

**Investigating the Presentation, Trajectory, and Treatment of Posttraumatic Stress  
Disorder in Children Exposed to Intimate Partner Violence**

by

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A dissertation written in partial fulfillment  
of the requirements for the degree of  
Doctor of Philosophy  
(Psychology)  
in the University of Michigan  
2018

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## Dedication

To my husband and best friend, Nick, to my wonderful family, and to my advisors, Sandy and Andy, for your steadfast support through all the ups and downs of this process.

## Acknowledgements

This research was made possible through the grants from the Blue Cross Blue Shield of Michigan Foundation, and from the University of Michigan Office of the Vice Provost (Principal Investigator: Sandra Graham-Bermann). This research was also supported by Center for the Education of Women Riecker Graduate Student Research Grant, the Edward S. Bordin Graduate Student Research Grant, the Blunt Family Childhood Trauma Research Award, the Al Cain Award, the Rackham Summer Award, the Eric Bermann Award, and the Blue Cross Blue Shield of Michigan Student Award Program, received by Maria M. Galano.

I am incredibly grateful for the support of Drs. Sandra Graham-Bermann and Andrew Grogan-Kaylor, who I have worked closely with over the years and have been instrumental to the completion of this and other projects. I wish to also recognize the project team, both past and current members, who have all contributed to this dissertation project: Dr. Kathryn Howell, Dr. Laura Miller, Dr. Erin Hunter, Margaret McGuire, Jessica Koolick, Molly Potel, Daley DiCorcia, Emmy Carey, Emily Adams, Kaitlin Prakken, Daniella Jaward, Diana Marino, and Alexandra Bayer. Special recognition is given to Hannah Clark and Sara Stein, who have been good collaborators. I also want to acknowledge the families that made this research possible by participating in the various research projects described in this dissertation. Finally, I am thankful for the collective wisdom of my committee members – Drs. Sandra Graham-Bermann, Andrew Grogan-Kaylor, Alytia Levendosky, Nestor Lopez-Duran, and Brenda Volling – their critique has contributed significantly to this work.

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## Abstract

Childhood exposure to intimate partner violence (IPV) is serious public health issue associated with a host of negative outcomes, including posttraumatic stress disorder (PTSD). Research on early-life violence exposure has found that it confers risk for further exposure to violence and poor mental health later in life; however, there is a lack of prospective research in this area. Further, there is little information on how treatment impacts mental health over the long-term, despite the chronic nature of IPV exposure. This dissertation has three specific aims: (1) to examine profiles of traumatic stress symptoms in children and women exposed to IPV, (2) to evaluate how mothers' and children's PTSD symptoms relate, and (3) investigate trajectories of PTSD in IPV-exposed children as well as assess if intervention has a positive impact on children's PTSD symptoms over an eight-year period. Two-hundred ten children (ages 4-12), and their mothers were interviewed as part of this study. Approximately sixty families completed an eight-year follow-up interview to an intervention trial. Results demonstrated age-related differences in profiles of PTSD symptoms, as well as significant functional impairment of symptoms. Further, mothers' and children's symptoms of PTSD were significantly related in both younger and older children, suggesting it may be important to intervene with maternal mental health to have a significant impact on child functioning. Finally, this research demonstrated that children's traumatic stress symptoms worsen over time, regardless of treatment participation, and that this was related, in part, to their continued IPV exposure. Altogether, these results suggest more support is needed for children exposed to early-life IPV to promote their health long-term functioning.

## Chapter I

### Introduction

Intimate partner violence (IPV) is defined as physical assault, sexual assault, psychological aggression, or stalking by a current or former romantic partner (Centers for Disease Control and Prevention, 2014). IPV exposure is a pressing public health concern, as approximately 27% of women are exposed to IPV in their lifetimes, and 5.3 million women experience at least one act of IPV each year (Breiding et al., 2011; Breiding et al., 2015). Unfortunately, these numbers are likely underestimates of the issue, as women will sometimes not report IPV due to fear of retaliation or fear that they will not be believed. The issue of IPV warrants further concern as research has demonstrated that this experience is more often chronic in nature; it is estimated that as many as 20% of abused women have more than one abusive partner, and that violent relationships last, on average, 4-8 years, depending on the type of abuse that was measured (Thompson et al., 2006). Although women of all backgrounds have been found to experience IPV, certain risk factors such as younger age, being a member of an ethnic minority group, having lower income, having less education, and being a single parent have been demonstrated to place women at higher risk for abuse (Breiding, Black & Ryan, 2008; Capaldi, Knoble, Shortt, & Kim, 2012; Lilly & Graham-Bermann, 2009; Thompson et al., 2006).

IPV not only presents a serious issue for women who are in violent relationships, but also for children, who are often bystanders to this type of violence (Fantuzzo & Fusco, 2007; Hamby, Finkelhor, Turner, & Ormrod, 2011). In fact, estimates show that more than eight million children are exposed to IPV each year (Hamby et al., 2011). And while children of all ages

witness IPV, children younger than age 6 are at higher risk of IPV-exposure (Fantuzzo & Fusco, 2007). Furthermore, children are direct witnesses to about 80-95% of violent acts in the home (Fantuzzo & Fusco, 2007; Graham-Bermann, Lynch, Banyard, DeVoe, & Halabu, 2007), and live in violent homes for an average of 10 years (Graham-Bermann & Perkins, 2010). Thus, IPV is not only likely to have an onset during early development; it is also likely to persist over a several year period. As such, it is especially important to understand not only the immediate impact of IPV on children's functioning, but also how IPV impacts children over the course of their development.

### **Immediate and Long-Term Effects of Early Exposure to IPV**

**Potential Physical Outcomes of Childhood Exposure.** Exposure to IPV has been demonstrated to have direct, negative effects on children's biological and physical health. One example of this is a study by Shalev and colleagues (2013) who looked at telomere length in children aged five, seven and ten. They found that children who had been exposed to two or more types of violence, which included witnessing IPV, being bullied, and experiencing maltreatment, had greater telomere erosion over the five year period than those exposed to less violence (Shalev et al., 2013). Telomeres, which 'cap' each end of a DNA sequence, generally shorten over time (Chan & Blackburn, 2004). However, the genomic instability associated with telomere shortening eventually leads to cell death and can have effects the result in serious illness or even death for the individual (Fyhrquist, Saijonmaa, & Strandberg, 2013; Yang et al., 2016). Thus, we see that IPV, particularly when experienced alongside other stressors, can significantly impact children at a cellular level.

Signs of premature aging in children exposed to early adversity have been found in other biological systems. For example, a study examining the connectivity between the amygdala and

the medial pre-frontal cortex (mPFC) in children and adolescents with and without experiences of maternal deprivation in infancy found that it was associated with mature coupling of the amygdala-mPFC in both childhood and adolescence (Gee et al., 2013). In contrast, children and adolescents without early adversity had the expected immature coupling of the amygdala-mPFC. Many other researchers demonstrate that experiences with violence in childhood can have a negative biological impact, from the dysregulation of the HPA-axis, the bodies' stress-response system, to abnormalities in brain structures and functioning; as well as changes to the regulation and expression of genes (for review, see McCrory, DeBrito, & Viding, 2010). Specific investigations into relationships between HPA-axis functioning and trauma have demonstrated that exposure to physical and emotional abuse is associated with alterations to the HPA-axis regulation in the context of a stress task (Kuhlman, Geiss, Vargas, & Lopez-Duran, 2015). Research also shows that decreased stress reactivity actually mediates the relationship between childhood physical abuse and adjustment in later childhood (Kuhlman, Geiss, Vargas, & Lopez-Duran, 2016).

IPV-exposure can also lead to increased experiences of physical health problems. In one study of school-age children exposed to IPV, caregivers reported that children exposed to IPV experienced more headaches, stomachaches, constipation, nausea, and difficulty sleeping than children without that exposure (Lamers-Winkelmann, Schippers, & Oosterman, 2012). In another study of preschool-age children, IPV-exposure was connected with increased allergies, dizziness, and asthma (Kuhlman, Miller, Howell, & Graham-Bermann, 2012). Further, these physical symptoms were associated with increased risk for experiencing traumatic stress symptoms (Kuhlman et al., 2012). Children exposed to IPV also interact with the health care system more

frequently; in a study by Rivara and colleagues (2007), IPV-exposed children attended more emergency room and primary care visits than non-exposed children.

**Potential Psycho-social Outcomes of Childhood Exposure.** In addition to effects on physical health, witnessing violence can have psychosocial consequences. One study on the impact of experiencing both abuse/neglect and intimate partner violence showed that the children exposed to such stressors had significantly lower self-esteem and were more likely to respond to hypothetical situations involving conflict with violence than children not exposed to those stressors (Chan, Brownridge, Yan, Fong, & Tiwari, 2011). Exposure to IPV can also impact cognitive functioning in children. In a study of 3-5 year-old children, those who witnessed conflict at home performed much more poorly on tests of their verbal functioning than children without such experiences; this relationship held even when accounting for differences in SES (Huth-Bocks, Levendosky, & Semel, 2001). Further, IPV-exposure in childhood can have more downstream social effects, including increased risk for engaging in risky sexual behavior, substance use problems, and increased risk for being involved in relationships characterized by violence (Faulkner, Goldstein & Wekerle, 2014; Gover, Kaukinen, & Fox, 2008; Narayan, Englund, Carlson & Egeland, 2014).

Childhood IPV-exposure also has direct, negative effects on children's emotional functioning. Meta-analysis has demonstrated moderate correlations between experiencing IPV and expressing externalizing/internalizing behavior problems as a child (Kitzmann, Gaylord, Holt, & Kenny, 2003). Of particular concern is the finding that children exposed to IPV are at increased risk of developing serious mental health disorders such as depression and PTSD (Graham-Bermann, Gruber, Howell, & Girz, 2009; Graham-Bermann & Perkins, 2010; Graham-Bermann, Castor, Miller, & Howell, 2012b; Kuhlman, Howell, & Graham-Bermann, 2012).

**Outcomes Specific to Adolescence and Adulthood.** One of the most comprehensive studies to date on the long-term effects of violence exposure is the Adverse Childhood Experiences (ACEs) study, with a sample comprised of several thousand individuals recruited from a health assessment center in San Diego, CA (Dube, Felitti, Dong, Giles, & Anda, 2003). This study collected retrospective reports of adverse experiences before the age of 18, including child maltreatment and exposure to domestic violence, as well as reports of current health, health behavior, and mental health symptoms (Dube et al., 2003). Results from studies utilizing these data have demonstrated a wide range of negative effects associated with childhood violence exposure, including increased risky sexual behavior, greater drug and alcohol use, higher rates of obesity, more mental health symptoms, and increased risk for IPV perpetration/victimization as the number of ACEs increases (Anda et al., 2006; Dube et al., 2003; Whitfield, Anda, Dube, & Felitti, 2003).

**Potential Long-Term Traumatic Effects of Childhood Exposure.** While we are learning more about how children react to traumatic experiences, the information we have is primarily from cross-sectional studies, which only give a point-in-time snapshot of children's functioning. To date, there are no prospective data on the long-term developmental trajectories of the ways in which children exposed to IPV may adjust to traumatic events over time. Of particular concern is the development of PTSD, an intense, negative response to the experience of a traumatic event that is highly prevalent following exposure to IPV. This information is critically important, as the experience of IPV is typically chronic in nature (Thompson et al., 2006) and can have effects persisting into adolescence and adulthood (Anderson & Bang, 2012; Graham-Bermann, Cater, Miller-Graff, & Howell, 2016; Narayan, Englund, Carlson & Egeland, 2014; Shen, 2009; Whitfield et al., 2003). Thus, by generating more knowledge around the

complex developmental presentations and trajectories of mental health issues associated with exposure to violence in early childhood, we can provide improved mental health services to children with IPV experiences.

### **Defining PTSD**

According to the Diagnostic and Statistical Manual of Disorders – 5<sup>th</sup> edition (DSM-5), PTSD is a disorder characterized by an unusually intense and long reaction to a traumatic event, such as a military combat, rape, accidents, disasters, and exposure to or experiencing domestic violence. While a good deal of research focused on the occurrence of PTSD in veteran populations, work over the past several decades has demonstrated that PTSD actually occurs with regularity in civilian populations as well (Johnson & Thompson, 2008; Kessler et al., 1995; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). In fact, rates of PTSD in IPV-exposed women are estimated around 64% (Golding, 1999; Jones, Hughes, & Unterstaller, 2001). Furthermore, definitions of trauma and PTSD have expanded in recent years to capture the experience of individuals who witness traumatic events, which includes child witnesses of IPV. Thus, PTSD is a phenomenon that can be experienced by a wide range of individuals exposed to traumatic stress.

In order to meet criteria for PTSD, an individual must be exposed to a traumatic event as was described previously. Beyond this, PTSD is characterized by four symptom domains, including re-experiencing symptoms, avoidance symptoms, negative alterations in cognition and mood, and hyperarousal symptoms (American Psychological Association, 2013). In previous iterations of the DSM, the categories of avoidance symptoms and negative alterations in cognition and mood were together in a single category; however, work over the past decade suggested that the diagnosis of PTSD was better defined by differentiating those two types of



symptoms (American Psychological Association, 2013). The re-experiencing category includes symptoms such as flashbacks to the traumatic event(s) as well as nightmares and dreams regarding the traumatic event(s). Avoidance symptoms include attempts to avoid thoughts or feelings related to the traumatic event(s) as well as avoiding reminders of the event(s). Negative alterations in cognition and mood include symptoms such as a reduced range of affect and forgetting or repressing part of the traumatic event(s). Finally, the hyperarousal category includes symptoms such as feeling alert or highly vigilant, as well as physiological responses such as shaking or sweating when reminded of the traumatic event(s). To meet criteria for PTSD, an individual must experience at least two re-experiencing symptoms, one avoidance symptom, two symptoms in the negative alterations in cognition and mood domain, and two symptoms in the hyperarousal domain; a total of seven symptoms.

### **Defining PTSD in Young Children**

Recent revisions to the DSM have included updated criteria for children younger than age six. In children less than age six, the symptom domains of avoidance symptoms and negative alterations in cognition and mood are combined into one symptom category, and children at that age need only experience four symptoms to meet criteria for PTSD. Further, symptoms also include regressive behavior such as the loss of the ability to use the toilet (Scheeringa, Zeneah & Cohen, 2011). These changes were in part due to the finding across studies that PTSD was likely being underreported in very young children given the downward extension of adult criteria to children. For example, a study of PTSD in children up to age 7 who witnessed intimate partner violence assessed symptoms of PTSD using both DSM-IV-TR criteria and the DC: 0-3R (Levendosky, Bogat, & Martinez-Torteya, 2013). Rates of PTSD were higher when using the DC: 0-3R compared to DSM-IV-TR criteria across all age groups (e.g., in four year-olds, the rate

was 14% using the DC: 0-3R vs. 2% when using DSM-IV-TR criteria), though the significance of these differences was not assessed statistically (Levendosky et al., 2013). Another study by Graham-Bermann and colleagues (2012) also assessed PTSD using multiple measures. In this study, PTSD was assessed in preschool-aged children using both DSM-IV-TR criteria as well as a more developmentally appropriate measure, The Posttraumatic Stress Disorder Semi-Structured Interview and Observational Record for Infants and Young Children (Graham-Bermann et al., 2012). Using DSM-IV-TR criteria, PTSD was diagnosed at a rate of 17% in this sample (Graham-Bermann et al., 2012). However, when the developmentally appropriate measure was used, PTSD was diagnosed at a much higher rate of 51% (Graham-Bermann et al., 2012). Together, these studies suggest that PTSD has been significantly under-diagnosed, especially in very young children. It is likely that previous work on PTSD in preschoolers included mostly very severe cases, with more moderate, but still clinical cases, being excluded. Estimated rates of PTSD in IPV-exposed children are approximately 50% when developmentally-appropriate criteria are applied (Graham-Bermann et al., 2012b). Researchers assert that it is essential that the measurement of PTSD take developmental differences into account in order to provide a much more complete and accurate assessment of the scope of PTSD in young children (Graham-Bermann et al., 2012b; Levendosky et al., 2013; Scheeringa et al., 2011; Scheeringa, Myers, Putnam, & Zeneah, 2012; Zeneah et al., 2016). By doing so, researchers are able to better elucidate the course and impact of PTSD across development.

### **A Developmental Psychopathology Framework for Understanding PTSD**

A developmental psychopathology framework seeks to understand how various biological, psychological, and contextual factors independently, additively, and interactively contribute to both normal and abnormal outcomes throughout development (Cicchetti, 2016;

Cicchetti & Cohen, 2016; Cicchetti & Toth, 2009). This perspective recognizes that shifts in development may lead to changes in how risk and protective factors affect outcomes (Cicchetti & Toth, 2009), and thus gives more nuanced information about how psychopathology emerges across the lifespan. In general, risk and protective factors are described in terms of equifinality and multifinality. Equifinality is the idea that there are multiple pathways that lead to the same disorder, while multifinality states that one risk or protective factor can lead to many different outcomes (Cicchetti & Rogasch, 1996; Cicchetti & Toth, 2009; Hinshaw & Beauchaine, 2015). As Cicchetti and Toth (2009) highlight in their analysis of the state of the field of developmental psychopathology, these concepts have led to changes in the types of questions asked about pathology that focus on differentiating pathways to normal and abnormal outcomes as well as understanding when a risk factor leads to one disorder versus another.

A specific approach to the study of developmental psychopathology is the Unified Theory of Development (Sameroff, 2014). This theory integrates five different models for studying development and pathology; a personal model, or the study of the individual; a contextual model, or the study of the environment; a regulation model, or how the individual interacts with the environment; a representational model, or how past experience informs current and future interactions; and an evolutionary model, which examines how biological, psychological, and social functioning co-develop (Sameroff, 2014). According to Sameroff, this theory allows for researchers to more thoroughly understand the complex nature-nurture influence on development. Thus, it is increasingly necessary for researchers to engage in longitudinal research that can analyze changes over time, as well as utilize models that examine multiple aspects of human development and their interactions in order to answer the questions of developmental psychopathology. In doing so, a developmental psychopathology perspective also

allows for more targeted prevention and treatment efforts (Cicchetti, 2016; Cicchetti & Toth, 2009; Sameroff, 2014). Given the broad and far-reaching effects of early exposure to violence, developmental psychopathology is a good framework for investigating the pathways by which violence exposure leads to adverse health outcomes such as PTSD.

There is evidence to support investigating childhood traumatic stress using a developmental psychopathology framework. A recent meta-analysis of risk factors for PTSD in childhood and adolescence estimated effect sizes for 25 different factors across 64 studies (Trickey, Siddaway, Meiser-Stedman, Serpell, & Field, 2012). They found significant small to medium effect sizes for demographic factors including race, gender, and income; pre-trauma factors such as having a psychological problem or having a parent with a psychological problem and characteristics of the traumatic event such as severity (Trickey et al., 2012). Medium to large effect sizes were found for perceived threat during the trauma as well as post-trauma factors such as low social support, having poor family functioning, as well as having a previous diagnosis of PTSD or a comorbid psychological condition (Trickey et al., 2012). This study has many strengths as it included data from a large number of studies and consisted of studies that used standardized measures of PTSD. However, one important factor that was not examined as part of this analysis was parenting behavior.

In general, positive parenting practices are linked with better developmental outcomes throughout early childhood. For example, in a study of infants, parental emotional availability (i.e., ability to attend to infant's emotional needs) during different tasks was predictive of infant emotional regulation one month later (Volling, McElwain, Notaro, & Herrera, 2002). Conversely, negative parenting practices such as the use of corporal punishment are consistently associated with worse developmental outcomes (Gershoff & Grogan-Kaylor, 2016; Holmes,

2013; Miller-Graff, Cater, Howell, & Graham-Bermann, 2016; Owen, Thompson, & Kaslow, 2006). Furthermore, exposure to conflict and violence in relationships, as well as experiencing mental health problems, are related to poorer caregiving (Levendosky & Graham-Bermann, 2000; McElwain & Volling, 1999; Murray, Bair-Merritt, Roche, & Cheng, 2012). Given the significant amount of stress experienced by mothers experiencing IPV, as well as the high prevalence of mental health problems in mothers exposed to IPV, it is important to consider parenting and parent-child relationships as essential elements that can serve as either risk or protective factors for child PTSD in the context of domestic violence.

### **A Relational Perspective on Childhood Trauma**

Exposure to IPV is a unique stressor, as it impacts both the child and the caregiver. IPV exposure accounts for 5.8 billion USD in decreased productivity and direct mental and physical health care costs each year (National Center for Injury Prevention and Control, 2003) and significantly increases women's risk of severe injury and even death (Sheridan & Nash, 2007). Additionally, women who have been exposed to IPV are generally less physically healthy than women without such experiences (Dutton et al., 2006) and suffer much higher rates of substance use problems, depression, and PTSD (Golding, 1999). These impacts on women also have significant impacts on their children, as research has demonstrated that experiencing IPV is related to worse parenting behaviors and increased parenting stress (Holmes, 2013; Murray, Bair-Merritt, Roche, & Cheng, 2012; Owen et al., 2006). Furthermore, these negative changes in parenting behaviors can lead to worse child adjustment (Owen et al., 2006). For example, a study of 52 mother-child pairs investigated the relationship between maternal PTSD, parenting stress, emotional insensitivity, and child adjustment (Samuelson, Wilson, Padrón, Lee, & Gavron, 2016). They found the parenting stress, but not emotional insensitivity, partially mediated the

relationship between maternal PTSD and child internalizing and externalizing behavior problems (Samuelson et al., 2016). Interestingly, other studies have found that maternal PTSD symptoms partially mediate the relationship between inconsistent discipline and child internalizing and externalizing behavior problems, and fully mediate the relationship between poor supervision and internalizing behaviors (Symes, McFarlane, Fredland, Maddoux, & Zhou, 2016).

Following a review of numerous studies of the relationships between caregiver and child functioning Scheeringa and Zeneah (2001) proposed a relational model of PTSD to explain the co-occurrence of PTSD symptoms in caregivers and their children. They state that this model applies regardless of whether or not the caregiver and child were exposed to the same traumatic event, and that the symptoms of one individual exacerbates the other's symptoms (Scheeringa & Zeneah, 2001). They then propose three patterns of behavior in caregivers that may exacerbate PTSD symptoms in the parent-child dyad: withdrawn/unresponsive/unavailable, overprotecting/constricting, and reenacting/endangering/frightening. The authors state that the first pattern more often occurs in mothers who have previous experiences with trauma or who have comorbid depression or grief, while the second two patterns are reactions to children's exposure to trauma. In all cases, the responses of the caregiver lead to increased trauma symptoms in both individuals (Scheeringa & Zeneah, 2001).

Several studies have examined the theory that parenting behaviors and parental mental health impact children's responses to trauma. A recent study, which examined the interaction between behavioral inhibition and parenting outcomes in predicting PTSD development, found that paternal rejection in kids with high behavioral inhibition increased PTSD risk, while paternal warmth decreased PTSD risk (Asselman, Wittchen, Lieb, Höfler, & Beesdo-Baum, 2015). Interestingly, there were more profound effects of parenting in the context of early trauma (age

10 or younger) versus later trauma (Asselman et al., 2015). Parenting has also been demonstrated to interact with biological risk factors for childhood PTSD. A prospective study of young war-exposed children found that in children with high genetic risk for PTSD, PTSD was diagnosed at significantly lower rates when there was high maternal support (Feldman, Vengrober, & Ebstein, 2014). In a two-year prospective study of 1-6 year-olds with PTSD, higher maternal PTSD symptoms and depression mediated increases in children's PTSD symptoms over a two-year period (Scheeringa, Myers, Putnam, & Zeneah, 2015). Further, parental symptoms of PTSD were related to poor attachment in their children between ages 1-3, and this relationship was not mediated by negative parenting behaviors (Van Ee, Kleber, Jongmans, Mooren, & Out, 2016).

This relational model of PTSD is particularly useful when thinking about trauma reactions in IPV-exposed children, as in most cases both the mother and child have experienced trauma, though not necessarily the same traumatic event. For example, in a study of children aged 1-7 and their mothers who had experienced IPV, PTSD symptoms in mothers and children, particularly those in the symptom category of arousal, were significantly correlated (Levendosky et al., 2013). Another study showed that maternal PTSD symptoms partially mediated the relationship between prenatal IPV exposure and child PTSD symptoms in infancy (Lannert et al., 2014). Furthermore, neglectful parenting fully mediated the relationship between mothers' trauma symptoms and children's trauma symptoms (Lannert et al., 2014). These studies, as well as several others on the relationships between maternal mental health, parenting, and child PTSD (Samuelson et al., 2016; Scheeringa et al., 2015), provide support for a relational model of childhood PTSD. Thus, both maternal mental health and parenting behavior seem to be important factors that have independent effects on child outcomes, particularly childhood PTSD. However, these risk factors have been relatively understudied in the context of IPV, an area

where caregivers experience high rates of stress, particularly in regards to parenting, and high rates of mental health concerns. Further, it is unclear how parenting and parent mental health impact symptoms of PTSD in older childhood (e.g., school age and early adolescence).

Therefore, more information is needed to understand how mothers' and children's symptoms of PTSD are related, as well as to understand the relationship between early parental risk factors and children's mental health outcomes later in life.

### **The Impact of Intervention**

Given the serious impact of childhood IPV exposure, particularly as it is connected to the development of PTSD, several treatment approaches have been developed to address these issues. One of the most commonly used treatments for PTSD in children and adolescents is Trauma Focused Cognitive Behavioral Therapy (TF-CBT). TF-CBT is a structured, individual psychotherapy approach that combines the use of cognitive coping skills and affect regulation with trauma specific components, including creating a trauma narrative and restructuring negative schemas around the traumatic event (Cohen & Mannarino, 2008). There is a large body of evidence to support the use of TF-CBT with traumatized children (for review, see Feeny, Foa, Tredwell, & March, 2004; Smith et al., 2013).

Less research has focused specifically on treating PTSD in IPV-exposed children using this approach. One study, which compared an 8-session version of TF-CBT with child-centered therapy, found that TF-CBT was superior in reducing symptoms of avoidance and hyperarousal, but did not have a significant impact on re-experiencing symptoms (Cohen, Mannarino, & Iyengar, 2011). A randomized controlled trial of a 12-week version of this treatment showed that it was effective in reducing preschoolers' symptoms of PTSD, including after six-month follow-up (Scheeringa, Weems, Cohen, Amaya-Jackson, & Guthrie, 2011). However, this follow-up



sample only involved 16 children, which meant the analyses were underpowered. In another study, analyses of treatment moderators demonstrated that children whose mothers had higher depressive symptoms experienced fewer treatment gains at six-month follow-up than children of mothers with lower depressive symptoms (Weems & Scheeringa, 2013). This highlights the fact that parent mental health can have a significant impact on children's treatment outcomes.

However, given that these treatments were not designed specifically for families exposed to IPV, it is possible that treatment tailored to those individuals would have more positive effects on children's traumatic stress symptoms.

Project Support was created to assist 4-9-year-old children diagnosed with externalizing behavior problems by providing weekly home-based services to mothers and their children over a period of 6 months (Jouriles et al., 1998; Jouriles et al., 2001). The program is based on social learning theory, and teaches and supports women who have experienced IPV to enhance the effectiveness of their parenting in order to reduce their child's aggressive behaviors. In the administration of this program, providers also help mothers learn problem-solving skills to cope with family stressors other than violence that might serve to negatively affect parenting (e.g., financial stress). Simultaneously, providers work directly with the children to help reduce their problematic behavior. Results of several randomized control trials of this program show that it significantly improves mother's child-management skills, reducing harsh parenting, and that it also significantly reduced children's externalizing behavior problems and other conduct problems (Jouriles et al., 2001; Jouriles et al., 2009; McDonald, Dodson, Rosenfield, & Jouriles, 2011; McDonald, Jouriles, & Skopp, 2006). Notably, this study has the longest follow-up to date, as they examined intervention effects 20 and 24 months post-treatment, and found positive treatment effects, but did not specifically study traumatic stress as an outcome for either the child

or the parent (Jouriles et al., 2009; McDonald et al., 2011; McDonald et al., 2006). It is possible that the focus on parent as well as child functioning contributed to the sustained reductions in externalizing behavior problems in this sample. However, this program did not directly address caregivers' mental health problems, which is likely a key need for effectively treating children's mental health issues.

One of the most studied interventions to date is the Kids' Club program (KC; Graham-Bermann, 1992). This intervention focuses on giving support to groups of children who have witnessed IPV by providing them with a space to discuss feelings about violence, shame and blame, and learn non-violent conflict resolution skills. This intervention was initially evaluated in three groups: a control group, a child-only condition, and a child + mother condition, where the mother received a separate group intervention called the Moms' Empowerment Program (MEP; Graham-Bermann, Lynch, Banyard, DeVoe, & Halabu, 2007). The initial study evaluated the program's effects in children aged 7-12 and found that the greatest gains were made with children whose mothers also received treatment (Graham-Bermann et al., 2007). Specifically, in this child-plus-mother condition there were 79% fewer children with clinical range externalizing scores and 77% fewer children with clinical range internalizing scores from baseline to follow-up. A second study examined treatment outcomes in preschool aged children (4-6 year-olds) and reported that children's internalizing problems were significantly reduced when both mothers and children participated in the group interventions (Graham-Bermann, Miller-Graff, Howell, & Grogan-Kaylor, 2015). Participation in the KC also bolsters resilient outcomes. A study of preschool children who participated in the KC demonstrated improved social competence compared to children who did not participate in the program (Howell, Miller, Lilly, & Graham-Bermann, 2013). By focusing on reducing negative cognitions around violence such as shame

and self-blame, increasing safety, and improving social skills and support, all of which impact the development of PTSD, while simultaneously addressing concerns specific to IPV, it is possible that participation in this program will lead to longer-term gains that other types of treatment for PTSD in this population.

Studies of the MEP alone show significant and positive effects on mothers' outcomes, which then affect child outcomes. The MEP has been demonstrated to reduce PTSD in women who participated in the program, with a reported reliable change rate of 85% (Graham-Bermann & Miller, 2013). A study on mediators of child adjustment demonstrated that as the MEP reduced symptoms of PTSD in mothers, child adjustment improved in school-age children (Graham-Bermann, Howell, Lilly, & DeVoe, 2011). Further, the MEP has been demonstrated to reduce women's exposure to partner violence, thereby reducing the amount of violence that children are exposed to and potentially decreasing their PTSD symptoms over time (Miller, Howell, & Graham-Bermann, 2014). The MEP has been proven to significantly impact parenting, enhancing women's use of positive parenting practices and reducing their use of corporal punishment (Graham-Bermann & Miller-Graff, 2015; Grogan-Kaylor, Galano, Howell, Miller, & Graham-Bermann, 2016; Howell et al., 2015). This positive impact on known correlates of PTSD symptoms in children then likely has impacts on children's mental health outcomes over time. By addressing parenting skills and parent mental health while also addressing children's mental health concerns, it is possible that the MEP combined with the KC has greater long-term, positive treatment effects for childhood PTSD than interventions that do not address all these issues at once.

### **The Dissertation Studies**

This dissertation aims to address several current gaps in the literature as well as extend our current understanding of PTSD in childhood in three studies. First, current research on IPV-exposed children typically examines their PTSD symptoms independently of their caregivers' traumatic stress symptoms, despite evidence to suggest a more interdependent relationship between children's and caregivers' responses to traumatic events. Therefore, the first study will examine concurrent symptoms of PTSD in mothers and children in order to ascertain the degree to which they co-occur.

Additionally, most of the current research on PTSD in young children has been cross-sectional, which provides limited insight into the developmental trajectory of PTSD. Therefore, by using a developmental psychopathology perspective and longitudinal data, the second research study will give more directional information about factors that may confer risk or protection for developing PTSD following exposure to IPV and will identify pathways to both negative and positive adjustment following violence exposure. While some factors may be fixed characteristics (e.g., gender, race or ethnicity), other factors are likely to be therapeutically-modifiable and potentially time-varying characteristics, such as parenting and the level of social support. These modifiable characteristics then become potential treatment targets to reduce symptomatology. Thus, the identification of risk and protective factors is critical not only in furthering our understanding of the trajectory of PTSD in children, but also in the development of effective treatments that reduce the impact of early violence exposure.

The third dissertation study seeks to evaluate the long-term effects of early treatment on the trajectory of posttraumatic stress symptoms by interviewing a sample of families that previously participated in a randomized control trial of an evidence-based treatment for early IPV exposure. This will allow for the evaluation of the impact of early intervention on the

trajectory of mental health symptoms, as well as learning more about the long-reaching effects of treatment, a currently understudied area in clinical psychology. A major limitation of current research is the dearth of information on long-term outcomes (e.g., several years post-treatment). Given the chronic nature of IPV exposure, as well as evidence that early violence experiences are associated with poor long-term outcomes, this research is necessary to understanding the best ways to support children who have experienced IPV.

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## Chapter II

### Profiles of Traumatic Stress Symptoms in Women and Children Exposed to Intimate Partner Violence

Intimate partner violence (IPV) is defined as physical assault, sexual assault, psychological aggression, or stalking by a current or former romantic partner (Breiding et al., 2015). Exposure to IPV, as defined in the previous sentence, is a serious public health issue, affecting approximately 30% of women over their lifetimes (Breiding, Basile, Smith, Black, & Mahendra, 2015). Further, IPV often occurs in households with children, which results in 16% of children witnessing psychological IPV and approximately 18% witnessing physical IPV over their lifetimes (Hamby, Finkelhor, Turner, & Ormrod, 2011). These experiences can lead to maladaptive outcomes in multiple areas of functioning. Women experiencing IPV report greater physical health problems and are at higher risk for significant injury than women without such experiences (Wu, Huff, & Bhandari, 2010; for review, see Black, 2011). Further, research has shown that parenting is negatively affected by stressful contexts such as living with a violent partner. Specifically, mothers exposed to IPV report increased parenting stress, and have been observed to engage in more hostile and disengaged parenting than mothers who are not experiencing IPV (Cohen, Hien, & Batchelder, 2008; Lannert et al., 2014; Levendosky, Leahy, Bogat, Davidson, & Von Eye, 2006). Importantly, both women and children experiencing IPV are at risk for developing serious mental health problems, including posttraumatic stress disorder (PTSD; Alisic et al., 2014; Golding, 1999; Dutton et al., 2006; Graham-Bermann, Gruber,

Howell, & Girz, 2009; Graham-Bermann, Castor, Miller, & Howell, 2012; Nathanson, Shorey, Tirone, & Rhatigan, 2012; Pico-Alfonso et al., 2006; Trevillion, Oram, Feder, & Howard, 2012).

PTSD is a serious mental illness that occurs following exposure to either a single or multiple traumatic events. Experiencing IPV, either directly or through witnessing acts of IPV, fits the definition of a traumatic event (American Psychiatric Association, 2013). In addition to experiencing a trauma, a diagnosis of PTSD involves a complex set of criteria (American Psychiatric Association, 2013). In the most recent iteration of the Diagnostic and Statistical Manual of Disorders (DSM), a diagnosis of PTSD was updated to a four-factor model of symptoms consisting of the following domains: Re-Experiencing, Avoidance, Negative Cognitions and Mood, and Hyperarousal (American Psychiatric Association, 2013). Prior to this revision, PTSD symptoms were thought to be part of a three-factor model where symptoms of negative cognitions and mood were listed within the category of Avoidance symptoms. In both definitions, individuals must experience at least seven symptoms across the categories, with a minimum number of symptoms in each category, in order to meet a diagnosis of PTSD. This leads to significant variations in presentations of PTSD between individuals. Therefore, researchers have been interested in identifying those factors that might influence these variations in symptoms.

The majority of investigations into patterns of PTSD symptom presentation have been conducted with adults. One study examined profiles of PTSD among survivors of three different types of trauma: sexual assault, car accident, and traumatic death of a loved one (Kelley, Weathers, McDevitt-Murphy, Eakin, & Flood, 2009). The authors found differences between the groups in terms of overall severity of symptoms, with sexual assault victims reporting the most severe level of symptoms (Kelley et al. 2009). Furthermore, they found that the group

differences varied based on specific symptoms (Kelley et al., 2009). Thus, the type of trauma that a person experiences seems to have an important influence of their presentation of PTSD symptoms. However, more recent studies focused on presentations of PTSD symptoms specifically in IPV-exposed populations have found similar patterns of results, suggesting that factors other than type of trauma are important to the development of PTSD. For example, one study used latent profile analysis to examine patterns of PTSD symptomatology in 229 women with recent experiences of IPV (Hebenstreit, Maguen, Koo, & DePrince, 2015). The authors identified five distinct profiles of PTSD; three of which were differentiated by overall severity (e.g., low, moderate, and severe), and two differentiated by both overall severity and presence of high Hyperarousal symptoms (Hebenstreit et al., 2015). These profiles were primarily differentiated by women's appraisals of fear, self-blame, and alienation following their exposure to IPV. Another study examined PTSD symptom profiles among women with histories of experiencing bidirectional IPV (Hellmuth, Jacquier, Swan, & Sullivan, 2014). In this sample, three profiles of PTSD emerged based on symptom severity: low, moderate, and severe. These profiles were differentiated by their level of depressive symptoms, as well as their specific IPV victimization/perpetration history. Further, they found that a greater percentage of women in the moderate and severe profiles reported meeting the DSM criteria for functional impairment (Hellmuth et al., 2014). However, they only measured general functional impairment, rather than specific domains of functional impairment such as work or school, friendships, and family relationships. If it can be determined how different presentations of PTSD symptoms connect to specific forms of functional impairment, then it may be possible to use this information to better tailor the structure and delivery of treatment for those with differing symptom presentations.



Other research has found variations in the primary type of PTSD symptom(s) experienced (Matlow & DePrince, 2013). Specifically, the authors demonstrated that chronic IPV victimization by one violent partner was significantly predictive of Avoidance of feelings or thoughts about the trauma, and diminished hope for the future. Conversely, they found a history of more than one type of traumatic experience was significantly predictive of several symptoms, including more active Avoidance symptoms, as well as Hyperarousal symptoms (Matlow & DePrince, 2013). Other research has demonstrated that PTSD symptom presentation varies by factors such as gender and race/ethnicity (Green, 2003; Marques, Robinaugh, LeBlanc, & Hinton, 2011). It is not clear from the results of these studies whether PTSD in women exposed to IPV varies solely by severity of symptoms, or if there is greater heterogeneity in the presentation of PTSD. This information is critically important, as it may be that there are subtypes of PTSD where there is significant severity in one or two symptom domains, but not in the other domains, which would lead one to rule-out a PTSD diagnosis.

Fewer studies have examined patterns of PTSD symptoms in children. As in adults, research with children has demonstrated that type of trauma is predictive of severity of PTSD symptoms. Specifically, a large-scale study of youth in the child welfare system found that exposure to interpersonal trauma or a combination of interpersonal trauma and emotional abuse/neglect was associated with the highest level of traumatic stress symptoms (Kisiel et al., 2014). Another study examined profiles of Hyperarousal, Re-Experiencing, and Avoidance symptoms in a sample of 749 children with histories of physical and/or sexual abuse (Runyon, Deblinger, & Steer, 2013). The analysis in this study yielded five different PTSD presentations that varied based on severity as well as primary symptom(s) domain. Being older and having concurrent internalizing symptoms predicted membership in the more severe categories (Runyon

et al., 2013). These results indicate that depressive symptomatology is also linked with PTSD symptomatology in children. However, these studies examined relationships between PTSD and interpersonal trauma more broadly, with no investigation to date into the connections between PTSD and witnessing IPV. Given that specific types of trauma have been linked to differences in PTSD symptom presentation, valuable information could be gained by examining profiles of symptoms in IPV-exposed children.

### **Study One Aims and Hypotheses**

The aim of this dissertation study is to gain a better understanding of the presentation of posttraumatic stress symptoms in children and women who have experienced intimate partner violence (IPV). Latent profile analysis (LPA) is a multivariate approach that uncovers latent grouping in data using a set of indicator variables. Therefore, using LPA allows for PTSD symptom domains to be examined, rather than PTSD summary scores. This is important, as PTSD summary scores conceal the degree to which each domain contributes to the overall PTSD presentation. For example, say there are two individuals, both with a PTSD summary score of 12 out of 17 possible symptoms. If only the summary score is calculated, then these may appear to be similar presentations of traumatic stress. However, if you examine the symptom domain scores instead, it may be that one individual has scores of 4 in each symptom domain, while the other individual has a score of 5 in the Re-Experiencing domain, a score of 2 in the Avoidance domain, and a score of 5 in the Hyperarousal domain. Diagnostically, the first individual would meet criteria for a diagnosis of PTSD, while the second person would not meet criteria. Additionally, if only the summary scores are examined, one might assume that these individuals have similar treatment needs; however, if symptom domain scores are examined instead, then it may be more evident that these two individuals likely have different treatment needs. Thus,

using LPA to examine traumatic stress symptoms is more reflective of the way that PTSD symptoms are assessed in clinical settings and will lend more clinical utility to these findings.

Further, this study will also examine associations between known risk factors for PTSD and differing profiles of symptoms. The information gained from this study can be used to better understand the presentation of PTSD symptoms in both children and adults, as well as guide clinical decision-making and potentially enhance treatment outcomes for women and children experiencing PTSD symptoms. The main study questions are:

1. How do symptoms of PTSD cluster in women with recent experiences of IPV?
2. How do symptoms of PTSD cluster in children with recent histories of exposure to IPV?
3. What are the functional impacts of different symptom structures of PTSD in women and children exposed to IPV?

Based on the literature, the following hypotheses are posed:

1. Profiles of PTSD symptomatology in both women and children will be differentiated by the severity of symptoms using three symptom domains (i.e., profiles of low, moderate, and high symptoms).
2. Those with worse symptom severity will experience greater functional impacts of their symptoms in specific areas of their daily lives, including performance at work and school and engagement in activities with family and friends.

## **Methods**

### **Participants**

Participants in this study were 233 mothers and one of their children between the ages of 4-12. On average, mothers were 33.28 years old ( $SD = 7.44$ ), and children were 6.49 years old ( $SD = 2.42$ ). Slightly less than half (47%) of the children were female. Families were predominately low-income, with average monthly incomes of \$996 ( $SD = \$1,129$ ). The children in this sample were ethno-racially diverse: 20% identified as African American, 48% as Latino/Hispanic, 11% as Biracial, and < 1% as Asian American. The women in this sample were similarly diverse: 20% identified as African American, 49% as Latino/Hispanic, 5% as Biracial, and 1% as Asian American. Thirty-seven percent of the mothers had a partial high school education or less, 25% of the sample had a high school diploma or GED, and 39% of the sample had at least some post-secondary education. Eighty percent of the sample identified as single, separated or divorced at the time of the interview. Table 1 also provides sample demographic information.

## **Procedures**

Baseline data from two randomized controlled trials of an intervention for mothers and their children exposed to recent IPV was used for this study. One intervention was specifically for mothers and their preschool-age children between the ages of 4-6; the other was for Spanish-speaking mothers and their children between the ages of 5-12. Families were recruited through contacts/postings at local shelters, community centers, doctor's offices, and local businesses. Any interested mother called a toll-free number to be assessed for eligibility. All families were deemed eligible if the mother endorsed recent IPV experiences (i.e., within the past two years) and if she had a child in the target age range. Following this, families were enrolled into the study via a block randomization procedure and subsequently completed a baseline interview. Mothers answered questions regarding her parenting, her exposure to IPV, as well as her and her

child's mental health, including their symptoms of PTSD. All study methods were approved by the University Institutional Review Board prior to data collection.

### **Measures**

**IPV Exposure.** Women's exposure to IPV was assessed using the Conflict Tactics Scale – Revised (CTS-2; Straus, Hamby, Boney, & McCoy, 1996). The full measure assesses both violence perpetration and victimization; however, only the victimization questions were asked at the request of participating agencies. Sample questions include, “My partner threatened to hit or throw something at me” and “My partner burned or scalded me on purpose.” Answers are given on the following frequency scale: never, one time, two times, 3-5 times, 6-11 times, 12-20 times, or more than 20 times. Answers are then summed to give a total violence score that includes the subscales of Physical Assault, Sexual Assault, Psychological Aggression, and Injury. The measure also includes the subscale of Negotiation, which measures the frequency of use of non-violent conflict resolution strategies; however, it is not included in the total violence score. The CTS-2 has been demonstrated to have good validity and reliability in reporting of partner violence (Straus, Hamby, Boney, & McCoy, 1996). Reliability for the current study is ( $\alpha$ ) 0.94.

**Additional Trauma.** Exposure to additional types of trauma was assessed using items 1-12 of the Posttraumatic Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997). These items assess previous history of exposure to interpersonal trauma such as assault or threatened assault, as well as exposure to accident or serious illness. For each item, mothers reported whether she, her child, both, or neither of them had experienced the traumatic event in question. Mothers were identified as having additional trauma exposure if she reported that she or both her and her child had been exposed to any of the twelve different types of trauma. Children were

identified as having additional trauma exposure if their mother reported that the child or both her and her child had been exposed to any of the twelve different types of trauma.

**Parenting.** Parenting was measured using the 42-item self-report Alabama Parenting Questionnaire (APQ; Shelton, Frick, & Wooten, 1996). This measure assesses both positive and negative parenting practices. Example items include, “You have a friendly talk with your child,” and “You feel that getting your child to obey you is more trouble than it’s worth.” Answers are given on a five-point scale from ‘1 – never’ to ‘5 – always.’ The two main scales are of Positive Parenting and Negative Parenting. The Positive Parenting score is an average of scores on the following subscales: Involvement, Positive Parenting, and Other Discipline Strategies; while the Negative Parenting score is an average of the Inconsistent Discipline, Poor Monitoring/Supervision, and Corporal Punishment subscales. Higher scores reflect more frequent use of a parenting behavior. The APQ has been demonstrated to have good internal consistency and reliability for most subscales (Shelton et al., 1996). Reliability the Positive Parenting scale is ( $\alpha$ ) 0.77, and reliability for the Negative Parenting scale is ( $\alpha$ ) 0.72.

**Mother’s Depression.** Mother’s depressive symptoms were assessed with the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977), which assesses frequency of depressive symptoms over the past week. Answers are given on the following four-point scale: ‘None of the time’ ‘Some of the time’ ‘Occasionally’ ‘Most or all of the time.’ Sample items include, “I did not feel like eating,” and, “People were unfriendly.” Positively worded items are then reversed coded, and then answers summed across all items to give a total score; higher scores reflect greater depressive symptomatology. The CES-D has high internal reliability and good convergent validity with other measures of depression (Radloff, 1977). Reliability for the current study is ( $\alpha$ ) 0.90.

**Mother's Posttraumatic Stress Symptoms.** Mother's PTSD symptoms were measured using the 49-item Posttraumatic Diagnostic Scale (PDS; Foa et al., 1997). Seventeen items assess past-month frequency of PTSD symptoms, and 9 items assess the functional impact of PTSD symptoms in several domains. Answers are given on a scale from 'Not at all or only one time,' to '5 or more times a week/almost always.' Symptom domain scores for Re-Experiencing, Avoidance, and Hyperarousal are calculated, with higher scores reflecting greater PTSD symptomatology. This measure also assesses functional impairment in the areas of work, household work and chores, friendships, fun and leisure activities, schoolwork, family relationships, and sexual relationships. Additionally, the measure assesses the degree to which women feel that their symptoms affect their overall level of functioning and general life satisfaction. The PDS has been shown to have good convergent validity and high reliability for the total scale (Foa et al., 1997). Reliability for the total scale for study one is ( $\alpha$ ) 0.88. Reliability for the symptom domain scores are as follows: Re-Experiencing ( $\alpha$ ) 0.82; Avoidance ( $\alpha$ ) 0.76; and Hyperarousal ( $\alpha$ ) 0.74.

**Younger Children's Posttraumatic Stress Symptoms.** The 31-item Posttraumatic Stress Disorder Semi-Structured Interview and Observational Record for Infants and Young Children was used to measure PTSD symptoms in children aged 7 or younger (Sheeringa & Zeanah, 1994). This measure was developed in accordance with DSM-IV-TR criteria for PTSD. Example questions include, "has your child had nightmares about it, or an increased frequency of nightmares since the event?" and "has your child had a hard time going to bed or falling asleep?" Caregivers are asked to give behavioral examples of any symptoms that they endorse for their children. Members of the research team trained code these examples to rate both symptom presence and severity on a 0-2 Likert scale. This scale can give summary scores for each of the

three symptom domains as well as a total symptom score. Further, five items assess functional impairment at home, at school, with friends, as well as child- and caregiver-related distress. Total scale reliability the current study is ( $\alpha$ ) 0.83. Reliability for the Re-Experiencing scale is ( $\alpha$ ) 0.66; reliability for the Avoidance scale is ( $\alpha$ ) 0.69; and reliability for the Hyperarousal scale is ( $\alpha$ ) 0.70.

**Older Children's Posttraumatic Stress Symptoms.** For children older than age seven, posttraumatic stress symptoms were measured using the 17-item Traumatic Stress Symptoms Child Scale (TSSC), which is based on DSM-IV-TR criteria for PTSD (Graham-Bermann & Levendosky, 1998). This measure has caregivers report on children's symptoms. Each item assesses one of the seventeen possible PTSD symptoms listed in the DSM-IV-TR. Caregivers identify both the presence and duration of symptoms (i.e., greater or less than one month). Answers are summed across questions to produce a total symptom score as well as a score for each symptom domain. Functional impairment related to PTSD symptoms was not assessed as part of this measure. Reliability for the current study is ( $\alpha$ ) 0.93. Symptom scale reliabilities are: Re-Experiencing ( $\alpha$ ) 0.81, Avoidance ( $\alpha$ ) 0.85, and Hyperarousal ( $\alpha$ ) 0.86.

### **Translations**

Interviews were conducted in Spanish if that was the preferred language of the participant. The interviews were translated into Spanish by individuals fluent in both English and Spanish if a published Spanish language version of the measure was not available. Measures were first translated into Spanish. Then, a different member of the team translated the measure back into English. Comparisons were made between the original English and back-translated English versions to identify any irregularities between the two. Adjustments were subsequently made to the Spanish translation to correct for these irregularities. Following this process, a fluent



Spanish-speaker read-through the questionnaire and made necessary changes to grammar and language in the measure.

### **Measurement Nonequivalence**

Children's PTSD symptoms were measured with developmentally sensitive measures. As a result, differences in the scaling and number of questions in the two questionnaires used were addressed before conducting any analyses. Scaling differences between the two questionnaires were addressed with a proportional linear transformation. The questions on the older child measure were answered on a 0-1 scale, while the questions on the younger child measure were answered on a 0-2 scale. Therefore, answers to all items on the younger child scale were divided by 2, which placed them on a 0-1 scale. To address differences in the number of questions in each measure (17 in the older child measure, 19 in the younger child measure), averages were taken of all total and subscale scores for the older and younger children. The use of these average scale scores allowed for the inclusion of both younger and older children in the same latent profile analysis of PTSD symptoms.

### **Analytic Plan**

Two separate latent profile analyses were conducted: one using children's PTSD symptoms domain scores; the other using mothers' PTSD symptom domain scores. Symptom domain average scores were used for both children and mothers in order to allow for comparisons to be made from one symptom domain to another. Model fit was assessed using the Bayesian Information Criteria and Lo-Mendel-Rubin likelihood ratio test (Nylund, Asparouhov, & Muthén, 2007; Lee, Kim, Taylor, & Perron, 2011). Following this, logistic regressions were conducted to predict profile membership in the children and the mothers. Chi-squared analyses

were then conducted to assess the relationship between profile membership and functional impairment in each of the domains described above.

## Results

Mothers and children in this sample experienced a high level of violence. Mothers reported an average of 203.97 ( $SD = 164.51$ ) total acts of relationship violence in the past year. Mothers and children also experienced high levels of PTSD. Exposure to additional trauma was also high, as 73% of the mothers and 40% of the children reported experiencing at least one trauma other than IPV. Mothers' PTSD symptoms were high, as they reported an average score of 21.48 ( $SD = 11.90$ ) on the PDS, which is in the moderate to severe range of symptoms (McCarthy, 2008). Average scores on the Re-Experiencing scale were 6.04 ( $SD = 4.15$ ). Scores on the Avoidance ( $M = 8.48$ ,  $SD = 5.49$ ) and Hyperarousal ( $M = 6.97$ ,  $SD = 4.36$ ) scales were similar.

Children's PTSD symptoms were in the mild range on average, with high variability in scores for both younger and older children in the sample. Younger children had an average score of 9.22 total symptoms ( $SD = 7.01$ ) on the younger child PTSD measure. Older children had an average score of 4.54 total symptoms ( $SD = 5.08$ ) on the older child PTSD measure. The following calculations were conducted with the transformed and averaged PTSD symptoms scores from both older and younger children. Across all children in the sample, average PTSD symptoms were mild ( $M = 0.25$ ,  $SD = 0.23$ ). Average Re-Experiencing scores for all children were 0.27 ( $SD = 0.26$ ). Scores on the Avoidance scale were slightly lower across the sample ( $M = 0.17$ ,  $SD = 0.23$ ). Scores were highest on the Hyperarousal scale ( $M = 0.34$ ,  $SD = 0.30$ ). Table 2 provides summary statistics covariates used in the logistic regressions.

### Latent Profile Analysis of Children's PTSD Symptoms

Results of the latent profile analysis of children's PTSD symptoms indicated that the best-fitting model was that with three latent profiles (BIC = -139.97, Lo-Mendell-Rubin LRT = 107.53,  $p = .01$ ). See Figure 1 for depictions of each profile. The first profile, which fit approximately 39% of the sample, had the lowest level of PTSD symptomatology. Children in this sample had equivalent levels of Re-Experiencing and Hyperarousal symptoms, with slightly lower levels of Avoidance symptoms. This was equivalent to less than one PTSD symptom in each domain, on average. The second profile fit the majority of the children in the sample (50%), and described a moderate level of PTSD symptomatology. Children in this profile had higher levels of Hyperarousal symptoms (around 2 symptoms), with lower levels of Avoidance symptoms (about 1 symptom). The third profile, which had the highest levels of PTSD symptomatology, described about 11% of the children in the sample. This profile was similar to profile 1 in terms of the relationships between symptom domains; in profile 3, there were similar levels of Avoidance and Hyperarousal symptoms (about 4 symptoms in each domain), with slightly lower levels of Re-Experiencing symptoms (about 3 symptoms). Overall, the three profiles were mostly differentiated by differences in symptom severity, with profile 1 having low PTSD symptoms, profile 2 having moderate PTSD symptoms, and profile 3 having high PTSD symptoms.

Post-hoc analyses were conducted to examine differences between PTSD symptom domains within each profile. Within profile 1, scores for Re-Experiencing symptoms were higher than those for Avoidance symptoms ( $t(69) = 2.73, p = .008$ ). Scores for Hyperarousal symptoms were also higher than those for Avoidance symptoms ( $t(69) = 2.68, p = .009$ ). There was not a significant difference between average scores in the Re-Experiencing and Hyperarousal domains

for profile 1 ( $t(69) = 0.09, p = .93$ ). However, calculating number of symptoms in each domain for profile 1, there was, on average, around zero symptoms in each category.

In profile 2, average Hyperarousal scores were significantly higher than average scores for Re-Experiencing ( $t(91) = 4.12, p < .001$ ) and Avoidance ( $t(91) = 12.57, p < .001$ ). Additionally, profile 2 average scores in the Re-Experiencing domain were significantly higher than average scores in the Avoidance domain ( $t(91) = 7.60, p < .001$ ). Translating this into number of symptoms, children in profile 2 had around one Re-Experiencing symptom, one Avoidance symptom, and three Hyperarousal symptoms.

In profile 3, there was not a significant difference between average scores in the Re-Experiencing and Avoidance categories ( $t(19) = -0.17, p = .87$ ). However, average scores in the Hyperarousal domain were significantly higher than average scores in the Re-Experiencing category ( $t(19) = 3.96, p < .001$ ) as well as the Avoidance category ( $t(19) = 2.33, p = .03$ ). Translating these scores into average number of symptoms in each domain gave the following: approximately two Re-Experiencing symptoms, about four Avoidance symptoms, and about four Hyperarousal symptoms.

A logistic regression was run to examine predictors of profile membership. Profile 2, the intermediate symptom profile, was used as the reference group. Age was the only factor that differentiated profiles 2 and 3, such that older children were more likely to be in profile 3 (that with the highest level of symptomatology). Profiles 1 and 2 were differentiated by age and violence exposure. Children who had experienced higher levels of PTSD were less likely to belong in profile 1 (that with the lowest level of symptoms). Further, children who experienced additional trauma beyond exposure to IPV were less likely to be in profile 1. Older children were more likely to be in profile 1 than in profile 2. None of the factors analyzed as part of this

regression differentiated profile 1 from profile 3. Children's gender and parenting did not predict membership in any of the three profiles. See Table 3 for full logistic regression results.

### **Associations between Children's PTSD Symptom Presentation and Functioning**

Information on functional impairment was only available for the younger children; therefore, only younger child data were used for the following chi-squared analyses. Five areas of functioning were assessed: impairment at home, at school, and with friends, as well as child- and caregiver-related distress; differences between profiles in rates of impairment were found for all five areas. Thirty-six percent of younger children were reported to experience problems at home as a result of their PTSD symptoms. Rates of impairment in this area were highest for children in profile 3, followed by profile 2, and then profile 1 ( $\chi^2 = 20.68, p < .001$ ). Twenty-six percent of children were reported to experience problems with friends as a result of their symptoms, with similar differences between the profiles in rates of impairment to problems at home ( $\chi^2 = 19.71, p < .001$ ). Thirty-two percent of children reportedly had problems at school related to their symptoms. Again, profile 3 had the highest rate of impairment in this area, followed by profile 2, then profile 1 ( $\chi^2 = 11.07, p = .004$ ). Fifty-eight percent of caregivers reported that they felt distressed by their children's PTSD symptoms, and there were again differences between the profiles in rates of impairment in this area ( $\chi^2 = 24.53, p < .001$ ). Fifty-eight percent of children were also reportedly distressed by their symptoms. Profile differences were found in terms of rate of impairment in the same pattern as with the other areas of impairment ( $\chi^2 = 21.36, p < .001$ ). See Table 4 for rates of impairment in each profile.

### **Latent Profile Analysis of Mothers' PTSD Symptoms**

Results of the latent profile analysis of mothers' PTSD symptoms indicated that the best-fitting model was that with two latent profiles (BIC = 1074.67, Lo-Mendell-Rubin LRT =

270.17,  $p < .001$ ). The profiles are illustrated in Figure 2. Forty-eight percent of the sample fit the first profile. Women in this profile had relatively similar scores in the domains of Re-Experiencing and Avoidance, with slightly higher Hyperarousal symptoms. The scores in this profile were consistent with the low end of the moderate range of PTSD symptoms (McCarthy, 2008). Just over half (52%) of the mothers fit the second profile. This profile had a similar pattern of symptomatology, with similar scores on Re-Experiencing and Avoidance symptoms, with higher scores on the Hyperarousal symptom domain. Scores in this profile were consistent with a moderate to severe level of PTSD symptomatology (McCarthy, 2008). Thus, the key difference between these two profiles was in the severity of symptom presentation, with seemingly no variation in the pattern of symptoms.

Post-hoc analyses were conducted to examine differences in symptom scores within each profile. In profile 1, there was no significant difference between scores on the Re-Experiencing and Avoidance symptom scales ( $t(69) = 0.68, p = .50$ ) or between Re-Experiencing and Hyperarousal symptom scores ( $t(70) = 1.25, p = .21$ ). There was also no significant difference between scores on the Avoidance or Hyperarousal scales ( $t(69) = 1.78, p = .08$ ). Translating the scores in each domain into number of symptoms, women in profile 1 had an average of one Re-Experiencing symptom, one Avoidance symptom, and one Hyperarousal symptom.

Within profile 2, Hyperarousal symptoms scores were higher than scores on the Re-Experiencing scale ( $t(83) = 2.41, p = .001$ ) and the Avoidance scale ( $t(83) = 4.17, p < .001$ ). There was no significant difference between Re-Experiencing and Avoidance scores ( $t(83) = 0.10, p = .92$ ). Women in profile 2 had an average of three Re-Experiencing symptoms, four Avoidance symptoms, and three Hyperarousal symptoms.

A logistic regression was subsequently run to examine predictors of profile membership. Profile 2 was used as the reference group. Higher levels of depressive symptomatology as well as greater past-year IPV exposure were associated with lower odds of being in profile 1. Women in the two profiles did not differ in terms of their age, monthly family income, or exposure to trauma beyond IPV. See Table 5 for full logistic regression results.

### **Associations between Mothers' PTSD Symptom Presentation and Functioning**

Mothers' functioning was assessed in seven specific areas. Additionally, two questions assessed general level of functioning and overall level of satisfaction with life. Thirty-six percent of the women reported that their symptoms interfered with work. There was a higher rate of impairment in this area for women in profile 2 than in profile 1 ( $\chi^2 = 7.12, p = .008$ ). Forty-four percent of the women reported that their symptoms caused problems with household work. Again, rates of impairment were higher for profile 2 ( $\chi^2 = 21.72, p < .001$ ). Fifty-six percent of the women reported symptoms causing problems with friendships; again, there was a significant difference between profiles in rates of impairment, with profile 2 having higher rates of impairment ( $\chi^2 = 45.35, p < .001$ ). Fifty percent of women reported that their symptoms interfered with fun and leisure activities. There was a higher rate of functional impairment in this area for women in profile 1 compared to the rate for women in profile 2 ( $\chi^2 = 23.08, p < .001$ ). Twenty-one percent of women reported that their symptoms interfered with their schoolwork. There were also profile differences in rates of impairment in this area; women in profile 2 had higher rates of impairment in schoolwork related to their PTSD symptoms than women in profile 1 ( $\chi^2 = 9.20, p = .002$ ). Fifty-four percent of women reported that their symptoms caused problems with their family relationships. There was a difference between profiles in rates of impairment in this area in a similar pattern to other areas ( $\chi^2 = 15.77, p < .001$ ). Forty-six percent

of women reported that their symptoms caused problems in their sex life. Again, there was a difference between profiles in rates of impairment in this area such that profile 2 reported higher rates of impairment than profile 1 ( $\chi^2 = 8.62, p = .003$ ).

Sixty-nine percent of women in the sample reported that their symptoms caused problems with their general level of satisfaction with their lives, while 62% reported that their symptoms impacted their overall level of functioning. Women in profile 2 reported higher rates of symptom-related impairment in their general life satisfaction ( $\chi^2 = 16.87, p < .001$ ), as well as their overall functioning ( $\chi^2 = 24.09, p < .001$ ), than women in profile 1. See table 6 for rates of impairment in each area by profile membership.

### **Discussion**

The findings of this study provide important information about the presentation and functional impact of PTSD symptoms in IPV-exposed women and children, a population particularly at-risk for the development of PTSD (Alisic et al, 2012; Graham-Bermann, Castor, Miller, & Howell, 2012; Nathanson et al., 2012; Trevillion et al., 2012). As hypothesized, results from the latent profile analysis of children's PTSD symptoms found that profiles largely differed by severity of symptoms. This is consistent with previous work on PTSD symptom presentation (Hellmuth et al., 2014; Kiesel et al., 2014). Though the profiles were mostly differentiated by symptom severity, profile 2 – which was more likely to fit younger children in this sample – was characterized by one Re-Experiencing symptoms, one Avoidance symptom, and three Hyperarousal symptoms. This presentation of PTSD with lower Avoidance symptoms fits research demonstrating that younger children are less likely to meet criteria for Avoidance symptoms, and reflects recent changes to the DSM-5 that require fewer Avoidance symptoms for children younger than age six to meet at diagnosis of PTSD (American Psychiatric Association,



2013; Scheeringa & Zeneah, 1994). Thus, younger children in this profile may be more likely to meet diagnostic criteria for PTSD, even with their low Avoidance score. Profiles 1 and 3, those with the lowest and highest levels of PTSD symptoms, respectively, had slightly different relationships between symptom domains. In profile 1, children had an average of less than one symptom in each domain. Given that around forty percent of the sample was in profile 1, this suggests that a large proportion of children exposed to IPV do not develop clinically significant trauma symptoms. Within profile 3, average number of Hyperarousal and Avoidance symptoms was similar, with around four symptoms in each domain. Average number of Re-Experiencing symptoms was around two symptoms. This might suggest that Hyperarousal and Avoidance symptoms are most salient for children with high levels of traumatic stress symptoms. Another possible explanation for this pattern of symptoms may be related to the measurement of PTSD in this sample. Traumatic stress symptoms were reported on by the mother for both older and younger children in this sample. Re-Experiencing symptoms are a highly internal experience (e.g., flashbacks, nightmares). It may be that, as children get older, they spend more time away from their caregivers, and thus Re-Experiencing symptoms are less noticeable than more behavioral symptoms such as Avoidance and Hyperarousal. However, research has shown that Re-Experiencing symptoms are noticeable in group therapy settings (Miller-Graff, Galano, & Graham-Bermann, 2015), therefore it is possible that caregivers also pick up on these symptoms, even in older children. Future research comparing children's and caregivers' reporting of symptoms could help answer whether caregivers can reliably report on older children's traumatic stress symptoms, especially in the Re-Experiencing domain.

Interestingly, older children were more likely to be in the profile with the highest or lowest level of symptoms, not the intermediate profile. This differs from previous research

demonstrating that PTSD symptom severity is worse in older children (Runyon et al., 2013; Trickey et al., 2012). The findings of this study suggest that as children age, there is a critical period when a cascade of improvement or worsening of PTSD symptoms occurs. It is possible that this period occurs during the transition from early to middle childhood, as that was the transition period captured in this sample. From a developmental psychopathology perspective, it may be that risk factors for the development of PTSD have a differential impact on children as they age. This is highly likely, as children experience significant growth in their cognitive abilities over the transition from early to middle childhood, and cognitive appraisals of trauma are an especially strong predictor of the development of PTSD (Hebenstreit et al., 2014; Stallard & Smith, 2007). Consistent with previous research on the relationship between trauma exposure and PTSD, more severe IPV as well as exposure to additional trauma beyond IPV were associated with membership in the worst child PTSD profile (Kisiel et al., 2014; Runyon et al., 2013). Parenting and child gender did not predict membership in any profile. It is possible that the gender differences that have been described in other samples of children with PTSD are driven by adolescents in those samples (Alisic et al., 2014; Trickey et al., 2012). That parenting did not predict profile membership somewhat fits with previous research on children's PTSD (Ehrensaft, Knous-Westfall, & Cohen, 2017). That study found that positive parenting reduced the association between IPV and PTSD symptoms; however, negative parenting did not have any impact on the relationship between IPV and PTSD (Ehrensaft et al., 2017). It is also notable that none of the factors included in this regression, including violence exposure, differentiated profile 1 (the lowest symptom severity) from profile 3 (the highest symptom severity). This suggests that profile 1, rather than reflecting lower trauma exposure, reflects a resilient PTSD symptom profile.

It should be noted that the results of the latent profile analysis of mothers' PTSD symptoms indicated that the best fitting model was one with only two profiles – low PTSD symptoms and high PTSD symptoms. In previous research with IPV-exposed women, there have been at least three distinct severity profiles – low, intermediate, and severe (Kelley et al. 2009; Hebenstreit et al., 2015; Hellmuth et al., 2014). It is not clear why there was not a distinct intermediate PTSD group in this sample. One reason might be that PTSD symptoms in this sample were especially high (average scores were in the moderate-to-severe range of symptoms), so there was not enough variation in this sample to statistically differentiate a distinct intermediate profile. Notably, all women in this sample were mothers, so these findings suggest that there may be differences between women with and without children in their presentations of PTSD.

Higher depressive symptoms were associated with women being in the severe PTSD symptom group. This relationship between depression and PTSD consistently emerges in the literature (Hellmuth et al., 2014; Nathanson et al., 2012), but the reason for this relationship remains unclear. Without longitudinal research examining the onset of the two disorders following exposure to violence, it remains possible that this association is commonly found in the literature due to the comorbidity between symptoms rather than one increasing risk for the other. Severity of IPV exposure, but not exposure to additional trauma beyond IPV, was associated with membership in the severe symptom profile. This is unexpected, given that prior research has found that severity of trauma exposure as well as exposure to more types of trauma is related to worse PTSD symptomatology (Hebenstreit et al., 2015; Hellmuth et al., 2014; Kisiel et al., 2014; Matlow & DePrince, 2015). One explanation might be that exposure to IPV was likely the most recent trauma that the mothers in this sample experienced, and therefore it is

more strongly linked with their current PTSD symptoms than more distal trauma experiences. However, given the young age of the children in this sample, the timing of all their traumas is closer together and their additional trauma exposure might have occurred more recently, thus additional trauma exposure is a significant predictor of PTSD symptom presentation in children. It might also be that since mothers' exposure to additional trauma was so high in this sample (73%), it is not possible to detect differences in profile membership based on this factor. In either case, these findings suggest it is necessary to study the timing of trauma in addition to the severity of trauma to fully understand the relationship between trauma exposure and PTSD symptoms development, particularly in samples with high rates of re-traumatization.

### **Functional Impact of PTSD Symptom Presentation**

As expected, children with more severe PTSD symptom presentations had greater functional impairment associated with their symptoms. Thus, higher levels of symptoms of PTSD weaken children's ability to engage with their social support network, including their families, friends, and teachers. Research on resilient coping has consistently found that having higher social support leads to more positive outcomes for children following exposure to trauma (Beteancourt and Khan, 2008; Cicchetti & Rogosch, 2009). Additionally, school can be an important place where children can gain confidence and a reprieve from the violence they experience, which can also contribute to better functioning (Beteancourt & Khan, 2008). Therefore, the functional impairment associated with PTSD may be playing a large role in preventing children from accessing support and coping skills to recover from their traumatic experiences. Notably, both children and caregivers had high levels of distress related to children's symptoms of PTSD. It is especially noteworthy that caregivers of children report significant distress related to their children's symptoms. It is possible that this distress makes it

more difficult for caregivers to provide support to their children in these instances. Given previous research suggesting that mother's functioning is tied children's resilience functioning (Beteancourt & Khan, 2008), it may be important to attend to both child and caregiver distress in order to effectively address children's PTSD symptoms. Further, children in the intermediate profile experienced significant rates of specific impairment as well symptom-related distress; and, a significant proportion of children in the lowest symptom profile (approximately 30%) reported symptom-related distress for both children and caregivers. These findings demonstrate that symptoms do not have to be severe in order to have a significant effect on functioning and distress, and thus even low levels of psychopathology may have the potential to undermine pathways to resilience and more positive outcomes following exposure to IPV.

Women with a more severe presentation of PTSD symptoms also reported higher rates of functional impairment. Notably, the highest rates of specific functional impairment for women in the more severe profile were in fun/leisure activities as well as in friendships. For women in the less severe symptom profile, the greatest impairment was to family relationships. As with children, these functional impairments significantly undermine women's abilities to engage in coping strategies that have been associated with positive outcomes following exposure to trauma. Sources of social support such as family, friends, and employers not only help women deal with the emotional aftermath of experiencing domestic violence, but these sources of social support also provide critical aid such as providing financial and housing resources after a woman leaves her abusive partner (Anderson, Renner, & Dannis, 2013). Other research has found that positive coping factors, like support from friends and family, protects women from IPV re-victimization (Iverson et al., 2013). Thus, the functional impacts associated with PTSD symptoms have significant effects in multiple areas of women's lives. The functional

impacts experienced by women also have the potential to negatively affect their children, especially as poor functioning in these domains can lead to greater caregiver mental health problems and greater risk for experiencing IPV. Further, a significant number of women reported impairment in the less severe PTSD symptom profile, with 53% of the women in that profile reporting that their symptoms negatively impacted their general satisfaction with their lives. These findings suggest that PTSD symptoms can have a significant impact on individuals' lives, even when they are well below criteria for meeting a diagnosis of PTSD.

### **Limitations**

One limitation of this research is that it utilizes baseline data from a randomized controlled trial of an intervention study. Therefore, this sample is a help-seeking sample and may represent a more severe presentation of PTSD and exposure to IPV than in non-help-seeking community samples. The use of different PTSD measures for older and younger children, while developmentally appropriate, poses challenges for analyzing these data and making comparisons based on age, despite the use of scale transformations. There are key differences in the wording of questions and in the number of items in each PTSD scale that affect the measurement of each symptom domain. The analyses in this study were also limited in that the measure of PTSD used with older children did not assess functional impairment. Therefore, it was not possible to report how the presentation of PTSD impacts functioning in older children. Additionally, this study is limited by the use of measures of PTSD based on DSM-IV-TR criteria. Given that there are now four symptom profiles for PTSD, this work does not accurately reflect the revised conceptualization of PTSD and these findings cannot be generalized to the current criteria outlined in the DSM-5.

### **Clinical Implications**

Despite the limitations to this research, these findings still have significant implications for clinical work with individuals with PTSD, particularly those exposed to IPV. This latent profile analysis demonstrated a relative homogeneity of PTSD symptoms in both children and mothers exposed to IPV, which is different from research with samples including individuals exposed to different types of trauma (Kelley et al., 2009; Runyon et al., 2013). This suggests that the presentation of PTSD symptoms following exposure to IPV may be unique to other types of trauma, such that Hyperarousal and Avoidance symptoms are the most salient symptoms, followed by Re-Experiencing symptoms. This finding may be related to the many safety concerns associated with experiencing IPV. Therefore, treatment of PTSD in IPV-exposed individuals may need to address women's safety concerns in order to help reduce the most severe area of symptoms. Hyperarousal symptoms also include difficulty sleeping, difficulty concentrating, and increased irritability. These symptoms likely have a significant effect on the functional problems described in this sample. Therefore, by addressing symptoms of Hyperarousal early in treatment, treatment may be able to quickly reduce the functional impairment associated with PTSD symptoms and allow women to assess resilient coping strategies that can lead to more positive outcomes. Furthermore, if treatments for IPV-exposed individuals focus on the most salient symptoms first, then greater gains may be made early in therapy, which may lead to better treatment adherence and ultimately better outcomes for women and children who experience IPV.

The results of this study also highlight the significant functional impairment associated with PTSD symptoms that affects both women's and children's social support networks. Treatment for PTSD in IPV-exposed women could focus on re-connecting individuals with their social support networks, if possible. Alternatively, it is important that treatment for PTSD in

IPV-exposed individuals connect women and children with the instrumental resources such as financial and housing assistance critical for reducing further exposure to IPV that might have otherwise been provided by friends and family members. Additionally, given that PTSD symptoms impair self-care activities such as leisure activities or playing with friends that have important protective effects on mental health, it is important to have individuals re-engage in self-care strategies as soon as possible in therapy. One method of doing this might be to connect families with support groups specifically for domestic violence, or to have families engage in fun activities through school or the local community center. These findings also demonstrate that functional impairment and distress can occur at mild levels of symptoms in IPV-exposed children. Thus, it is likely that intervention aimed at these symptoms is needed, even when children do not meet criteria for a diagnosis of PTSD.

### **Conclusions and Future Directions**

A developmentally-informed understanding of the presentation and course of PTSD is highly important, as this is the only way to provide the most effective services for children and families affected by trauma. By collecting data from children of varied ages/developmental stage, this study was able to make direct comparisons between traumatic stress symptoms in different age groups. In so doing, the results of this study contribute important knowledge about the developmental presentation of PTSD in children, with its novel, unique insights about age-related differences in PTSD symptom presentation. Further research is needed to identify how this presentation changes over time, specifically to understand how children move from an intermediate level of symptomatology to either a severe or low symptom presentation. Future research is also needed to develop validated measures of PTSD that allow for more direct comparisons to be made between PTSD symptoms in younger and older children. The results of



this study provide additional evidence that exposure to more severe and more types of trauma is detrimental for children's mental health.

These findings further highlight the connections between PTSD and depression in women exposed to IPV. Longitudinal research is needed to better understand how this comorbidity between the two disorders develops. This line of research can also inform clinical work with IPV-exposed populations, as current treatments are typically designed to target one or the other, not both. Given close connections between PTSD and depression, it may be necessary to develop treatments that are able to simultaneously address both disorders in order to be most effective.

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**Table 2.1. Sample Demographic Information**

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Child's Gender	
Male	53%
Female	47%
Child's Age	6.49 ( <i>SD</i> = 2.42)
Mother's Age	33.28 ( <i>SD</i> = 7.44)
Mother's Relationship Status	
Single, Separated, or Divorced	80%
Married or Living with Partner	20%
Family Monthly Income	\$996 ( <i>SD</i> = \$1,129)
Mother's Education	
HS Diploma/GED or less	61%
Post-secondary education	39%

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**Table 2.2. Descriptive Statistics for Predictor Variables**

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Child's Gender	
Male	53%
Female	47%
Child's Age	6.49 ( <i>SD</i> = 2.42)
Mother's Age	33.28 ( <i>SD</i> = 7.44)
Family Monthly Income	\$1,045.62 ( <i>SD</i> = \$1,148.30)
Positive Parenting	3.66 ( <i>SD</i> = 0.41)
Negative Parenting	1.84 ( <i>SD</i> = 0.44)
Mother's Depression	26.15 ( <i>SD</i> = 12.78)
Mother Additional Trauma	73%
Child Additional Trauma	40%
IPV Exposure	203.97 ( <i>SD</i> = 164.51)

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**Table 2.3. Results of Logistic Regression Predicting to Children's PTSD Symptoms Profiles**

Profile 1 vs. 2	B	SE (B)	z	Odds Ratio
Child Gender	-0.17	0.69	-0.25	0.84
Child Age	0.57	0.17	3.36**	1.76
Positive Parenting	1.11	0.74	1.49	3.03
Negative Parenting	-1.00	0.79	-1.28	0.37
Additional Trauma	-0.23	0.61	-0.38	0.79
IPV Exposure	-0.006	0.003	-1.79	1.00
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Profile 1 vs. 3				
Child Gender	0.22	0.48	0.46	1.25
Child Age	0.37	0.15	2.50*	1.45
Positive Parenting	0.06	0.46	0.14	1.07
Negative Parenting	-0.98	0.66	-1.48	0.38
Additional Trauma	-1.21	0.46	-2.62**	0.29
IPV Exposure	-0.006	0.002	-2.35*	0.99

\* $p < .05$ , \*\* $p < .01$



**Table 2.4. Rates of Impairment in By Child PTSD Symptom Profile for Children Younger Than Age 7**

	Profile 1	Profile 2	Profile 3
Problems at Home	14%	47%	86%
Problems with Friends/Play	2%	35%	57%
Problems at School	16%	35%	83%
Caregiver distress related to symptoms	30%	70%	100%
Child distress related to symptoms	32%	69%	100%

**Table 2.5. Results of Logistic Regression Predicting to Mother's PTSD Symptoms Profiles**

Profile 1 vs. 2	B	SE (B)	z	Odds Ratio
Monthly Income	0.00	0.00	1.36	1.00
Mother Age	0.04	0.04	1.22	1.04
Depressive Symptoms	-0.15	0.02	-6.29*	0.86
Additional Trauma	-1.01	0.68	-1.48	0.36
IPV Exposure	-0.01	0.001	-3.65	1.00

\* $p < .001$

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**Table 2.6. Rates of Impairment in By Mother PTSD Symptom Profile**

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	Profile 1	Profile 2
Problems at work	29%	51%
Problems with housework/chores	24%	61%
Problems with friendships	30%	83%
Impairment in fun/leisure activities	34%	71%
Impairment in schoolwork	11%	31%
Problems with family relationships	36%	68%
Problems with sex life	34%	58%
Impairment in general satisfaction with life	53%	83%
Impairment in overall level of functioning	46%	83%

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Figure 2.1. Results of Latent Profile Analysis of Children's PTSD Symptoms

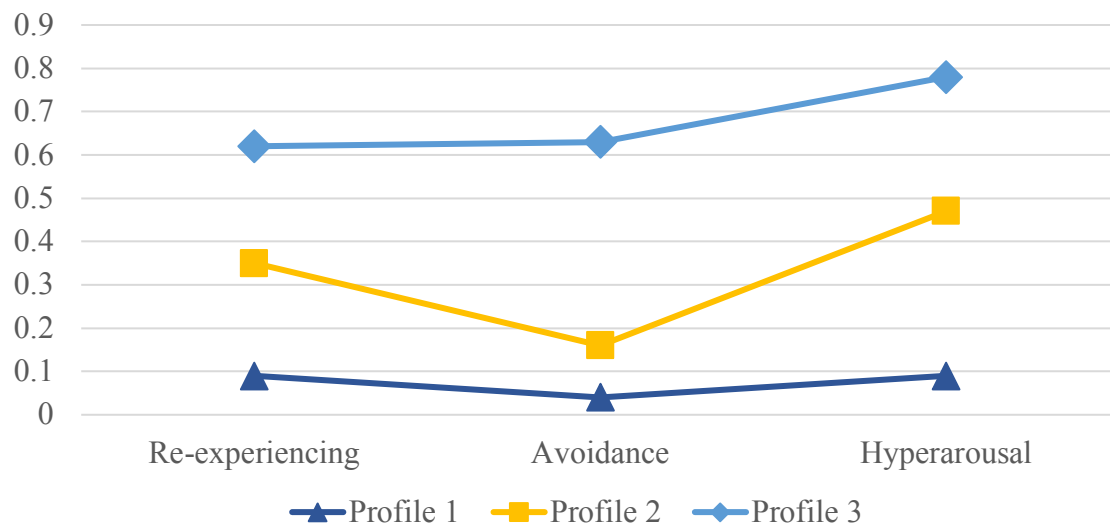
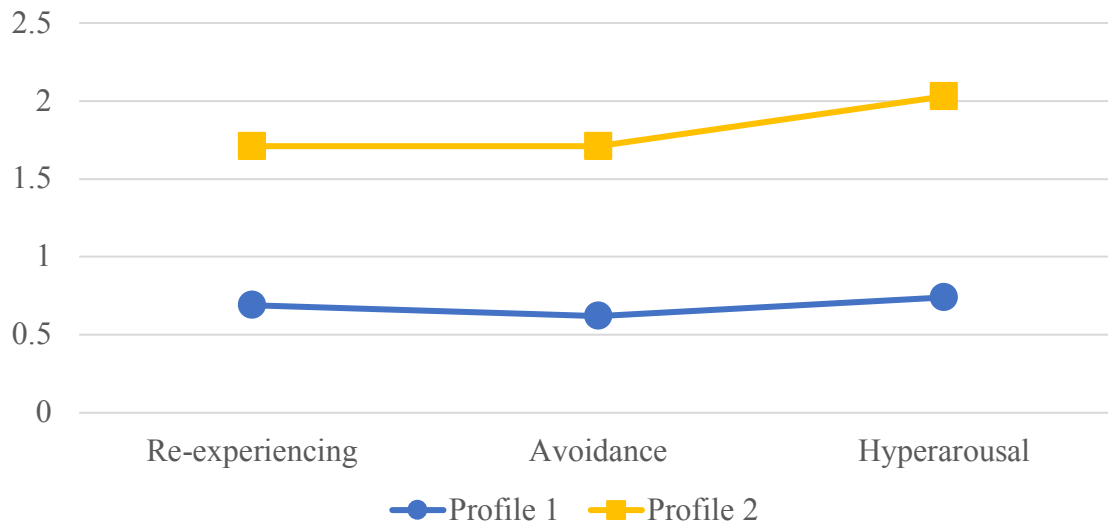


Figure 2.2. Results of Latent Profile Analysis of Mother's PTSD Symptoms



### Chapter III

#### Profiles of Relational Posttraumatic Stress in Mothers and their Young Children Exposed to Intimate Partner Violence

Intimate partner violence is a highly prevalent public health issue, affecting nearly five million women each year (Breiding et al., 2015). Further, as many women affected also have children, approximately eight million children are exposed to IPV each year (Hamby, Finkelhor, Turner, & Ormrod, 2011). These experiences of violence in the home can have serious negative impacts on women's and children's functioning. Research has demonstrated that women exposed to IPV are at greater risk for developing physical health problems and are more likely to experience serious bodily injury or death (Dutton et al., 2006; Sheridan & Nash, 2007; Wu, Huff, & Bhandari, 2010). Women who experience IPV are also more likely to struggle with substance use problems, suicidality, depression, and posttraumatic stress disorder (PTSD; Golding, 1999; Lilly & Graham-Bermann, 2010; Pico-Alfonso et al., 2006; Trevillion, Oram, Feder, & Howard, 2012). A growing body of work has found that depression and PTSD often occur together, especially in women exposed to IPV (Fedovskiy et al., 2008; Nathanson, Shorey, Tirone, & Rhatisson, 2012; Pico-Alfonso et al., 2006). Exposure to IPV and developing these mental health conditions can subsequently affect a woman's ability to function in her daily life, including working and parenting (Alexander, 2011).

IPV also negatively affects children's well-being and functioning. Children who witness IPV are at higher risk of developing physical problems such as gastrointestinal distress, headaches, and bodily aches and pains (Kuhlman, Miller, Howell, & Graham-Bermann, 2012;

Lamers-Winkelmann, Schippers, & Oosterman, 2012). Furthermore, like women who experience IPV, children exposed to IPV are also at risk for developing significant mental health problems, including PTSD (Graham-Bermann, Gruber, Howell, & Girz, 2009; Graham-Bermann & Perkins, 2010; Graham-Bermann, Castor, Miller, & Howell, 2012; Kuhlman et al., 2012). In fact, one recent meta-analysis estimates the general prevalence of PTSD in trauma-exposed children and adolescents to be around 16%; however, the rate was closer to 25% for interpersonal trauma such as IPV (Alisic et al., 2014).

### **Risk Factors for Childhood PTSD**

Given the high prevalence and severity of childhood PTSD, researchers have investigated risk factors that increase susceptibility for developing this disorder. A meta-analysis on studies of childhood PTSD by Alisic and colleagues (2014) found higher rates of PTSD in girls than in boys, and found higher rates of PTSD in children exposed to interpersonal trauma versus non-interpersonal trauma. The results of another meta-analysis reported that child race, family income, the severity of the trauma, and having a previous mental health condition were also risk factors for PTSD (Trickey et al., 2012). Further, having a parent with a mental health problem was a significant risk factor for the development of childhood PTSD, with an estimated effects size of .29 across 25 studies (Trickey et al., 2012). There is a need to study the relationship between parent and child mental health, especially because this may be an important barrier to treatment success for children with mental health problems, specifically in the context of IPV, where caregivers are at high risk for developing mental health problems.

### **The Theory of Relational PTSD**

The theory of relational trauma was developed to explain connections between parent and child mental health following exposure to a traumatic event (Scheeringa & Zeneah, 2001). This

theory posits that as experiences of traumatic stress for the caregiver and the child lead to negative changes in their mental health, resultant changes in parent behaviors and child behavior ultimately lead to worsening traumatic stress symptoms for both the caregiver and the child (Scheeringa & Zeneah, 2001). Thus, this theory posits that PTSD symptoms in parent-child dyads are highly correlated. There is support for this theory in samples of mothers and children with various types of trauma-exposure (Samuelson et al., 2016; Scheeringa et al., 2015; Valentino, Berkowitz, & Stover, 2010); however, relatively little research has examined relational trauma solely in IPV-exposed individuals. This is important, as IPV is a distinct type of traumatic event where both the caregiver and child are exposed to a trauma — sometimes the same trauma — typically over a long period of time (Graham-Bermann & Perkins, 2010; Thompson et al., 2006). The theory of relational trauma is posited to apply to cases where both the caregiver and child are exposed to trauma and has been studied in samples that include some IPV-exposed individuals. However, given the unique shared nature of IPV exposure, there is a need for more research solely with IPV-exposed dyads to better understand the phenomenon of relational PTSD in this population.

### **IPV, Parenting, and Child Outcomes**

It has been hypothesized that negative alterations in parenting caused by parental PTSD may lead to worsening child PTSD. Even though there is little research focused explicitly on how parenting may be a pathway through which relational PTSD occurs, there is a good deal of research on parenting as well as the relationships between parenting and child outcomes in the context of IPV. Exposure to IPV has been connected to negative changes in parenting behavior, including more hostility, disengagement, and greater use of negative parenting practices (Cohen, Hien, & Batchelder, 2008; Levendosky, Leahy, Bogat, Davidson, & Von Eye, 2006). Further,



research has connected these shifts in parenting to worse child adjustment in several different developmental periods. For example, one study examined the relationships between domestic violence before, during, and after pregnancy, maternal mental health, maternal parenting, and children's externalizing symptoms at age 1 (Levendosky et al., 2006). In their model, experiences of domestic violence were significantly related to increased hostility and decreased warmth in mother's parenting behaviors (Levendosky et al., 2006). In turn, decreased maternal warmth and increased hostility was related to more child externalizing problems. The authors also found that maternal mental health was also significantly related to children's externalizing behavior problems, but they found no relationship between maternal mental health and maternal parenting (Levendosky et al., 2006). The authors posit that this might mean that maternal mental health and maternal parenting are separate pathways that mediate the relationship between domestic violence exposure and children's behavior problems (Levendosky et al., 2006). However, it is possible that this mediation may be unique to this outcome or to this developmental period, and that in the context of other outcomes or over time, there may be more overlap in how problems in maternal parenting and mental health impact child outcomes.

More recent research has found similar relationships between parenting and child outcomes. One study examined the impact of parenting on the outcomes of children age 6-12 over a three-week period (Gerwitz, DeGarmo, & Medhanie, 2011). They found that effective parenting had a positive impact on the trajectory of children's internalizing behavior problems in the three weeks following an incident of physical IPV (Gerwitz et al., 2011). Interestingly, they also did not find a significant relationship between maternal parenting and maternal mental health (Gerwitz et al., 2011). However, given that they had a sample size of only 35 mother-child dyads, and that the indicator for mother's mental health included both measures of

psychopathology and general distress, it is difficult to draw definitive conclusions from this analysis.

Another recent study examined the longitudinal connections between parental IPV involvement (e.g., both perpetration and victimization), parenting practices, and children's PTSD with a sample of 243 parents and their oldest child between the ages of 6-18 (Ehrensaft, Knous-Westfall, & Cohen, 2017). They found that more severe IPV exposure was associated with worse children's PTSD symptoms approximately 6 years later, and that there was a protective effect of positive parenting on this relationship (Ehrensaft et al., 2017). Interestingly, there was no significant moderating effect of negative parenting on the relationship between parental IPV involvement and children's PTSD (Ehrensaft et al., 2017). Although this study makes significant contributions to the understanding of the relationships between IPV and childhood PTSD by including fathers in these analyses, no conclusions can be made about relationships between parent and child mental health, as parental psychopathology was controlled for in the analyses. Based on the results of these studies, there is a need to continue to examine the overlap between parenting and parent mental health as they relate to child outcomes.

### **Relational PTSD in the Context of IPV**

There have been some studies conducted with IPV-exposed populations that have directly examined the relationship between caregiver and child PTSD symptoms. For example, one study with younger children between the ages of 1-7 and their mothers with histories of IPV-exposure found correlations between mothers' and children's PTSD symptoms (Levendosky, Bogat, & Martinez-Torteya, 2013). They found significant, positive correlations between total PTSD symptoms, as well as in the sub-symptom categories of avoidance and hyperarousal (Levendosky et al., 2013). Interestingly, these relationships varied based on the age of the child, with the

greatest number of correlations at age four and no relationship between mothers' and children's PTSD symptoms at age three (Levendosky et al., 2013). While this study provides important information about the nature of relational PTSD in IPV-exposed individuals, it does not point toward any mechanism that might explain the relationship between mothers' and children's PTSD symptoms. Further, this study does not provide conclusive information about how relational trauma might vary based on the age of the child.

Another study of relational trauma in IPV-exposed mother-child dyads also examined the impact of parenting. Lannert and colleagues (2014) demonstrated that while maternal PTSD partially mediated the relationship between prenatal IPV-exposure and infant's PTSD symptoms, the relationship between mothers' and infants' PTSD symptoms was fully mediated by neglectful parenting (Lannert et al., 2014). Thus, this study provides important evidence that parent mental health and parenting interact in ways that significantly impact child mental health, particularly in the context of IPV.

However, there are some limitations to the current research on relational trauma in IPV-exposed individuals. Importantly, most of the research on the relationships between parenting, parent mental health, and child mental health has focused on infants and very young children. Although the theory of relational PTSD was developed to understand the presentation of PTSD in early childhood, PTSD continues to persist and develop in later childhood and adolescence. Given that caregiver mental health has been demonstrated to significantly impact children's internalizing and externalizing behavior problems in middle and late childhood, it is reasonable to hypothesize that caregiver mental health might continue to impact children's PTSD symptoms as they age. Further, as IPV is often a chronic condition that affects children through several developmental periods, understanding how parenting and parent mental health have an effect on

PTSD symptoms as children age can give important information to better tailor interventions appropriate for children's developmental stage (Graham-Bermann & Perkins, 2010; Thompson et al., 2006). Another significant limitation of the relational PTSD literature, which is true of trauma research more generally, is that it is difficult to predict which dyads will experience relational PTSD. Thus, there is a need to distinguish between dyads that do and do not experience relational presentations of PTSD. The relational PTSD literature is also limited in that it mainly investigates the relationships between negative parenting behaviors and the development of PTSD. Parenting represents a broad constellation of behaviors that involve both positive and negative interactions, and recent research on IPV-exposed individuals has found that parental warmth has a protective effect on the pathway between childhood IPV-exposure and adult outcomes (Miller-Graff, Cater, Howell, & Graham-Bermann, 2016). Research has also found positive relationships between caregiver PTSD and positive parenting (Grogan-Kaylor, Galano, Stein, Clark, & Graham-Bermann, under review), and that caregivers of children with PTSD are more involved and attentive to their children (Kiser, Nurse, & Collins, 2008). Thus, it is important to examine the more immediate impact of positive parenting behavior, especially as it connects to relational trauma in the context of IPV. A deeper understanding of the complex relationship between parent mental health, parenting, and child mental health will allow for the creation of more targeted treatments for childhood IPV exposure and PTSD that can identify dyads where it is potentially necessary to simultaneously intervene with the caregiver's and child's traumatic stress symptoms to have positive impacts on children's functioning.

### **Aims and Hypotheses**

The aim of this dissertation study is to extend the literature on relational PTSD in the context of IPV as well as address some of the limitations of previous research in this area. Using

developmentally sensitive measures of PTSD, this study examines relationships between PTSD symptoms in pairs of mothers and children between the ages of 4-12. This study uses Latent Profile Analysis (LPA) to identify profiles of relational PTSD. LPA provides several important advantages that address some of the limitations of the current research on PTSD. Importantly, this approach uncovers underlying, or latent, groupings in data – in this case, LPA can be used to distinguish dyads where mothers and children experience similar severity of PTSD symptoms from dyads where there are dissimilarities in severity of PTSD symptoms. Further, LPA allows for a set of indicators to be used to estimate these groupings, rather than using summary scores. The use of summary scores such as these can mask the variation within each individual subscale of the score, as is the case with a total PTSD symptom score. Thus, this study uses PTSD symptom domain scores (e.g., re-experiencing, avoidance, hyperarousal) rather than summary PTSD scores, which gives clinical information about the presentation of relational PTSD. Finally, in addition to providing more nuanced information about relational PTSD symptoms in IPV-exposed mother-child dyads, this study also adds to the literature by examining relationships between rates of PTSD diagnoses. Based on previous research in this area, the following hypotheses are posed:

1. Research in younger children (age 0-7) suggests that symptoms of PTSD occur similarly in mothers and children exposed to domestic violence (Levendosky et al., 2013). Given the strong links between parenting and parent mental health in younger children, it is likely that this relationship continues to occur even in older children.
  - a. It is hypothesized that children's symptoms of PTSD will be high when their mothers' symptoms of PTSD are high, irrespective of child age, and this will be

the case for total PTSD symptoms, as well as for the three symptom domains: re-experiencing, avoidance, and hyperarousal.

2. Although the current literature has not examined rates of PTSD diagnosis among caregiver-child dyads, given the relationships between mothers' and children's PTSD symptoms, it reasonable to assume that there will be similar patterns in diagnostic rates.
  - a. It is hypothesized that children with a diagnosis of PTSD will be more likely to have a mother who also has a diagnosis of PTSD, compared to children without PTSD.
3. Research suggests that while there are similarities in PTSD symptoms among some caregivers and their children, this relationship is not true of all mother-child dyads.
  - a. Thus, it is hypothesized that in addition to a relational profile of PTSD (i.e., those dyads where both mother and child have high PTSD symptoms), there will also be dyads where only the mother has high PTSD symptoms, where only the child has high PTSD symptoms, and where they both have low PTSD symptoms.
4. Following the identification of the dyads' symptom profiles, analyses of factors that distinguish the profiles will be undertaken.
  - a. Based on research with younger children, it is hypothesized that negative parenting, high maternal depression, and more severe IPV will predict membership in the relational PTSD profile (i.e., where both mother and child experience high symptoms of PTSD).

## **Methods**

### **Participants**

Two-hundred thirty-three mother-child dyads participated in this study. Children were between the ages of 4-12, with an average age of 6.49 years ( $SD = 2.42$ ). Mothers were an average of 33.18 years old ( $SD = 7.36$ ). The sample was primarily low-income, with average family monthly income of \$996 ( $SD = \$1,129$ ). The sample was ethno-racially diverse, with 48% of the children in the sample identifying as Latino/a, 20% as Black/African-American, 21% as White, 11% as Biracial, and 1% as Asian American. Mothers in the sample were similarly diverse. See Table 1 for more sample demographic information.

### Procedures

Participants for this study were drawn from two randomized controlled trials of an intervention for mothers and their children exposed to recent IPV, one for mothers and their preschool-age children exposed to IPV and another for Spanish-speaking mothers and their children exposed to IPV. Only data from their baseline, pre-intervention interviews were used. Families were recruited into the study through contacts at community centers and domestic violence shelters, as well as through postings at local businesses and health clinics. Women called into a toll-free number to be screened for study eligibility; they could enroll into the study if they had experienced IPV in the past two years and had a child in the target age range. Once deemed eligible to participate, each mother and her identified child completed an interview assessing their exposure to violence and their current mental health. Mothers and children who were primarily Spanish-speaking selected whether they completed the interview in Spanish or English. Mothers answered questions regarding demographic information such as her relationship status, her and her child's race/ethnicity, and the family monthly income. Mothers also responded to questions about her parenting, her exposure to IPV, her depressive symptoms,

as well as her and her child's posttraumatic stress symptoms. All study methods were reviewed and approved by the University Institutional Review Board before data collection began.

### **Measures**

**IPV Exposure.** Women's exposure to IPV was assessed using the Conflict Tactics Scale – Revised (CTS-2; Straus, Hamby, Boney, & McCoy, 1996). This 72-item questionnaire measures the frequency of relationship violence over the past year. At the request of participating agencies, only the 39 items assessing victimization were administered. Respondents are asked to rate the past-year frequency of violent acts on the following scale: never, one time, two times, 3-5 times, 6-11 times, 12-20 times, or more than 20 times. Sample questions include, "My partner used a gun or knife on me" and "My partner called me fat or ugly." Answers are then summed to give a total violence score; scores can also be reported over four subscales: Physical Assault, Sexual Assault, Psychological Aggression, and Injury. A fifth subscale called Negotiation, which measures attempts to utilize non-violent conflict resolution strategies in the relationship, can be calculated; however, it is not included in the total violence score. The CTS-2 has been demonstrated to have good validity and reliability in reporting of partner violence (Straus, Hamby, Boney, & McCoy, 1996). Reliability for the current study is ( $\alpha$ ) 0.92.

**Parenting.** Parenting was measured using the Alabama Parenting Questionnaire (APQ; Shelton, Frick, & Wooten, 1996). This 42-item self-report measure assesses the frequency of both positive and negative parenting practices. Answers are given on a five-point scale from 'never' to 'always.' Example items include, "You play games or do other fun things with your child," and "Your child is out after dark without an adult with him/her." Six subscales can be calculated: Involvement, Positive Parenting, Other Discipline Strategies, Inconsistent Discipline, Poor Monitoring/Supervision, and Corporal Punishment. Scores are averaged across each



subscale to give an overall Positive Parenting score as well as a Negative Parenting Score, with an average score range of 0-5 for each scale. Higher scores reflect greater use of a parenting practice. The APQ has been demonstrated to have good internal consistency and reliability for most subscales, with the exception being the Corporal Punishment subscale, which has moderate reliability (Shelton et al., 1996). Reliability for the current study for the Positive Parenting scale is ( $\alpha$ ) 0.80. Reliability for the Negative Parenting scale is ( $\alpha$ ) 0.71.

**Mother's Depression.** Mother's depressive symptoms were assessed with the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). This 20-item self-report questionnaire assesses frequency of depressive symptoms over the past weeks. Answers are given on the following four-point scale: 'None of the time' 'Some of the time' 'Occasionally' 'Most or all of the time.' Sample items include, "I felt hopeful about the future," and, "I had crying spells." Positively worded items are then reversed coded, and then answers summed across all items to give a total score; higher scores reflect greater depressive symptomatology. Scores range from 0-60, and scores above 16 reflect clinically concerning levels of depressive symptomatology. The CES-D has high internal reliability and good convergent validity with other measures of depression (Radloff, 1977). Reliability for the current study is ( $\alpha$ ) 0.92.

**Mother's Posttraumatic Stress Symptoms.** Mother's symptoms of posttraumatic stress were measured using the Posttraumatic Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997). This 49-item measure assesses the presence of various traumatic events, past-month frequency of PTSD symptoms, and functional impact of PTSD symptoms in several domains. This measure can generate a DSM-IV-TR PTSD diagnosis as well as numerical scores of the frequency of PTSD symptoms. Answers are given on a scale from 'Not at all or only one time,' to '5 or more times a week/almost always.' Answers can be summed to give a total symptom

severity score as well as symptom domain scores for Re-experiencing, Avoidance, and Hyperarousal. Higher scores reflect greater PTSD symptomatology. Scores range from 0-51, and total scores above 27 are conservative estimates of a likely diagnosis of PTSD (Sheeran & Zimmerman, 2002). The PDS has been shown to have strong, positive correlations with other validated measures of PTSD and good internal consistency for the total scale (Foa et al., 1997). Reliability for the total scale for the present study is ( $\alpha$ ) 0.88.

**Younger Children's Posttraumatic Stress Symptoms.** For children age seven or younger, posttraumatic stress symptoms were measured using The Posttraumatic Stress Disorder Semi-Structured Interview and Observational Record for Infants and Young Children (Sheeringa & Zeanah, 1994). This 31-item caregiver report measure was based on DSM-IV-TR criteria, but also incorporates developmentally-appropriate questions, including questions regarding changes in play, aggression, and developmental regression (e.g., loss of ability to use the toilet). Thus, this measure is in line with changes made to the diagnosis of PTSD in children younger than age 6 in the DSM-5. Example questions include, "has your child looked really upset because he/she saw or heard something that reminded him/her of what happened" and "has your child shown increased irritability, fussiness, extreme mood swings, or temper tantrums?" Caregivers are asked to give behavioral examples if they say yes to any of the questions. Members of the research team trained in clinical interviewing then code examples to rate both symptom presence and severity on a 0-2 Likert scale. This scale can give summary scores for each symptom domain as well as a total symptom score. The total score does not include the experimental subscale of developmental regressions. As this measure also assesses symptom duration as well as functional impairment, it can also be used to assess a diagnosis of PTSD using DSM-IV-TR criteria. Total scale reliability the current study is ( $\alpha$ ) 0.84.

**Older Children’s Posttraumatic Stress Symptoms.** For children older than age seven, posttraumatic stress symptoms were measured using The Traumatic Stress Symptoms Child Scale (TSSC; Graham-Bermann & Levendosky, 1998). This 17-item caregiver-report measure follows DSM-IV criteria for PTSD, assessing the symptom domains of Re-Experiencing, Avoidance, and Hyperarousal. Sample questions include, “Trouble concentrating, paying attention, either at home or in school since violence event(s)” and “Specific dreams or nightmares of violent events.” Caregivers identify whether the symptom is present, and then whether it has been present for more than one month. Items are scored a ‘1’ if they are present, and a ‘0’ if they are not present. Scores range from 0-17, with higher scores reflecting greater symptomatology. Additionally, this measure can produce scores for each symptom domain as well as a total symptom score. Reliability for the current study is ( $\alpha$ ) 0.99 for the total symptom scale.

### **Translations**

Spanish-language versions of measures were used in the interview, if available. All other interview materials were translated into Spanish by individuals fluent in both English and Spanish. One individual first translated the measure into Spanish. A different individual then back-translated that version into English. The translation team then met to compare the original English and back-translated English versions and highlighted any inconsistencies between the two. These inconsistencies were then addressed in the Spanish-language version of the document. Following this process, a native Spanish-speaker read-through the questionnaire and made any necessary adjustments to grammar/language.

Measurement Nonequivalence

Children's PTSD symptoms were measured with different questionnaires based on their age. Although both questionnaires assessed PTSD symptoms using DSM-IV-TR criteria and shared common language in 65% of their questions, they were slight differences between the two questionnaires that needed to be addressed before proceeding with any analyses. A proportional linear transformation was conducted to address scaling differences between the two measures. The questions on the older child measure were answered on a 0-1 scale, while the questions on the younger child measure were answered on a 0-2 scale. Therefore, answers to all items on the younger child scale were divided by 2, which placed them on a 0-1 scale. This technique has been used to address measurement nonequivalence in others studies on child functioning (Ma & Grogan-Kaylor, 2017). There were also 19 items on the younger child measure, while there were only 17 items on the older child measure. To address this, averages were taken of all total and subscale scores for the older and younger children. These average scale scores were then used in subsequent analyses in order to facilitate the inclusion of both younger and older children in the same models.

### **Analytic Plan**

Correlation and chi-square analyses were used to assess relationships between mothers' and children's symptoms of PTSD as well as rates of PTSD diagnosis. Following this, a latent profile analysis was conducted using mothers' and children's standardized PTSD symptom domain scores to create the profiles. The Bayesian Information Criteria and Lo-Mendel-Rubin likelihood ratio test were used to assess goodness of model fit (Nylund, Asparouhov, & Muthén, 2007, Lee, Kim, Taylor, & Perron, 2011). Once the appropriate number of profiles was determined, a logistic regression was conducted to predict profile membership. The following

predictors were included in the logistic regression: child's age, child's gender, mother's age, positive parenting, negative parenting, mother's depression, and violence exposure.

## Results

Families in this study reported high rates of intimate partner violence, with an average number of yearly IPV incidents of 203.97 ( $SD = 164.51$ ). Mothers and children also reported high rates of PTSD symptoms as well as diagnoses. Mothers in this sample had an average score of 21.38 ( $SD = 11.94$ ), indicating a moderate-severe presentation of PTSD symptoms. Further, 45% of the sample had total scores above 27, indicating that almost half the mothers in the sample likely met criteria for PTSD. Older children had average total scores of 4.54 ( $SD = 5.03$ ), which directly reflects their average number of PTSD symptoms. Younger children had average total scores of 0.49 ( $SD = 0.37$ ), indicating an average response score between 'No' and 'Sometimes.' Using, DSM-4-TR criteria, 40% of all children in this sample had a diagnosis of PTSD. See Table 2 for descriptive statistics on all variables of interest.

### Relationships between Mother's and Children's PTSD Symptoms

Correlations between mothers' and children's PTSD symptoms were assessed. Significant, positive correlations were found for the three symptom domains of Re-Experiencing, Avoidance, and Hyperarousal. A significant, positive correlation was also found for total PTSD symptoms ( $r = .42, p < .001$ ). See Table 2 for a matrix of all correlations. Given this study's interest in relational PTSD, correlations between mothers' and children's PTSD symptoms were also assessed in two age groups: children ages 4-7 ( $N = 168$ ), and children ages 8-12 ( $N = 69$ ). Interestingly, there were some differences based on age group. For children ages 4-7, significant, positive correlations with their mothers' PTSD symptoms were found for all three symptom domains as well as for total PTSD symptoms. For children ages 8-12, significant correlations

were found for the Hyperarousal subscale ( $r = .31, p < .05$ ), as well as the total PTSD symptom scales ( $r = .29, p < .05$ ), but no other significant correlations were found. See Table 3 for all correlations by age group.

Relationships between diagnostic rates of PTSD in mothers and children were also assessed. A chi-square analysis was run using the entire sample, which did not reveal any significant relationship between mothers' and children's PTSD diagnosis rates ( $\chi^2 = 2.14, p = .14$ ). This chi-square analysis was also run using the two age groups (children ages 4-7, children ages 8-12). A significant association was found for children ages 4-7 ( $\chi^2 = 7.51, p < .01$ ). Here, 56% of children with a diagnosis of PTSD also had a mother with a diagnosis of PTSD, while 44% did not have a mother with a diagnosis of PTSD. Conversely, 66% of children without a diagnosis of PTSD also had a mother without a diagnosis of PTSD, while 34% had a mother with a PTSD diagnosis. The chi-square test was not significant for children ages 8-12 ( $\chi^2 = 2.52, p = .11$ ).

### **Latent Profile Analysis**

Results of the latent profile analysis indicated that the best-fitting model was that with two latent profiles (BIC = 2,618.88 , Lo-Mendell-Rubin LRT = 326.47,  $p < .01$ ). The two profiles are illustrated in Figure 1. Mothers' PTSD symptoms across the three symptom domains in the first profile were at a total score of 30, which would place them in the moderate/severe range (McCarthy, 2008). Children in the first profile experienced about seven symptoms of PTSD across the three symptom domains, which, given that criteria for a DSM-IV-TR diagnosis of PTSD require experiencing at least seven symptoms of PTSD, would place them in a moderate range of symptoms. In the second profile, mother's PTSD symptoms fell around a total score of 12 on the PDS, which is in the low moderate range. Children in the second profile

experienced an average of approximately four symptoms of PTSD, which, in the context of needing seven symptoms for a diagnosis of PTSD, would place them in the mild/moderate range of symptom severity. Overall, the profiles were similar in the relationship between mothers' and children's PTSD symptoms, with mothers' symptoms slightly higher than children's symptoms. However, the profiles differed in that the severity of PTSD symptoms for both mothers and children was higher in the first profile than in the second profile.

Finally, a logistic regression was run to examine predictors of profile membership. Children's gender and age were not predictive of profile membership. Mothers' age was also not predictive of profile membership. In terms of parenting, positive parenting significantly predicted membership in Profile 1, while negative parenting did not significantly predict membership in either profile. Mothers' depressive symptoms as well as violence exposure also significantly predicted membership in Profile 1. See Table 4 for full logistic regression results.

### **Discussion**

The results of this study have given novel information about the relationships between PTSD symptoms in mothers and their children exposed to IPV. Importantly, there does seem to be a relationship between mothers' and children's symptoms of PTSD, even as children age. However, this may be attributed to their symptoms of Hyperarousal rather than symptoms of Avoidance or Re-experiencing. This is somewhat similar to the results found in Levendosky and colleagues' (2013) study, which showed developmental variations in relationships between mothers' and children's PTSD symptoms. However, that study did not find relationships between mothers' and children's Re-experiencing symptoms at any age. It is not clear why older children's (ages 8-12) Hyperarousal and total PTSD symptoms, but not their Re-experiencing or Avoidance symptoms, remain significantly related to their mother's PTSD symptoms. One

possible explanation is that Hyperarousal symptoms are the most visible symptoms of PTSD (e.g., hypervigilance, aggressive behavior). Thus, even as children age and begin to individuate from their caregivers, these behaviors still cause reactions within the caregiver-child dyad that might lead to increased expression of Hyperarousal symptoms for both the caregiver and child. Future research that takes a more nuanced approach to understanding relational PTSD in older children might give better insight into the process that leads to the continued association of mothers' and children's PTSD symptoms.

To my knowledge, this is the first study that has examined relationships between diagnostic rates in mother-child dyads. Interestingly, there were age differences in the relationship between diagnostic rates of PTSD in mother-child dyads. Children with a diagnosis of PTSD were more likely to have a mother with a diagnosis of PTSD, while children without a diagnosis of PTSD were more likely to have a mother without PTSD; however, this was only true for the young children in our sample. This result follows what was found with the correlations in our sample. Naturally, as children have less in common with their mothers' PTSD symptom presentation, they are less likely to have relationships in diagnostic rates, given that a diagnosis of PTSD requires symptoms across the domains. This is consistent with research demonstrating that maternal and child PTSD symptoms become less correlated as children age (Levendosky et al., 2013).

The results of the latent profile analysis were also different than predicted. While four profiles were hypothesized, the best-fitting model only included two profiles. In the first profile, both mothers and children were experiencing significant levels of PTSD, although the mothers were doing slightly worse overall. In the second profile, both mothers and children were experiencing a low-to-moderate range of symptoms, again with mothers doing slightly worse.



Thus, these profiles suggest that, in general, there is consistency in level of PTSD symptoms across mother-child dyads, at least in the context of IPV. That both profiles showed a similar pattern of symptoms might be related to the fact that every individual in this sample was exposed to IPV. Previous research has found that type of trauma experienced is not just a risk factor for PTSD, but that it also associated with variation in the presentation of PTSD (Hellmuth, Jacquier, Swan, & Sullivan, 2014; Kelley, Weathers, McDevitt-Murphy, Eakin, & Flood, 2009; Runyon, Deblinger, & Steer, 2013). What is less clear is how type of trauma impacts the presentation of PTSD symptoms. In our sample, Hyperarousal symptoms were the highest symptom type and Avoidance symptoms were the lowest for both mother and child. It may be that chronic unpredictable violence, such as experiencing IPV, creates a need for constant vigilance and restricts a person's ability to avoid reminders of trauma, hence why we see this pattern of symptoms.

The profiles that were not observed in our sample also provide information about relational PTSD. There was no profile where only one member of the dyad was experiencing high levels of PTSD while the other dyad member was doing well. The lack of these profiles taken together with the current study findings indicates that, in general, children do not experience good mental health if their mothers are struggling with their mental health, which is consistent with the theory of relational trauma as well as research on the connections between parent-child mental health (Levendosky et al., 2006; Sheeringa & Zeneah, 2001; Scheeringa et al., 2015). These results also suggest that the reverse is true – that children will not experience poor mental health if their mothers are well in terms of their mental health. Thus, relational PTSD is potentially the norm, not the exception, in children and their mothers exposed to IPV.

There were also some interesting results when examining predictors of profile membership. The finding that violence exposure significantly increased odds of being in the worse profile is consistent with previous research on PTSD (Ehrensaft, Knous-Westfall, & Cohen, 2017; Trickey et al., 2012). This has been found for both mothers and children exposed to violence. In our sample, increases in the number of acts of IPV experienced was associated with more severe PTSD symptoms. Given the broad range of IPV that this sample experienced, it is unclear whether this relationship is driven by the severity of each one of these acts, the type of IPV (e.g., sexual IPV, physical IPV, psychological IPV), or some combination of the two. It was also not surprising that higher depressive symptoms in the mother predicted membership in the worse profile, given the known associations between depression and PTSD (Fedovskiy et al., 2008; Nathanson, Shorey, Tirone, & Rhatison, 2012; Pico-Alfonso et al., 2006). It is possible that this is an area where mothers' mental health problems have indirect effects on children's mental health problems. Thus, one hypothesis for exploration would be that as depressive symptoms lead to worsening PTSD symptoms in the mother, mothers' worse PTSD symptoms lead to children also experiencing worsening PTSD.

Notably, positive parenting, but not negative parenting, was associated with increased odds for membership in the worse profile. This is consistent with previous research demonstrating positive correlations between effective parenting and children's PTSD symptoms (Scheeringa et al., 2015). Further, recent research suggests that caregivers with PTSD are more likely to engage in positive parenting behaviors (Grogan-Kaylor et al., under review) and that caregivers of children with PTSD report positive changes in parent-child relationships (Kiser et al., 2008). However, other research on relational PTSD suggests that negative parenting behaviors are related to observed relationships between parent-child PTSD (Ehrensaft, Knous-

Westfall, & Cohen, 2017; Lannert et al., 2014). One possible explanation for this finding is that mothers with PTSD may be more alert or attentive due to their symptoms, which may then result in greater involvement with their children and ultimately greater use of positive parenting practices. Another explanation might be that mothers of children exposed to IPV are aware of the negative impact of witnessing IPV in the home, and they are trying to offset this negative impact by engaging in more positive parenting. Future work may need to examine the more specific aspects of positive parenting as they predict relational PTSD.

### **Limitations**

There are several limitations to this study that should be noted. One limitation is that this research only includes IPV-exposed individuals. While this provides needed information about the presentation of relational PTSD in this population, it also limits the generalizability of these findings to populations with different types of trauma. Further, although the findings of this study are consistent with a theory of relational PTSD, these results do not provide complete evidence for this theory. Without longitudinal data that tracks changes in parenting, parent-child interactions, and how these relate to trauma symptoms in both the caregiver and the child, these similarities might solely be an artifact of their shared experiences of IPV. Another significant limitation of this research is the use of two different measures of PTSD with the children in this sample. Although this allows for greater developmental sensitivity in the assessment of PTSD symptoms, the differences in these measures may make it difficult to compare age groups, despite the use of scale transformations. Further, the measure change occurred between ages 7-8, the same divide that was used in the analyses. Thus, it is possible that some of the observed age differences in our findings can be attributed to differences in the measure used with those age groups. Relatedly, this study is limited by the sample size, particularly with older children. The

age groups in this study (4-7 years-old, 8-12 years-old) are fairly large and include children who may be at very different developmental stages in the same group. Ideally, relational PTSD would be examined within smaller developmental periods; however, I was unable to do this in this study as the resulting age groups would have been too small to make meaningful comparisons. Finally, this study is limited by the use of measures of PTSD based on DSM-IV-TR criteria. The criteria for PTSD were revised in the most recent version of the DSM to include four instead of three symptom domains (American Psychiatric Association, 2013), yet much of the current research on PTSD uses the older criteria. Thus, these findings cannot be generalized to diagnostic formulations of PTSD that use the current criteria outlined in the DSM-5.

### **Clinical Implications**

The results of this study have applications for clinical work and clinical research. Strikingly, these findings consistently suggest that there are significant, moderate-to-large relationships between mothers' and children's PTSD symptoms. These results also suggest that it may be necessary to treat caregivers' PTSD symptoms in order to have meaningful impact on children's PTSD symptoms. Currently, while many treatments for PTSD include caregivers, they do not specifically address the mental health of caregivers. Thus, there is a need to design interventions that address caregivers' and children's symptoms of PTSD, particularly when both members of the dyad have been traumatized. This may be especially true for children exposed to IPV, even as they age into middle childhood/pre-adolescence.

### **Conclusions and Future Directions**

Current research on relationships between caregiver and child traumatic stress symptoms has focused on infants and toddlers, not considering this relationship in later childhood. Therefore, by including older children in this study, important information was gained about the

relationships between parent and child mental health across developmental periods. The results of this study not only provide further evidence for a relational profile of PTSD in the context of IPV, but more importantly, suggest that the relationships between mothers' and children's PTSD persist, though to a lesser degree, as children age. Therefore, future work on relational PTSD should include older children in their samples in order to better understand why this persistence is observed and when it is not observed. Future research should also examine these relationships in non-IPV-exposed populations. It cannot be determined from this research whether these relationships are specific to IPV-exposed populations or if they are true of PTSD in general, regardless of the type of trauma exposure. Finally, future research should investigate other potential risk factors for relational PTSD, particularly the nature of the relationship between maternal PTSD and positive parenting practices, as this may have important implications for the study of the presentation and treatment of PTSD in children.

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**Table 3.1. Sample Demographic Information**

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Child's Gender	
Male	53%
Female	47%
Child's Age	6.49 ( <i>SD</i> = 2.42)
Mother's Age	33.18 ( <i>SD</i> = 7.36)
Mother's Relationship Status	
Single, Separated, or Divorced	80%
Married or Living with Partner	20%
Family Monthly Income	\$995.92 ( <i>SD</i> = \$1,129.34)
Mother's Education	
HS Diploma/GED or less	62%
Post-secondary education	38%
Employed	42%

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**Table 3.2. Descriptive Statistics for Covariates**

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Positive Parenting	3.66 ( <i>SD</i> = 0.41)
Negative Parenting	1.85 ( <i>SD</i> = 0.45)
Mother's Depression	26.30 ( <i>SD</i> = 12.89)
Violence Exposure	203.97 ( <i>SD</i> = 164.51)

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**Table 3.3. Correlation Matrix of Mothers' and Children's PTSD Symptoms**

	1	2	3	4	5	6	7	8
1. Mother Total PTSD	-	-	-	-	-	-	-	-
2. Mother Re-experiencing	.82*	-	-	-	-	-	-	-
3. Mother Avoidance	.90*	.59*	-	-	-	-	-	-
4. Mother Hyperarousal	.86*	.57*	.69*	-	-	-	-	-
5. Child Total PTSD	.42*	.36*	.37*	.37*	-	-	-	-
6. Child Re-experiencing	.40*	.36*	.35*	.32*	.86*	-	-	-
7. Child Avoidance	.32*	.30*	.30*	.27*	.85*	.56*	-	-
8. Child Hyperarousal	.38*	.29*	.33*	.38*	.88	.67*	.63*	-

\* $p < .001$

**Table 3.4. Correlations between Mothers' and Children's PTSD Symptoms by Age Group**

	Children age 4-7	Children Age 8-12
Mother Total PTSD - Child Total PTSD	.52**	.29*
Mother Re-experiencing -Child Re-experiencing	.44**	.19
Mother Avoidance - Child Avoidance	.38**	.22
Mother Hyperarousal - Child Hyperarousal	.40**	.31*

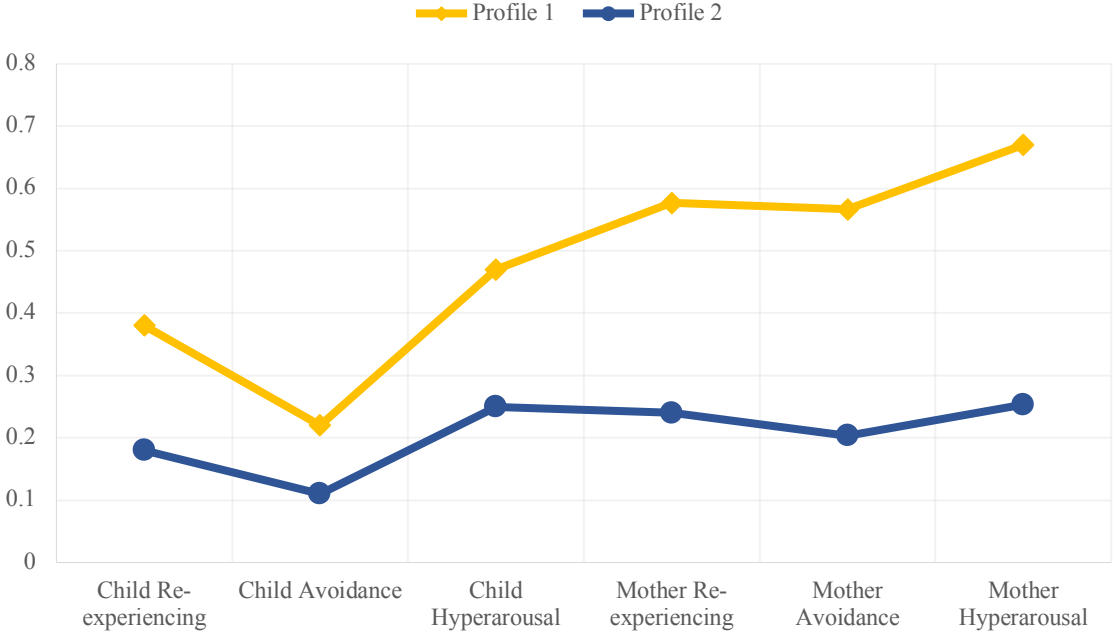
\* $p < .05$ , \*\* $p < .001$

**Table 3.5. Results of Logistic Regression Predicting to Profile Membership**

Profile 2 vs. 1	B	SE (B)	z	Odds Ratio
Child Gender	0.06	0.64	0.09	1.06
Child Age	0.16	0.14	1.18	1.18
Mother Age	-0.01	0.05	-0.21	0.99
Positive Parenting	-2.09	0.80	-2.61*	0.12
Negative Parenting	-1.25	0.84	-1.49	0.29
Mother's Depression	-0.17	0.03	-6.01**	0.85
Violence Exposure	-0.01	0.002	-2.54*	1.00

\* $p < .05$ , \*\* $p < .001$

**Figure 3.1. Results of Latent Profile Analysis**



## Chapter IV

### Examining the Impact of Intervention on the Trajectory of Posttraumatic Stress Symptoms in Children Exposed to Intimate Partner Violence

Nearly eight million children each year live in homes where intimate partner violence (IPV) occurs (Hamby, Finkelhor, Turner, & Ormrod, 2011). IPV is defined as physical assault, sexual assault, psychological aggression, or stalking by a current or former partner or spouse (Centers for Disease Control, 2014), and approximately one-third of women experience this type of violence in their lifetimes, many of whom are mothers (Breiding et al., 2014). Further, approximately 85% of children who live in homes with IPV are direct witnesses to the violence (Fantuzzo & Fusco, 2007).

Witnessing IPV in childhood has been demonstrated to have serious, negative impacts on children's physical and mental health, including increased risk for internalizing and externalizing behavior problems, as well as risk for serious mental illnesses such as depression and posttraumatic stress disorder (PTSD; Graham-Bermann, Gruber, Howell & Girz, 2009; Kitzmann, Gaylord, Holt, & Kenny, 2003; Kuhlman, Miller, Howell, & Graham-Bermann, 2012). The development of PTSD is of special concern, as rates of PTSD in IPV-exposed young children have been estimated to be as high as 50% when developmentally appropriate criteria are used to assess the disorder (Graham-Bermann, Castor, Miller, & Howell, 2012). However, much of our understanding of the impact of IPV-exposure on children's mental health comes from cross-sectional data, which gives only a point in time snapshot of children's functioning. Research demonstrates that the issue of IPV is typically chronic, with women involved with

violent partners for a several-year duration, and children exposed to IPV for an average of 10 years (Graham-Bermann & Perkins, 2010; Thompson et al., 2006). Further, a large body of research links early childhood violence exposure to negative outcomes in adolescence and adulthood (Anderson & Bang, 2012; Graham-Bermann, Cater, Miller-Graff, & Howell, 2016; Narayan, Englund, Carlson & Egeland, 2014; Shen, 2009; Whitfield, Anda, Dube, & Felitti, 2003). Given the long-term prevalence and impact of IPV exposure, it is important to conduct prospective, longitudinal studies of children's functioning to understand not only the immediate impact of IPV exposure, but also how IPV exposure impacts the trajectories of outcomes throughout childhood.

### **Risk Factors for PTSD in Children**

Various risk factors for PTSD in childhood have been identified. A recent meta-analysis examined 25 different risk factors for childhood PTSD, including various demographic factors, having previous psychopathology, exposure to more severe trauma, and having a parent with a mental health problem (Trickey, Siddaway, Meiser-Stedman, Serpell, & Field, 2012). Recent research also supports the findings of this meta-analysis (Lannert et al., 2014; Scheeringa, Myers, Putnam, & Zeneah, 2015). Findings from this meta-analysis as well as other research also suggest that being a member of a minority group, being female, having less social support, and having fewer economic resources are associated with increased risk for PTSD (Adams et al., 2014; Rosshandler, Hall, & Canetti, 2016; Trickey et al., 2012). Other risk factors for PTSD include higher levels of trauma exposure, having poor coping skills, a previous diagnosis of PTSD, or a comorbid psychological condition (Trickey et al., 2012).

Especially strong associations have been found between maternal and child mental health. For example, one study reported that maternal PTSD symptoms and depression mediated



increases in children's PTSD symptoms over a two-year period (Scheeringa et al., 2015). In another study of infants exposed to IPV, maternal PTSD symptoms partially mediated the relationship between prenatal IPV exposure and child PTSD symptoms (Lannert et al., 2014). This study also highlighted relationships between parenting and child PTSD, as they found that the relationship between mothers' and children's trauma symptoms was fully mediated by neglectful parenting (Lannert et al., 2014). Another study examined PTSD symptoms in children following Hurricane Katrina, and found that parental use of corporal punishment increased risk for PTSD (Kelley et al., 2010). Clearly, different factors impact the development of PTSD post-trauma exposure. However, few studies have examined the cumulative effect of IPV exposure, parenting, and maternal mental health on children's PTSD symptoms. Additionally, there is no information over how these factors might affect the trajectory of PTSD over time. This information is important to understanding how to best support children and families who experience chronic violence exposure, such as IPV.

### **The Impact of Treatment on Children's PTSD Symptoms**

Given the high prevalence of PTSD following exposure to IPV, as well as the significant negative consequences associated with the development of PTSD, treatment programs have been designed to address childhood PTSD and IPV exposure. Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) has been evaluated and found to significantly reduce children's PTSD symptoms post-treatment (for review, see Feeny, Foa, Tredwell, & March, 2004; Smith et al., 2013). Some research suggests that TF-CBT is effective for treating PTSD in IPV exposed children, although TF-CBT was not originally designed to address the needs of IPV exposed children (Scheeringa, Weems, Cohen, Amaya-Jackson, & Guthrie, 2011). Another intervention program specifically designed for IPV-exposed children, called Project SUPPORT, significantly

improves mother's child-management skills, reducing harsh parenting, and that it also significantly reduced children's externalizing behavior problems and other conduct problems (Jouriles et al., 2001; Jouriles et al., 2009; McDonald, Dodson, Rosenfield, & Jouriles, 2011; McDonald, Jouriles, & Skopp, 2006). This treatment was found to maintain positive effects at 20 and 24 months post-treatment, but did not specifically study children's traumatic stress symptoms (Jouriles et al., 2009; McDonald et al., 2011; McDonald et al., 2006). Thus, there is a need to evaluate how treatment programs for IPV-exposed children impact their PTSD symptoms over the long-term.

### **The Preschool Kids' Club Program and Moms' Empowerment Program**

The Preschool Kids' Club (PKC; Graham-Bermann, 2000) is a ten-session group intervention for children who have been exposed to IPV. As part of this program, children discuss feelings about violence in the home, process shame and self-blame about the violence, learn safety planning to remove themselves from violent situations when they occur, as well as learn non-violent conflict resolution skills. This program is offered in conjunction with the Mom's Empowerment Program (MEP), a ten-session group intervention for mothers who have experienced IPV (Graham-Bermann, 2012a). In this program, women process their experiences around IPV, are empowered to access support, and develop parenting skills. Evaluations of the program have found that when the PKC and MEP are offered in tandem, children's behavior problems and internalizing symptoms are significantly reduced at 6-8-months post-intervention (Graham-Bermann, Miller-Graff, Howell, & Grogan-Kaylor, 2015). Further, it has been demonstrated that participation in the MEP leads to reduced IPV-exposure, enhanced positive parenting, decreased use of corporal punishment, and decreases in mothers' PTSD symptoms, all of which can potentially have positive effects on child functioning (Graham-Bermann & Miller-

Graff, 2015; Grogan-Kaylor, Galano, Howell, Miller, & Graham-Bermann, 2016; Howell, Miller, Lilly, Burlaka, Grogan-Kaylor, & Graham-Bermann, 2015; Miller, Howell, & Graham-Bermann, 2014).

### **The Current Study**

The goal of this study is to evaluate the long-term effects of early treatment on the trajectory of children's PTSD symptoms, as well as investigate other factors that might affect the trajectory of PTSD symptoms during childhood. Such information can provide important knowledge about the long-reaching effects of PTSD treatment, a currently understudied area in clinical psychology. The main study hypotheses are:

1. There will be a treatment by time interaction such that children who participated in the Preschool Kids' Club Program for IPV exposure will experience greater reductions in their PTSD symptoms over an 8-year period compared to those who did not participate in this early intervention.
2. In addition to the effect of intervention over time, it is hypothesized that there will be a treatment by baseline trauma exposure by time interaction such that children in the intervention group who experienced more violence at baseline (8 years ago) will experience less change in symptoms of PTSD than children who experienced less violence at baseline.
3. Further, it is hypothesized that there will be a treatment by additional trauma exposure by time interaction such that children in the intervention group who experienced more violence within the past 8 years will experience less change in symptoms of PTSD than children who experienced less violence in the previous 8 years.

4. Beyond program participation, reductions in children's PTSD symptoms will be further predicted by improvements (positive change) in mothers' parenting, as well as reductions in mothers' depression and traumatic stress over time.
5. Finally, it is hypothesized that children in the intervention group will have lower rates of PTSD diagnosis at 8-year follow-up, compared to children in the control group.

## **Methods**

### **Participants**

A total of 120 mother-child dyads were enrolled in the randomized controlled trial (RCT) of the Preschool Kids' Club Program. At baseline the children were an average age of 4.94 years ( $SD = 0.85$ ), and the sample was 50% girls, 50% boys. The sample was ethno-racially diverse, with 37% of the sample identifying as African American, 20% as Biracial, and 5% Latino/a. The rest of the sample identified as White. Children came from primarily low-income families with a baseline average monthly income of \$1,348 ( $SD = \$1,277$ ). Following three prior interviews, at the time of the fourth follow-up interview, there were 60 children with an average age of 12.43 ( $SD = 1.76$ ). There were 35 children from the Treatment condition and 33 from the Control condition. See Table 1 for sample demographic information at each time point.

### **Procedures**

Families were recruited throughout Southeast Michigan and Ontario, Canada using flyers posted at various businesses and clinics, as well as through flyers posted at domestic violence shelters. Mothers called a toll-free number to indicate their interest in participating. Families were eligible to participate if the mother had experienced IPV within the past two years and had a child between the ages of 4-6. Once deemed eligible to participate, families were randomly

assigned to treatment and wait-list control conditions via block randomization such that the first six families were in the treatment condition, the following six were in the control condition, and so forth. Mothers and children participated in four interviews over the course of the study: baseline, post-treatment (5 weeks from baseline), 6-8-months post-treatment, and 8-years post-treatment. At each interview, mothers answered questions about their parenting, their mental health, their child's mental health, as well as their demographic information. Children answered questions about their perceptions of family violence as well as their PTSD symptoms.

### **Measures**

**Conflict Tactics Scale – Revised (CTS-2).** The CTS-2 is a 72-item questionnaire designed to assess the level of violence between intimate partners; however, in this study only the 39 questions assessing violence victimization were administered. This questionnaire provides a total violence score, which represents the frequency of all types of IPV over the past year. Women report the frequency at which different events occur on the following scale: never, one time, two times, 3-5 times, 6-11 times, 12-20 times, or more than 20 times. The CTS-2 has good face validity for examining different types of IPV and has been demonstrated to have good validity and reliability in reporting of partner violence (Straus, Hamby, Boney, & McCoy, 1996). Reliability for the current study at baseline is ( $\alpha$ ) 0.92. Reliability at follow-up is ( $\alpha$ ) 0.84.

**UCLA Posttraumatic Stress Disorder – Reaction Index (PTSD-RI) for DSM-IV.** The PTSD-RI is a self-report measure designed to assess PTSD symptoms and diagnosis in school-age children and adolescents using DSM-IV criteria (Steinberg, Brymer, Decker, & Pynoos, 2004). This questionnaire includes 20 questions regarding frequency of PTSD symptoms in the past month. Children are asked to report on the frequency of their symptoms over the past month on a five-point scale from '0' 'None of the time' to '4' 'Most of the time'. Higher scores reflect

more frequent PTSD symptoms. The UCLA PTSD-RI has been shown to have high validity and reliability (Steinberg et al., 2004). Further, the questions on the measure correspond well with DSM criteria for PTSD and the reliability for the current study at 8-year follow-up is ( $\alpha$ ) 0.92.

**Social Support.** Caregivers provided information at baseline, time 3, and time 4 on the important individuals in their child's life. These included siblings, grandparents, aunts, uncles, mom's romantic partner, cousins, and children's friends. Caregivers could identify up to 10 important individuals for their child. A social support score was created by summing the number of important individuals identified. All children had at least one person in their social support network, as caregivers were included in the list of important individuals.

**The Posttraumatic Stress Disorder Semi-Structured Interview and Observational Record for Infants and Young Children.** This is a 31-item caregiver report measure that assesses PTSD symptoms in children less than 7-years-old (Sheeringa, Zeanah, Drell, & Larrieu, 1995). This measure incorporates developmentally-appropriate questions regarding changes in play, aggression, and developmental regression (e.g., loss of ability to use the toilet) with DSM-IV-TR criteria, which is in line with criteria in the most recent version of the DSM. Caregivers are asked to give behavioral examples of symptoms that they endorse for their child. These responses are then coded by a team of trained interviewers to rate both symptom presence and severity. This measure assesses both PTSD symptom severity and diagnosis and appears to align well with DSM-IV-TR criteria for PTSD. Reliability for the current study at baseline is ( $\alpha$ ) 0.86.

**Alabama Parenting Questionnaire (APQ).** The APQ is a 42-item self-report questionnaire designed to measure both negative and positive parenting practices (Shelton, Frick, & Wooten, 1996). Positive parenting is assessed by three subscales (Involvement, Positive Parenting, Other Discipline); negative parenting is also assessed by three subscales (Inconsistent

Discipline, Poor Monitoring/Supervision, Corporal Punishment). Answers are given on a scale from '1' 'Never' to '5' 'Always.' Higher scores represent more frequent use of parenting practices. The APQ has been demonstrated to have good internal consistency and reliability for most subscales, with moderate reliability for the Corporal Punishment subscale. Reliability for Negative Parenting at baseline is ( $\alpha$ ) 0.71, and for Positive Parenting at baseline is ( $\alpha$ ) 0.79. At 8-year follow-up, reliability for Negative Parenting was ( $\alpha$ ) 0.76, and for Positive Parenting was ( $\alpha$ ) 0.81.

**Posttraumatic Diagnostic Scale (PDS).** The PDS was designed to assess PTSD diagnosis and frequency of trauma symptoms in a one-month period in adults, and DSM-IV-TR diagnosis (Foa, Cashman, Jaycox, & Perry, 1997). Possible responses range from '0' 'Not at all or only one time' to '3' '5 or more times per week/almost always.' Answers to each item are summed to give a total symptom severity score. Higher scores reflect greater PTSD symptomatology, with scores over 20 falling in the moderate-severe range. The PDS has been shown to have strong, positive correlations with other validated measures of PTSD and good internal consistency for the total scale (Foa et al., 1997). Reliability for the current study at baseline is ( $\alpha$ ) 0.89, and at follow-up is ( $\alpha$ ) 0.92.

**Center for Epidemiological Studies Depression Scale (CES-D).** The CES-D is a 20 item self-report questionnaire that assesses depression symptoms in the past week (Radloff, 1977). Answers are given on a scale from '1' 'None of the time' to '4' 'Most or all of the time.' Higher scores reflect higher symptom frequency, and scores greater than 16 reflect likely clinical levels of depressive symptomatology. Reliability for the current study at baseline, as well as at the 8-year follow-up is ( $\alpha$ ) 0.92.

### **Measurement Nonequivalence**

Given that the children in the study were much older at time four, it was necessary to use a different measure of children's PTSD symptoms at the fourth time point. Again, the four experimental items from the IPOR were dropped. To address this, a proportional linear transformation was conducted to scale the PTSD-RI to have the same range (0-2) as the Observational Record used at baseline, time 2, and time 3. This process maintains the five points (0, 0.5, 1, 1.5, 2) used on the PTSD-RI scale, however the range will match that of the Observational Record, which facilitates comparison between the measures. Then, to address the difference in number of items between each measure, an average score was calculated at each time point. This process of creating measurement equivalence allows for direct comparison between measures, while maintaining fidelity with the original scales. This method also conserves the variation in the data that is important to conducting the proposed analyses.

### **Power Analysis**

The required sample size to detect significant effect varies by several factors, including the proposed significance level (i.e., alpha level or p-value), the desired power to detect differences (i.e., beta), and the estimated effect size of the difference that is being examined. An alpha of .05 and a beta of .80 were the parameters set for the power analysis given commonly held assumptions in the literature. Based on the review of current treatment literature, the estimated Cohen's *d* effect size is .3. With these assumptions, a sample size of 176 is needed for each group, with a total N of 352, to detect an effect of this size. However, because the analysis used in this study is a repeated-measures, clustered design, the design effect (DE) needs to be taken into account when examining estimates of power. The DE is calculated as follows:

$$DE = 1 + (n-1)\rho,$$



Where  $n$  is the number of data points in each cluster and  $\rho$  is the intra-class correlation (ICC). In this sample, there are, on average, four data points in each cluster. Assuming an ICC = .2, the DE would equal 1.6. To calculate the effective sample size (ESS) for this clustered design, divide the total number of data points across all four time points (i.e., the sum  $N$  at each time point), and divide this number by the DE. The sample size across all four time points in this study is 363. Dividing this number by the DE of 1.6, the ESS = 226. Thus, this study is underpowered to detect small effects, and results from this study should be considered preliminary.

### **Analytic Plan**

Attrition was examined using t-tests, ANOVAs, and  $\chi^2$  analyses, and any identified differences were statistically controlled for in all subsequent analyses. Further, baseline differences between the treatment and control group were also assessed, and if significant differences emerged they were also statistically controlled for in the subsequent analyses. Following these analyses, multilevel modeling (MLM) testing for random intercepts and slopes was used to analyze the longitudinal trajectory of children's PTSD symptoms, using person-observations at each of the four time points as the level 1 units of measurement, and the individual as the grouping, or level 2 level of measurement. A series of four models were used to test each of the four hypotheses. The following variables were included as predictors, although predictors varied between models: time (measured in years), treatment participation, mother's PTSD symptoms, total violence exposure, mother's depression symptoms, and mother's parenting. A treatment by time interaction was included in the model to assess the relationship between treatment and changes in PTSD symptoms over time. Further, a random slope for time was also included in the model to examine inter-individual differences in PTSD symptom trajectory. Multilevel modeling is appropriate because this strategy easily incorporates multiple

time points by accounting for the non-independence of observations for the same individual across time points, which is an advantage over OLS regression. Additionally, multilevel modeling is useful as it easily accommodates “unbalanced” longitudinal data in which not every subject is present for every wave of data and is also able to account for uneven time intervals when testing for effects.

## Results

There was high retention over 8 years for study participants, such that 96% of those interviewed at time 3 were in the study at time 4. Still, 43% of the original sample did not complete the fourth interview. See Figure 1 for the CONSORT diagram. Children who were not present at time 4 were more likely to be older at baseline than children present at time 4 ( $t(118) = -1.97, p < .05$ ). There were no other differences between those who did and did not participate in the time 4 interview. Given that children’s age and PTSD symptoms were not correlated ( $r = 0.12, p = .18$ ), age was not controlled for in subsequent analyses.

Children in this study were exposed to a high level of violence. Baseline scores of the CTS-2 indicated that children were exposed to an average of 191.56 ( $SD = 137.68$ ) IPV acts over that past year. Violence exposure at time four was much lower ( $M = 35.17, SD = 59.12$ ). Children’s PTSD symptoms were high at baseline as well as time four. There were no baseline differences between the Treatment or Control groups in any of the outcome or predictor variables. There were also no differences between the Treatment and Control groups on any demographic variables. See Tables 2 and 3 for more information on the outcome and predictor variables.

Before running the full model, an unconditional model was run and the intra-class correlation (ICC) was calculated. PTSD symptom score was the dependent variable. The ICC

was 0.28, suggesting that 28% of the variance in children's PTSD symptoms was due to time invariant differences between children. An MLM was a better fit than a linear model ( $\chi^2 = 19.83$ ,  $p < .001$ ); therefore, the MLM models were run.

The first model examined only the main effects of time and treatment condition, as well as a time by treatment condition interaction, which estimated the way in which trajectories of symptoms varied by treatment group. Time was the only significant predictor in this model ( $B = 0.04$ ,  $p < .01$ ). Contrary to expectations, treatment and the treatment by time interaction were not significant predictors in this model, indicating that there was no effect of treatment participation on the trajectory of PTSD symptoms. This model also included a random effect term for time to examine the potential unmeasured inter-individual differences in time trajectories of PTSD symptoms. This term was significant, indicating that there was individual variation in time trajectories of PTSD symptoms. Additionally, a covariance term for time was tested to examine the interaction between the intercept and slope of the time trajectory of children's PTSD symptoms. This term was significant ( $\rho = -0.007$ ,  $p < .05$ ), indicating that children with higher PTSD symptoms at baseline experienced less overall increases in PTSD symptoms than children with lower PTSD symptoms at baseline. See table 4 for the full model results.

The second model examined the main effects of time, baseline IPV exposure, treatment participation, and the interactions between these factors, on children's PTSD symptom trajectories. Time ( $B = 0.08$ ,  $p < .01$ ) and baseline IPV exposure ( $B = 0.0008$ ,  $p < .01$ ) were significant predictors in this model. There was also a significant time by baseline IPV exposure interaction ( $B = -0.0002$ ,  $p < .05$ ), indicating that the relationship between baseline IPV exposure and children's PTSD symptoms became weaker over time. The random effect of time was again significant in this model, indicating that there were inter-individual differences in

trajectories of PTSD symptoms that were not explained by differences in baseline IPV exposure. This model also included the  $\rho$  term to examine the association of baseline PTSD symptoms with growth trajectories; however,  $\rho$  was not significant in this model. No other predictors in this model were significant. See table 5 for the full model results.

The third model examined specifically how additional IPV exposure post-baseline impacted children's PTSD symptoms, as well as how additional IPV exposure moderated the impact of time and treatment. There were main effects of time ( $B = 0.05, p < .01$ ) and exposure to additional IPV ( $B = 0.001, p < .05$ ) on children's PTSD symptoms. The positive beta coefficients indicated that as time and additional IPV exposure increased, so did PTSD symptoms. There were no significant interaction terms in this model, indicating that the effect of additional IPV exposure on PTSD did not vary by time or by treatment participation. The random effect for time was again significant, indicating inter-individual differences in the trajectory of PTSD symptoms. The  $\rho$  term was also not significant in this model. See table 6 for the full model results.

The fourth and final model examined how factors other than treatment participation and IPV exposure impacted the trajectory of children's symptoms by including time x predictor terms in the regression. Treatment was not included in this model as there were no demonstrated treatment effects in any of the previous models; however, IPV exposure was included in the model as it was significantly related to children's PTSD symptoms in previous models. The fixed effect of time remained significant, again indicating that PTSD symptoms increased over time ( $B = 0.07, p < .001$ ). IPV exposure remained significantly associated with children's PTSD symptoms, which indicated that as IPV exposure increased, so did children's PTSD symptoms ( $B = 0.001, p < .01$ ). There was also a significant positive relationship between mothers' and

children's PTSD symptoms ( $B = 0.009, p < .01$ ), but there was not a significant relationship between mother's depression and children's PTSD symptoms ( $B = 0.002, p = .42$ ). Parenting was not significantly associated with children's PTSD symptoms. The only significant interaction was between time and mothers' PTSD which was negative ( $B = -0.002, p < .05$ ), indicating that the strength of the relationship between mothers' and children's PTSD symptoms became weaker over time. Given that no other interaction terms were significant, they were not included in the final model. A random effect of time was also included in the final model to evaluate the inter-individual effect of time on PTSD symptoms. This term was significant, indicating that the time trajectory of PTSD symptoms was not the same for all children even when accounting for the covariates included in the model. See table 7 for full model four results.

The relationship between treatment participation and rate of PTSD diagnosis was also examined. There were no differences in rate of PTSD diagnosis between the Treatment and Control groups at baseline ( $\chi^2 = 2.12, p = .15$ ), time 2 ( $\chi^2 = 0.59, p = .44$ ), time 3 ( $\chi^2 = 0.59, p = .44$ ), or time 4 ( $\chi^2 = 0.003, p = .96$ ). Thus, treatment participation did not impact the rate of PTSD diagnosis. See table 8 for information on rates of PTSD diagnosis at each time point.

## **Discussion**

This study has provided novel information about the trajectory of children's PTSD symptoms over the span of several years, as well as the long-term effects of treatment. Interestingly, children's PTSD symptoms increased over time following early-life exposure to IPV, and treatment participation did not impact this trajectory. There was also no relationship between treatment participation and rates of PTSD diagnoses. It is important to note that the intervention tested was a five week, 10 session intervention that was not specifically designed to address children's symptoms of traumatic stress or PTSD. Given the very short duration of that

treatment alongside the long duration of IPV (Graham-Bermann & Perkins, 2010), it is likely that the continued IPV exposure overrode any potential impact of treatment over the course of this 8-year period. Further, it is possible that children in this sample were exposed to additional trauma beyond exposure to IPV, which would increase risk for PTSD (Graham-Bermann et al., 2012) and potentially drown out any impact of treatment.

Although there were no significant relationships between IPV exposure and treatment participation as hypothesized, there were interesting relationships found between IPV exposure and children's PTSD symptoms. In general, exposure to higher levels of IPV was associated with greater levels of PTSD, which is consistent with previous research on risk factors for PTSD (Adams et al., 2014; Rosshandler et al. 2016; Trickey et al., 2012). However, this relationship seemed to be driven by additional IPV exposure rather than baseline IPV exposure, as the impact of early childhood exposure to IPV attenuated over time. The significant interaction between baseline IPV exposure and time indicates that growth trajectories of PTSD were relatively flat for children with high baseline IPV exposure. This suggests that while early-life exposure to IPV is a relevant risk factor for PTSD symptoms later in life, it is necessary to consider intervening trauma when examining the trajectory of PTSD symptoms over time. Interestingly, once these risk factors were accounted for, children's initial levels of PTSD symptoms did not have a significant effect of their symptom trajectory.

These results also provide information about how early experiences of PTSD impact children's trajectory of symptoms. In the first model tested, children with higher levels of PTSD symptoms at baseline had a slower growth trajectory than children with lower initial level of PTSD symptoms; however, in the final model found that initial levels of PTSD did not have any impact on the rate of change in PTSD symptoms over time. This result is inconsistent with

previous findings that suggest that higher levels of initial PTSD increase risk for future PTSD (Adams et al., 2014; Rosshandler et al. 2016; Trickey et al., 2012). These results suggest that children exposed to IPV are set on a path of deteriorating mental health, regardless of their initial level of symptoms. These results also provide support for the idea that, while past experiences are relevant for current functioning, factors in the more recent past, such as exposure to additional trauma, are more relevant to current functioning. However, it is also important to note that the timing of initial trauma varied considerably for the children in this sample, with many of their initial IPV exposures occurring more than two years prior to the study. Thus, the PTSD measurement captured in the first interview was likely not the baseline level of PTSD symptoms that occurred in the time immediately following the trauma, which may explain why the relationship between level of PTSD symptoms at baseline and trajectory of PTSD symptoms was not significant in this sample.

These findings lend further support to the idea that mothers' PTSD symptoms are uniquely related to PTSD symptoms in their children (Lannert et al., 2012; Scheeringa et al., 2015). Previous research on the relationships between child and caregiver mental health has focused primarily on this risk factor in younger children; however, these results suggest that it is still important to consider caregivers' PTSD symptoms as children age into middle childhood and early adolescence. Notably, mothers' symptoms of depression were not related to children's PTSD symptoms, suggesting that there are important ties between trauma symptoms in children and their caregivers that are not necessarily attributable to caregiver's overall mental health. Surprisingly, parenting was not associated with children's PTSD symptom trajectory, which is inconsistent with previous work on PTSD (Kelley et al., 2010; Lannert et al., 2014). This might suggest that while parenting behavior plays an important role in the emergence of PTSD

symptoms, parenting behaviors do not necessarily influence the persistence or decrease in these symptoms over time. Another possible reason for this nonsignificant relationship might be due to the simultaneous effects of compensatory and spillover parenting process. While some research has found more support for a spillover hypothesis in the context of marital conflict (Erel & Burman, 1995; Sturge-Apple, Davies, Cicchetti, & Fittoria, 2014), other research has found positive relationships between maternal mental health and parenting behaviors in the context of family stress, which is more consistent with a compensatory hypothesis (Grogan-Kaylor, Galano, Stein, Clark, & Graham-Bermann, under review; Kiser, Nurse, & Collins, 2008; Nelson, O'Brien, Blankson, Calkins, & Keane, 2009). It may be that while mothers exposed to IPV initially use compensatory strategies to engage with their children, as mothers are continually exposed to violence and have persisting mental health problems, their ability to engage in compensatory parenting diminishes and the spillover effect of IPV on parent-child relationships occurs.

There were also significant inter-individual differences in the time trajectory of children's PTSD symptoms not accounted for in this model. Thus, while on average, children in this study experienced an overall increase in PTSD symptoms, a significant number of children did not experience that trajectory of PTSD symptoms. Unfortunately, this model does not give specific information about what the other time trajectories of PTSD might look like. Future work should investigate other potential trajectories, which could include resilient groups that experience consistently low PTSD symptoms over time, or recovering groups that show decreased in PTSD symptoms over time. It might be then be useful to identify factors related to membership in each trajectory, as that information would be useful in created treatments targeted at minimizing the



negative effects of risk factors for PTSD while enhancing the positive impact of protective factors.

### **Limitations**

There are several limitations to the current study. This sample was recruited throughout Southeast Michigan and Windsor, Ontario; therefore, the results may not generalize to people in other geographic regions. This sample was also recruited due to their specific exposure to IPV, thus these findings may not generalize to children with different trauma histories. Additionally, the sample size for this study also limits the power to detect differences that exists, and thus increases the chance for type II error to occur (i.e. incorrect acceptance of the null hypothesis). While it is remarkable that more than 50% of a high-risk sample was retained from baseline to 8 months, and 96% of those were retained after 8 years, less study attrition would provide better insight into trajectories of PTSD symptom development. This study is also limited by the measurement non-equivalence at fourth time point. While the measure used is more appropriate given the age of the children at time 4, it's range is significantly different from the measure used at the previous 3 time points. Further, at time 4 children reported on their own symptoms, compared to the previous 3 time points where caregivers reported on children's symptoms. This likely introduced different measurement error at time 4 that could impact the utility of making comparisons across all 4 time points.

### **Clinical Implications**

While the PKC program was successful in reducing children's internalizing and externalizing behavior problems, it was not effective in treating their symptoms of traumatic stress and did not show evidence of change in PTSD over time (Graham-Bermann, Miller-Graff, Howell, & Grogan-Kaylor, 2015). These results provide further evidence that this ten session

treatment is not effective in reducing IPV-exposed children's PTSD symptoms over time, and that perhaps more intensive and extensive treatment is needed to support children who experience a severe stressor, such as IPV, that they likely experience over the span of several years. It is possible that a program more focused solely on PTSD symptoms, such as Trauma-Focused CBT, would have a greater long-term impact on children's functioning; however, there is no current evidence suggesting that such programs continue to work over a long period of time.

### **Conclusions and Future Directions**

This study provides important new information about the trajectory of PTSD symptoms across an 8-year period. Continued exposure to IPV clearly influences this trajectory, as does maternal PTSD. Future work with IPV-exposed children needs to focus on how exposure to additional types of trauma might mediate the relationship between early-life IPV exposure and children's PTSD symptoms later in childhood. It is possible that if we can minimize children's exposure to additional trauma beyond early childhood, we can reduce the negative impact that those experiences may have on children's long-term functioning. Additionally, future research needs to investigate the relationship between parent and child PTSD, as this seems to remain an important factor for the trajectory of PTSD symptoms throughout childhood. These close ties might suggest that it is necessary to treat caregiver's PTSD symptoms to reduce children's PTSD symptoms, particularly in shared traumatic experiences such as exposure to IPV. Finally, future work should examine individual differences in trajectories of childhood PTSD symptoms, as this work may lead to the identification of children who demonstrate resilient responses to chronic stress, which can inform the development of preventive interventions for PTSD in children exposed to IPV.

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**Table 4.1. Sample demographic information across the four time points\***

	Baseline	Post-intervention (5 weeks)	8 month follow- up (28 weeks)	8 year follow- up (416 weeks)
Sample Size (N)	120	101	74	68
Child age	4.94 (0.85)	-	-	12.46 (1.77)
Income	\$1,348 (\$1,277)	\$1,112 (\$992)	\$1,738 (\$1,705)	\$2,679 (\$2,661)
Child Race				
White	38%	-	-	32%
African-American/Black	37%	-	-	35%
Latino/a	5%	-	-	6%
Biracial /Another minority	20%	-	-	27%
Mother's Education				
High School/GED or more	87.5%	-	94%	94%
Mother's Relationship Status				
Single/Separated/Divorced	77%	81%	-	66%
Married/Living with Partner	23%	19%	-	34%

\*note: some information not collected at all time points

**Table 4.2. Means and Standard Deviations of Predictor variables at Each Study Wave**

	Baseline	Time 2	Time 3	Time 4
Social Support	6.17 ( <i>SD</i> = 2.33)	-	5.80 ( <i>SD</i> = 2.02)	6.94 ( <i>SD</i> = 2.10)
IPV Exposure	191.56 ( <i>SD</i> = 137.68)	-	39.13 ( <i>SD</i> = 50.07)	35.17 ( <i>SD</i> = 59.12)
Mother's PTSD	21.95 ( <i>SD</i> = 11.66)	17.87 ( <i>SD</i> = 11.54)	14.14 ( <i>SD</i> = 10.69)	16.59 ( <i>SD</i> = 13.55)
Mother's Depression	25.70 ( <i>SD</i> = 13.49)	21.08 ( <i>SD</i> = 12.78)	17.77( <i>SD</i> = 10.61)	21.22 ( <i>SD</i> = 8.79)
Negative Parenting	1.79 ( <i>SD</i> = 0.39)	1.75 ( <i>SD</i> = 0.40)	1.70 ( <i>SD</i> = 0.36)	1.68 ( <i>SD</i> = 0.39)
Positive Parenting	3.74 ( <i>SD</i> = 0.41)	3.71 ( <i>SD</i> = 0.39)	3.76 ( <i>SD</i> = 0.42)	3.76 ( <i>SD</i> = 0.44)

**Table 4.3. Means and Standard Deviations of Total PTSD Symptoms at Each Study Time Point by Treatment and Control Condition**

	Treatment	Control
Baseline PTSD	0.49 (0.33)	0.47 (0.36)
Time 2 (5 weeks) PTSD	0.44 (0.31)	0.38 (0.30)
Time 3 (6-8 months) PTSD	0.30 (0.31)	0.28 (0.24)
Time 4 (6-8 years) PTSD	0.65 (0.47)	0.70 (0.47)

\*note: these are standardized scores



**Table 4.4. Impact of Treatment Participation on Children's PTSD symptoms**

<b>Variable</b>	<b>B</b>	<b>Std (B)</b>	<b>Standard Error</b>	<b>z</b>	<b>p</b>
Years	0.04	0.33	0.01	2.77	.006**
Treatment	0.03	0.04	0.05	0.49	.62
Treatment x Years	-0.01	-0.07	0.02	-0.55	.39
<b>Random Effects</b>	<b>Estimate</b>	<b>Standard Error</b>	<b>95% Confidence Interval</b>		
Var (years)	0.003	0.001	0.002	0.006	
Var (cons)	0.04	0.01	0.02	0.07	
Cov (years, cons)	-0.007	0.003	-0.01	-0.001	
Var (residual)	0.05	0.006	0.07	0.10	

\*\* $p < .01$

**Table 4.5. Impact of Baseline IPV Exposure and Treatment on Children's PTSD symptoms**

<b>Variable</b>	<b>B</b>	<b>Std (B)</b>	<b>Standard Error</b>	<b>z</b>	<b>p</b>
Years	0.07	0.68	0.02	3.35	.001**
Treatment	-0.04	-0.05	0.08	-0.44	.66
Baseline IPV	0.0007	0.28	0.0003	2.78	.005**
Treatment x Years	-0.009	-0.07	0.03	-0.31	.76
Baseline IPV x Years	-0.0002	-0.43	0.00009	-2.07	.04*
Treatment x Baseline IPV	0.0002	0.09	0.0003	0.50	.50
Treatment x Years x Baseline IPV	-0.000002	-0.003	0.0001	0.02	.99
<b>Random Effects</b>	<b>Estimate</b>	<b>Standard Error</b>	<b>95% Confidence Interval</b>		
Var (years)	0.002	0.001	0.001	0.005	
Var (cons)	0.04	0.009	0.03	0.06	
Cov (years, cons)	-0.003	0.003	-0.01	0.002	
Var (residual)	0.05	0.005	0.04	0.07	

\* $p < .05$ , \*\* $p < .01$ ,

**Table 4.6. Impact of Additional IPV Exposure and Treatment on Children's PTSD symptoms**

<b>Variable</b>	<b>B</b>	<b>Std(B)</b>	<b>Standard Error</b>	<b>z</b>	<b>p</b>
Years	0.05	0.48	0.02	2.66	.008**
Treatment	0.006	0.01	0.06	0.12	.91
Additional IPV	0.001	0.26	0.0003	2.40	0.02*
Treatment x Years	0.02	0.12	0.03	0.63	.53
Additional IPV x Years	0.00002	0.05	0.0001	0.22	.83
Treatment x Additional IPV	-0.0003	-0.08	0.0004	-0.62	.54
Treatment x Years x Additional IPV	0.0001	0.25	0.0001	1.13	.26
<b>Random Effects</b>	<b>Estimate</b>	<b>Standard Error</b>	<b>95% Confidence Interval</b>		
Var (years)	0.002	0.001	0.001	0.004	
Var (cons)	0.04	0.01	0.02	0.08	
Var (residual)	0.07	0.01	0.05	0.10	

\*\* $p < .01$

**Table 4.7. Longitudinal Multilevel Model of Children's PTSD symptoms**

<b>Variable</b>	<b>B</b>	<b>Std(B)</b>	<b>Standard Error</b>	<b>z</b>	<b>p</b>
Years	0.07	0.67	0.02	4.07	< .001***
Social Support	-0.002	-0.01	0.01	-0.18	.86
IPV Exposure	0.001	0.21	0.0002	3.45	.001**
Mother's PTSD	0.01	0.35	0.003	3.96	< .001***
Mother's PTSD x Years	-0.002	-0.31	0.001	-2.11	.04*
Mother's Depression	0.002	0.08	0.002	0.82	.42
Positive Parenting	0.08	0.09	0.05	1.60	0.11
Negative Parenting	-0.04	-0.04	0.06	-0.61	.54
<b>Random Effects</b>	<b>Estimate</b>	<b>Standard Error</b>	<b>95% Confidence Interval</b>		
Var (Years)	0.003	0.001	0.001	0.01	
Var (cons)	0.02	0.01	0.005	0.06	
Cov (Years, cons)	-0.002	0.003	-0.01	0.003	
Var (residual)	0.06	0.01	0.04	0.08	

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 4.8. Rates of PTSD Diagnosis at Each Study Time Point by Treatment and Control Condition**

	Treatment	Control
Baseline	46%	33%
Time 2 (5 weeks)	31%	24%
Time 3 (28 weeks)	28%	20%
Time 4 (6-8 years)	47%	46%

Figure 4.1. Sample Size at each Time Point.

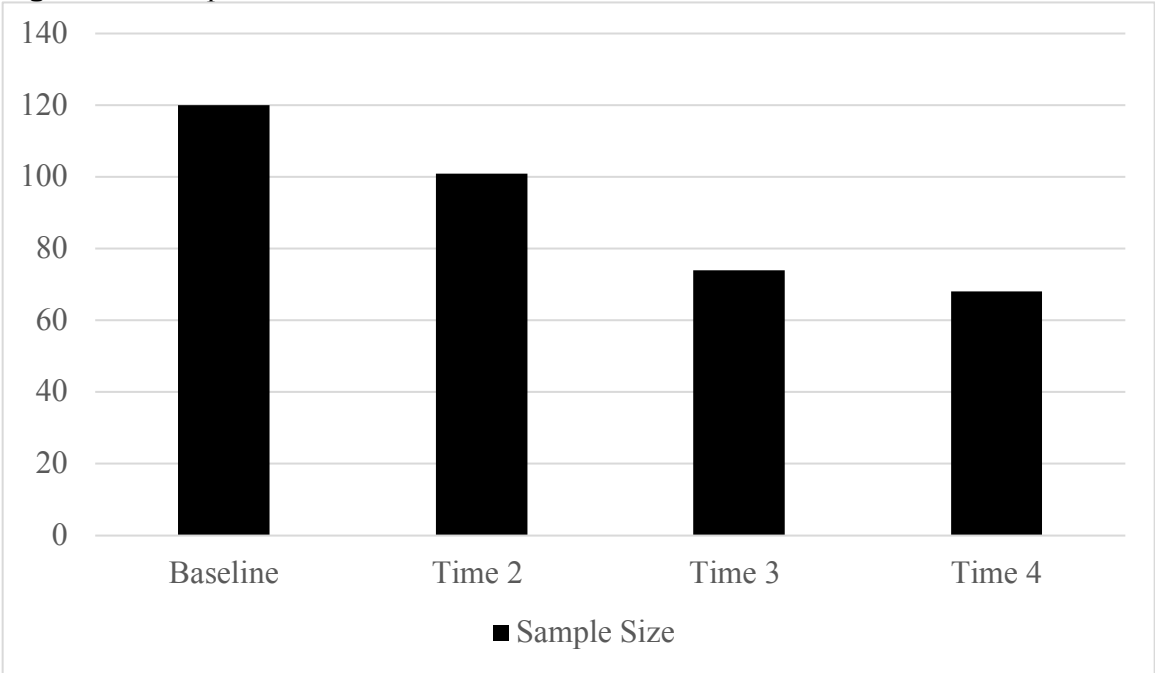
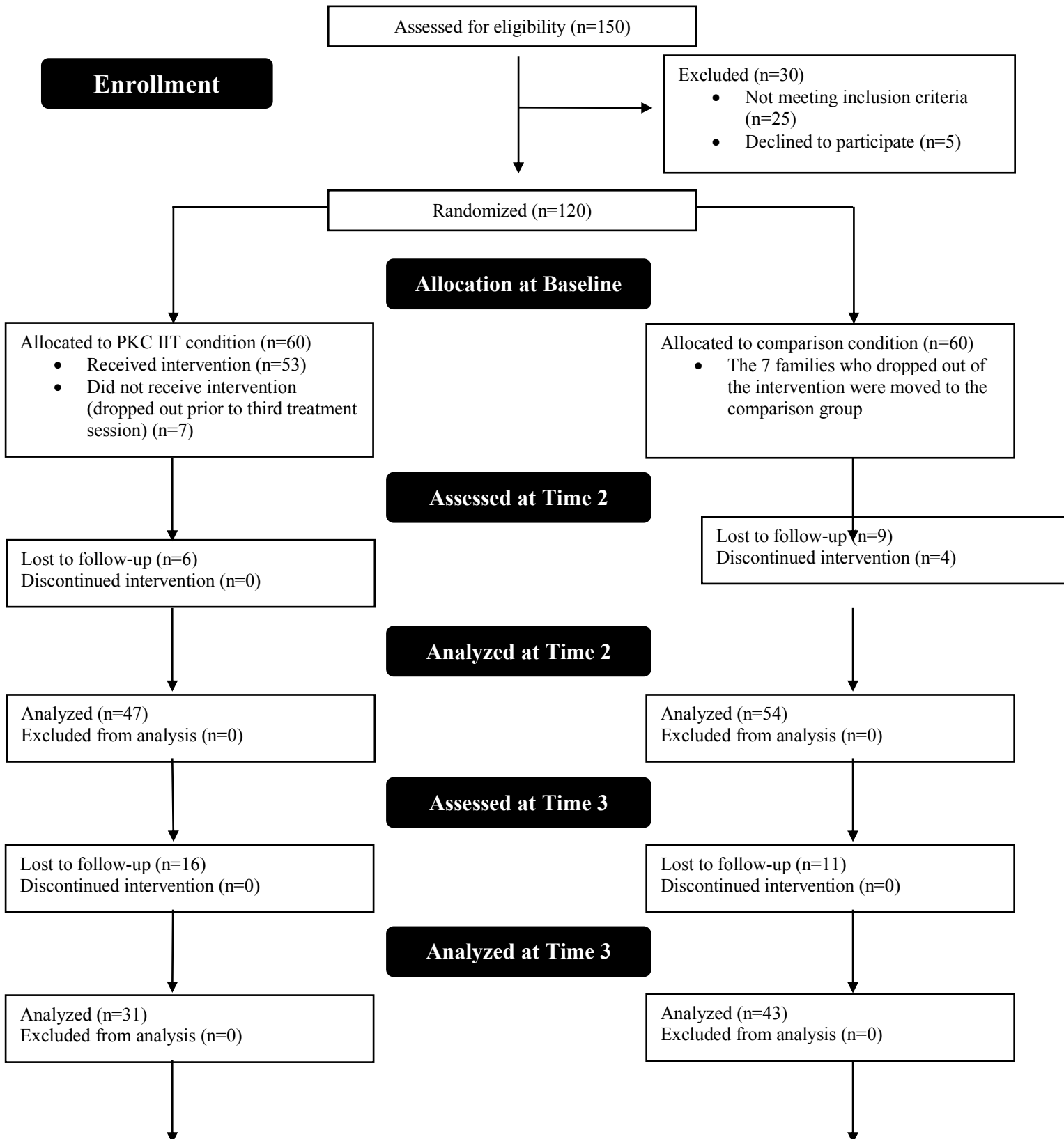


Figure 4.2. CONSORT Diagram



**Assessed at Time 4**

Lost to follow-up (n=18)  
Deceased (n=0)  
Discontinued intervention (n=0)

Lost to follow-up (n=29)  
Deceased (n=4)  
Discontinued intervention (n=1)

**Analyzed at Time 4**

Analyzed (n=35)  
Excluded from analysis (n=0)

Analyzed (n=33)  
Excluded from analysis (n=0)



## Chapter V

### Conclusion

The connections between witnessing domestic violence in childhood and the development of PTSD have been well-established (Alisic et al., 2014; Azoulay et al., 2005; Graham-Bermann, Castor, Miller, & Howell, 2012; Trickey et al., 2012). Subsequent work identified specific risk factors in several domains, including type of trauma experienced, children's cognitions around traumatic events, and parenting behaviors (Alisic et al., 2014; Trickey et al., 2012). More recent research has begun to examine PTSD in young children exposed to violence; however, more work is needed to understand how PTSD develops and changes as children age. Related research has investigated ties between mothers' and children's symptoms of PTSD following exposure to IPV, but this work has been limited to studies of infants and very young children (Levendosky et al., 2013; Scheeringa et al., 2015). Continued research in this area can help to understand how relational presentations of trauma affect children's long-term mental health outcomes.

In addition to basic science research on mental health in children exposed to violence, researchers have also developed and tested ways to address the effects of exposure to IPV. Several programs have been shown to significantly improve children's mental health and functioning in various domains. However, little is known about the long-term durability of these effects. It is unclear to what extent a brief intervention continues to have significant effects on children's well-being, given the high risk for continued exposure to IPV throughout childhood. Thus, research is needed to evaluate the long-term effects of treatment in order to magnify the short-term effects of current treatment programs. Through a series of three studies, this

dissertation research addresses some of the current questions related to the presentation, trajectory, and treatment of PTSD in children exposed to early-life IPV.

### **The Dissertation Studies**

The aim of the first dissertation study was to examine the presentation of posttraumatic stress symptoms (PTSS) in women and children exposed to intimate partner violence. Following the identification of PTSS profiles, functional impairment associated with profile membership was examined. The results of this study indicated that children exposed to IPV fit into three categories of PTSS. These three profiles were as follows: one with low symptoms, one with moderate symptomatology, and one with high symptomatology. The only factor that differentiated all three profiles was age. Older children were more likely to be in either the high or low symptom profile, while younger children were more likely to be in the moderate symptom profile. Additionally, while exposure to other types of trauma beyond IPV differentiated the low symptom profile from the intermediate symptom profile, violence exposure did not differentiate the high symptom profile from any other profile. Severity of symptoms had significant impact on functioning of the younger children in this sample. The highest rates of functional impairment were problems at home as well as in school. Additionally, caregivers and children reported high rates of distress related to children's symptoms of PTSD.

The first dissertation study also examined profiles of women's PTSS. Here, only two profiles were identified, one with high symptoms, the other with moderate symptoms. These profiles were differentiated such that women with greater levels of depressive symptoms and who had experienced more severe IPV were more likely to be in the high PTSS profile. Women in the high symptom profile had significantly higher rates of functional impairment than women in the moderate symptom profile across many domains, including functioning at work and school, as

well as impairment in personal relationships. The highest levels of impairment were in general life-satisfaction as well as overall levels of functioning.

The primary aim of the second dissertation study was to examine profiles of relational PTSD in mothers and children who had recently experienced IPV. The results of this analysis demonstrated that a two-profile model was the best-fitting one. The profiles were as follows: mother high symptoms, child moderate symptoms; and mother low symptoms, child low symptoms. Greater use of positive parenting, high mother depression, and more severe IPV exposure predicted membership in the higher symptom profile. Child age did not predict membership in either profile. However, there were age differences in correlations between mother's and children's PTSD symptoms. There were significant moderate, positive correlations between mothers' and children's symptoms for children younger than age 7. Yet, for children aged 8-12, the only significant correlations were for hyperarousal symptoms and total PTSD symptoms. Further, relationships between diagnoses of PTSD in mothers and children were only found for the younger children. These results suggest that a relational framework fits with children's presentations of PTSD, at least in the context of IPV, and that this framework continues to hold, though becomes weaker, as children age.

The aims of the third dissertation study were to examine longitudinal trajectories of children's PTSD symptoms, as well as examine the effect of treatment on this trajectory. The results of a hierarchical linear model suggest that, in general, children symptoms of PTSD become worse over time, following exposure to IPV in the preschool years. Although, there were also significant inter-individual differences in the trajectories of PTSD, suggesting that not every child follows this pathway. The models used in this study also examined the differential effects of violence exposure in the preschool years vs. violence exposure in the eight years following.

These results suggest that while initial IPV exposure is detrimental to children's immediate PTSD, it is the continued exposure to IPV over time that contributes to the worsening of children's PTSD symptoms. The results of this study also suggest that mothers' and children's PTSD symptoms are significantly related; however, this relationship appears to weaken over time. Finally, there was not an effect of treatment participation on the trajectory of PTSD symptoms or on the rate of PTSD diagnosis at follow-up.

### **Limitations**

There are several limitations to these dissertation studies that should be discussed. One of the biggest limitations to these studies is with the measurement of the outcome of interest, children's PTSD symptoms. Although all measures used were validated measures of PTSD, different measures had to be used in the same sample as preschool- and school-age children were included together in one analysis. This was necessary, given that research has demonstrated that the presentations of PTSD symptoms differ, especially in very young children. But, differences in scale and scoring of these measures made it difficult to draw comparisons between the measures, even with the use of standardization. A better approach to studying PTSD across children of different ages would be to use measures that are structurally similar, even if there are slight differences in question wording. This would allow for comparisons to be made without having to change the structure of the measure scoring.

The measurement of PTSD in these dissertation studies is also limited, as measures tailored to the DSM-IV-TR were used. In the most recent iteration, the DSM-5, the diagnosis of PTSD was changed to a four-factor model. Though there is some overlap between the DSM-5 symptom category of 'Negative alterations in cognition and mood' and the DSM-IV-TR 'Avoidance' categories, not all the symptoms included in the DSM-5 diagnosis were included in the previous

manual. Future work on PTSD should use measures that are validated according to DSM-5 criteria to allow for specific examination of risk factors for the new category of symptoms as well as to have greater clinical utility.

These dissertation studies were also limited by their small sample sizes. Given that small sample sizes can increase the possibility of Type II error, it is possible that some of the null results around age and parenting in these studies were found because these samples were smaller than those of previous studies. The samples were also limited in their composition, as there was not an equal distribution of children across all the ages included. This prevented a more nuanced examination of age-related effects and led to comparisons being made between unbalanced age-groups. This affected both studies one and two, as there were around 70 children between the ages of 8-12 in those samples, while there were about 160 children between the ages of 4-6.

There were also sampling issues related to the geographic regions from which participants were recruited. The participants in this study were recruited from Southeast Michigan, Ohio, Southwest Ontario (Canada), and Southern Texas. There are likely differences between these areas and other areas in terms of resources and support, as well as in political climate that may have had unmeasured effects on women's and children's mental health. Thus, it may be that these findings do not hold for children outside these areas. Finally, all participants for these studies were recruited from an intervention RCT, making this a help-seeking sample. It is possible that there are differences between the families in this sample and non-help-seeking families in terms of resources or mental health that could have had a significant impact on the results of these studies. Therefore, results of this research might only reflect the mental health of help-seeking populations in these areas exposed to IPV.

### **Clinical Implications**

The results of this dissertation research can inform clinical practice with IPV-exposed children. One of the primary findings from these studies is that there is a significant relationship between mothers' and children's symptoms of PTSD, and this relationship continues, albeit to a lesser extent, as children get older. This has two significant implications for clinical work. First, it is especially important for mothers to receive mental health care in the context of IPV, as this will not only improve their mental health, but also improve their functioning in other areas that will allow them to better support their children. Second, this research suggests that it is important to include caregivers in their child's treatment, even as children go beyond the preschool/early elementary period, as caregivers continue to matter to children's mental health functioning beyond this period.

The results of this research also suggest that treatment that is not directly focused on children's PTSD symptoms will not have short- or long-term effects on their mental health. However, receiving treatment that addresses concerns unique to IPV is also vital for this population. Therefore, IPV-exposed children would likely benefit from treatment that addresses both the unique issues related to IPV as well as issues specific to PTSD. Further, there is still no evidence to suggest that brief interventions for chronic violence exposure have a long-term impact on children's functioning. Therefore, it is possible that children need repeated courses of evidenced-based treatments (e.g., TF-CBT) in order to effectively address their PTSD symptoms, especially if children are exposed to further violence.

### **Future Directions**

Several new directions of inquiry are generated by this dissertation research. These future lines of research include specific issues to childhood exposure to IPV, but also involve larger

questions around the development of PTSD as a result of exposure to various types of trauma, as well as questions regarding familial mental health and culture and mental health.

**Trajectories of PTSD.** Young children in this sample were most likely to have intermediate symptoms of PTSD, while older children were more likely to have high or low PTSD symptoms. Clearly, there are connections between age and PTSD following exposure to early-life IPV. The results of this dissertation study suggest that there are potentially two age-related pathways of PTSD – those whose PTSD symptoms worsen over time, and those whose PTSD becomes better over time. Given the limitations of this sample, it is possible that there are other trajectories of PTSD where PTSD symptoms remain consistently high or low over time. Future work on trajectories of PTSD can address this question by using larger samples of children exposed to violence.

Future work should also identify factors that predict the different trajectories of PTSD. This research suggests that one factor that predicts worsening PTSD is that children with early life IPV exposure continue to experience violence as they age. Further, the timing and severity of the traumatic events seem to play a significant role in changes in PTSD symptoms. Specifically, this research demonstrates that, while initial exposures to trauma have significant effects of initial levels of PTSD symptoms, continued exposure to trauma over time significantly contributes to the worsening of children's PTSD symptoms over time. However, data regarding children's trauma exposures was collected beginning from baseline, which was when children were between the ages of 4-6. Thus, it is likely that some of the children in our sample had previous trauma exposure that was not measured but still contributed to this longitudinal trajectory of PTSD symptoms. Future work should examine whether there are different trajectories of PTSD symptoms depending on developmental period at which trauma is first experienced (e.g.,

infancy, toddler years, preschool, elementary school, etc.). This work may also contribute to identification of critical periods of risk for PTSD, when children are at especially high risk for developing PTSD following exposure to trauma.

There are other potential factors that contribute to the various trajectories of PTSD symptoms, such as developmental changes in biological, cognitive, and social processes that possibly affect their risk for PTSD (Miller, Howell, & Graham-Bermann, 2014; Pervanidou, 2008; Rosshandler, Hall, & Canetti, 2016). This might include biological sensitivities to traumatic events (e.g., individual differences in HPA axis functioning), individual differences in the perceived threat of a traumatic experience or the degree to which a child believes violence is a normative experience, and individual differences in abilities to form friendships and build social support networks outside the home; all of which could affect the development and persistence of PTSD symptoms. In order to better understand the differential impact of individual- and family-level risk factors for PTSD, future research should include multiple siblings in each family, rather than focus on one target child within a family. This approach will then allow for the use of nested models that can simultaneously analyze within- and between-family effects. The advantage of this approach over more traditional approaches of assessing one target child in each family is that it allows for the examination of individual risk factors for PTSD while better controlling for factors such as the type of trauma experienced, parental mental health, and parenting. Further, this approach collects much more family-level data than other methodological approaches to studying PTSD, which then support examinations of family-level influences on the development of PTSD. Additionally, research involving multiple siblings per family can give more insight into the characteristics of children who do not develop PTSD following chronic trauma exposure. This can provide important information about protective



factors following exposure to trauma that can be used to develop interventions that can prevent the occurrence of PTSD, or at least reduce the severity at which it presents.

**Pre-trauma Functioning and Risk for PTSD.** Current research focuses largely on post-trauma factors that contribute to the development of PTSD. However, research also suggests that pre-trauma factors also play an important role in the development of childhood PTSD (Trickey et al., 2012). This may include factors such as pre-trauma cognitions, family relationships, and social support (Trickey et al., 2012). It is not clear the degree to which initial status of these factors vs. post-trauma shifts in these factors leads to the development of PTSD. Prospective, longitudinal research aimed at following children before they have been exposed to trauma could be useful in answering these questions. The identification of pre-trauma protective factors for the development of PTSD can be used to inform preventive interventions that can be given to buffer children against the negative effects of adversity, before they have experienced that event. Therefore, future research should involve prospective research with young children, before they have experienced traumatic events. Though there are many children who experience trauma beginning in the pre-natal period or during infancy (Finkelhor, Turner, Shattuck, & Hamby, 2013), this research can still potentially provide information that can support children exposed to violence their entire lives by elucidating factors that buffer against the negative effects of trauma on mental health.

**Comorbidity of PTSD and Other Disorders.** Research on PTSD has unveiled significant rates of comorbidities of PTSD and other conditions such as depression and substance use disorders (Piertrzak, Goldstein, Southwick, & Grant, 2011). Current research on mental health development and treatment does not typically take the presence of a comorbid condition into account. This is important, as risk factors for comorbid conditions may be different than risk

factors for individual disorders. Further, having multiple mental health problems potentially leads to more complex symptom presentations that are more difficult to treat. The fact that current treatment options have been developed with samples of individuals with only one disorder may be one reason why treatments are not always effective. Given the dearth of information in this area, particularly as it relates to child mental health, this is an area where much more research is needed.

Given the limited research on the prevalence of comorbid PTSD and other mental health conditions in individuals exposed to trauma, especially in children, future work aimed at estimating the prevalence of comorbidities is needed. Future work should also examine similarities or differences in risk factors for single versus comorbid mental health disorders as well as age-related and cultural differences in the presentation of comorbidities with PTSD. Finally, future research should investigate treatment outcomes for individuals with only PTSD as compared to PTSD with comorbid conditions. Given that most evidence-based treatments are designed and tested with individuals with only one disorder, it is possible that the presence of multiple disorders changes the effectiveness of treatment. Taken together, research on PTSD and comorbid conditions will provide new insights into the presentation as well as treatment of PTSD that can be used to improve current efforts to aid children and families who experience traumatic stress.

**Relational Mental Health.** The results of this research suggest, in general, a relational perspective is helpful for understanding childhood PTSD, at least in the context of IPV. This context is unique, as it is a trauma that affects both the mother and the child. Future research on children's PTSD symptoms should examine the degree to which this relationship holds when caregivers and children are both traumatized, but have not been exposed to the same type of

violence, as it is possible that this relationship is related to the shared trauma experience, rather than a direct relationship between the two. Further, the results of this research suggest that other forms of mental health problems in caregivers (e.g., depression) do not significantly affect PTSD symptoms. Future work examining whether there are relational presentations of other disorders might also give insight if there is a more general parent-child mental health relationship, or if this relational presentation is specific to traumatized caregiver-child dyads.

Factors beyond the specific experience of trauma may also affect the development of relational PTSD. Negative parenting practices as a result of maternal PTSD have been posed as one mechanism that might lead to increases in children's PTSD symptoms. However, there was no evidence of any relationship between negative parenting practices and child PTSD in our sample. This is potentially because self-reporting of parenting, especially negative parenting, tends to be less reliable. Future research should use observational methods of measuring parenting in addition to self-reporting of parenting practices in order to collect a fuller picture of parenting practices. Interestingly, positive parenting behaviors were related to increases in children's PTSD symptoms. This measure captures parental attention and involvement with their children. It is possible that mothers with PTSD attempt to become more engaged with their children following exposure to trauma due to concerns for the safety of their children, or because caregivers are trying to compensate for the negative changes in their own behavior related to their traumatic experiences. Through this process, caregivers may unintentionally model their own responses to a traumatic event (i.e., their PTSD symptoms) that then leads to increases in children's PTSD symptoms. Longitudinal research aimed at untangling the relationship between parental PTSD, parenting, and child PTSD may give more insight into whether parenting is a process of interest in the development or maintenance of PTSD.

Future research should also aim to understand how presentations of relational PTSD unfold over time. Hierarchical Linear Models and Structural Equation Models can give further insight into the questions of how relational PTSD unfolds over time, which will give important information regarding the development of childhood PTSD. Additionally, research aimed at understanding how relational PTSD affects treatment outcomes is also crucial. Current research demonstrates that evidenced-based treatments are only effective for about 60% of individuals. It is possible that individual child treatment of PTSD is less effective when there is a relational presentation of PTSD in the caregiver-child dyad, as the effects of caregiver's untreated PTSD symptoms may cancel out any potential gains made through treatment. If this is the case, there may be increased treatment success for childhood trauma symptoms if caregiver's symptoms are also treated.

**Culture and Mental Health in Trauma-Exposed Children.** Research has demonstrated that minority populations may be at higher risk for violence exposure than non-minorities (Breiding et al., 2015; Clark, Galano, Stein, Grogan-Kaylor, & Graham-Bermann, 2016). Additionally, research has identified ethno-racial differences in risk factors for mental health problems as well as differences in PTSD symptoms (Galano et al., 2016; Galano et al., 2017; Koolick, Galano, Clark, Grogan-Kaylor, & Graham-Bermann, 2016). However, there is a good deal of heterogeneity in minority populations in terms of level of acculturation (Sam & Berry, 2010), immigrant status, and country of origin. Research on differences between immigrant and US born minorities has demonstrated an “immigrant paradox,” such that mental health is worse in US born minorities than in immigrant minorities (Abe-Kim et al., 2011). This may be an important framework for understanding disparities in mental health outcomes in the context of violence exposure. However, there is little empirical data in this area. Therefore, future research

on differential mental health outcomes in minorities who experience traumatic stress should account for immigration status, generational status (i.e., 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>) as well as level of acculturation. This research can provide greater knowledge of the role of culture in the development of mental health problems, as well as aid in the development of better treatment adaptations for minority individuals to address disparities in mental health outcomes.

**Treatment of Childhood PTSD.** Finally, future work needs to focus on the long-term effects of our current intervention strategies for children with PTSD, particularly in the context of exposure to chronic trauma. This work should be done with treatment models that demonstrate initial improvements for children's PTSD symptoms, such as Trauma-Focused Cognitive-Behavioral Therapy (Cohen & Mannarino, 2008). It is possible that children see less change in their PTSD symptoms over time following these treatments. Furthermore, treatment research should begin to more closely examine the elements of treatment that have the most significant impact on the long-term stability of treatment gains or even long-term improvement in symptoms. It is likely that general treatment factors such as treatment dosage (i.e., number of session attended), treatment intensity (i.e., the length and frequency of treatment sessions), and treatment timing (i.e., timing of treatment in relation to children's age as well as their initial exposure to trauma), all have significant effects on treatment outcomes, both in the short- and long-term. Future research should also examine the specific elements of treatment in relation to treatment effects. This might include examining how the sequencing or duration of the teaching of certain skills, such as cognitive or behavioral coping strategies, contribute to differences in treatment outcomes. This more nuanced approach to treatment research can help tailor current evidenced-based treatment models to better address the needs of children exposed to chronic trauma and potentially increase the long-term gains associated with treatment participation.

## **Conclusion**

This dissertation research has made significant contributions to the understanding of childhood PTSD. Specifically, this research has provided new knowledge around age-related differences in the presentation of PTSD symptoms, has contributed evidenced that supports that a relational theory of PTSD is typical in children exposed to IPV, and that relational PTSD is also present in older children. Finally, this dissertation has provided important information regarding factors that lead to changes in PTSD symptoms in children exposed to early violence. This research also informs clinical practice by highlighting the persistent nature of childhood PTSD following chronic trauma exposure, as well as by emphasizing the significant role that caregiver PTSD symptoms have in the development of children's PTSD symptoms. Millions of women and children experience IPV every year (Breiding et al., 2015; Hamby et al., 2008). This comes with significant consequences on the mental health and well-being of those exposed (Graham-Bermann, Gruber, Howell, & Girz, 2009; Kitzmann, Gaylord, Holt, & Kenny, 2003; Trevillion, Oram, Feder, & Howard, 2012). The goal of these dissertation studies is to propel several new lines of inquiry around the development and treatment of childhood PTSD that can ultimately be used to improve the lives of children and families who have experienced the negative effects associated with IPV and other forms of chronic traumatic stress.

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## Appendix A: Demographics Questionnaire

Child's Birthdate: \_\_\_\_\_

Date of Interview \_\_\_\_\_

Child's Age: \_\_\_\_\_

Person Completing Form (Circle One):    Mother    Other: \_\_\_\_\_

1) We want to get a sense of who are the people in your child's life. Please tell us who are the people (family and friends, including parents, siblings, partners/boyfriends, other relatives, etc.) whom your child sees on a regular basis. For each, tell if you think your child would identify that person as a significant person in their life. Please indicate if that person is a member of the household (living in your home).

<u>Relationship</u> <u>To Child</u> (e.g., mom, dad, family , friend)	<u>Sex</u>	<u>Age</u>	<u>Lives in home</u> <u>with child?</u>	
1. <u>    Mom    </u>	___	___	Yes	No
2. <u>          </u>	___	___	Yes	No
3. <u>          </u>	___	___	Yes	No
4. <u>          </u>	___	___	Yes	No
5. <u>          </u>	___	___	Yes	No
6. <u>          </u>	___	___	Yes	No
7. <u>          </u>	___	___	Yes	No
8. <u>          </u>	___	___	Yes	No
9. <u>          </u>	___	___	Yes	No
10. <u>          </u>	___	___	Yes	No

2) Your relationship status (check one):

- |  |                                    |
|--|------------------------------------|
| <input type="checkbox"/> Single                      | <input type="checkbox"/> Widowed   |
| <input type="checkbox"/> Living with partner         | <input type="checkbox"/> Divorced  |
| <input type="checkbox"/> Married                     | <input type="checkbox"/> Remarried |
| <input type="checkbox"/> Separated (How long? _____) |                                    |

3) What category best describes your and your child's race or ethnicity?

- |                          |                          |                                 |
|--------------------------|--------------------------|---------------------------------|
| you                      | child                    |                                 |
| <input type="checkbox"/> | <input type="checkbox"/> | Native American                 |
| <input type="checkbox"/> | <input type="checkbox"/> | Asian                           |
| <input type="checkbox"/> | <input type="checkbox"/> | Black, African-American         |
| <input type="checkbox"/> | <input type="checkbox"/> | Latino, Hispanic-American       |
| <input type="checkbox"/> | <input type="checkbox"/> | Biracial (mixed): specify _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | White                           |
| <input type="checkbox"/> | <input type="checkbox"/> | Other _____                     |

4) What is the highest level of education that you have completed?

- |  |   |
|--|---|
| <input type="checkbox"/> Grade school or less              | <input type="checkbox"/> College degree       |
| <input type="checkbox"/> Some high school                  | <input type="checkbox"/> Some graduate school |
| <input type="checkbox"/> High school degree/GED            | <input type="checkbox"/> Graduate degree      |
| <input type="checkbox"/> Some college or vocational school |   |

5) Are you working at this time?

Yes      Hours per week? \_\_\_\_\_  
 No

6) What job do you do (i.e., what is your job title)? \_\_\_\_\_

7) What was your total household income last month?      \$ \_\_\_\_\_

8) How many times have you moved in the last 6 years?      \_\_\_\_\_

9) Have you ever gone to a “safe house” or battered women’s shelter in the last 6 years?

Yes                       No

## Appendix B: Alabama Parenting Questionnaire

The following are a number of statements about your family. Please tell me how often these events TYPICALLY occur in your home. The possible answers are NEVER (1), ALMOST NEVER (2), SOMETIMES (3), OFTEN (4), ALWAYS (5).

	Never	Almost Never	Sometimes	Often	Always
1. You have a friendly talk with your child.	1	2	3	4	5
2. You let your child know when he/she is doing a good job with something.	1	2	3	4	5
3. You threaten to punish your child and then do not actually him/her.	1	2	3	4	5
4. You volunteer to help with special activities that your child is involved in (such as sports, boy/girl scouts, church groups).	1	2	3	4	5
5. You reward or give something extra to your child for obeying you or behaving well.	1	2	3	4	5
6. Your child fails to leave a note or to let you know where he/she is going.	1	2	3	4	5
7. You play games or do other fun things with your child.	1	2	3	4	5
8. Your child talks you out of being punished after he/she has done something wrong.	1	2	3	4	5
9. You ask your child about his/her day in school.	1	2	3	4	5
10. Your child stays out in the evening past the time he/she is supposed to be home.	1	2	3	4	5
11. You help your child with	1	2	3	4	5

his/her homework.

	1	2	3	4	5
	Never	Almost Never	Sometimes	Often	Always
12. You feel that getting your child to obey you is more trouble than it's worth.	1	2	3	4	5
13. You compliment your child when he/does something well.	1	2	3	4	5
14. You ask your child what his/her plans are for the coming day.	1	2	3	4	5
15. You drive your child to a special activity.	1	2	3	4	5
16. You praise your child if he/she behaves well.	1	2	3	4	5
17. Your child is out with friends you don't know.	1	2	3	4	5
18. You hug or kiss your child when he/she has done something well.	1	2	3	4	5
19. Your child goes out without a set time to be home.	1	2	3	4	5
20. You talk to your child about his/her friends.	1	2	3	4	5
21. Your child is out after dark without an adult with him/her.	1	2	3	4	5
22. You let your child out of a punishment early (like lift restrictions earlier than you originally said).	1	2	3	4	5
23. Your child helps plan family activities.	1	2	3	4	5
24. You get so busy that you forget where your child is and what he/she is doing.	1	2	3	4	5
25. Your child is not punished when he/she has done something wrong.	1	2	3	4	5
26. You attend PTA meetings,	1	2	3	4	5

parent/teacher conferences, or other meetings at your child's school.

	Never	Almost Never	Sometimes	Often	Always
27. You tell your child that you like it when he/she helps out around the house.	1	2	3	4	5
28. You don't check that your child comes home at the time he/she was supposed to.	1	2	3	4	5
29. You don't tell your child where you are going.	1	2	3	4	5
30. Your child comes home from school more than an hour past the time you expect him/her.	1	2	3	4	5
31. The punishment you give your child depends on your mood.	1	2	3	4	5
32. Your child is at home without adult supervision.	1	2	3	4	5
33. You spank your child with your hand when he/she has done something wrong.	1	2	3	4	5
34. You ignore your child when he/she is misbehaving.	1	2	3	4	5
35. You slap your child when he/she has done something wrong.	1	2	3	4	5
36. You take away privileges or money from your child as a punishment.	1	2	3	4	5
37. You send your child to his/her room as a punishment.	1	2	3	4	5
38. You hit your child with a belt, switch, or other object when he/she has done something wrong.	1	2	3	4	5
39. You yell or scream at your child when he/she has done something wrong.	1	2	3	4	5

40. You calmly explain to your child why his/her behavior was wrong when he/she misbehaves.	1	2	3	4	5
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	Never	Almost Never	Sometimes	Often	Always
41. You use time out (make him/her sit or stand in a corner) as a punishment.	1	2	3	4	5

42. You give your child extra chores as a punishment.	1	2	3	4	5
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## Appendix C: Conflict Tactics Scale – Revised

No matter how well a couple gets along, there are times when they disagree, get annoyed with one another, want different things from each other, or just have spats or fights because they are in a bad mood, are tired, or are upset for some other reason. Couples also have many different ways of trying to settle their differences. This is a list of things that might happen when you have differences. Please tell us how many times these things have happened in the past year.

	1x	2x	3-5x	6-10x	11-20x	>20x	Never
1. <i>My partner</i> showed care for me even though we disagreed.	1	2	3	4	5	6	7
2. <i>My partner</i> explained his or her side of a disagreement to me.	1	2	3	4	5	6	7
3. <i>My partner</i> insulted or swore at me.	1	2	3	4	5	6	7
4. <i>My partner</i> threw something at me that could hurt.	1	2	3	4	5	6	7
5. <i>My partner</i> twisted my arm or hair.	1	2	3	4	5	6	7
6. <i>You</i> had a sprain, bruise or small cut because of a fight with your partner.	1	2	3	4	5	6	7
7. <i>My partner</i> showed respect for my feelings about an issue.	1	2	3	4	5	6	7
8. <i>My partner</i> made me have sex without a condom.	1	2	3	4	5	6	7
9. <i>My partner</i> pushed or shoved me.	1	2	3	4	5	6	7
10. <i>My partner</i> used force to make me have oral or anal sex.	1	2	3	4	5	6	7
11. <i>My partner</i> used a knife or gun on me.	1	2	3	4	5	6	7
12. <i>You</i> passed out from being hit on the head by your partner in a fight.	1	2	3	4	5	6	7
13. <i>My partner</i> called me fat or ugly.	1	2	3	4	5	6	7
14. <i>My partner</i> punched or hit me with something that could hurt.	1	2	3	4	5	6	7
15. <i>My partner</i> destroyed something that belonged to me.	1	2	3	4	5	6	7
16. <i>You</i> went to a doctor because of a fight with your partner.	1	2	3	4	5	6	7
17. <i>My partner</i> choked me.	1	2	3	4	5	6	7
18. <i>My partner</i> shouted or yelled at me.	1	2	3	4	5	6	7
19. <i>My partner</i> slammed me against a wall.	1	2	3	4	5	6	7
20. <i>My partner</i> was sure we could work it out.	1	2	3	4	5	6	7
21. <i>You</i> needed to see a doctor because of a fight with your partner, but didn't.	1	2	3	4	5	6	7
22. <i>My partner</i> beat me up.	1	2	3	4	5	6	7
23. <i>My partner</i> grabbed me.	1	2	3	4	5	6	7
24. <i>My partner</i> used force to make me have sex.	1	2	3	4	5	6	7
25. <i>My partner</i> stomped out of the room or house or yard during a disagreement.	1	2	3	4	5	6	7
26. <i>My partner</i> insisted that I have sex when I didn't want to (but did not use physical force).	1	2	3	4	5	6	7
27. <i>My partner</i> slapped me.	1	2	3	4	5	6	7
28. <i>You</i> had a broken bone from a fight with your partner.	1	2	3	4	5	6	7
29. <i>My partner</i> used threats to make me have oral or anal sex.	1	2	3	4	5	6	7
30. <i>My partner</i> suggested a compromise to a disagreement.	1	2	3	4	5	6	7
31. <i>My partner</i> burned or scalded me on purpose.	1	2	3	4	5	6	7
32. <i>My partner</i> insisted that I have oral or anal sex (but did not use physical force)	1	2	3	4	5	6	7
33. <i>My partner</i> accused me of being a lousy lover.	1	2	3	4	5	6	7
34. <i>My partner</i> did something to spite me.	1	2	3	4	5	6	7
35. <i>My partner</i> threatened to hit or throw something at me.	1	2	3	4	5	6	7
36. <i>You</i> still felt physical pain the next day because of a fight you had with your partner.	1	2	3	4	5	6	7

37. *My partner* kicked me. 1 2 3 4 5 6 7  
38. *My partner* used threats to make me have sex. 1 2 3 4 5 6 7  
39. *My partner* agreed to try a solution I suggested. 1 2 3 4 5 6 7

40. Are you currently living with a violent partner? Yes No

a. If yes, how long have you lived with this partner? \_\_\_\_\_

b. If no, when was the last time that you lived with a violent partner, if ever? \_\_\_\_\_

41. How many violent partners have you had in your life? \_\_\_\_\_

42. How many total years of your life have you been involved in a violent relationship with an intimate partner?



## Appendix D: Posttraumatic Diagnostic Scale

The next questions have to do with dealing with stressful situations that may have happened to you or you may have seen. It is OK to pass on any question you do not want to answer. Many people have lived through or witnessed a very stressful and traumatic event at some point in their lives. Indicate whether or not you or your child have experienced or witnessed each traumatic event. We may ask you when was the last time that the event occurred.

1. Serious accident, fire, or explosion (for example, an industrial, farm, car, plane, or boating accident)  
Me \_\_\_ Child \_\_\_ Both \_\_\_ No One \_\_\_
2. Natural disaster (for example, tornado, hurricane, flood, or major earthquake)  
Me \_\_\_ Child \_\_\_ Both \_\_\_ No One \_\_\_
3. Non-sexual assault by a family member or someone you know (for example, being mugged, physically attacked, shot, stabbed, or held at gunpoint)  
Me \_\_\_ Child \_\_\_ Both \_\_\_ No One \_\_\_ When \_\_\_\_\_
4. Non-sexual assault by a stranger (for example, being mugged, physically attacked, shot, stabbed, or held at gunpoint)  
Me \_\_\_ Child \_\_\_ Both \_\_\_ No One \_\_\_
5. Sexual assault by a family member or someone you know (for example, rape or attempted rape)  
Me \_\_\_ Child \_\_\_ Both \_\_\_ No One \_\_\_ When \_\_\_\_\_
6. Sexual assault by a stranger (for example, rape or attempted rape)  
Me \_\_\_ Child \_\_\_ Both \_\_\_ No One \_\_\_
7. Military combat or a war zone  
Me \_\_\_ Child \_\_\_ Both \_\_\_ No One \_\_\_
8. Sexual contact when you were younger than 18 with someone who was 5 or more years older than you (for example, contact with genitals, breasts)  
Me \_\_\_ Child \_\_\_ Both \_\_\_ No One \_\_\_
8. Imprisonment (for example, prison inmate, prisoner of war, hostage)  
Me \_\_\_ Child \_\_\_ Both \_\_\_ No One \_\_\_
10. Torture  
Me \_\_\_ Child \_\_\_ Both \_\_\_ No One \_\_\_
11. Life-threatening illness  
Me \_\_\_ Child \_\_\_ Both \_\_\_ No One \_\_\_
12. Other traumatic event (read examples below)  
Me \_\_\_ Child \_\_\_ Both \_\_\_ No One \_\_\_

e.g., Attacked by an animal, Man-made disasters (crashes, fires, war), Witnessed another person being beaten, raped, threatened with serious harm, shot at, seriously wounded, or killed, Accidental burning, Near drowning, Hospitalization, emergency room visit, or invasive medical procedures, Kidnapped or Other event.

13. Explain if 'yes' to item 12: \_\_\_\_\_

Though you may have experienced a variety of traumatic events, we would like for you to respond to the following questions only in relation to physical and/or sexual assault that you've experienced from a partner.

14. Though you may have had many traumatic events occur with your partner, can you tell me which one you remember as the worst, or the one that has maybe stuck with you the most?

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15. How long ago did that traumatic event happen? Or, when was the last time it happened? (mark ONE)

1. Less than 1 month
2. 1 to 3 months
3. 3 to 6 months
4. 6 months to 3 years
5. 3 to 5 years
6. More than 5 years

16. During this traumatic event, were you physically injured?      \_\_\_\_\_ Yes      \_\_\_\_\_ No
17. During this traumatic event, was someone else physically injured?      \_\_\_\_\_ Yes      \_\_\_\_\_ No
18. Did you think that your life was in danger?      \_\_\_\_\_ Yes      \_\_\_\_\_ No
19. Did you think that someone else's life was in danger?      \_\_\_\_\_ Yes      \_\_\_\_\_ No
20. Did you feel helpless?      \_\_\_\_\_ Yes      \_\_\_\_\_ No
21. Did you feel terrified?      \_\_\_\_\_ Yes      \_\_\_\_\_ No

Below is a list of problems that people sometimes have after experiencing a traumatic event. Please choose an answer that best describes how often that problem has bothered you IN THE LAST MONTH:

- 0: not at all or only one time                      2: 2-4 times a week/half the time  
1: once a week or less/once in awhile              3: 5 or more times a week/almost always

22. Having upsetting thoughts or images about the traumatic event that came into your head when you didn't want them to: \_\_\_\_\_
23. Having bad dreams or nightmares about the traumatic event: \_\_\_\_\_
24. Reliving the traumatic event, acting or feeling as if it was happening again: \_\_\_\_\_
25. Feeling emotionally upset when you were reminded of the traumatic event (for example, feeling scared, angry, sad, guilty, etc.): \_\_\_\_\_
26. Experiencing physical reactions when you were reminded of the traumatic event (for example, breaking out in a sweat, heart beating fast): \_\_\_\_\_
27. Trying not to think about, talk about, or have feelings about the traumatic event: \_\_\_\_\_
28. Trying to avoid activities, people, or places that remind you of the traumatic event: \_\_\_\_\_
29. Not being able to remember an important part of the traumatic event: \_\_\_\_\_
30. Having much less interest or participating much less often in important activities: \_\_\_\_\_
31. Feeling distant or cut off from people around you: \_\_\_\_\_
32. Feeling emotionally numb (for example, being unable to cry or unable to have loving feelings): \_\_\_\_\_
33. Feeling as if your future plans or hopes will not come true (for example, you will not have a career, marriage,



## Appendix E: Center for Epidemiological Studies Depression Scale

These questions are about how you, the parent, have been feeling within **the past week**. Please tell me how much of the time you have felt a certain way: 1= None of the time, 2= Some of the time, 3 = Occasionally or a moderate amount of the time, and 4 = Most or all of the time.

1= None of the time  
of the time

2= Some of the time 3 = Occasionally

4 =Most or all

- \_\_\_\_\_ 1. I was bothered by things that don't usually bother me.
- \_\_\_\_\_ 2. I did not feel like eating.
- \_\_\_\_\_ 3. I felt that I could not shake off the blues, even with help from family or friends.
- \_\_\_\_\_ 4. I felt that I was just as good as other people.
- \_\_\_\_\_ 5. I had trouble keeping my mind on what I was doing.
- \_\_\_\_\_ 6. I felt depressed.
- \_\_\_\_\_ 7. I felt that everything I did was an effort.
- \_\_\_\_\_ 8. I felt hopeful about the future.
- \_\_\_\_\_ 9. I thought my life had been a failure.
- \_\_\_\_\_ 10. I felt fearful.
- \_\_\_\_\_ 11. My sleep had been restless.
- \_\_\_\_\_ 12. I was happy.
- \_\_\_\_\_ 13. I talked less than usual.
- \_\_\_\_\_ 14. People were unfriendly.
- \_\_\_\_\_ 15. I felt lonely.
- \_\_\_\_\_ 16. I enjoyed life.
- \_\_\_\_\_ 17. I had crying spells.
- \_\_\_\_\_ 18. I felt sad.
- \_\_\_\_\_ 19. I felt that people disliked me.
- \_\_\_\_\_ 20. I could not "get going".

21. Is the last week typical of how you have been feeling? Y or N

## Appendix F: UCLA PTSD Reaction Index

1. Have you ever been exposed to a traumatic event (interviewer can give examples of these – “something that was very upsetting or scary, like an accident, violence, a fire, a people getting hurt or you getting hurt”)? YES or NO (Circle one)

2. What was that event?

3. Could you please answer these questions about how you felt after the event? (Interviewer can explain and then use the attached rating sheet)

	None	Little	Some	Much	Most
1. (D4) I watch out for danger or things that I am afraid of	0	1	2	3	4
2. (B4) When something reminds me of what happened, I get very upset, afraid, or sad	0	1	2	3	4
3. (B1) I have upsetting thoughts, pictures, or sounds of what happened come into my mind when I do not want them.	0	1	2	3	4
4. (D2) I feel grouchy, angry, or mad	0	1	2	3	4
5. (B2) I have dreams about what happened or other bad dreams	0	1	2	3	4
6. (B3) I feel like I am back at the time when the bad thing happened, living through it again	0	1	2	3	4
7. (C4) I feel like staying by myself and not being with my friends	0	1	2	3	4
8. (C5) I feel alone inside and not close to other people	0	1	2	3	4
9. (C1) I try not to talk about, think about, or have feelings about what happened	0	1	2	3	4
10. (C6) I have trouble feeling happiness or love	0	1	2	3	4
11. (C6) I have trouble feeling sadness or anger	0	1	2	3	4
12. (D5) I feel jumpy or startle easily, like when I hear a loud noise or when something surprises me	0	1	2	3	4
13. (D1) I have trouble going to sleep or I wake up often during the night	0	1	2	3	4

14. (AF) I think that some part of what happened is my fault	0	1	2	3	4
15. (C3) I have trouble remembering important parts of what happened	0	1	2	3	4
16. (D3) I have trouble concentrating or paying attention	0	1	2	3	4
17. (C2) I try to stay away from people, places, or things that make me remember what happened	0	1	2	3	4
18. (B5) When something reminds me of what happened, I have strong feelings in my body, like my heart beats fast, my head aches, or my stomach aches.	0	1	2	3	4
19. (C7) I think that I will not live a long life	0	1	2	3	4
20. (AF) I am afraid that the bad thing will happen again	0	1	2	3	4

Did these issues last for more than one month? (Choose one)    Yes        No

Do the any of these issues interfere with how you are/were doing:

	Yes	No
at home	___	___
in school	___	___
with friends	___	___

## Appendix G: Traumatic Stress Symptom Child Scale

Only answer the following questions if the child is older than 7.

1. Has your child experienced a potentially traumatic event? Yes or no (circle one)

2. What was that event? \_\_\_\_\_

3. Was your child very upset by this event? Yes or no (circle one)

4. Did your child have any of the following problems or symptoms as a result of this event? Did the problem or symptoms persist for longer than a month following the traumatic event?

Was the symptom present?    For longer than a month?

Symptom:

1. Intrusive memories of violent events	_____	_____		
2. Specific dreams or nightmares of violent events	_____	_____		
3. Repeat acting out, perseverative play of event(s)	_____	_____		
4. Reaction to mention of or remembering viol. event(s)	_____	_____		
5. Avoiding thoughts or feelings related to viol. event(s)	_____	_____		
6. Avoiding activities or play related to violence event(s)	_____	_____		
7. Forgetting or repressing parts of violence event(s)	_____	_____	_____	_____
8. Reduced interest in activities since violence event(s)	_____	_____		
9. Isolation or detachment from others since viol. event(s)	_____	_____		
10. Flat affect or reduced feelings since violence event(s)	_____	_____		
11. Not having long range, future plans since viol. event(s)	_____	_____		
12. Sleep disturbance, trouble either falling asleep or staying asleep since violence event(s)	_____	_____	_____	_____
13. Irritable, more angry since violence event(s)	_____	_____		
14. Trouble concentrating, paying attention, either at home or in school since violence event(s)	_____	_____		
15. More alert, vigilant, or on guard since viol. event(s)	_____	_____		
16. Startles or jumps more easily since viol. event(s)	_____	_____	_____	_____
17. Physical reaction, e.g., shaking or sweating, when reminded of violence event(s)	_____	_____	_____	_____

## Appendix H: Posttraumatic Stress Disorder Semi-Structured Interview and Observational Record for Infants and Young Children

For interviewer (DO NOT READ TO INTERVIEWEE):

When an item is endorsed, examples must be provided. Follow up questions and clarifications are used until the interviewer is persuaded that the symptom is present. To be endorsed, an event must have led to serious injury or the potential for serious injury to the child or to a loved one and the child witnessed it.

START HERE:

We've talked about your reactions to some traumatic events in your life, and now I would like to ask you some questions about how your child may or may not have reacted to witnessing or hearing violence in the home.

	<b>DSM-IV</b>		
	<b>Criteria</b>		
	None	A little	A lot
1. Establish that the child witnessed a traumatic event	0		2
2. Did your child respond at the time of the event by looking very afraid, acting helpless, or very disturbed in some way?	0	1	2
Now I'd like to ask you how your child reacted after the event.			
For example...			
3...did your child reenact some part of the traumatic event? (Write a note to distinguish between play reenactments and the compulsive, repetitive, and monotonous posttraumatic play.)	0	1	2
4...has your child made repeated statements or questions about the event? Did he appear distressed by these?	0	1	2



5...has your child had nightmares about it, or an increased frequency of nightmares since an event?	0	1	2
6...did your child appear to have flashbacks, that is for a minute or more acting like the event was happening all over again?	0	1	2
7...or, appear to space out in a daze?	0	1	2
8...has your child looked really upset because he/she saw or heard something that reminded him/her of what happened?	0	1	2
9...has your child gotten biologically worked up because of a reminder of the event, such as having a fast heart rate, looking shaky, sweaty, or breathing really fast?	0	1	2
Since the event...			
10...has your child tried to avoid hearing conversations about it?	0	1	2
11...or tried to avoid places, persons, or things connected to the event?	0	1	2
12...has your child been unable to remember only a certain part of the trauma?	0	1	2
13...does your child play less than before?	0	1	2

14...has your child been more withdrawn and less sociable than before?	0	1	2
15...has your child shown less emotion than usual?	0	1	2
16...has your child seemed to you like there was nothing to look forward to in the future?	0	1	2
Since the trauma...			
17...has your child had a hard time going to bed or falling asleep?	0	1	2
18...has your child shown increased irritability, fussiness, extreme mood swings, or temper tantrums?	0	1	2
	None	A little	A lot
19...has your child had more difficulty concentrating on things than he use to?	0	1	2
20...has your child seemed watchful or on guard even when there was no reason to be?	0	1	2
21...were there times when your child got scared or very upset when he heard a sudden noise, or if someone came up from behind him when he	0	1	2

didn't know they were coming?

ASSOCIATED SYMPTOMS:

22...did your child lose some skills that he had learned before?  
Did he lose toileting skills, become mute, or lose some speech skills? 0 1 2

23...has your child become afraid of things he didn't used to be afraid of?  
Such as fear of toileting alone, of the dark, of strangers, or other things? 0 1 2

None A little A lot

24...has your child been upset when he had to be separated from his  
mother a lot more than he use to be? 0 1 2

25...has your child been a lot more aggressive than he used to be? 0 1 2

26. Has your child been bothered by most of these things for as long as a month? 0 2

Now I'm going to ask you a series of about 5 questions to see if some of the behaviors that we talked about just now get in the way of doing things in everyday life.

27. Because of these behaviors (may need to list them again), do they get in the way of being able to function within your family? I mean, do they prevent your child from being able to do things with the family, like go out to eat, go to the store, go on outings (may use other examples)? Or do they get in the way with activities in the house, like examples may be that they prevent him from doing chores, get dressed, clean up, take baths, or do fun activities with the family?

A lot of the time 3  
Some of the time 2  
Hardly ever or none 1

28. Because of these behaviors (may need to list them again), does that prevent your child from being able to do things with other children like playing, keeping friends, spend the night, go on outings (may use other examples)?

A lot of the time 3

Some of the time	2
Hardly ever or none	1

29. Because of these behaviors (may need to list them again), do you know if your child's teacher gets distressed? Has the teacher ever said anything to you about your child being a problem in the class?

A lot of the time	3
Some of the time	2
Hardly ever or none	1
Not applicable	-8

30. Do you (the child's caregiver) get distressed because of these behaviors (may need to list them again)? Do they affect the quality of the times you spend with your child?

A lot of the time	3
Some of the time	2
Hardly ever or none	1

31. And last, do you think that these behaviors (may need to list them again) cause your child to feel upset? I mean, do they cause your child to feel emotionally bad inside, like feel bad about himself, or cry, or just seem real upset because of these things?

A lot of the time	3
Some of the time	2
Hardly ever or none	1

## **Appendix I: Mother Consent**

### **Consent to Participate in a Research Study**

Title of the Project: The Early Child Intervention Follow-up Program

Principal Investigator: Sandra Graham-Bermann, Ph.D., The University of Michigan

Co-investigator: Andrew Grogan-Kaylor, Ph.D., The University of Michigan

### **Invitation to Participate in a Research Study**

We invite you to be part of a research study about how domestic violence affects children over time. Many children are exposed to violence every year and children can have problems as a result. We know that children do better when their mothers get support after violence. But we don't know very much about how early support affects children when they get older. Psychologists and social workers at the University of Michigan are trying to learn more about the best way to help children exposed to domestic violence. In this study we want to do three things. First, we want to find out whether mothers and their young children who take part in group support programs do better over time than mothers and children who do not take part in group support programs. Second, we want to find out which mothers and which children are helped the most. Third, we want to learn more about the ways mothers and children cope with the violence and stress in their lives over time.

### **Description of Your Involvement**

If you agree to be part of the research study, we will ask you and your child who participated in the Early Child Intervention study to complete an interview now. Then we ask permission to contact you for an additional interview in the future. Today we will ask you about both the strengths and problems in your family. The questions ask about the stressful experiences you may have had, including the violence in your life, how you and your child are coping now, and your thoughts on parenting and your child's behavior. We will also ask you to complete some tasks to look at how mothers plan and pay attention to words and feelings. We want to learn how mothers and children are doing over time following violence.

The interviews take place at the University of Michigan or at another convenient and safe place. Money for transportation costs and childcare for younger or older siblings are provided, if needed. The interviewers and childcare providers are graduate students in psychology and social work, and junior and senior college students at the University of Michigan.

### **Benefits of Participation**

Although you may not directly benefit from being in this study, others may benefit because this information will be used to improve services for mothers and children who experience domestic violence.

#### Risks and Discomforts of Participation

There is no more than minimal risk or discomfort from your participation in this research. There is a small possibility that your child's personal information may become known to individuals who are not part of the study. There is also a chance that if information that you or your child shares makes us believe that the child is being physically harmed, we may report that information to the appropriate agencies. However, if you feel uncomfortable or distressed during any part of the interview we will be glad to end it at any time. The interviewers are trained in interviewing women exposed to domestic violence and will be sensitive to your needs. A list of affordable services will be provided to you should you want to contact either a shelter or mental health agency in the future.

#### Compensation for Participation

For your participation in this research project, you will receive \$75 in cash for each interview.. You can skip any question or task. You will still be paid \$75 even if you choose to end the interview early.

#### Confidentiality

To help us protect your privacy, we have applied for a Certificate of Confidentiality from the National Institutes of Health. The researchers can use this Certificate to legally refuse to disclose information that may identify you in any federal, state, or local civil, criminal, administrative, legislative, or other proceedings, for example, if there is a court subpoena. The researchers will use the Certificate to resist any demands for information that would identify you, except as noted below. A Certificate of Confidentiality does not prevent you or a member of your family from voluntarily releasing information about yourself or your involvement in this research. For example, if an insurer, medical care provider, or other person obtains your written consent to receive research information, then the researchers will not use the Certificate to withhold that information. The Certificate of Confidentiality will not be used to prevent disclosure to state or local authorities of child abuse and neglect. That means, your responses will be kept confidential with this exception - if you or your child tells us something that makes us believe that your child is being physically harmed, we may report that information to the appropriate agencies. It is possible that other people may need to see the information you give us as part of the study, such as organizations responsible for making sure the research is done safely and properly like the University of Michigan or government offices.

We plan to publish the results of this study, but we will not include any information that would identify you. When information is reported, it will be used to describe groups and

not individual people. All the personal information you give us (in other words, your name or any identifying information) will be kept strictly confidential and will not be shared with anyone outside of the Early Child Intervention Follow-up research staff, with the exceptions noted above. Numbers will be substituted for names in our datafiles for identification purposes. Papers that link names with identification numbers will be kept in a locked file in the project director's locked office, with keys given only to members of the program staff.

#### Storage and Future Use of Data

We will store your data to use for future research studies. Only the program staff will have access to your interview papers and only data without names or other information that could identify you or your child will be shared with other researchers, including those outside of the University of Michigan. Your personal identifiers will be retained if you give us permission to be contacted for an additional interview (outside of this second interview) at some time in the future.

#### Voluntary Nature of the Study

Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and end the interview at any time. You do not have to answer a question you do not want to answer. Just tell us and we will go to the next question. If you decide to drop out of the study before this study is over it will not result in negative consequences to you or your child. All documents with your identifying information on them will be shredded should you decide to drop out of the study.

#### Contact Information for the Study Team

If you have questions about this research, including questions about scheduling or your compensation for participating, you may contact Sandy Graham-Bermann, Project Director, at the toll-free number – 734-647-0789.

#### Contact Information for Questions about Your Rights as a Research Participant

If you have questions about your rights as a research participant, or wish to obtain information, ask questions or discuss any concerns about this study with someone other than the researcher(s), please contact the:

University of Michigan Health Sciences and Behavioral Sciences Institutional Review Board  
2800 Plymouth Road  
Building 520, Room 1169  
Ann Arbor, MI 48109-2800  
Phone: (734) 936-0933 or toll free, (866) 936-0933  
Email: [irbhsbs@umich.edu](mailto:irbhsbs@umich.edu)

#### Consent

You can either sign this consent form or just give your initials below. Either way, you are agreeing to be in the study. We will give you a copy of this consent form for your records. We will keep one copy with the study records. Be sure that I/we have answered

any questions you have about the study and that you understand what you are being asked to do. You may contact the researcher if you think of a question later.

*I agree to participate in the study.*

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature or Initials

\_\_\_\_\_  
Date

*I agree that my data may be used in future research.* YES \_\_\_\_\_ NO \_\_\_\_\_

\_\_\_\_\_  
Signature or Initials



## **Appendix J: Mother Consent for Child**

### **Consent for Child to Participate in a Research Study**

Title of the Project: The Early Child Intervention Follow-up Program

Principal Investigator: Sandra Graham-Bermann, Ph.D., The University of Michigan

Co-investigator: Andrew Grogan-Kaylor, Ph.D., The University of Michigan

### **Invitation for Your Child to Participate in a Research Study**

We also invite your child to be part of a research study about how domestic violence affects children. Many children are exposed to violence every year and children can have problems as a result. We know that children do better when they and their mothers get support after violence. But we don't know very much about how early support affects children over time. Psychologists and social workers at the University of Michigan are trying to learn more about the best way to help children exposed to domestic violence. In this study we want to do three things. First, we want to find out whether mothers and their young children who take part in group support programs do better over time than mothers and children who do not take part in group support programs. Second, we want to find out which mothers and which children are helped the most. Third, we want to learn more about the ways mothers cope with the violence and stress in their lives.

### **Description of Your Child's Involvement**

If you agree for your child to be part of the research study, we will ask your child who was part of the Preschool Kids' Club study to complete an interview. The interview will take place at the University of Michigan or at another convenient and safe location. When we talk with your child we will ask about both the strengths and problems in your family. For example, we will ask things like what your child thinks about how your family resolves conflicts, what is good about families, and the meaning of everyday words. In addition a 5 minute task is used to find out how your child pays attention to shapes and words. This interview will take about 45 minutes. We also ask permission to contact you for your child to participate in an additional interview in the future.

Even though you give your permission, your child can skip any question or task and end early if he or she chooses. The interview will end if the child shows any signs of

discomfort. Your child will still be given a gift, even if he or she ends the interview early. You are welcome to view the interview questions that we will ask your child now, or at any time in the future, but we will not share your child's answers to the questions.

#### Benefits of Participation

Although your child may not directly benefit from being in this study, other people may benefit because what we learn will be used to improve how we help mothers and children who experience domestic violence.

#### Risks and Discomforts of Participation

There is no more than minimal risk of your child being uncomfortable if he or she participates in this research. If your child feels uncomfortable or distressed during any part of the interview we will be glad to end the interview at any time. The interviewers are trained in interviewing children exposed to domestic violence and will be sensitive to your child's needs. There is a small possibility that your child's personal information may become known to individuals who are not part of the study. There is also a chance that if information that you or your child shares makes us believe that the child is being physically harmed, we may report that information to the appropriate agencies.

#### Compensation for Participation

Your child will receive a small gift worth about \$10 as a thank you after each interview, even if your child doesn't want to do the interview or ends early.

#### Confidentiality

To help us protect your child's privacy, we have applied for a Certificate of Confidentiality from the National Institutes of Health. The researchers can use this Certificate to legally refuse to disclose information that may identify your child in any federal, state, or local civil, criminal, administrative, legislative, or other proceedings, for example, if there is a court subpoena. The researchers will use the Certificate to resist any demands for information that would identify your child, except as noted below. A Certificate of Confidentiality does not prevent you or a member of your family from voluntarily releasing information about your child or your child's involvement in this research. For example, if an insurer, medical care provider, or other person obtains your written consent to receive research information, then the researchers will not use the Certificate to withhold that information. The Certificate of Confidentiality will not be used to prevent disclosure to state or local authorities of child abuse and neglect. That means, your child's responses will be kept confidential with this exception - if your child tells us something that makes us believe that your child is being physically harmed, we

may report that information to the appropriate agencies. It is possible that other people may need to see the information your child gives us as part of the study, such as organizations responsible for making sure the research is done safely and properly like the University of Michigan or government offices.

We plan to publish the results of this study. We will not include any information that would identify your child. When information is reported, it will be used to describe groups and not individual people. Your child's privacy will be protected and your child's research records will be confidential. All the personal information your child gives us will be kept strictly confidential and will not be shared with anyone outside of the Early Child Intervention Follow-up Program staff. Names will not be used so that confidentiality will be protected. Numbers will be substituted for names for identification purposes. Papers that link names with identification numbers will be kept in a locked file in the project director's locked office. It is possible that other people may need to see the information your child gives us as part of the study, such as organizations responsible for making sure the research is done safely and properly like the University of Michigan or government offices.

#### Storage and Future Use of Data

We will store your child's answers without personal information to use for future research studies. Only the program staff will have access to your child's interview papers. We may share the answers with other researchers outside the University of Michigan, however we will not share any names or other information that could identify you or your child.

#### Voluntary Nature of the Study

Participating in this study is completely voluntary. Even if you and your child decide to participate now, you or your child may change your mind and end the interview at any time. Your child does not have to answer a question they do not want to answer. If you or your child decides to end before this study is completed it will not result in negative consequences to you or your child. All documents with your information on them will be shredded if you decide to withdraw from the study.

#### Contact Information for the Study Team

If you have questions about this research, including questions about scheduling or your compensation for participating, you may contact Sandy Graham-Bermann, Project Director, at the toll-free number – 734-647-0789.

#### Contact Information for Questions about Your Rights as a Research Participant

If you have questions about your rights as a research participant, or wish to obtain information, ask questions or discuss any concerns about this study with someone other than the researcher(s), please contact the:

University of Michigan Health Sciences and Behavioral Sciences Institutional Review Board  
2800 Plymouth Road  
Building 520, Room 1169  
Ann Arbor, MI 48109-2800  
Phone: (734) 936-0933 or toll free, (866) 936-0933  
Email: [irbhsbs@umich.edu](mailto:irbhsbs@umich.edu)

### Consent

You can either sign this document or just give your initials below. By doing that you are agreeing for your child to be in the study. We will give you a copy of this form for your records. We will keep one copy with the study records. Be sure that we have answered any questions you have about the study and that you understand what you are being asked to do. You may contact the researcher if you think of a question later.

*I agree to allow my child to participate in the study.*

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature or Initials

\_\_\_\_\_  
Date

*I agree that my child's data may be used in future research.* YES \_\_\_\_\_  
NO \_\_\_\_\_

\_\_\_\_\_  
Signature or Initials

## Appendix K: Child Assent

### CHILD ASSENT TO BE INTERVIEWED FORM

Hello \_\_\_\_\_. My name is \_\_\_\_\_ (interviewer's first name)\_\_\_\_\_.

I am talking to kids about what they think and about what words they know. I also ask children to draw and read some words. Is it OK with you if I ask you some questions and show you some pictures? It is OK to say no if you don't want to answer questions right now. (IF Yes) You can skip any questions that you don't want to answer and stop any time you like. (IF No) It's OK if you don't want to answer questions right now. (Either way) I have a small gift for you to thank you for your time.

Child gives assent (agrees) to participate.

Child would rather not participate.

Child's Name: \_\_\_\_\_

Interviewer's Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Appendix L: Recruitment Letter

Dear \_\_\_\_\_,

Approximately 6 years ago, you participated in a study at the University of Michigan. You are being contacted now to see whether you would be interested in participating in a follow-up to this survey at the University of Michigan based on your past participation. This survey would ask your opinions about parenting and families. If you decide to participate you will be paid \$75 for your time. If you are interested and want to know more, please call us at **734-436-1297**, or e-mail us at [pkc.followup@gmail.com](mailto:pkc.followup@gmail.com).

Thank you,

Survey Staff  
The University of Michigan