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Title: Do Family Risk Classes Predict Attrition in Parent Child Interaction Therapy?

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Shannon T. Lipscomb

Child behavior disorders are the second most prevalent form of mental illness affecting children in the United States (Perou et al., 2013), with lifetime prevalence estimated at 10% (Nock, Kazdin, Hiripi & Kessler, 2007). Negative outcomes associated with ODD during childhood and adolescence include conflict in families, poor peer relationships, peer rejection, and academic difficulties (Burke, Rowe & Boylan, 2013). Parent training programs are shown to be effective in reducing child behavior disorders (Thomas & Zimmer-Gembeck, 2011). One such program, Parent Child Interaction Therapy (PCIT), is a widely disseminated intervention implemented in diverse settings with populations of at-risk families. PCIT is an intervention shown to be effective in preventing and reducing behavior disorders in children aged 2- to 7-years old (Brinkmeyer & Eyberg, 2003). However, a large barrier to treatment success is that families often dropout before therapy is completed (Fernandez & Eyberg, 2009). A small collection of studies specifically examining attrition in PCIT have explored family risks as treatment barriers. Models exploring the shared influence of multiple risk factors in the literature on PCIT attrition are uncommon,

but given the co-occurring contextual risks often seen in families enrolled in PCIT, studies documenting the shared influence of multiple risks on attrition are important and have potential value in research and practice. Studies associating family risks with PCIT attrition have typically operationalized single variables and findings have been inconsistent. Although children and parents in parent-child therapies are known to have adverse family experiences (i.e. abuse, neglect, witnessing violence) (Kazdin, 1996), studies on the influence of adverse family experiences in PCIT attrition are few, and none have looked at the combined influences of family risks.

To help address these gaps, the current study will examined the ways in which family risks operate in combination with one another to help explain attrition in PCIT. More specifically, this study examines whether or not families participating in PCIT differ not only in the number of risks they present, but also in the ways in which risks combine, forming distinct patterns of risks.

To address this question, we conduct a Latent Class Analysis to identify family risk classes examining how two overarching types of risk; low-SES, and adverse family experiences. We addressed our main study aim by examining how the classes predicted the likelihood of dropping out of PCIT overall, and prior to the completion of the CDI component.

To help address these gaps, the current study will examine the ways in which family risks operate in combination with one another to help explain attrition in PCIT. More specifically, this study examines whether or not families participating in PCIT differ not only in the number of risks they present, but also in the ways in which risks combine, forming distinct patterns of risks. The goals of the present study were to

explore patterns of risks among families participating in PCIT, and to examine associations between these patterns and the likelihood of dropping out of PCIT, both prior to completing the first component (CDI) of the therapy and prior to completion of the full program. Findings pointed to three distinct patterns of risk but did not detect any significant associations between these patterns of risk and attrition in PCIT. These findings are important for guiding future research and provide preliminary information for practitioners to better understand the complexity of risks among families attending PCIT. Although the primary study aim was to examine links between classes of risk and attrition in PCIT, preliminary analysis detected two specific risk variables linked with PCIT attrition prior to completion of CDI: low parental education and having a mental health disorder in the household. There was also a trend toward low parental education being associated with attrition from PCIT overall

Do Family Risk Classes Predict Attrition in Parent Child Interaction Therapy?

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Major Professor, representing Human Development and Family Studies

Co-Director of the School of Social and Behavioral Health Sciences

Dean of the Graduate School

I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

Grace M. Hartman, Author

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Chapter 1. Introduction

Child behavior disorders are the second most prevalent form of mental illness affecting children in the United States (Perou et al., 2013). Meta-analytic and population studies have reported that 5 to 7% of preschool-aged children's behaviors fit the diagnostic criteria for Oppositional Defiant Disorder (ODD) (Egger & Angold, 2006; Perou et al., 2013), with lifetime prevalence estimated at 10% (Nock, Kazdin, Hiripi & Kessler, 2007). The developmental model expressed in the Diagnostic Statistical Manual (DSM), edition 5 (American Psychiatric Association, 2013) is that ODD is not transient, but that it is a stable disorder that can progress toward a more severe diagnoses of Conduct Disorder (CD). ODD and CD are characterized by developmentally atypical levels of hostility, aggression, and defiance (Maughan, Rowe, Messer, Goodman & Meltzer, 2004). Outcomes associated with these disorders are a cause for concern. Negative outcomes associated with ODD during childhood and adolescence include conflict in families, poor peer relationships, peer rejection, and academic difficulties (Burke, Rowe & Boylan, 2013). When it persists into young adulthood ODD is associated with social relationship problems with family, peers, romantic partners, and a lack of extended social supports (Burke, Rowe & Boylan, 2013). Preventing negative outcomes associated with ODD and CD is most effectively done through early intervention (Burke, Rowe & Boylan, 2013).

The most effective therapeutic strategies for young children exhibiting symptoms of ODD or CD include family treatment (Burke, Loeber & Birmaher, 2002). Because of

the substantial influence of parenting on child outcomes (Blair & Raver, 2012; Kalil, 2015) the parent-child relationship is accepted as an important point of intervention. A positive parent-child relationship is a powerful protective factor against poor outcomes for families living in adverse contexts (Blair & Raver, 2012). Early childhood is considered a window of opportunity for developmental plasticity (Shonkoff et al., 2012), allowing for a greater chance that intervention will interrupt escalation of diagnoses.

Parent training programs are shown to be effective in reducing child behavior disorders (Thomas & Zimmer-Gembeck, 2011). One such program, Parent Child Interaction Therapy (PCIT), is a widely disseminated intervention implemented in diverse settings with populations of at-risk families. PCIT is an intervention shown to be effective in preventing and reducing behavior disorders in children aged 2- to 7- years old (Brinkmeyer & Eyberg, 2003). PCIT works to repair the parent-child relationship by facilitating positive parent-child interactions and effective behavioral guidance (Brinkmeyer & Eyberg, 2003). PCIT focuses on two forms of interaction: The Child-Directed Interaction (CDI) and the Parent Directed Interaction (PDI). The CDI component aims to strengthen the parent-child relationship by increasing parents' sensitivity and responsiveness to the child during shared play sessions. In the PDI component parents learn to use specific behavior management techniques as they play with their child. Trained therapists observe interactions through a one-way mirror. Parents receive guidance by therapists through microphone-in-the-ear technology, which

allows the therapist to provide real-time suggestions and feedback on parents' interactions with their child.

PCIT is based on Baumrind's (1971) conceptualization of authoritative parenting, which involves a combination of parent nurturance and limit-setting (Brestan & Eyberg, 2003). Closely related to the concepts provided by Baumrind (1971), PCIT uses attachment theory principles (Ainsworth, 1979) which encourage warm, responsive, consistent caregiving as a basis for secure caregiver-child relationships (Ainsworth, 1979). PCIT allows parents to practice engaging in consistent, responsive interactions with their children through therapist-guided play, thus integrating attachment principles by promoting secure relationships (Brinkmeyer & Eyberg, 2003). The relational security and behavioral guidance fostered by PCIT aims to reduce the extreme negativity, hostility, and low academic and social competence associated with child behavior disorders (Brestan & Eyberg, 1998).

PCIT is an intensive intervention. The number of weekly sessions needed to graduate from PCIT typically ranges from 12 to 16 (Eyeberg, Nelson & Boggs, 2008), but it can take several weeks longer, depending on client progress. Graduating from PCIT indicates that child behavior levels are in a developmentally typical range and the parent-child dyad has mastered the skills practiced in therapy sessions (Eyeberg, Boggs & Algina, 1995).

Research on PCIT has documented statistically and clinically significant improvements in the behavior of young children (Eyeberg, Boggs & Algina, 1995).

Studies also demonstrate significant benefits of PCIT for parents' mental health, reductions of personal distress, and ability to stay in control (Brestan & Eyeberg, 2008). Parents who complete PCIT tend to be highly satisfied with the process and outcome of treatment (Brestan & Eyeberg, 2008). However, a large barrier to treatment success is that families often dropout before therapy is completed (Fernandez & Eyberg, 2009).

Studies documenting PCIT attrition (dropout before treatment completion) rates in community-based settings have reported that between 12 and 69% of participants dropout (Danko, Garbacz & Budd, 2016). This is in-line with the attrition rate for other parent-child therapies for child behavior disorders which ranges between 40 and 60% (Wierzbicki & Pekarik, 1993). Attrition in PCIT is a concern because families who drop out of therapy are less likely to experience positive behavioral gains than families who complete treatment. Boggs and colleagues (2004) found that families who dropped out of PCIT showed no improvement in behavioral outcomes at one and two years following treatment, compared to behavioral gains for those who complete treatment; unfortunately, no documentation of a dose-response pattern was reported.

Research findings on attrition in the broader field of parent-child therapies for child behavior problems indicate that multiple family risks are associated with dropping out (Ingoldsby, 2010; McKay & Bannon, 2004). The most comprehensive summary of research findings on attrition in parent-child therapies (Kazdin, 1996) suggests that abuse and neglect in families, socio-demographic risk (e.g. low income, single-parent status, low parental education), and mental health disorders have all been associated with

attrition from therapy for children with behavior disorders. Though each of the aforementioned risks have been studied in relation to attrition, there are inconsistent findings related to the causes of attrition and no specific patterns, or combinations of family risks that help explain attrition have been identified (Kazdin, 1996).

Family risks such as low-socioeconomic status (SES), household mental health and substance abuse disorders are associated with the development of child behavior disorders (Burke, Rowe & Boylan, 2013) and at the same time may create practical, emotional, and behavioral challenges that stand in the way of completion of PCIT (Wadsworth & Ahlkvist, 2015). Families disadvantaged by few social and financial resources may face practical barriers to attending treatment such as a lack of child care for siblings, transportation problems, or the imperative to prioritize basic family needs over going to therapy (Wadsworth & Ahlkvist, 2015). For families experiencing risks like mental health disorders, and violence in the home, events and behaviors related to these risks may prevent families from regularly attending PCIT (Kazdin, Mazurin & Bass, 1993; Timmer, Ware, Urziqua, & Zebell, 2010). A difficulty in retaining families in PCIT may be that the risks that have influenced the development of behavior disorders may be concurrent with treatment barriers for adult family members (Kazdin, Holland & Crowley, 1997; Werba, Eyeberg, Boggs & Algina, 2006). Just as behavior disorders are unlikely to be influenced by one risk factor, attrition is likely to be caused by multiple, co-occurring risks (Kazdin, 1996).

PCIT studies examining single risk factors in isolation of one another have

documented higher attrition among families with low-SES, high parent stress (Boggs et al., 2004; Werba, Eyeberg, Boggs & Algina, 2006), negative maternal verbal behaviors during parent-child interactions (Fernandez & Eyeberg, 2009; Werba, Eyeberg, Boggs & Algina, 2006), and exposure to interparental violence (Timmer, Urquiza, & Zebell, 2010), though results have not been consistent across studies. In demonstrating the cumulative manner in which multiple risks influence attrition, Bagner and Graziano (2012) found a positive relationship between the number of family risks and the likelihood of dropping-out of PCIT.

It is helpful to study the cumulative effects of risks in order to understand that multiple risks work together to influence attrition in PCIT. What is still unclear is whether certain combinations of risks pose greater treatment barriers than others. Additionally, although PCIT often targets families with risks like mental health disorders and child maltreatment (Thomas, Zimmer-Gembeck, 2012; Timmer, Urziqua, Zebell, & McGrath, 2005) these types of adverse family experiences have rarely been included in studies of PCIT attrition, leaving their relationship to attrition unclear. Moreover, it is unknown how adverse family experiences may work in conjunction with other factors like socio-demographic risks (defined in our study as family use of public assistance programs, low-parental education levels and single-parent households) to influence attrition in PCIT.

To help address these gaps, the current study examines the ways in which family risks operate in combination with one another to help explain attrition in PCIT. More

specifically, this study examines whether or not families participating in PCIT differ not only in the number of risks they present, but also in the ways in which risks combine, forming distinct patterns of risks. We call these patterns “family risk classes”. Identifying how different family risk classes are associated with attrition could have important implications for treatment retention strategies (Lanza & Rhoades, 2013). In order to understand how mechanisms between family risks and attrition may operate, the following review of the literature describes family risks in relation to family theories, and in the context of prior research on PCIT attrition.

Chapter 2. Literature Review

Theoretical Models

The risks experienced by families enrolled in PCIT are consistent with contemporary family theories, which suggest that family risks often occur simultaneously (Evans, 2004), and that one risk, such as having low financial resources may be concurrent with other risks within families, and poor outcomes for children (Conger, 2002). Moreover, contextual resources (e.g. income, education, local services), supports and stresses in families' lives can affect the way that they experience risks and outcomes related to risks (Evans, Boxhill & Pinkava, 2008; Raver, Roy & Pressler, 2014; Wadsworth & Ahlkvist, 2014). Conger's (2002) family stress model, and concepts from the relational developmental systems literature (Lerner, 2006; Lerner, Rothbaum, Boulos, & Castellino, 2002; Sameroff, 2000) were used to form the foundation for this study.

Family Stress Model. The study of influences of family risks on attrition in PCIT is informed by the Family Stress Model (Conger, 2002). The Family Stress Model explains that economic hardship creates financial pressure based on unpaid debts and unmet family needs. This economic pressure then challenges parents' abilities to meet demands, leading to emotional distress and in turn, to relational turmoil in families such as parental conflict and disrupted parent-child relationships. When families lack the needed interpersonal skills (e.g. responsive, consistent parenting), and emotional and material resources to mitigate the influences of economic hardship, child and adolescent development can become compromised (Conger, 2002; Conger & Donnellan, 2007;

Conger, Martin, Masarik, Widaman & Donnellan, 2015). Child behavior disorders are an example of maladaptive development that can stem from family stress and related risks.

The Family Stress Model informs the current study by offering a theoretical explanation for how economic hardship, conceptualized as socio-demographic risk in the current study, could interfere with completion of PCIT, by increasing stress within families, thus concurrently contributing to difficulties in parent-child interactions, and compromising families' abilities to complete PCIT. Conceptually the current study utilizes the underlying concepts introduced by Conger (2002) and extends upon them to include adverse family experiences such as household mental health and substance abuse disorders in predicting attrition in PCIT.

Concepts from the Family Stress Model describe relationships among economic hardship, family stress, and poor outcomes, and are useful to this study, but the model does not adequately address the variation seen in family risk experiences, or the reciprocal nature of risks. It is important to consider that different risks may be present for some families but not for others. How families experience risks is highly context-dependent (Lerner, Rothbaum, Boulos, & Castellino, 2002), and depends on a families' resources, supports and extent of disadvantage (Burton, 2007). A useful model for understanding the complexity of families' contextual experiences is the relational developmental systems metamodel (Lerner, Agans, DeSouza, & Hershberg, 2014; Lerner, Rothbaum, Boulos, & Castellino, 2002; Overton & Lerner, 2014).

Relational Developmental Systems Metamodel. The relational developmental systems (RDS) metamodel (Overton & Lerner, 2014) explains that human development is bidirectional, and context-dependent (Lerner, Agans, DeSouza, & Hershberg, 2014; Sameroff, 2000). From a RDS perspective, the effect of one variable on another is governed by the structure and function of other variables. The relationships among individuals and the context in which they live are the basic unit of analysis within human development (Lerner, 2006). When thinking of the ways in which family risks may influence attrition in PCIT, it is important to consider that family risks are part of a complex interplay among individuals and their environments. This means that different families may come to therapy sharing some of the same risks related to the development of behavior disorders, but because development is unique to the environment and the individuals in it, not all families will show the same combinations of risks. In addition, the RDS illustrates that risks do not occur in isolation of one another; risks like mental health and substance abuse often co-occur (Green et al., 2010; Regier et al., 1990) and can exacerbate each other (American Psychiatric Association, 2013). Thus, it is difficult to separate the influence of co-occurring risks. Recent RDS theoretical literature calls for the use of statistical models that can account for multiple co-occurring influences (Overton, 2015). Because family risks are an important aspect of the family environmental context, it is important to consider the ways that risks work in conjunction with one another to influence a phenomenon like attrition.

To capture family risk combinations it is possible to analyze the ways in which risks group together within families through person-centered analyses (Bauer & Shanahan, 2007). Person-centered analyses are intended to identify patterns in individuals or families/households across a set of variables. For our study, a person-centered approach is intended to illuminate how risks group together in families, specifically using Latent Class Analysis (LCA; Collins & Lanza, 2010). It is important for clinicians to know that that families can group into classes based on patterns of risks, and if classes are known to be associated with attrition. Such information may allow treatment options to be tailored to clients' needs thus allowing for a greater chance at treatment success (Lanza & Rhoades, 2013).

Strategies like LCA that examine how combinations of risks may relate to an outcome like PCIT attrition differ from variable-centered approaches, which focus on isolating individual variables of interest and/or examining additive or cumulative effects of the number of risks families face in explaining a phenomenon like PCIT attrition. In contrast to LCA, cumulative risk models emphasize the ways in which risks incrementally amass to impact development (Appleyard, Edgeland, Dulmen, & Sroufe, 2005; Masten & Wright, 1998). Studies utilizing this type of model typically create indices by summing the number of risk factors families experience and then examine associations between this cumulative risk index and outcomes. A benefit of a cumulative risk model is that it allows for the simultaneous consideration of co-occurring risks (Masten & Wright, 1998). A limitation is that cumulative risk models treat each risk as

equal without considering the type or combination of risk factors present (Evans & English, 2002). Treating risks as equal can be problematic because some combinations of risks may be related to more difficulty for families than others (Anthony, 2008). Additionally, evidence suggests that family risk experiences are heterogeneous, meaning that families experience different types of risks based on inputs in their environments, and the presence of additional risks like substance abuse and mental health disorders (Burton, 2007; Sameroff, 2002). Thus, leaders in the RDS field (Overton & Lerner, 2014: Overton & Molernaar, 2015) call for models that are able to describe with greater nuance the ways in which multiple factors combine to influence phenomenon that impact human development; in this case attrition from parent-child therapy.

In sum, as shown by the Conceptual Model (Figure 1), the current study draws upon the Family Stress Model to conceptualize how economic strain related to socio-demographic risks may present barriers to PCIT completion, such as through family stress and difficult family processes. The current study also expands upon this model to include adverse family experiences, which research links with family stress (Belsky, 1993; Belsky & Jaffey, 2006; Brooks-Gunn, Schneider & Waldfogel, 2013; Repetti, Taylor & Seeman, 2002). The RDS metamodel is used to inform our analytic approach. The RDS metamodel underscores the shared influence of family risks, meaning that risks reciprocally inform the presence of additional risks and their presence impacts outcomes for families in a complex manner. To further examine the potential mechanisms involved,

the following sections describe how the risks families face may introduce barriers to completing PCIT.

Family Risks and PCIT Attrition

Socio-demographic risk. Difficulties associated with socio-demographic risk for children and families are well-documented (Amatto, Booth, McHale & Van Hook, 2014; Bornstein & Bradley, 2014; Duncan & Brooks-Gunn, 1995). The current study examines key aspects of socio-demographic risk including low-SES (low-financial resources, low levels of parental education), and membership in single parent households; aspects of which are connected to difficulties for children and families (Brown & Moran, 1997; Duncan & Brooks-Gunn, 1995). Our study uses participation in public assistance programs (programs providing food, medical care, and cash aid) as a proxy for low financial resources because having few financial resources is a requirement for qualifying for public assistance programs, though acknowledging that access to assistance is beneficial to families. Families with low financial resources are often unable to adequately meet basic needs like nutrition, safe and healthy housing, and medical care (Bornstein & Bradley, 2014). The struggle to meet basic needs can be highly time consuming and logistically difficult in a low-resource environment (Lareau, 2011), challenges which have been reported to act as barriers to treatment in PCIT (Fernandez & Eyeberg, 2009).

Two groups that are more likely to be socio-demographically at risk are parents with low education levels and single parents. Parents with low formal education levels

often lack the leverage required to access higher paying jobs and professional social networks (Bornstein & Bradley, 2014), aspects that connect to difficulties related to low financial resources, with the added disadvantage of being cut off from helpful social connections. Single parents are often inadequately supported financially and socially, leaving many single parent households struggling with depression, parenting strains and logistical constraints (Brown & Moran, 1997). A family headed by a single parent, with low financial resources and low parental education is likely to face the difficulties that are often cited in the literature on socio-demographic risks and families (Bornstein & Bradley, 2014), obstacles which could block a family from attending treatment.

Socio-demographic risk can mean a lack of access to critical services like child care and mental health care (Coulton, Korbin, Su & Chow, 1995; Garbino & Crouter, 1980), leaving families without the support they may need to successfully attend parent-child therapy (Ingoldsby, 2010). Families who are socio-demographically at risk may be isolated by both geography and a lack of safe choices for friends and family, requiring extensive work to connect with supportive individuals (Notter, MacTavish & Shamah, 2008). Social isolation in families reduces emotional support, caregiving help, and outside intervention in family crises (Belsky, 1993; Zielinski & Bradshaw, 2006). Barriers like these, precipitated by socio-demographic risks, may be disruptive to completion of treatment in a program like PCIT because of heavy burdens on time, physical, mental and emotional capacity, lack of support, and logistical constraints related to transportation and child care (Ingoldsby, 2010; McKay & Bannon, 2004).

Adverse Family Experiences. For the purposes of this study, adverse family experiences include substance abuse in the home, mental health disorders in the home, and child abuse and neglect; risks which are often cited in the growing body of adverse childhood experiences (ACES) literature (Felitti et al., 1998). The use of the term adverse *family* experiences is intended to draw attention to the shared nature of adverse experiences among parents and other family members. Typically ACES literature looks at the outcomes of adverse experience for adults who had these difficulties during childhood (Felitti et al., 1998). In the context of our study the review of the ACES literature is to demonstrate that multiple risks often occur at the same time, that certain risks precipitate others, and that adverse experiences may concurrently impact the daily functioning of families in the midst of such difficulties.

It is clear from prominent studies on adverse child/family experiences that risks often occur together. Co-occurrence of multiple forms of child abuse, household mental health, and substance abuse disorders is common (Dong, Anda, Dube, Giles, & Felitti, 2003; Dube, et al., 2001a; Dube, et al., 2004; Felitti et al., 1998; Finkelhor, 1998). Mental health and substance abuse disorders in the home are connected to occurrences of abuse and neglect (De Bellis et al., 2001; Dube, et al., 2001b). Parental alcohol abuse is associated with a 2 to 13-fold increase in the odds of children experiencing abuse (physical, emotional, sexual and witnessing domestic violence) and neglect (Dube, et al., 2001b). In addition to multiple adverse family experiences, socio-demographic risks are often a co-occurring factor (Fellitti, 1998).

Socio-demographic risks may combine with adverse experiences in complex ways. In a study focused on socio-demographically disadvantaged mothers, Arditti, Burton and Neeves-Botelho (2010) found substance abuse to differentially affect mothers' abilities to promote better circumstances for their children. Mothers without substance abuse were shown to promote better circumstances for their children, and those with substance abuse did not (Arditti, Burton and Neeves-Botelho, 2010). Studies on families experiencing adversity demonstrate that risks combine differently in different families, depending on many factors, such as the duration and extent of disadvantage, the presence or absence of substance abuse and mental health issues, and the level of support available to parents (Burton, 2007; Conger & Donnellan, 2007; Lerner, 2003).

PCIT, Family Risk and Attrition. Prior studies of PCIT are informative about the different risks participating families face. Such work has emphasized the ways in which socio-demographic risks, parent stress, dysfunctional parent-child interactions, parent mental health status, substance abuse, and child abuse, impact family function (Borrego, Timmer, Urquiza & Follete, 2004; Borrego, Urquiza, Rasmussen & Zebell, 1999; Callahan & Eyeberg, 2010; Harwood & Eyeberg, 2006; Herschell & McNeil, 2007). For example, a PCIT case study described a family struggling with the destructive behavior of a child whose mother was at-risk for child physical abuse and had a severe substance abuse disorder (Borrego, Urquiza, Rasmussen & Zebell, 1999). PCIT studies have documented motivation and stress as barriers to treatment success for abusive parents (Chaffin, Funderbunk, Bard, Valle, Gurwitch, 2011; Herschell & McNeil, 2007). For abusive parents

who are in need of mental and behavioral-health treatment, the work of establishing a healthy parent-child relationship concurrent with individual treatment can be emotionally exhausting, impacting motivation to engage in PCIT (Herschell & McNeil, 2005). Demonstrating the influence of mental health and stress on families, Harwood and Eyeberg (2006) found that 75% of the variance in impaired parent-child functioning prior to PCIT was predicted by maternal depression and daily stress. Studies like these emphasize the multiple risks and challenges among families enrolled in PCIT, and illustrate variation in the types of risks families attending PCIT face.

A small collection of studies specifically examining attrition in PCIT have explored family risks as treatment barriers. Models exploring the shared influence of multiple risk factors in the literature on PCIT attrition are uncommon, but given the co-occurring contextual risks often seen in families enrolled in PCIT, studies documenting the shared influence of multiple risks on attrition are important and have potential value in research and practice. The only study to date that has accounted for the cumulative effect of multiple risks on PCIT attrition used a variable-centered approach and found that each increase in the number of risks occurring for families in PCIT was associated with a near doubling of the odds of dropping out of therapy (Bagner & Graziano, 2012). Considering poverty, single parent status, maternal education, minority status, lower maternal IQ, and parental distress, Bagner and Graziano (2012) found that families with 3 or more risk factors were 10 times more likely to drop out than families experiencing no risks factors (Bagner & Graziano, 2012). Studies associating family risks with PCIT

attrition have typically operationalized single variables and findings have been inconsistent. For example, Harwood and Eyeberg (2004) found significant differences in attrition based on family SES, contrary to the finding that SES was not seen as salient to attrition by Nieter, Thornberry & Brestan-Knight (2013). Although children and parents in parent-child therapies are known to have adverse family experiences (i.e. abuse, neglect, witnessing violence) (Kazdin, 1996), studies on the influence of adverse family experiences in PCIT attrition are few, and none have looked at the combined influences of family risks.

Identifying the ways in which socio-demographic factors and adverse family experiences co-occur is key to understanding the lives of families who participate in PCIT. Moreover, how combinations of risks may be related to families' ability to stay in therapy informs the foundation of this study, and is important when considering the practical value of predicting treatment dropout.

The Present Study

To help address these gaps, the current study will examine the ways in which family risks operate in combination with one another to help explain attrition in PCIT. More specifically, this study examines whether or not families participating in PCIT differ not only in the number of risks they present, but also in the ways in which risks combine, forming distinct patterns of risks.

The aim of this study is to understand how multiple family risks coincide to form family risk classes, and whether membership in classes differentially predicts attrition in

PCIT. Data were collected as part of a larger evaluation study of Project LAUNCH (Substance Abuse and Mental Health Service Administration, 2009) in Deschutes County, Oregon. Project LAUNCH is nationally disseminated, multi-pronged initiative designed to improve wellness for children ages 0-8 years and their families. PCIT was an important component of Project LAUNCH in Deschutes County and continues as a treatment modality in the county even after completion of Project LAUNCH. Consistent with prior efforts, retention of families in PCIT was a constant challenge (Armington et al., 2014).

The current study examines the questions: *What are the unique classes of risk present for families in PCIT?* And, *Do family risks classes differentially predict attrition in PCIT*?

To address this question, a preliminary step was to conduct a Latent Class Analysis to identify family risk classes. We examined two overarching types of risk; socio-demographic risks, and adverse family experiences. We expected that risk classes would be distinguishable from one another by different types and amounts of risk. Given that families with socio-demographic risks sometimes, but not always, exhibit adverse family experiences (Burton, 2007), and that the types of adverse experiences vary (Arditti, Burton & Neeves-Bortelho, 2010), we expected that one or more family risk classes would indicate socio-demographic risks in combination with some (e.g. mental health and substance abuse), but not other (e.g. child abuse and neglect) risks.

We addressed our main study aim by examining how the classes predicted the likelihood of dropping out of PCIT overall, and prior to the completion of the CDI component. We examined both attrition overall and attrition prior to CDI completion because identifying a risk class, or classes associated with attrition before a midpoint milestone like completion of the CDI may be useful to programs looking to tailor treatment for families who are at risk for dropping out.

Chapter 3. Materials and Methods

Participants

Participants were 166 parent-child dyads participating in PCIT through Project Launch. Children ranged from age 2 to 7 years, with an average age of 4 years, 11 months. Children were 65% male. At baseline 75% of children displayed clinical or near-clinical levels of externalizing behaviors, as rated by their parents on the Child Behavior Checklist (Armington et al., 2014).

Parents were aged 20 to 57 years, with an average age of 32 years (SD = 7.98). Parents were primarily biological mothers with the exception of 15 biological fathers, and a small number of foster parents (n = 4), adoptive parents (n = 3), stepparents (n = 2), and grandparents (n = 4). The racial and ethnic composition of the families was 85% White, 4% Black, 2% Native American, 1% Pacific Islander, and 10% Hispanic.

Of the families in our sample 84% (n = 143) were using assistance programs, such as WIC, TANF, SNAP, Head Start, SSI, and Medicaid. Forty-four percent (n = 127) of parents had a high school education or less. Forty-eight percent (n = 151) were living in single parent households.

The rate of children in our sample exposed to adverse family experiences was over 50%, including mental illness of a family member in the home (48%, n = 133), substance use in the home (34%, n = 138), and abuse or witness to domestic violence (51%, n = 150), and neglect (22%, n = 137).

Procedure

Data regarding family demographics and risks were collected within the first two PCIT appointments through a combination of client intake forms and conversations between families and their PCIT therapists. These data were collected between October of 2010 and July of 2014 and were recorded by therapists on a PCIT Log Intake form. There were 16 trained PCIT therapists facilitating the program and collecting data. Training on PCIT involved an intensive 3-day orientation, several follow-up sessions, and feedback and guidance for improvement from trainers. After completion, each participant was certified in PCIT.

Measures

Household participation in assistance programs. Household participation in assistance programs was measured dichotomously 0 (*no*) 1 (*yes*). Participation in assistance programs is used as a proxy for low-economic resources, which was not measured directly. Yet, we also acknowledge that receiving public assistance and linking to services can be a protective factor.

Low parental education. Low parental education was measured categorically using parents' self-reported education level with six response options 1 (*no high school diploma or GED)*, 2 (*high school diploma or GED)*, 3 (*some college credits)*, 4 (*2-year college degree)*, 5 (*4-year degree)*, 6 (*graduate school or higher degree)*. Because of the relative advantages of obtaining higher education compared to a high school degree or less, low parent education was coded dichotomously with 1 (*yes*) representing high

school education or less, and 0 (*no*) representing some college or higher.

Adverse family experiences. Parents reported occurrences of household mental health disorders, substance abuse, and child abuse, child neglect either through direct inquiry or during conversations with PCIT therapists, who then recorded responses. Questions asked were: whether or not the child in therapy had been a victim of neglect; a victim of violence or trauma *(physical, psychological or sexual abuse)* or a witness to domestic violence; whether or not someone in family/household has a problem with alcohol, drugs or substance abuse; and if someone in the family/household has a mental health disorder. There were three response options for each of the four items (*none, suspected, documented)*. Due to the large number of unreported cases of child maltreatment (Gilbert et al., 2009), for the purposes of this study *suspected* responses were combined with *documented* responses and were coded as 0 (*no*), 1 (*yes*).

Attrition is defined as a termination of treatment prior to the completion of PCIT. Information on attrition was reported by therapists and coded dichotomously 0 (*no*) 1 (*yes*).

Attrition prior to completion of CDI is defined as completion of the CDI component of PCIT as defined by therapists' assessments of treatment progress. Information on attrition prior to CDI was reported by therapists and coded dichotomously 0 (*no*) 1 (*yes*).

Analytic Plan

Preliminary steps were to examine rates of each risk, and to generate tetrachoric

correlations. We examined frequencies of each risk in order to understand which risks were more or less prevalent, the rates of attrition, and to inform expectations about what latent classes might look like. Tetrachoric correlations are used for binary variables to estimate the strength and statistical significance of associations among variables.

The goal of the present study is to understand how family risk classes predict PCIT attrition. A Latent Class Analysis (LCA) approach was used to identify family risk classes using Mplus 7.1 (Muthén & Muthén, 1998-2012). Three solutions with one, two, and three classes were compared to identify a model with the optimum number of classes. Our final model was selected through consideration of statistical model fit information, precision of classification and substantive interpretability.

When specifying a latent class model there are several model fit statistics that indicate the most appropriate number of latent classes. Best practices were followed by comparing all statistical indices (Masyn, 2013; Nylund, Asparouhov, & Muthén, 2007), these included the *Lo-Mendell-Rubin Likelihood Ratio Test* (LMR-LRT; Lo, Mendell, & Rubin, 2001), and *Bootstrap LRT* (BLRT; McLachlan & Peel, 2000) as well as the *Bayesian Information Criteria* (BIC). The LMR-LRT and BRLT are considered the most reliable indicators of model fit for small sample sizes (Masyn, 2013; Nylund, Asparouhov, & Muthén, 2007). For the LMR-LRT and BRLT, a significant *p*-value suggests that the given solution has a significantly better fit than the solution with one fewer classes (Masyn, 2013; Nylund, Asparouhov, & Muthén, 2007). Model fit was also examined using the BIC which accounts for model fit, sample size, and the number of

parameters in the model. The most optimal fit can be determined by identifying the model with the lowest BIC. When comparing models with differing class solutions it is common that fit indices can conflict (Muthén, 2012; Nylund, Asparouhov, & Muthén, 2007). In the instances where fit indices conflicted in our analyses we considered the conceptual interpretability of each solution, alongside model fit statistics, to identify the most parsimonious model solution able to explain the data substantively and conceptually (Muthén, 2012; Nylund, Asparouhov, & Muthén, 2007).

The precision of classification for the whole sample across all latent classes, or *entropy*, was used to assess the extent of separation between classes (Ramaswamy, DeSarbo, Reibstein, & Robinson, 1993). Entropy values range from zero to one, with higher values indicating better separation between classes.

Initially we established a model of family risk classes, and then examined whether or not probability of membership in the family risk classes differentially predicted attrition in PCIT using a Bayes Theorem approach in Mplus that was developed by Lanza (2013) and referred to as DCATEGORICAL (DCAT) (Asparouhov & Muthén, 2013; Lanza, Tan & Bray, 2013; Muthén & Muthén, 1998-2012). DCAT is considered the preferred method for categorical, distal outcomes in LCA (Asparouhov & Muthén, 2013). In the DCAT approach classes are binomially regressed on a distal, observed outcome (attrition) which is treated as a covariate (Lanza, Tan & Bray, 2013). DCAT is preferred to the traditional classify-analyze approach used to analyze distal outcomes related to latent classes, which commonly fails to account for classification error due to fact that

latent classes cannot truly be known (Masyn, 2013), but only assigned probabilities (Collins & Lanza, 2011). We used this approach to predict attrition in PCIT according to families' probabilities of membership in each subgroup (Asparouhov & Muthén, 2013).

Missing data. Variables with missing data included PCIT attrition (39%), attrition prior to completion of CDI (46%), parent education (24% missing), use of assistance programs (14% missing), household mental health disorder (20% missing), household substance abuse (17% missing), child neglect (18% missing), and child abuse (10% missing). Missing data on outcome variables were coded dichotomously (*1 = missing, 0 = not missing*), then analyzed using logistic regression on all study variables. No study variable was associated with missingness on outcome variables.

To reduce potential bias that could result from using listwise deletion and account for missingness, Mplus uses full information maximum likelihood estimation (Acock, 2012). For the analyses of the family risk classes, Mplus excluded cases that were missing on all of the risk variables (n = 158) (Table 3). For the Binomial regression of risk classes on attrition variables Mplus excluded cases that were missing on outcome variables: attrition overall (n = 95) and attrition prior to CDI (n=87).

Chapter 4. Results

Family Risk Frequencies

Families exhibited high rates of risk, including socio-demographic risks and adverse family experiences (Table 1). Rates of socio-demographic risks were as follows: public assistance (84%), low-parental education levels (44%), and single parent households (48%). Rates of adverse family experience (documented or suspected by therapists) were as follows: mental health disorders in the home (48%), substance abuse in the home (34%), child abuse (51%) and child neglect (22%). The frequency of documented responses were as follows; child neglect (10%), child abuse (33%), household substance abuse (21%), household mental health disorders (35%). The frequency of suspected responses were as follows; child neglect (12%), child abuse (17%), household substance abuse (22%), household mental health disorders (13%). The original distribution of parental education level was (16%) *no high school diploma or GED*, (16%) *high school diploma or GED,* (20%) *some college credits*, (3%) *2-year college degree*, (7%) *4-year degree*, (2%) *graduate school or higher degree.*

Preliminary Analyses

All study variables were analyzed using Stata IC13 to obtain tetrachoric correlations (Stata Corporation, College Park Texas, 2014) (Table 2) (n = 166). Attrition in PCIT overall showed a marginally significant association with low parental education that was moderate in size, $r = .35$, $p = .09$. Attrition prior to the completion of the CDI was moderately associated with low parental education, $r = .38$, $p = .04$. Attrition prior to

the completion of the CDI was also moderately associated with the presence of household mental health disorder(s), $r = .39$, $p = .04$. No other study variables were significantly associated with attrition overall or attrition prior to the completion of the CDI component. It was notable that correlations among adverse family experiences were high. Specifically, household mental disorders were highly correlated with household substance abuse $r = .46$, $p = .001$, child abuse $r = .49$, $p = .01$, and, child neglect $r = .46$, $p = .01$. Child abuse and substance abuse were highly correlated $r = .56$, $p = .001$. Child neglect and child abuse were highly correlated $r = .51$, $p = .001$.

Family Risk Classes

Results from LCA analyses in Mplus (Muthén & Muthén, 1998-2012) were used to determine the final family risk class solution. Mplus can be used to estimate a model in which some of the variables have missing values using full information maximum likelihood (FIML) (Acock, 2012). Both the two- and three-class solutions demonstrated adequate absolute fit as indicated by the BLRT statistic and LMR-LRT, while the sample-size adjusted BIC indicated the three-class solution had a better fit due to the lower BIC statistic in the three- versus two-class solution (Table 3). The separation of classes, as indicated by the entropy statistic, was higher with the three-class solution. The substantive difference between the two and three class solutions centered on inclusion of the smallest of the three classes, which would be considered lower risk in terms of SES, but also high in adverse family experiences, which we termed *Mixed Risk*. We selected the three-class model, which included the *Mixed Risk* class, because of the

model fit statistics, the higher entropy statistic, and its consistency with our theoretical foundations emphasizing that family risk experiences are likely heterogeneous.

Three-class model of family risk. The probabilities for each of the seven risk variables for the final three-class model are presented in Table 4. In the *High Risk* class (approximately 27% of the study sample), families exhibited a 63% probability or higher for each of the seven risks, with some approximating 100% (household mental health disorders, household substance abuse, and child abuse). In the *Moderate Risk* class (approximately 64% of the study sample), families exhibited a 57% probability or lower for all but one risk (the use of public assistance approximated 84%). In the *Mixed Risk* class (approximately 10% of the study sample), families exhibited a 36% probability or lower for each socio-demographic risk, and a 50% probability or higher for each adverse family experience risks. These classes are illustrated in Figure 1.

The two largest classes in our LCA, referred to as *Moderate Risk*, and *High Risk* revealed high probabilities (>50%) of socio-demographic risks including *use of assistance*, *low parental education* and *single-parent households*. The primary distinction between these two classes centered on their different levels of adverse family experiences. The *Moderate Risk* class showed SES risks as moderately to highly probable (52% - 84% across indicators of socio-demographic risks) but lower than 50% probabilities of showing adverse family experiences. The *High Risk* class showed higher probabilities (72% - 96%) of socio-demographic risks and very high probabilities of adverse family experiences including household mental health disorders (72%), substance

abuse disorders (100%), child abuse (100%) and neglect (63%). It should be noted that probabilities that reach the maximum threshold of 100% may be approximate. The *Mixed Risk* class is represented by a small number of families (n = 15) who were less likely to use assistance programs, have low parent education, or come from single-parent households, yet had high probabilities of adverse family experiences, such as substance abuse (64%), child abuse (64%), and neglect (100%).

Family Risk Classes and Attrition in PCIT

Results from the DCAT did not support our hypothesis that families' probabilities of membership in the three classes would predict PCIT attrition. Families' probabilities of membership in the various family risk classes was not associated with dropping out of PCIT overall, Chi^2 (2, N = 97) = 1.03, p = .60, nor prior to completion of the CDI component of PCIT, Chi^2 (2, N = 87) = 2.88, p = .22.

Table 1

Frequencies for all Study Variables (*N* = 166)

	% Yes (N)	% No (N)
Indicator variables		
Use of assistance programs	84.12 (118)	14.71 (25)
Low parental education level	43.53 (74)	31.18 (53)
Single parent household	48.24 (82)	40.59 (69)
Household member mental health disorder	47.65 (81)	30.59 (52)
Household member substance abuse	34.12 (58)	47.06 (80)
Child abuse	50.59 (86)	37.65 (64)
Child neglect	22.35 (38)	58.24 (99)
Outcome variables		
PCIT attrition	36.47 (62)	23.53 (40)
PCIT attrition prior to CDI	25.29 (43)	28.24 (48)

Note: Percentages based on cases with available data.

Table 2

Tetrachoric Correlations Among all Study Variables (*N* =166)

Variable	1	2	3	4	5	6	7	8	9
1. Attrition	–								
2. Attrition prior to CDI	1.00***	–							
3. Use of public assistance	.21	.23	–						
4. Low parental education level	.35†	.38*	.37†	–					
5. Single-parent household	-.16	-.23	.29†	-.01	–				
6. Household mental health disorder	.20	.39*	.32†	.15	-.08	–			
7. Household substance abuse	-.04	.09	.03	.13	.25†	.46***	–		
8. Child abused	.02	.06	.26	.18	.26†	.49**	.56***	–	
9. Child neglected	-.01	.16	-.20	.06	-.21	.46**	.71***	.51***	–

*** $p < .001$, ** $p < .01$, * $p < .05$, † p<.10

Note: all study variables were coded as 0 = no, 1 = yes

Table 3

Model Fit Indices for Latent Class Analysis of Family Risk Variables (*N* = 158)

Number of Classes	BIC	Sample-size adjusted BIC	Entropy	LMR-LRT p-value	BLRT p-value	Estimated proportion of dyads in smallest class	Estimated number of dyads in smallest class
one	1196.139	1173.980	n/a	n/a	n/a	n/a	n/a
two	1193.826	1146.343	0.74	0.00	0.00	0.32	51
three	1204.078	1131.271	0.82	0.00	0.00	0.09	15

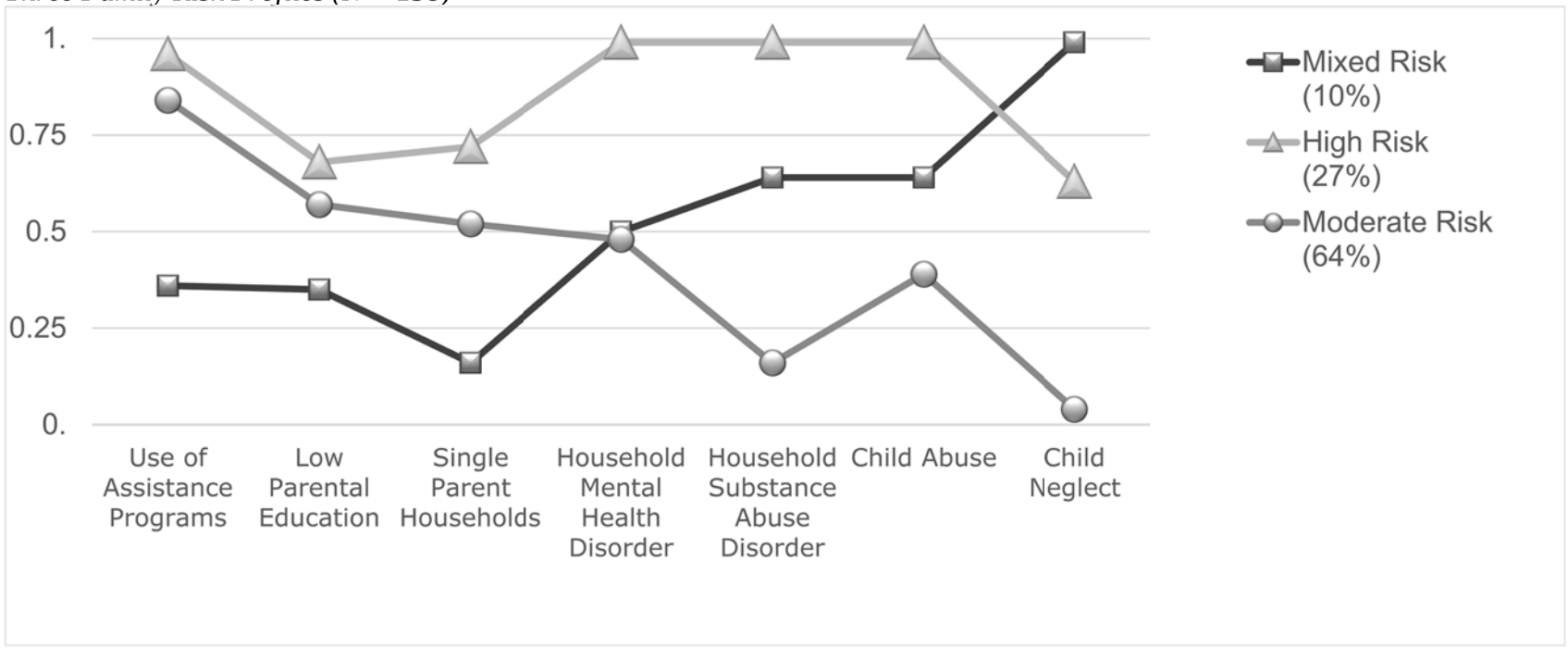
Table 4

Item Response Probabilities (Dichotomous Indicators), and Prevalence Rates for Three-Class Model (*N* = 158)

	Risk Class		
Risk Indicators	Moderate Risk	High Risk	Mixed Risk
Use of public assistance	0.84	0.96	0.36
Low parental education level	0.57	0.68	0.35
Single-parent household	0.52	0.72	0.16
Household mental health disorder	0.48	1.00	0.50
Household substance abuse	0.16	1.00	0.64
Child Abused	0.39	1.00	0.64
Child neglected	0.04	0.63	1.00
Prevalence rates (%)	63.65	26.62	09.74

Figure 1

Three Family Risk Profiles (N = 158)



Chapter 5. Discussion

The goals of the present study were to explore patterns of risks among families participating in PCIT, and to examine associations between these patterns and the likelihood of dropping out of PCIT, both prior to completing the first component (CDI) of the therapy and prior to completion of the full program. Findings pointed to three distinct patterns of risk but did not detect any significant associations between these patterns of risk and attrition in PCIT. These findings are important for guiding future research and provide preliminary information for practitioners to better understand the complexity of risks among families attending PCIT.

Family Risk Classes

A first step in our analysis was to explore family risks classes for families attending PCIT. Results from the current study suggested that although families in PCIT are considered to be high-risk (Boggs et al., 2004; Timmer, Urquiza, & Zebell, 2010; Werba, Eyeberg, Boggs & Algina, 2006), there are notable differences in types (socio-demographic and family adversity) and levels of risks they experience (Figure 1). These findings are consistent with our theoretical foundations and prior research indicating that risks often co-occur (Conger, 2002; Lerner, Rothbaum, Boulos, & Castellino, 2002) and that the prevalence of certain risks vary by the presence or absence of other risks (Burton, Arditti & Neeves-Borthello, 2010; Burton, 2007; Conger & Donnellan, 2007). While various combinations of risks are possible, the current study identified three distinct family risk classes: *High-Risk*, *Moderate Risk*, and *Mixed Risk*. This idea that families participating in PCIT may have different patterns of risks may be important for

practitioners to better understand the variation in the families with whom they work, and to inform program planning and treatment protocols.

The subgroup of families (27%) estimated to represent the *High-Risk* class had high rates of all seven family risk variables, including socio-demographic risks (use of public assistance, low parental education, and single-parent households) and adverse family experiences (household mental health and substance abuse disorders, and child abuse and neglect). The high rates of risks exhibited among families in this *High-Risk* class are similar to those reported by families in prior PCIT studies (Boggs et al., 2004; Timmer, Urquiza, & Zebell, 2010; Werba, Eyeberg, Boggs & Algina, 2006). The pattern of risks seen in this class align with prior research showing that multiple family risks prevalently co-occur (Dong et al., 2004; Felliti, 1998; Evans & English, 2002) and families who are under financial pressure may also experience emotional and behavioral health risks (Conger, 2002; Conger, Martin, Maserik, Widaman, Donnelan, 2015). The characteristics of the *High Risk* class are consistent with literature suggesting that problems with substance abuse and mental health increase the likelihood of child maltreatment (De Bellis et al., 2001; Dube, et al., 2001; Finkelhor, Hotaling, Lewis, & Smith, 1990). One potential implication of this *High Risk* class for practice could be that PCIT practitioners recognize the very high rates and substantial breadth of risk experienced by a subgroup of families. This could help them to focus on linking these families with other services and resources, and depending on clinical judgement, referral to additional or alternative treatment outside of PCIT.

The majority of families (64%) were estimated to represent a *Moderate Risk* class. This class was characterized by moderate probabilities (40 - 60%) for 4 out of 7 family risks. Yet, this class was marked by high probabilities of using public assistance and relatively lower probabilities of substance abuse in the home, and child neglect. The use of public assistance was used as a proxy for low financial resources in our study, however this also meant that families in this class had access to important supports. Our theoretical foundations suggest that family experiences are part of a complex interplay among individuals and their environments (Lerner, Rothbaum, Boulos, & Castellino, 2002), and that having fewer risks and conversely, more strengths, reduces the chances for additional risks to occur. The more moderate levels of risks across this class compared to the *High Risk* class are consistent with studies suggesting that risks combine differently in different families, depending on the duration and extent of disadvantage, and the presence or absence of substance abuse and mental health disorders (Arditti, Burton and Neeves-Botelho, 2010; Burton, 2007). Lower probabilities of single-parent households, and higher parental education levels indicate that families in this class have important strengths that can serve as protective factors against the strains of having low financial resources. The *Moderate Risk* class showed lower probabilities of adverse family experiences than the *High Risk* class. Practitioners who are able to differentiate between families who are very high risk, and families who have moderate levels of risks could use this information to bolster family strengths through linking families with continued resources and allowing strengths to inform the PCIT treatment protocol and relationship.

For example, if families are more likely to be headed by two parents, both parents could be encouraged to participate in treatment.

The smallest group of families (10%) estimated to represent the *Mixed Risk* class was characterized by low levels of socio-demographic risks and high levels of adverse family experiences, with the most prominent risk being child neglect (estimated at approximately 100%). This study tended to focus on the relationship of socio-demographic risks and adverse family experiences; however this class points to a greater nuance in the characterization of family risk experiences. The *Mixed Risk* class represents families who despite having lower socio-demographic risks are likely to have high rates of adverse family experiences. Prior research indicates that financial stress impacts families with greater socio-demographic assets as well, and can contribute to child maltreatment (Brooks-Gunn, Schneider, & Waldfogel, 2013). Furthermore, families can have problems with child abuse and neglect in the absence of socio-demographic risk factors (Belsky & Jaffee, 1996; Finkelhor, Hotaling, Lewis, Smith, 1990). Like families in the *High-Risk* class, the high probability of substance abuse in the *Mixed-Risk* class may be an important factor that plays a role in the high levels of child abuse and neglect. An implication of this *Mixed Risk* class for practice may involve an understanding that some families have very particular risks that may not fit an expected class, but could require extra resources to keep families involved in PCIT.

Predicting Attrition

Although the primary study aim was to examine links between classes of risk and attrition in PCIT, preliminary analysis detected two specific risk variables linked with

PCIT attrition prior to completion of CDI: low parental education and having a mental health disorder in the household. There was also a trend toward low parental education being associated with attrition from PCIT overall. Low parental education has been found to be associated with attrition in several studies on attrition from parent training to prevent child behavior disorders (Danko, Lagat Gebascz, Budd, 2016; Fernandez and Eyeberg, 2009, Lavigne et al., 2010; Reyno & McGrath, 2006). This study adds to the literature on PCIT attrition by identifying a link between low parental education and dropout prior to the CDI component of PCIT, and by detecting an association between household mental health disorders and attrition from PCIT.

Despite preliminary findings that low parental education, and mental health disorders were associated with dropout prior to the CDI, the overall patterns of family risks did not differentially predict PCIT attrition. This could be due, in part, to the fact that other variables (e.g. low parental education level, household mental health) were more salient to dropout than those identified in the family risk classes in the LCA. In other words, the variables that may be most closely linked with PCIT attrition were not those that drove the differences in the risk classes. Nonetheless, these family risk patterns add potential value in practice because they bring attention to the concept that although an overall group of families may be considered high-risk, there may be distinctions in the types of risk present for families, thus possibly calling for a different set of retention and support strategies.

Strengths and Limitations

This study has several limitations, including a small sample size, missing data, and lack of additional information about the families that could be important in understanding links with PCIT attrition and family risks. The small sample size is a notable limitation in the current study. LCA is typically used with larger samples but can successfully identify classes with smaller samples, like those in the present study (Masyn, 2013). LCA relies on there being enough variation in the sample that classes can meaningfully and reliably be identified. Replication of this approach with a larger sample size may provide more variation in experiences of risks to identify more distinct classes.

Second, missing data on several variables including our outcome variables may limit our ability to explain PCIT attrition. Missing data could potentially add bias to the patterns of family risk classes if data had a pattern to missingness (MAR); however, we are unable to test whether data was missing completely at random (MCAR). Additionally, missing data limits statistical power to predict PCIT attrition.

Third, we lack additional information, such as whether families who abused and neglected their children were court-mandated to attend PCIT. Being court-mandated to attend may act as a strong incentive to stay in treatment, even if a family has multiple co-occurring risks that may otherwise influence dropout.

Finally, we do not have a direct measure of families' financial resources, which meant the use of public assistance as a proxy for low financial resources. Having access to public assistance indicates socio-demographic risk because families usually have to have low financial resources to qualify, and at the same time use of assistance means a

family is connected to supports. Such connection to support may be a reason why we did not see a link between our risks and dropping out.

Even with these limitations, there are important strengths of the current study. A key strength is our use of data on adverse family experiences. This was the first time variables like these had been examined in conjunction with one another in a study on PCIT attrition. Inclusion of these adverse family experiences variables led to detection of subgroups of families experiencing different combinations of risks that may be useful to guiding future research. Studies using data from community-based settings may have pitfalls relating to inconsistent data collection, reporting and loss, but they allow us to understand some of the ways in which families are experiencing risk in a real-world context which is highly valuable when attempting to inform programs and practice.

Future Directions

Our findings indicated that families show distinct patterns of risks, which is important because families with multiple risks may need more tailored support than PCIT as a single program encompasses. Yet, possibly due to study limitations, we were unable to identify links between these classes and PCIT attrition. It is important for future research to expand upon these findings by further exploring whether family risk classes demonstrate different patterns of treatment completion by using larger sample sizes with more complete data. Our findings raise questions about how family risk classes relate not only to attrition, but also to other aspects of treatment such as patterns of engagement, responses to therapist styles, and treatment outcomes. In addition, only one study has looked at adverse family experiences and dropout in PCIT (Timmer, Urquiza, & Zebell,

2010). Further research on attrition in PCIT should include information on additional family risks such as trauma, and specific kinds of parent mental health and substance abuse disorders (in addition to household level disorders). Future research should explore the relationship between dropout and economic disadvantage with access to assistance, versus economic disadvantage without access to assistance. In order to truly inform practice, studies must also examine what supports parents need in order to stay engaged with, and complete PCIT, which could be a useful strengths-based perspective on treatment retention.

Chapter 6. Conclusion

It is clear from the literature that families in PCIT are likely to experience multiple risks (Boggs et al., 2004; Timmer, Urquiza, & Zebell, 2010; Werba, Eyeberg, Boggs & Algina, 2006). Findings from the current study indicate that risks co-occur in unique combinations. Although findings did not point to a link between classes of risk and PCIT attrition, it is important to continue to assess how groups of risks influence dropout, using stronger research designs. Positive changes can happen in the lives of families in PCIT if they are able to complete treatment (Boggs et al., 2004; Danko, Garbacz, & Budd, 2016), and working to explain dropout while respecting the complexity of families is potentially useful for programs.

Understanding PCIT attrition is a necessary step toward effectively directing resources to improve retention. Children who are demonstrating atypical levels of defiance and hostility may be doing so as a result of maladaptive inputs from their environments, stemming from family risks. In order to prevent escalation of behavior disorders by restoring the protective parent-child relationship, it is imperative to understand what leads to such high rates of PCIT attrition.

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