significant differences in their parenting self-efficacy for tasks related to providing nurturance and discipline, both at baseline and post-treatment. At both time points, parents reported significantly greater self-efficacy for nurturance than for discipline. Significant differences between these two domains were not expected at post-treatment, since the literature reports that mothers of children with ADHD may rely more on discipline than nurturance and warmth (Danforth, Barkley, & Stokes, 1991; Finzi-Dottan, Manor, & Tyano, 2006; Gau, 2007). This finding may highlight parent tendencies to rely upon a dominant parenting strategy for the majority of behavior management demands rather than a balanced repertoire of skills. An example of this would be viewing all child difficulties as problems arising from a lack of positive attention or nurturance instead of disciplinary issues.

Further examination of PSE data revealed the greatest treatment-related improvement for discipline tasks. Though continued statistical differences were observed at post-treatment between nurturance and discipline, clinically meaningful improvements

were ultimately achieved across both domains. Furthermore, the differences observed between nurturance and discipline at post-treatment, while still significant, were much smaller in magnitude than the differences reported between these two domains at baseline. Consequently, these data illustrated improvements for both domains of self-efficacy following parent participation in BPT, but with nurturance and promotion of positive interactions emerging as a dominant style for parents. Improvements across both domains may also reflect the two main treatment objectives for BPT: to improve skills for effective discipline while increasing positive parent-child interactions.

Data from mothers were used for the main analyses of this study given their participation in BPT was greater than fathers'. While relatively large changes were observed for mothers, no significant pre-post changes in PST and PSE were identified for fathers. This lack of change in PST and PSE among fathers may have resulted from some fathers completing pre- and post-treatment measures without attending BPT as consistently as mothers or perhaps not attending BPT at all. Alternatively, fathers may not have served in primary caregiving roles as frequently within the home, deferring to the mothers as primary for these roles. Thus, fathers may have also deferred the primary responsibilities for implementing the parenting skills learned within BPT.

Fathers reported lower stress and higher self-efficacy than mothers before participating in treatment. Following completion of BPT, mothers reported higher PST and PSE than fathers, though these differences were not statistically significant. Fathers also reported levels of parenting stress at baseline that were at the lower end of the "high parenting stress" range. Though fathers' stress decreased to the normal range following BPT, their degree of change was more constricted than the larger degree of changes

observed for mothers. Conversely, mothers reported much higher stress at baseline, but they also achieved a much larger reduction in parenting stress at treatment outcome. Nonetheless, their reported stress remained within the "high stress" range at post-treatment. Thus, mothers experienced greater parenting stress overall than fathers even upon completion of BPT and greater change in stress at BPT outcome. These results may suggest differences in role restrictions experienced by mothers and fathers, or the limitations parenting roles place on freedom in other life roles (Abidin, 1995). Specifically, these results may be indicative of mothers' role restrictions to primary caregiving tasks. Though beyond the scope of this study, fathers may have experienced less role restriction, with primary affiliations in work and professional roles.

Specific Aim #3

The final part of this study examined differential parenting outcomes based upon child treatment responses. "Higher Treatment Response" (HTR) was defined two different ways. The first way HTR was defined was based upon the magnitude of child ADHD symptom change (> 1 standard deviation change in symptom severity). The second depicted HTR by the clinical meaningfulness of child ADHD symptom changes (BASC-2 T-scores < 60).

Even when the magnitude of child ADHD symptom change was very high, no significant differences in parenting outcomes were observed. At post-treatment, parents of children who demonstrated greater magnitude of improvement did no better with regard to their parenting stress or self-efficacy than parents of children who experienced less reduction in ADHD symptoms. An example of this would be the instance of a child responding to treatment with a two standard deviation change in symptoms (e.g., Time 1

ADHD Composite T-score = 90, Time 2 ADHD Composite T-score = 70), yet symptoms remaining within a clinically significant level of impairment. In instances such as this, the magnitude of change may have been deemed less pertinent to parenting outcomes than the continued impairment or clinical significance of child symptom change. As a result, parents of children who demonstrated large reductions in ADHD symptoms felt equally efficacious and stressed as parents whose children did not respond with as much symptom change.

While the impact of the magnitude of child symptom change was unremarkable, the clinical significance of ADHD symptom changes did result in meaningful differences for parents. Parents of children whose symptoms abated to a level of severity deemed "Within Normal Limits" reported significantly less stress and greater parenting self-efficacy than those of children with continued impairments. Thus, parents of children whose symptoms were within the normal range following BPT demonstrated greater improvements in parent functioning.

These findings are especially notable given the focus and structure of the BPT intervention. BPT interventions as a group focus on parenting self-efficacy, but do not necessarily focus on coping with parenting-related stress. Parents were not presented with strategies to cope with stressors or frustration that may arise when caring for a child who exhibits difficult behavior. However, parents of children who responded most favorably to the intervention demonstrated a marked reduction in parenting stress compared to those of children who responded less favorably. It would seem that the reduction in PST may be due to removal of a stressor (child ADHD symptoms). This may

also suggest that the acquisition of effective behavior management skills also assists parents in managing stress related to child ADHD symptoms.

For those parents of children whose ADHD symptoms improved to "Within Normal Limits," the stressor of difficult child behavior was greatly reduced. In fact, these children achieved a level improvement that resulted in behaviors comparable to those of peers without diagnoses of ADHD. These clinically meaningful child improvements may have created a context for parenting experiences more similar to parents of children without ADHD. Likewise, parenting self-efficacy also increased as parents learned more effective ways to manage their children's difficult behaviors. As previously suggested by the results of the full model (PSE x PST x Time), the causal direction of the relationship between child treatment response and parent treatment response is unclear. Parenting stress may decrease as parents learn new behavior management skills, which may further result in more effective implementation of strategies to better reduce child symptoms. Reduction of child symptoms may also prompt parents' improvements by alleviating significant parenting challenges. Additional study is needed to better understand the causal elements of these relationships.

Limitations

Four major limitations were noted for this study: lack of a control group, use of parent reports of child behavior, possible selection bias, and limited assessment of parenting variables. The absence of a control group prevented changes in parent functioning to be directly attributed to their participation in BPT. It is possible that other factors not considered in this study may have contributed to parenting outcomes such as time or repeated exposure to the parenting measures. However, changes in parenting

stress and self-efficacy were not limited to only a few individual participants; rather, the improvements in parent functioning were observed to be a group effect with moderately high levels of change. Thus, these improvements were not likely related to potential confounding variables. Future investigation utilizing a randomized controlled trial (RCT) would control for such threats to internal validity.

Parent ratings of child behavior were utilized in this study as a measure of child symptom improvement. Parent ratings of child behaviors may have somehow been biased by their personal experiences of parenting self efficacy and parenting stress. The decision to use parent data was based on multiple considerations. BPT objectives focused primarily upon improving child management in the home setting, with relatively less emphasis placed on indirect intervention in the school setting. Further, studies have demonstrated that parent and teacher reports of child outcomes are consistent (Biederman, Faraone, Monuteaux, & Grossbard, 2004), and parent ratings of child ADHD symptoms were consistent with the teacher data that were also collected for this sample (Curtis, Chapman, Dempsey & Mire, in press). However, use of teacher data in this study, while consistent with parent ratings of child behavior, would have limited the sample size due to missing teacher data (i.e., summer and winter vacations).

Another possible limitation was a potential selection bias. Participants were seeking BPT at a large outpatient hospital setting with many significant barriers to access (e.g. treatment waitlists, referral requirements, traffic, parking costs, etc.). The process of seeking services in this setting was complex, time-intensive, and not necessarily reflecting the typical, community-based experience for families seeking care for their child ADHD. Therefore, this sample may represent children who had been previously

minimal treatment responders and/or parents with greater socioeconomic resources. Specifically, the sample may consist of caregivers who have persisted in seeking treatment because they are experiencing a high degree of distress. Additionally, other characteristics of the participants may have influenced the outcomes of the analyses. The majority of the sample identified themselves as high socioeconomic status, regarding both income and education. Thus, parent experience and ability to implement the skills presented in BPT may have differed based on demographic factors.

A final consideration is that this study may have been limited by the types of measures used to assess parenting functioning. The Self-Efficacy for Parenting Tasks Index (SEPTI) includes assessment of domains that are a focus of BPT, including nurturance and discipline. However, this scale also evaluates PSE for other domains not directly related to the goals or tasks of BPT (i.e., achievement, health, recreation). Parents may or may not have demonstrated improvement in these additional domains. A potential solution would be to limit the evaluation of self-efficacy to the domains that are more directly linked to BPT. In addition, there were only two measures used to assess parent outcomes, parenting stress and parenting self-efficacy. Incorporating other measures of parent functioning such as parenting alliance, satisfaction/fulfillment, as well as reports of treatment adherence and fidelity would further contribute to our knowledge about parents' BPT outcomes.

Future Directions

It would be beneficial for future studies to employ an experimental design to compare these differences in BPT parenting outcomes to those observed for a control group. This would allow for greater generalizability of these conclusions, particularly

relevant to the extent to which changes may be directly attributed to participation in the BPT intervention. Also contributing to greater study generalizability of these results would be a broader range of participant recruitment. Parents in this sample reported relatively high socioeconomic status, which may have influenced observed outcomes. Thus, future examination of BPT parenting outcomes may be strengthened by recruiting community sample of participants reflecting greater socioeconomic diversity.

Future research may also compare the BPT intervention utilized in this study to one that incorporates treatment modules that directly address parenting stress and offer coping strategies and stress management techniques. This would improve our understanding of the potential additive effects of such treatment objectives and provide evidence about how these parent changes may also ultimately improve child outcomes.

Since the effectiveness of child treatments for ADHD is dependent upon whether or not parents implement the strategies learned in session, it will be important to consider factors that may promote or inhibit successful treatment adherence. Future research should examine the degree to which parents participate and attempt to implement behavioral strategies, as well as how levels of adherence may be associated with parenting outcomes. In addition to adherence, examination of treatment fidelity should also be considered. Assessing parents' understanding of intervention principles would be important to ensure that they are carrying out treatment strategies accurately in the spirit in which they are intended. For example, this study demonstrated significant outcome differences between mothers and fathers. Knowing more about fathers' level of adherence and treatment fidelity may explain these outcome differences more clearly. Examination of treatment adherence should also consider ways to identify barriers and

facilitators to treatment implementation. Potential barriers may include difficulty accessing care, transportation limitations, lack of support from others, and negative perceptions of the treatment.

Conclusions

This study has several important implications for the practice of psychology. The results illustrated significant benefits for parents who participated in behavioral parent training for their child's ADHD. Even though parents were not the focus of treatment, they reported positive changes for themselves in addition to the child benefits sought. Child treatment responses were associated with parenting outcomes. Specifically, parents of children who demonstrated the best symptom responses to treatment, as defined by clinical cutoff scores, reported significantly less stress and higher self-efficacy than parents of children who demonstrated continued impairment. Child functioning considered to be within the normal range suggest that behavioral difficulties related to inattention and hyperactivity/impulsivity were no longer any different from those of their same-age, same-gender peers. Thus, the behavior of children in this sample whose ADHD symptoms were reduced to a level "within normal limits" probably looked very similar to their peers without ADHD. This would suggest that parenting a child who demonstrated clinically meaningful reduction in ADHD symptoms may better reflect the experience of parenting a child who does not have a diagnosis of ADHD.

Conversely, the magnitude of child symptom change was not associated with differences in parents' treatment outcomes. This suggests that it is the quality/level of child symptom improvement rather than the magnitude of improvement that results in more positive parenting outcomes. Thus, professionals who provide BPT may consider

prioritizing clinically significant child symptom change over magnitude of change with regard to parenting outcomes. While much satisfaction may be gained by facilitating a large degree of progress regarding ADHD symptom management, such progress maybe insufficient grounds for terminating treatment. Therapy targets should thus aim to further reduce symptom impairments; prioritizing "quality" over "quantity" of change when it comes to setting treatment targets. This finding also supports flexibility with regard to the duration of treatment and the types of treatments provided.

The BPT intervention represented a time-limited approach to treatment with the use of a manualized10-week protocol. While approximately one-third of child participants demonstrated an optimal level of symptom improvement, most parents reported continued child symptom impairment following completion of BPT. Still another third of the sample achieved improvements below a high level of impairment to achieve a status of "at risk" symptoms (BASC-2 T-score 60-69; Reynolds & Kamphaus, 1994). Extending the duration of treatment beyond the existing 10 sessions may ultimately be beneficial for both child and parent participants. Since parents reported the greatest improvement in their own PST and PSE when child symptoms returned to the normal range, it may be beneficial to re-evaluate child and parent functioning in a booster session following the 10-week protocol and discuss ways to extend treatment gains even further. Thus, clinicians may need to use additional sessions to help with issues related to treatment adherence and implementation fidelity for behavioral strategies at home. Continued BPT support for these families may enable more to achieve child outcomes that are within the normal range.

IMPROVEMENTS IN PARENT FUNCTIONING

Parents reported clinically meaningful improvements in both parenting stress and self-efficacy, indicating that parents who participate in treatment for their child's ADHD-related problems experience meaningful changes in their own functioning. However, parents' improvements in self-efficacy represented a larger effect following treatment than parenting stress. This is likely due to the focus of BPT on improving parenting skills, and the lack of direct emphasis placed upon parent coping and stress management. Some BPT programs, such as Triple P (enhanced) include modules related to parent coping (Sanders, Markie-Dadds, Tully, & Bor, 2000). While the findings for such programs have been mixed, this addition to BPT has not yet been well studied or widely implemented. Thus, BPT interventions that include treatment modules focusing on stress management and coping may result in even greater improvements in parents' stress.

Clinicians may wish to develop modules that target specific dimensions of parent coping. Such modules may include identification of stressors and discussion of coping/relaxation response strategies to improve parents' awareness and management of their own reactions to daily stressors. Psychoeducation may also be provided related to the common experience of elevated stress among parents of children with chronic conditions as well as the negative effects of parenting stress. While many stressors may be related to caregiving demands, identifying other life stressors and setting goals for managing other life stressors can also assist in improving parenting interventions. Inclusion of these modules may augment the improvements in parenting stress over the course of BPT, further enhancing parents' outcomes during participation in a child-focused treatment. This type of module would allow BPT objectives to extend beyond

their direct focus on child behaviors to help parents improve their own functioning as well as the overall functioning of their families.

Parent participation and adherence in BPT is vital given the role of caregivers in this child-focused treatment. Parents are responsible for ensuring family attendance and for carrying out the specific behavioral strategies learned in BPT. Given the lack of significant improvement observed for fathers, as well as the lower percentage in this sample of male participants compared to females, it would be useful to explore ways to increase treatment participation and motivation for all caregivers. Treatment adherence is associated with more favorable outcomes in BPT (Reyno & McGrath, 2006). Thus, intervening to promote greater participation and adherence will likely have positive implications for parent and child treatment responses. Research supports the role of brief interventions in improving parents' motivation, attendance, and adherence to treatment (Nock & Kazdin, 2005). The addition of such an intervention may promote greater participation and motivation among caregivers who are seeking treatment for their child's ADHD.

Improving parent participation and adherence across caregivers may have a number of potential benefits. Specifically, parents who attend treatment together and adopt a shared role in implementing behavioral strategies may improve their shared parenting alliance. Parents often present for BPT with different parenting styles and behaviors. Collaborating together within BPT may provide a unifying function by allowing parents to apply their own parenting styles, but carrying out the same, identified behavior management tasks. Parents' perceptions of stress and self-efficacy may also benefit by the support gained from their shared participation in BPT and commitment to

helping their child. Further, child behavior may demonstrate greater improvements when both parents are implementing behavioral strategies consistently. Benefits may also be observed in the overall family system, including family satisfaction and quality of life.

Parent participation and adherence may be targeted in a number of ways. First, consideration of logistical factors is important. Clinicians should attempt to schedule appointments for times when all caregivers may attend. Prior to participation in BPT, families may also be provided with information about the importance of caregiver involvement and consistency between parents related to child behavior outcomes. Further, use of a brief intervention similar to the one created by Nock and Kazdin (2005) would provide structured opportunities to evaluate parents' engagement and barriers that may inhibit progress in implementing behavioral strategies. This would also allow for opportunities to address barriers to implementation, thus improving adherence to treatment. Additionally, behavioral activation may be used to increase parents' adherence during treatment. Thus, parents could be encouraged to schedule weekly "check-in" sessions to plan for the week, including planning tasks and activities with their child related to the goals of BPT. These plans may be written down and scheduled to promote treatment adherence between sessions. Behavioral activation procedures may be particularly effective in helping to parents to make child behavior change procedures a priority during the week as well as to improve consistency of implementation.

This study examined parent outcomes related to participation in child-focused behavioral parent training. The findings from this applied clinical research provide many practical implications for working with families who present for BPT. Significant improvements in parents' stress and self-efficacy were observed for mothers, but not for

fathers. These differences highlight the importance of engaging fathers in their child's treatment. Differences in parent outcomes were also observed based on child outcomes. Parents of children who demonstrated the greatest quality of improvement in ADHD symptoms reported greater reductions in stress as well as improved parenting self-efficacy relative to parents of children with continued symptom impairment. These findings highlight the importance of actively engaging parents in their child's treatment, most notably illustrating that parents also benefit from the intervention process. Further, parents participating in time-limited behavioral parent training may benefit from flexibility related to duration of treatment, and clinicians may consider structuring additional assessment endpoints to evaluate needs for possible continuation of BPT for families until optimal child outcomes are achieved.

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