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**Engagement in Parent-Child Interaction Therapy:
The Influence of Mothers' Adverse Childhood Experiences**

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Report

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Abstract

Engagement in Parent-Child Interaction Therapy: The Influence of Mothers' Adverse Childhood Experiences

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Abstract: Adverse childhood experiences (ACEs) are early life events associated with negative physical, psychological, and social outcomes. In subsequent generation parent-child interactions, these outcomes are associated with adverse parenting practices. Parent-Child Interaction Therapy (PCIT) is an established intervention to mitigate potentially harmful outcomes of adverse parenting. However, poor parental engagement in PCIT can devalue the benefits of the intervention. The proposed study seeks to investigate the predictive role of mothers' history of ACEs in four PCIT engagement outcomes: treatment completion, attendance rate, homework completion rate, and attitude towards therapy. Descriptive analyses, Student's t-tests, and linear and logistic regression analyses will be conducted. Implications and future directions to address engagement in PCIT will be discussed.

Table of Contents

Integrative Analysis	1
Adverse Childhood Experiences	2
Implications of ACEs in Parent-Child Dynamics	4
Making Links with Theory	7
Parent-Child Interaction Therapy	8
Definition of Parental Engagement	11
Predictors of Attendance Outcomes in PCIT	12
Demographic Variables	12
Parental Stress	13
Parent Behaviors	14
Predictors of Adherence Outcomes in PCIT	14
Predictors of Cognitive Outcomes in PCIT	15
The Proposed Study	16
Research Questions and Hypotheses	16
Methods	19
Participants	19
Measures	20
Procedures	25
Data Analysis	27
Discussion	33
Summary	33
Limitations	33

Future Directions and Implications	32
References	36

Integrative Analysis

In early childhood, disruptive behavior problems – including frequent or severe opposition, noncompliance, and/or aggression – are highly prevalent (Keenan & Wakschlag, 2000). Left untreated, these problems can persist and lead to a more chronic and severe developmental trajectory (Mash & Barkley, 2014). Behavioral parent training (BPT) is a commonly used intervention for parents of children with behavior problems. Although BPT programs may differ in terms of minutes per session, treatment format (group- or individual-based delivery), and overall length of treatment, each BPT protocol is based on principles of behavior modification and social learning theory (Kazdin, 1993; Weisz & Kazdin, 2017). BPT interventions are often recommended for child behavior problems which are believed to be maintained by caregivers' behaviors. As such, parent engagement in BPT services is an integral component of effective treatment delivery. The bulk of extant literature on engagement outcomes for BPT programs yields inconsistent findings on predictors of poor parent engagement. Risk factors for poor parental engagement are likely dependent on not only the parent-child and family dynamics that are a function of the child's disruptive behavior diagnosis but also on the treatment-specific demands of a given BPT protocol (Kazdin, 1993). As such, systematic investigation of parent engagement outcomes specific to a discrete child clinical population and form of BPT is warranted.

Alongside the growing emphasis on identifying families at-risk of poor parent engagement outcomes in BPT programs, there is a parallel emphasis on understanding the full extent of negative outcomes in adulthood associated with adverse childhood

experiences (ACEs). Although ACEs have been associated with harmful long-term physical, psychological, and social outcomes (Felitti et al., 1998; Gilbert et al., 2009), the connection between ACEs and adverse parenting practices in subsequent generation mother-child interactions is an emerging field of study. Parent-Child Interaction Therapy (PCIT) is an established BPT program to mitigate potentially harmful outcomes of adverse parenting (Chaffin, Funderburk, Bard, Valle, & Gurwitch, 2011; Chaffin et al., 2004). Empirical studies of the predictive nature of maternal ACEs and engagement in PCIT do not exist.

Adverse Childhood Experiences

The first descriptive study of ACEs – The Adverse Childhood Experiences (ACE) Study – was an epidemiological study conducted with a sample of 13,494 adult patients at the Kaiser Permanente clinic in San Diego (Felitti et al., 1998). Respondents were surveyed using the ACE Study Questionnaire which included items across two domains (and seven categories) of ACEs: abuse (emotional, physical, sexual) and household dysfunction (witnessing physical aggression towards mother; household member with substance abuse, mental illness, or history of incarceration). Respondents who answered yes to any question in a given ACE category were reported as having a history of that specific ACE. Integer counts of each of these childhood exposure categories were summed to reflect a measure of aggregate exposure to adverse events. Total scores ranged from 0 (no exposure to ACEs) to 7 (exposure to all categories of ACEs).

Subsequent recent research on ACEs has utilized questionnaires with varying numbers of ACE categories. One of the most frequently cited versions of the ACE

questionnaire (Dong, Anda, et al., 2004; Murphy et al., 2014; Steele et al., 2016) is an extension of the original measure and includes three additional items: two items on neglect (physical and emotional) and one item pertaining to household dysfunction (parental separation or divorce). Thus, total ACE scores on this version of the ACE questionnaire range from 0 to 10.

Irrespective of how many additional ACE categories are included in a given questionnaire, studies consistently indicate ACEs are interrelated events (Brown et al., 2013) and that the presence of one ACE increases the likelihood of additional ACE exposures (Dong, Anda, et al., 2004). As an individual's ACE score increases, so too does their risk of negative outcomes such as: cancer, cardiovascular disease, liver disease, diabetes, depression, suicidality, poor academic achievement, poor work performance, and financial stress ((R. F. Anda et al., 2006; Robert F. Anda et al., 2004; R. Anda et al., 2010; D. W. Brown et al., 2010; Chapman et al., 2004; Dong, Anda, et al., 2004; Dube, Williamson, Thompson, Felitti, & Anda, 2004; Edwards, Holden, Felitti, & Anda, 2003; Jimenez, Wade, Lin, Morrow, & Reichman, 2016; Pickles et al., 2010). This risk for negative outcomes later in life increases in a "dose-response" manner consistent with the accumulation of ACEs in an individual's formative years (R. Anda et al., 2010; Katz, Sprang, & Cooke, 2012). Research indicates individuals who have experienced 4 or more ACE categories have significantly poorer outcomes compared to individuals who have not experienced any ACEs. Specifically, individuals with 4 or more ACEs were reported to have a 2 to 4 times increased risk for smoking, poor self-rated health, and a sexually

transmitted disease and a 4 to 12 times increased risk for alcoholism, drug abuse, depression, and suicide attempt later in life (Felitti et al., 1998).

Estimates from a national survey of health-related risk behaviors, chronic health conditions, and use of preventive services (Behavioral Risk Factor Surveillance Survey; BRFSS) indicate approximately 60% of respondents experienced at least one ACE (CDC, 2016). However, the actual prevalence rates of childhood adversity may be higher.

Among mothers surveyed within urban community settings, 67% to 79% of participants reported experiencing at least 1 ACE (Lange, Callinan, & Smith, 2018; Murphy et al., 2014). In a clinical sample of mothers referred to services due to concerns about their ability to meet their child's emotional needs, 97% of participants reported experiencing at least 1 ACE (Murphy et al., 2014).

Implications of ACEs in Parent-Child Dynamics

Outside of the ACE literature, there have been substantial efforts to understand the relationship between maternal depression and subsequent parenting behaviors. A meta-analysis of 46 observational studies noted maternal depression to be most strongly associated with demonstrated irritability and hostility towards the child (Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Maternal depression was also found to be associated with disengagement with the child (Lovejoy et al., 2000). The timing of the mother's depressive episode was found to be a salient variable, whereby a current depressive episode was associated with increased effect sizes for harmful parenting behaviors. Of note, socioeconomic status was reported to moderate the relationship between maternal depression and parenting behaviors (Lovejoy et al., 2000). Amidst this

literature, there have also been findings indicating that depressed mothers commonly report more adverse experiences in childhood than non-depressed mothers (Ammerman et al., 2012).

Thus, seemingly disparate fields of study are now being bridged by research investigating the influence of mothers' early childhood adversity of subsequent generation parenting behaviors. Emic approaches to investigating this relationship have involved the use of qualitative interviews to better understand, from the mothers' perspectives, how their experiences with ACEs have adversely influenced their own parenting behaviors.

Wright et al. (2012) conducted interviews with a sample of childhood sexual abuse survivors and found mothers commonly reported difficulty discerning appropriate limits and implementing effective disciplinary strategies. Mothers also commonly reported emotional and behavioral dysregulation in response to their child's violation of established limits. Some mothers described how strong feelings of anger or anxiety impeded their ability to remain emotionally present or attuned with their child. As a result of their emotional dysregulation, mothers sometimes engaged in raging or shaming behaviors towards their child. In other reports, mothers described difficulty asking for help with caregiving, citing hesitancy to disclose their history of ACEs or their inability to effectively manage the demands of parenting. In these qualitative interviews, mothers also reported difficulty building and maintaining emotional closeness with their child. In all, findings from these interviews shed light on the multiple parenting challenges experienced by mothers with a history of childhood sexual abuse.

Another qualitative study conducted by Kistin et al. (2014) investigated parenting attitudes and behaviors among mothers with any history of childhood trauma. In this sample, mothers commonly expressed beliefs that their child's problematic behaviors were an indication of future aggressive behaviors or violent tendencies. As such, there was a common belief that harsh punishment was necessary and effective in ensuring their child's problematic behaviors did not persist in the long-term. In response to their child's escalating behaviors, mothers commonly reported physically distancing themselves from their child in order to relieve their own parental distress. Of note, some mothers reported excessive withdrawal of parental attention (i.e., 30-minute time outs) to not only aid in their own emotional regulation but to also serve as a punishment for the child's misbehavior.

Etic investigations of the relationship between mothers' history of early childhood adversity and subsequent parenting behaviors have yielded quantitative evidence analogous to those findings described in the qualitative interviews. For instance, mothers with a history of childhood maltreatment have been observed to demonstrate decreased maternal sensitivity and responsivity towards their infant (Bert et al., 2009; Pereira et al., 2012). Maternal history of sexual abuse in childhood has also been associated with restricted affect towards and decreased involvement with their infant (Lyons-Ruth & Block, 1996). These disruptions in maternal responsiveness, namely the ability to attune to a range of infant affects, are associated with unfavorable attachment styles (Haft & Slade, 1989).

Lyons-Ruth & Block (1996) observed mothers with a history of childhood physical abuse to demonstrate higher rates of hostile behaviors towards their infant. Mothers who have experienced abuse in childhood have also been reported to endorse positive attitudes towards implementing abusive parenting practices, including the use of corporal punishment (Bert et al., 2009; Chung et al., 2009). Prospective studies have indicated that mothers with exposure to two or more ACEs are 1.6 times more likely to spank their infant compared to mothers with no history of ACEs (Chung et al., 2009).

The dose-response relationship between mothers' exposure to childhood abuse and their decreased maternal responsiveness and increased propensity for abusive parenting practices has been observed in samples of both teenage and adult low-resource mothers and high-resource mothers (Bert et al., 2009). Thus, there is evidence to suggest that regardless of the amount of external sources of support available to mothers, those with a history of childhood abuse are at an increased risk of intergenerational transmission of abuse.

Quantitative studies have also demonstrated evidence for a dose-response relationship between maternal ACEs and levels of parenting stress. Regardless of whether a family was of wealth or experiencing poverty, each additional maternal ACE was found to be associated with higher self-reported scores of parental distress (Lange et al., 2018). This suggests that the burden of ACEs alone can result in significant levels of parenting stress.

Making Links with Theory

According to Baumrind's model of parental control (1967, 1971), parenting styles can be classified in one of three ways: permissive, authoritarian, and authoritative.

Permissive parenting is characterized by high levels of warmth and low levels of limit setting. Parents with this model of parental control commonly demonstrate a consistently accepting demeanor towards the child while placing few demands on the child.

Conversely, authoritarian parenting is characterized by low levels of warmth and high levels of limit setting, and authoritarian parents rely heavily on the use of punitive measures to secure their child's obedience. Authoritative parenting can be seen as the synthesis of these two antithetical models of parental control by which only the valid behaviors of permissive and authoritarian parenting styles are embraced. Thus, authoritative parents are able to establish appropriate limits without using forceful measures to secure compliance all the while encouraging the development of their child's autonomy.

Both permissive and authoritarian parenting styles have been associated with child-reported poorer quality of relationships with parents (Shucksmith, Hendry, & Glendinning, 1995; Slicker, 1998), higher levels of conflict with parents (Shucksmith et al., 1995); and with substance abuse (Cohen & Rice, 1997), depression (Radziszewska, Richardson, Dent, & Flay, 1996), and poorer academic performance (Cohen & Rice, 1997; Radziszewska et al., 1996) in adolescence. In contrast, authoritative parenting styles have consistently demonstrated stronger associations with positive short- and long-term child outcomes.

Parent-Child Interaction Therapy

PCIT has been validated for use with families of children, ages 2 to 7, with a disruptive behavior disorder (E. V. Brestan & Eyberg, 1998; S. M. Eyberg, Nelson, & Boggs, 2008). PCIT follows Hanf's two-stage model of intervention by way of sequencing a Child Directed Interaction (CDI) phase followed by a Parent Directed Interaction (PDI) phase (Eyberg, 1988). Parents presenting to PCIT are coached to use authoritative parenting skills across both phases of treatment. During CDI, parents are taught to follow their child's lead in play while differentially applying positive attention for desired child behaviors and actively ignoring negative child behaviors. Parents are also coached to minimize the use of questions, commands, and negative talk during dyadic play. Together, these coaching targets help parents foster a more positive and nurturing parent-child relationship. During the second phase of treatment, PDI, parents are coached to generate effective commands deliver appropriate consequences. Providers emphasize the importance of maintaining consistency and predictability when delivering the prescribed consequences, and parents are coached to maintain a high rate of CDI skills between commands to maintain the positive parent-child dynamic established during the first phase of treatment. Parents' mastery of authoritative parenting skills is assessed during a timed coding period during which providers refrain from any coaching statements. There is evidence to support the effectiveness of PCIT up to six years after parents meet graduation criteria (Hood & Eyberg, 2003). This, in turn, suggests that the CDI phase of PCIT serves as a foundation for the discipline strategies introduced in PDI.

One of the unique features of PCIT, as compared to other BPT programs, is the use of live skills coaching of parents as they engage in dyadic play with their child. By

providing prompt feedback to parents as they execute parenting behaviors, providers are able to shape parents' use of appropriate techniques with more accuracy. Live coaching also allows for the provider to complete in-the-moment functional behavioral analyses and craft coaching statements to address parent-child interaction patterns which are hypothesized to maintain negative child behaviors.

As a result, PCIT has been successfully applied to a wide variety of child behaviors and parent-child dynamics. Depressed mothers (Timmer et al., 2011), physically abusive families (Chaffin et al., 2011, 2004), underserved youth in community mental health settings (Lyon & Budd, 2010), and battered women and their children (Borrego, Gutow, Reicher, & Barker, 2008) have all been shown to benefit from PCIT. In light of the long-term negative outcomes for mothers with a history of ACEs and the qualitative and quantitative findings that suggest maternal history of ACEs can result in harmful parenting practices in subsequent generation mother-child relationships, mothers with a history of ACEs would likely also benefit from the authoritative parenting skills taught in PCIT.

Although PCIT is an established intervention to mitigate potentially harmful outcomes of adverse parenting, poor engagement can devalue the benefits of the intervention. Unlike adult treatment settings where the patient is the sole client variable to account for in treatment engagement dynamics, child treatment settings must account for both child and parent variables. Furthermore, since the delivery of child treatment is contingent on parents' initiation of and willingness to participate in the prescribed

treatment, engagement in child therapy is largely defined by parents' behaviors.

However, parental engagement outcomes in PCIT remains an under-studied topic.

Definition of Parental Engagement

Due to varying conceptualizations of what constructs constitute engagement, studies do not uniformly report on engagement outcomes. To allow for more systematic investigation of predictors of poor parental engagement, revised conceptualizations of treatment engagement have been proposed which acknowledge three discrete sub-constructs: attendance, adherence, and cognitive preparation (Becker et al., 2015; Nock & Ferriter, 2005; Staudt, 2007). The construct of *attendance* refers to the client's fulfillment of the agreed terms of treatment delivery (Nock & Ferriter, 2005). This is a behavioral component of engagement that is measured by clients' adherence to scheduled sessions and compliance with the number of sessions required for successful completion of treatment (Staudt, 2007). The construct of *adherence* refers to the client's demonstrated willingness to abide by the prescribed therapeutic behaviors (Nock & Ferriter, 2005). This is another behavioral component of engagement that can be measured in terms of compliance with between-session homework assignments or other recommended strategies to be implemented alongside the primary treatment intervention (Becker et al., 2015; Staudt, 2007). The final construct, *cognitive preparation*, is an attitudinal component of engagement which refers to a client's thoughts about treatment, expectations for outcome, and willingness to follow recommended therapeutic behaviors (Becker et al., 2015; Staudt, 2007). Although clients may demonstrate attendance to scheduled sessions or complete homework assignments, a negative attitude towards

therapy may negate the level of engagement accounted for by clients' seemingly engaged outward behaviors (Staudt, 2007). As such, engagement is comprehensively assessed when attendance, adherence, and cognitive preparation outcomes are accounted for.

Predictors of Attendance Outcomes in PCIT

To date, the wealth of study on parental engagement in PCIT has focused on premature dropout as the primary variable of interest. There is evidence to suggest families who complete PCIT have more positive long-term outcomes, such as significant improvements in parents' ratings of frequency and severity of child disruptive behaviors and parenting stress levels, compared to families who prematurely drop out of treatment (Boggs et al., 2005; Lyon & Budd, 2010). Of note, attrition rates from PCIT have been reported to range from 36% to 69% (Fernandez & Eyberg, 2009; Lanier et al., 2011; Lyon & Budd, 2010).

Using the revised conceptualization of engagement, attendance outcomes in PCIT can be assessed in terms of both treatment status (dropout versus completer) and rate of session attendance (number of sessions attended versus cancelled or no-showed). Commonly identified predictors of poor attendance engagement outcomes in PCIT are discussed in detail below.

Demographic Variables

Younger maternal age has been noted as a predictor of dropout from PCIT (Werba, Eyberg, Boggs, & Algina, 2006). There is mixed evidence regarding ethnicity as a variable associated with a higher likelihood of attrition or poor attendance. In one study of PCIT delivered in a community setting, families that prematurely terminated treatment

during CDI were more likely to be African American whereas families who terminated treatment during PDI were more likely to be Caucasian (Lanier et al., 2011). However, another study found no evidence of significant differences between African American and Caucasian families on either number of sessions completed or time of dropout (Capage, Bennett, & McNeil, 2001).

Income level has also been implicated as a possible predictor of attrition in PCIT. In a community clinic sample, families who completed treatment had higher average annual incomes (\$30,100) compared to CDI dropouts (\$14,500) and PDI dropouts (\$15,400) (Lanier et al., 2011). Within this sample, multivariate logistic regression analyses indicated that for each \$10,000 increase in annual income, there was a 24% increased probability that a family would complete PCIT. Even in treatment settings where mothers received financial support to offset logistical barriers to treatment such as child care and travel costs, mothers' socioeconomic status proved to be the single best predictor of attrition (Fernandez & Eyberg, 2009). When delivering PCIT to low socioeconomic status families in a community mental health setting, treatment dropout rates have been reported to be as high as 67% (Lyon & Budd, 2010).

Parental Stress

There are also inconsistent findings regarding the relationship between parental stress and risk for dropout. While some studies have demonstrated higher maternal ratings of parenting stress are associated with dropout from PCIT (Werba et al., 2006), others have found no significant association between parental stress and premature termination (Fernandez & Eyberg, 2009).

Parent Behaviors

Additionally, parent attendance and adherence engagement behaviors have also been associated with attrition. Families that drop out of PCIT have demonstrated significantly lower rates of CDI homework completion compared to treatment completers (62.7% versus 47.4%; Lyon & Budd, 2010). Families with lower average attendance rates to weekly scheduled PCIT sessions were more likely to drop out of treatment (47.7% versus 90.1%; Lyon & Budd, 2010). Premature termination from PCIT has also been associated with higher instances of maternal negative talk and lower rates of maternal praise at pretreatment (Fernandez & Eyberg, 2009).

Predictors of Adherence Outcomes in PCIT

Adherence engagement outcomes in PCIT can be assessed in terms of parents' rate of homework completion. A common element of BPTs, homework assignments are opportunities for between-session rehearsal of therapeutic skills. The benefits of PCIT homework have been supported by recent findings which associate higher rates of homework completion with higher rates of positive parenting skills, decreased levels of parenting stress, and decreased child behavior problems (Ros, Hernandez, Graziano, & Bagner, 2016). Higher rates of CDI homework completion have also been associated with fewer sessions to CDI mastery and fewer sessions to graduation criteria (Stokes et al., 2016). Such findings further implicate parents' level of engagement in treatment as a key agent for positive change in both parent and child behaviors.

Despite the proven benefits of parental homework completion, rates of adherence remain suboptimal. Average rates of PCIT homework completion in community mental

health care settings have been reported to be 45% (range: 0 – 86%; Danko, Brown, Van Schoick, & Budd, 2016). There are reported differences in average rates of homework completion across phases of PCIT treatment, with higher rates of adherence in CDI (59%) compared to PDI (47%) (Danko et al., 2016).

Currently, there is a paucity of research on predictors of poor homework adherence in PCIT. One study indicated families who prematurely terminated PCIT were less likely to be compliant with homework completion (Lyon & Budd, 2010). Another study suggested levels of parenting stress mediate the relationship between PCIT homework completion and child behavior problems (Ros et al., 2016).

Predictors of Cognitive Outcomes in PCIT

Cognitive preparation, the attitudinal engagement outcome, in PCIT can be assessed by treatment satisfaction ratings. The limited research, to date, on this engagement outcome suggests parents who prematurely terminate PCIT report neutral or negative ratings of treatment satisfaction, while parents who complete treatment report higher levels of treatment satisfaction (Boggs et al., 2005; Lyon & Budd, 2010). There is also evidence that higher rates of PCIT homework completion are associated with higher levels of treatment satisfaction (Danko et al., 2016).

The Proposed Study

The current study seeks to bridge two traditionally disparate literature bases by examining the predictive nature of maternal ACEs on PCIT engagement outcomes. Qualitative and quantitative studies demonstrate a relationship between mothers' history of ACEs and adverse parenting practices in subsequent generation parent-child interactions. Although PCIT is a well-established BPT program which has demonstrated success in mitigating potentially harmful outcomes of authoritative or permissive parenting styles (Chaffin et al., 2011, 2004), its clinical effectiveness can be limited by poor levels of parental engagement (Boggs et al., 2005; Lyon & Budd, 2010). The study of engagement outcomes in PCIT has been hampered by the diverse and sometimes narrow ways in which it has been defined. However, recent efforts have led to a revised conceptualization of engagement which acknowledges the various domains within the overarching construct of engagement (Becker et al., 2015; Nock & Ferriter, 2005; Staudt, 2007). The literature on parental engagement outcomes in PCIT has also been inherently limited by the paucity of research in this field. As such, there is much room for investigation of the predictors of parental attendance, adherence, and cognitive preparation outcomes in PCIT. Given the specific parental demands unique to the PCIT protocol, the focus on the current study is limited to investigation of parental engagement outcomes for parents receiving PCIT services.

Research Questions and Hypotheses

Primary Research Question. How does mothers' history of adverse childhood experiences (ACEs) predict engagement outcomes in Parent-Child Interaction Therapy (PCIT)?

PRQ 1a. How does mothers' history of ACEs predict retention to PCIT?

Hypothesis 1a. A greater number of maternal ACEs will predict higher log-odds of dropping out of PCIT.

PRQ 1b. How does mothers' history of ACEs predict PCIT session attendance rates?

Hypothesis 1b. A greater number of maternal ACEs will predict lower attendance rates to PCIT sessions.

PRQ 2. How does mothers' history of ACEs predict rates of PCIT homework completion?

Hypothesis 2. A greater number of maternal ACEs will predict lower rates of PCIT homework completion.

PRQ 3. How does mothers' history of ACEs predict PCIT treatment satisfaction ratings?

Hypothesis 3. A greater number of maternal ACEs will predict lower ratings of PCIT treatment satisfaction.

Secondary Research Questions.

SRQ 1. How do prevalence rates of maternal ACEs in the PCIT Clinic at DCMC compare to previously reported rates of ACEs (Dube et al., 2003)?

Hypothesis 1. Prevalence rates of reported ACEs will be similar to those reported in the original ACE study (12.2% emotional abuse, 25.1% physical abuse, 24.3% sexual abuse, 16.7% emotional neglect, 9.2% physical neglect, 30.5% exposure to substance abuse, 25.3% exposure to mental illness, 13.9% mother treated violently, 6.9% exposure to criminal behavior in household, 25.4% parental separation or divorce).

SRQ 2. How do homework completion rates of mothers with a history of ACEs compare to previously reported rates of homework completion in PCIT (Ros et al., 2016)?

Hypothesis 2. Homework completion rates at the PCIT clinic at DCMC will be similar to the rates reported in an outpatient psychology clinic sample (mean = 57.97; range: 8.13 – 91.9).

SRQ 3. How do treatment satisfaction ratings of mothers with a history of ACEs compare to previously reported ratings of parental treatment satisfaction with PCIT (Brestan, Jacobs, Rayfield, & Eyberg, 1999)?

Hypothesis 3. Treatment satisfaction rates at the PCIT clinic at DCMC will be similar to the rate reported in an outpatient psychology clinic sample (mean = 44.58; range: 28 – 50).

Methods

Participants

The target sample is 96 mother-child dyads receiving treatment in the PCIT clinic at Dell Children's Medical Center (DCMC). The target sample size was selected based on power analyses, described below, which indicated a total sample of 96 will yield adequate power for subsequent data analyses. Families can be referred to the PCIT clinic by any DCMC provider, including but not limited to providers in the Developmental Pediatrics, Pediatric Psychiatry and Pediatric Endocrinology clinics. Families referred to the PCIT clinic at DCMC may consist of both a mother-child dyad and father-child dyad. However, only mother-child dyads will be recruited to participate in order to avoid violating the assumption of independence of data. For the purposes of this study, any female caregiver with legal rights to consent to treatment (i.e., biological, adoptive, or foster parent) will be referred to as 'mother'. To be eligible to participate in the study, mothers must be fluent in English and have a child between the ages of 2 and 7 who is diagnosed with a primary disruptive behavior disorder (DBD). Children with any comorbid psychological diagnosis will not be eligible to participate in this study. Mothers who attend the first session of the PCIT treatment protocol (CDI Teach) will be considered active participants in treatment.

Based on chart reviews of mother-child dyads who have received PCIT services in this clinic, it is estimated that 59% of study participants will be Caucasian and 28% will be Hispanic. It is estimated the mean age of mothers participating in treatment will

be 38 years (range: 23 to 61). It is also estimated that 28% of study participants will have Medicaid health coverage.

Measures

The standard DCMC intake questionnaire will be administered to the mother presenting to the baseline appointment. This intake questionnaire includes questions about mothers' age and race / ethnicity. For the purposes of this study, the intake questionnaire will be supplemented with an additional item to assess mothers' household income.

The *Eyberg Child Behavior Inventory* (ECBI; Eyberg & Pincus, 1999) is a 36-item parent-rating scale that assesses child behavior problems across two subscales: an intensity scale and a problem scale. The intensity scale measures the frequency of disruptive behaviors on a scale from 1 (never) to 7 (always). The problem scale asks whether the parent perceives a specific behavior to be a problem (yes or no). This measure has demonstrated strong internal consistency ($\alpha = .98$) and content and discriminant validity (Burns & Patterson, 2000; Elizabeth A. Robinson, Eyberg, & Ross, 1980). It has also demonstrated sensitivity to change during the course of treatment ($r = .86 - .88$; Robinson et al., 1980). Cutoff scores have been established as scores 132 on the intensity scale and 15 on the problem scale (both at $T = 60$), and studies have demonstrated the sensitivity and specificity of these cutoff scores in distinguishing between children with and without disruptive behavior disorders (Rich & Eyberg, 2001).

The *Parenting Stress Index – Short Form* (PSI-SF; Abidin, 1995) is a 36-item parent self-report form designed to assess stress associated with parenting and the parent-

child relationship. Each item is rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The PSI-SF provides a Total Stress score and three subscale scores. The Parental Distress subscale measures perceptions of parenting competence, lack of social support, and stresses in other life roles. The Difficult Child subscale measures the parent's perception of their child's demandingness, noncompliance, and temperament. The Parent-Child Dysfunctional Interaction subscale measures the parent's perception of the relationship between the parent and child and whether the child meets expectations. The PSI-SF subscales have demonstrated acceptable to good internal consistency ($\alpha = .75 - .85$) and the PSI-SF Total Stress scale has demonstrated excellent internal consistency ($\alpha = .91$; Barroso, Hungerford, Garcia, Graziano, & Bagner, 2016). The PSI-SF has also demonstrated high test-retest reliability ($r = .61 - .75$) and strong predictive validity of parents' reports of behaviors 1 year later (Haskett, Ahern, Ward, & Allaire, 2006).

The *Beck Depression Inventory, Second Edition* (BDI-II; Beck, Steer, & Brown, 1996) is a 21-item self-report measure designed to assess the presence of adult depressive symptoms spanning a two-week time frame. Each item is rated on a four-point Likert scale ranging from 0 (symptom absent) to 3 (severe symptoms). The maximum total score is 63. Raw scores of 0-13 indicate "minimal depression", 14-19 indicate "mild depression", 20-28 indicate "moderate depression", and 29-63 indicate "severe depression". The BDI-II has demonstrated excellent test-retest reliability ($r = .96$; Sprinkle et al., 2002) and high internal consistency ($\alpha = .91$; (Dozois, Dobson, &

Ahnberg, 1998). The BDI-II has demonstrated concurrent validity with Center for Epidemiological Studies of Depression Scale (CES-D; $r = .66$; Segal, Coolidge, Cahill, & O'Riley, 2008) and the Patient Health Questionnaire (PHQ-9; $r = .77$; Kung et al., 2013) and has demonstrated discriminant validity with the Hamilton Rating Scale for Anxiety ($r = .47$; Beck et al., 1996).

The *Dyadic Parent-Child Interaction Coding System, Fourth Edition* (DPICS-IV; Eyberg, Chase, Fernandez, & Nelson, 2014) is an observational coding system used to categorize parent verbalizations, vocalizations, and behaviors during parent-child interactions. This coding system allows PCIT providers to assess parents' rate of spontaneous positive and negative verbalizations. Negative verbalizations include questions (verbalizations that require an answer from the child), commands (verbalizations directing the child to complete a behavior), and negative talk (verbalizations which either express disapproval towards the child or contain impudent speech). The DPICS has demonstrated excellent interrater reliability ($r = .91$) and concurrent validity with the ECBI ($r = .94$; Robinson & Eyberg, 1981). Only the PCIT certified therapist will be responsible for coding the mother-child interactions at baseline. The baseline observation involves 5-minute coding segments across three standard situations: child-led play (CLP), parent-led play (PLP), and clean-up (CU). Each situation is designed to require varying levels of parental directiveness. The total number of questions, commands, and negative talk observed in the baseline CLP, PLP, and CU parent-child interactions will serve as the baseline measure of negative parent verbalizations.

Predictor variable. The *ACE Questionnaire* (Dong et al., 2004) is a self-report measure designed to assess exposure to abuse (i.e., psychological, physical, and sexual abuse), neglect (i.e., emotional and physical), and household dysfunction (i.e., presence of substance abuse, presence of mental illness, violent treatment of mother or stepmother, parental separation or divorce, or an incarcerated household member) during the first 18 years of life. This 10-item ACE Questionnaire has been used in numerous studies investigating the relationship between adverse childhood experiences and long-term social, behavioral and health outcomes (Dong et al., 2004; Murphy et al., 2014; Steele et al., 2016). Although there is a 14-item version of the questionnaire which includes items such as property victimization, exposure to community violence, and below average grades in addition to the more traditional items of abuse, neglect, and household dysfunction, there is insufficient evidence that the revised ACE items make discrete contributions to the likelihood of later life outcomes (Finkelhor, Shattuck, Turner, & Hamby, 2013). As such, the more commonly cited 10-item version of the ACE Questionnaire will be used in this study.

Outcome variables.

Attendance outcomes.

Treatment status (dropout versus completer). Parents will be considered treatment completers if they meet PCIT graduation criteria. Parents will be considered treatment dropouts if they explicitly tell the provider they want to discontinue treatment or if they stop attending weekly scheduled appointments and become unresponsive to phone calls from staff in an attempt to re-engage the family in treatment.

Attendance rate. For each participant, the number of sessions attended, cancelled, and no-showed will be recorded. Session attendance rates will be calculated by dividing total number of sessions attended by total number of sessions scheduled.

Adherence outcome.

Homework completion. Each parent presenting for treatment will be given a homework sheet to record their individual practice of PCIT-specific therapeutic skills between sessions. These homework sheets are consistent with the PCIT protocol. Homework completion rates will be calculated by dividing the number of days homework was completed by the total number of possible days for practice. Although most parents will have 7 days of possible CDI practice between sessions, some parents may have shared custody which limits the possible number of days they are able to practice CDI. As such, this method of calculating homework completion provides a fair and accurate assessment of parents' treatment adherence between coaching sessions.

During the CDI phase of treatment, parents are asked to record the number of days they completed 5-minutes of CDI practice with their child (yes/no), the activity they engaged in, and any questions or concerns that arose during CDI time. During the PDI phase of treatment, parents continue to complete CDI homework sheets. They then also complete PDI homework sheets to denote days when parents practiced use of effective commands and the PCIT time-out procedure in gradually more demanding situations (i.e., commands in play, clean-up commands, running commands outside of play). Parents are assigned the 'level' of PDI homework that corresponds to the specific situation and types of commands the parent was coached to use most recently during session. Parents will be

offered flexibility in terms of recording their daily practice (i.e., on paper logs supplied by Provider, recording relevant notes on their phone or on a Google Document).

Cognitive outcome.

Treatment satisfaction. The Therapy Attitude Inventory (TAI; Eyberg, 1993) is a measure of treatment satisfaction designed specifically for participants of behavior parent training programs. The TAI includes 10-items to assess the amount of perceived benefit from treatment by inquiring about both parents' satisfaction with the parenting skills taught and changes in child behaviors. Items are rated on a scale from 1 (extreme dissatisfaction with treatment / worsening of negative behaviors) to 5 (extreme satisfaction with treatment / improvement in negative behaviors). The TAI has demonstrated very good internal consistency ($\alpha = .88 - .91$; Brestan et al., 1999; Eisenstadt, Eyberg, McNeil, Newcomb, & Funderburk, 1993) and high test-retest reliability (.85; Brestan et al., 1999). The TAI has also demonstrated external validity with moderate correlations between TAI total scores and changes in pre- and post-treatment ECBI scores ($r = .36$) and moderate correlations between TAI satisfaction with outcome factor scores and behavioral observations of child compliance (.49; Brestan et al., 1999). In a study of two different parent training programs – a didactic group program versus an individual interaction training program – the TAI demonstrated discriminative validity (Eyberg & Matarazzo, 1980).

Procedures

Schedule of assessments. If any study participant is unable to complete a self-report measure due to their limited reading abilities, the provider will orally administer the measure.

Baseline measures. Prior to initiating PCIT, mothers will be asked to complete the standard DCMC intake questionnaire and self-report measures (PSI-SF, BDI-II, and ACE Questionnaire). At the intake appointment, a PCIT certified therapist will code mothers' verbalizations across the three standard parent-child interaction situations (CLP, PLP, and UP) using the DPICS-IV.

Repeated measures. For each scheduled session at the PCIT Clinic, mothers' attendance status will be recorded (1 = attended; 0 = cancelled or no-showed). Upon check-in for a scheduled session, mothers will be asked to complete the ECBI. At the beginning of each PCIT session, the provider will review mothers' homework completion since the last session. Mothers' homework completion will be recorded for each day an opportunity was available (1 = completed; 0 = not completed) and separate records will be maintained for CDI and PDI homework assignments.

Post-treatment measure. Mothers who complete PCIT will be asked to complete the TAI at the graduation session. Every effort will be made to contact mothers who prematurely discontinue treatment so that the TAI measure may be administered over the phone. Mothers' treatment status will either be contemporaneously recorded at the time of the graduation session (completer) or retrospectively coded if they stop attending weekly scheduled appointments (dropout).

Parent-Child Interaction Therapy.

PCIT is an intensive parent training program that involves the use of live skills coaching of the parent during parent-child interactions in dyadic play. The standard PCIT intervention, one-hour, once-weekly sessions, will be delivered by a PCIT certified therapist. Unlike time-limited interventions, PCIT does not involve a preset number of sessions. Rather, progress through each stage of treatment is dictated by parents demonstrated mastery of a specific number and type of parenting skills across each phase of treatment.

Parents demonstrate mastery criteria for CDI when they (a) generate 10 behavior descriptions, 10 reflections, and 10 labeled praises and (b) have 3 or fewer “don’t” verbalizations (questions, commands, negative talk) during a 5-minute coding period. PDI mastery is also assessed during a 5-minute coding period and is established when a parent (a) generates a minimum of 4 total commands, of which 75% are effective commands, (b) demonstrates appropriate follow-through to effective commands 75% of the time, and (c) demonstrates follow-through with the appropriate consequence to child behavior following an effective command. PCIT mastery, also known as graduation criteria, is established when a parent (a) has demonstrated both CDI and PDI mastery, (b) has reported an ECBI score ≤ 114 , and (c) reports confidence in managing child behavior on their own.

Data Analysis

Power analysis.

A power analysis was conducted using G*Power 3.1 software to determine the number of participants needed to detect a significant effect (Faul, Erdfelder, Buchner, &

Lang, 2009; Ferguson, 2009). A power analysis for detecting the significance of a moderate effect size ($f^2 = 0.33$) with a power of 0.80 at an alpha of 0.05 with 8 predictor variables indicated a need for 27 participants for linear regression analyses. A power analysis for detecting the significance of a moderate effect size (odds ratio = 3) with a power of 0.80 at an alpha of 0.05 indicated a need for 42 participants for logistic regression analysis. As such, the larger minimum sample size value ($N = 42$) was established as the minimum target sample size for this study. A review of PCIT clinic outcomes at DCMC to date suggest rates of dropout to be 44%. As such, the minimum target sample size was increased to 96 to compensate for anticipated dropouts.

Preliminary analysis.

Descriptive statistics, including means, standard deviations, minimums, maximums, and frequencies, will be calculated and analyzed for each variable. All data will be assessed to check assumptions of normality. Linearity will be determined by examining scatterplots. Effect sizes will be computed for categorical variables using Cramer's V and continuous variables using Cohen's d . Both measures of effect sizes vary between 0 and 1, with higher values indicating stronger associations between variables.

Possible covariates.

Demographic and clinical characteristics previously found to be related with one or more treatment engagement outcomes in PCIT treatment programs will be accounted for and considered as possible covariates in subsequent regression analyses. Pre-treatment ECBI scores will serve as a measure of child symptom severity; pre-treatment

PSI-SF scores will serve as a measure of parenting distress; and pre-treatment BDI-II scores will serve as a measure of parental depression severity.

Overview of data analyses.

Linear regressions. Linear multiple regression analyses will be conducted to examine the relationships between parents' history of ACEs and three continuous engagement outcome variables: session attendance rate, homework completion rate, and treatment satisfaction scores. Separate linear regressions will be conducted for each of these three engagement outcomes, adjusting for potential covariates. Each continuous engagement outcome will be regressed on number of parental ACEs. Covariates to be included in the regression model were identified a priori on the basis of the literature review and theoretical considerations. Standardized residuals from each linear multiple regression analysis will be examined to identify potential outliers, evaluate normality of the data, and to check that the assumption of homoscedasticity has been met for the independent variable. The independent variable of interest in this study is continuous. The p-value associated with the regression weight will be examined to determine if parents' history of ACEs explain a significant amount of variance in a given engagement outcome, after controlling for potentially confounding variables, at an alpha level of 0.05.

Logistic regression. Logistic regression analysis will be conducted by regressing the dichotomous engagement outcome of treatment status (dropout; complete) on the number of maternal ACEs, after controlling for potential covariates. Adjusted odds ratios (ORs) and 95% confidence intervals will be reported to allow the reader to understand

how differing scores on the dependent variable may lead to different odds ratios of obtaining the outcome (i.e., binary outcome of treatment status).

Data Analysis and Expected Results

Primary Research Question. How does mothers' history of adverse childhood experiences (ACEs) predict engagement outcomes in Parent-Child Interaction Therapy (PCIT)?

PRQ 1a. How does mothers' history of ACEs predict retention to PCIT?

Using logistic multiple regression analysis, the dichotomous outcome of treatment status (dropout; completer) will be regressed on number of maternal ACEs, after controlling for potential covariates, to determine if mothers' history of ACEs predicts retention to PCIT. It is hypothesized that a greater number of maternal ACEs will predict higher log-odds of dropping out of PCIT.

PRQ 1b. How does mothers' history of ACEs predict PCIT session attendance rates?

Using linear multiple regression analysis, session attendance rate will be regressed on number of maternal ACEs to determine if mothers' history of ACEs explains a significant amount of variance in the session attendance rate outcome after controlling for potential covariates, at an alpha level of .05. It is hypothesized that a greater number of maternal ACEs will predict lower attendance rates to PCIT sessions.

PRQ 2. How does mothers' history of ACEs predict rates of PCIT homework completion?

Using linear multiple regression analysis, homework completion rate will be regressed on number of parental ACEs to determine if mothers' history of ACEs explains a significant amount of variance in the adherence engagement outcome of rate of homework completion after controlling for potential covariates, at an alpha level of .05. It is hypothesized that a greater number of maternal ACEs will predict lower rates of PCIT homework completion.

PRQ 3. How does mothers' history of ACEs predict PCIT treatment satisfaction ratings?

Using linear multiple regression analysis, treatment satisfaction rating will be regressed on number of parental ACEs to determine if mothers' history of ACEs explains a significant amount of variance in the cognitive engagement outcome of treatment satisfaction rating after controlling for potential covariates, at an alpha level of .05. It is hypothesized that a greater number of maternal ACEs will predict lower ratings of PCIT treatment satisfaction.

Secondary Research Questions.

SRQ 1. How do prevalence rates of maternal ACEs in the PCIT Clinic at DCMC compare to previously reported rates of ACEs (Dube et al., 2003)?

Student's t-test will be used to compare frequencies of each ACE category reported by mothers in the PCIT clinic at DCMC and those reported by participants of the original ACE Study. It is hypothesized that prevalence rates of reported ACEs will be similar to those reported in the original ACE study (12.2% emotional abuse, 25.1% physical abuse, 24.3% sexual abuse, 16.7% emotional neglect, 9.2% physical neglect,

30.5% exposure to substance abuse, 25.3% exposure to mental illness, 13.9% mother treated violently, 6.9% exposure to criminal behavior in household, 25.4% parental separation or divorce).

SRQ 2. How do homework completion rates of mothers with a history of ACEs compare to previously reported rates of homework completion in PCIT (Ros et al., 2016)?

Student's t-test will be used to compare rates of homework completion reported by mothers in the PCIT clinic at DCMC to those reported by mothers receiving PCIT in an outpatient psychology clinic. It is hypothesized that homework completion rates at the PCIT clinic at DCMC will be similar to the rates reported in an outpatient psychology clinic sample (mean = 57.97; range: 8.13 – 91.9).

SRQ 3. How do treatment satisfaction ratings of mothers with a history of ACEs compare to previously reported ratings of parental treatment satisfaction with PCIT (Brestan et al., 1999)?

Student's t-test will be used to compare treatment satisfaction ratings reported mothers in the PCIT clinic at DCMC to those reported by mothers receiving PCIT in an outpatient psychology clinic. It is hypothesized that treatment satisfaction rates at the PCIT clinic at DCMC will be similar to the rate reported in an outpatient psychology clinic sample (mean = 44.58; range: 28 – 50).

Discussion

Summary

There is evidence to suggest a relationship between maternal history of ACEs and adverse parenting practices in subsequent generation parent-child interactions. Parents with permissive or authoritarian parenting styles have been shown to benefit from PCIT, a BPT which teaches parents how to effectively implement authoritative parenting skills to manage child disruptive behaviors. Despite the positive outcomes for PCIT, insufficient parent engagement over the course of treatment can limit the benefits of the intervention. Recent research has not examined engagement outcomes as defined by the three sub-constructs of attendance, adherence, and cognitive preparation. To this end, the current study proposes to systematically investigate the predictive role of maternal ACEs in parent engagement outcomes in PCIT.

Limitations

The proposed study has a number of limitations. First, the convenience sampling method limits the generalizability of study findings. Families that present for services at DCMC either have health coverage in the form of private insurance or Medicaid. This represents a subset of the population at large and does not account for families without access to health care benefits. Thus, study findings may reveal a limited range of reported maternal ACE scores. To address this limitation, future studies should include mothers seeking PCIT services within community mental health settings.

Another limiting aspect of the sampling method is the exclusion of children with comorbid diagnoses. To better satisfy the participant enrollment component of Weisz et

al. (2005) criteria for clinical representativeness, future studies should include mothers of children with comorbid neurodevelopmental, anxiety, and trauma- or stressor-related disorders.

The reliance on self-report measures is another limitation of the proposed study. Self-report measures are subject to social desirability bias and expectancy effects. As such, these measures may yield inaccurate data across the span of treatment. This limitation may be addressed in future research by using additional methods of measurement for each examined variable. For instance, behavioral observations of child disruptive behaviors could be used to supplement parent-reported frequency and intensity of child behavior problems endorsed on the ECBI.

Another limitation of the current study is that high rates of attrition in the PCIT clinic at DCMC may lead to few completed reports of the TAI, which is typically administered at the graduation session. To address this limitation, every effort will be made to reach out to mothers who prematurely dropout of treatment so that TAI data can be obtained via phone interview. In future studies, this limitation may also be addressed by administering the TAI at multiple time points across the intervention to increase the likelihood of securing treatment satisfaction data from each mother presenting to treatment.

Future Directions and Implications

The current proposal did not statistically examine the relationships between different engagement outcomes. Future studies should examine the statistical significance of these relationships in order to obtain a greater understanding of how these outcome

variables are related to each other. Future research should also examine the relationships between covariates included in the regression analyses in order to optimize the level of variance explained by the predictor variables.

This study may be a crucial step in understanding how mothers' history of ACEs predict their engagement outcomes in PCIT. Results of this study may also help inform providers' pre-treatment orientation and commitment strategies to enhance retention, attendance rates, and adherence to between-session skill practice. Similarly, study findings could help providers develop more aptly tailored coaching statements to enhance mothers' perceived levels of support and motivation to change across treatment. Lastly, findings from this proposed study may help inform providers' future practice of assessing parent engagement outcomes in treatment settings with typically poor attendance, adherence, or cognitive engagement outcomes. Such findings may have implications that extend to other BPT protocols and child mental health services.

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