THE LONG TERM EFFECT OF EXPOSURE TO INTIMATE PARTNER VIOLENCE (IPV) ON CHILDREN'S TRAUMA, DEPRESSION AND ACADEMIC ACHIEVEMENT AMONG A NATIONALLY REPRESENTATIVE CHILD WELFARE SAMPLE

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A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

Social Work--Doctor of Philosophy

2015

ASBTRACT

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Children exposed to intimate partner violence (IPV) experience a range of developmental consequences including psychological, behavioral, social and academic difficulties. Children in the Child Welfare System (CWS) are exposed to IPV at substantially higher rates than the general population, and are therefore at higher risk of experiencing these negative consequences. However, despite the fact that research on the effects of IPV exposure has become increasingly sophisticated over the past 20 years, to date little is known about the effects of IPV exposure on children in the CWS independent of the effects of child abuse and/or neglect. This dissertation extends existing literature by examining the long-term effect of IPV exposure on trauma, depression and academic achievement utilizing a nationally representative sample of school-aged children in the CWS who remain in their parents' custody.

Secondary data analysis was conducted using the second National Survey of Child and Adolescent Well-Being (NSCAW-II), a nationally representative, longitudinal survey of children referred to Child Protective Services (CPS) for alleged child abuse and/or neglect. Results from multilevel models found that IPV frequency and severity were significantly related to children's trauma and depression over time, with severe IPV exposure, but not minor IPV exposure, predicting greater trauma and depression symptoms. Multivariate regression revealed that child race/ethnicity did not moderate the

relationship between IPV exposure and trauma, although differential predictors of trauma by child race/ethnicity emerged. Specifically, caregiver depression was related to heightened trauma symptoms for white children in the CWS exposed to IPV but not African American and Hispanic children in the CWS, while household poverty and neighborhood quality predicted greater trauma among Hispanic and African American children in the CWS exposed to IPV but not white children. Structural equation modeling (SEM) found that the direct path of exposure to severe IPV at Wave 1 (baseline; mean age = 12 years) to reading scores at Wave 3 (3 years later; mean age = 15 years) was significant after controlling for child abuse and/or neglect and demographic covariates. Greater frequency of exposure to severe IPV was related to poorer reading scores over time. This relationship was mediated by depression, such that greater frequency of exposure to severe IPV at Wave 1 predicted more depression symptoms at Wave 2 and more depression symptoms at Wave 2 predicted poorer reading scores at Wave 3. However, the direct path of severe IPV exposure at Wave 1 to math scores at Wave 3 was not significant. Similarly, exposure to minor IPV at Wave 1 was not related to reading and math scores at Wave 3.

Results from this dissertation suggest that CWS caseworkers should screen for the presence of IPV in the home. Screenings must assess the frequency and severity of the IPV exposure among children investigated for abuse/neglect and should be conducted on an ongoing basis at regular contact points. Interventions for children exposed to IPV in the CWS should be targeted toward decreasing psychological effects, including depression and trauma, to foster healthy development and enhance educational outcomes.

ACKNOWLEDGEMENTS

I am grateful for my committee members – Dr. Sheryl Kubiak, Dr. Amanda Woodward and Dr. Anne Bogat – for their mentorship and feedback throughout this process.

I am especially grateful for my chair – Dr. Sacha Klein. I simply cannot imagine a better advisor. You spent countless hours with me over many years conceptualizing ideas, reading drafts and listening to all my fears and anxiety. Your guidance has been instrumental in my doctoral work and I will forever be thankful for your endless support.

To my grandparents Carl and Myra Gornbein, my brother Michael Fries and my mother Faye Fries for being my first and biggest fans. You have shaped me in to the person I am today. Thank you for your never-ending stream of encouragement, unwavering belief in me, for always telling me I could do anything, and for keeping me sane and happy.

To my husband – Jason Costello – for being my biggest support throughout these past five years. This dissertation is as much a product of you as it is of me. You have encouraged me, doubted my fears and challenged me to go as far as possible every step of the way. None of this would have been possible without you.

And finally to my son – Cameron – for always reminding me what is truly important. You provide me with so much happiness and make me want to be the best person I can be.

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CHAPTER ONE

INTRODUCTION

Scope and Nature of Child Exposure to IPV

Research suggests that a substantial number of U.S. children are exposed to adult partner-on-partner violence within their homes, referred to as intimate partner violence (IPV). The Center for Disease Control and Prevention (CDC) (2013) defines IPV as behaviors of physical, sexual or psychological violence between current or former partners or spouses. Exposure to IPV can involve a range of experiences. For example, children may be directly involved in physical assaults that occur between caregivers, and attempt to intervene and stop abuse (Holt, Buckley, & Whelan, 2008). Alternatively, children may be indirectly exposed; they may overhear arguments or see results of the abuse such as bruises on the mother's body or broken furniture (Cunningham & Baker, 2004). They may also experience the aftermath of IPV, such as being told about the violence, see their mother's expressed fear of the partner, or be present when police respond to the incident (Edleson, 1999; Evans, Davies, & DiLillo, 2008). Several researchers have suggested that less direct forms of exposure make up a significant proportion of the experiences of children exposed to IPV (Fantuzzo & Mohr, 1999; Holden, 2003). Because of this, the term "exposure" will be used throughout this dissertation when referring to children's experience of living in a home where interpersonal violence between adults occurs.

It is estimated that approximately 3 to 10 million children are exposed to IPV each year in the U.S. (Straus, 1992; Straus, Gelles, & Steinmetz, 1980). In fact, approximately 38% of victims of partner assault have children under the age of 12 living

in the home (Catalano, Smith, Snyder, & Rand, 2009). Data from the 2008 National Survey of Children's Exposure to Violence (NatSCEV), the most comprehensive nationwide survey of the incidence and prevalence of children's IPV exposure to date, found that 16% of children ages 17 and younger were exposed to physical assault between caregivers in their lifetime, with one in 15 (7%) exposed in the past year (Finkelhor, Turner, Ormrod, & Hamby, 2009; Hamby, Finkelhor, Turner, & Ormrod, 2011). Moreover, research also suggests that children are often not spared from exposure to the most severe forms of IPV. For example, McDonald and colleagues (2006) found that 50% of children exposed to IPV saw a parent being choked, burned or threatened with a knife. High rates of IPV exposure among children are alarming considering that IPV exposure in childhood is associated with heightened psychological, emotional and social problems (Kitzmann, Gaylord, Holt, & Kenny, 2003).

Research suggests that exposure to IPV is experienced even more frequently by children in the Child Welfare System (CWS) than children in the general population. The prevalence of IPV in households involved with Child Protective Services (CPS) may be six-fold higher, with a third of caregivers investigated for child abuse and/or neglect experiencing IPV in the past year (Casanueva, Martin, Runyan, Barth, & Bradley, 2008; Hazen, Connelly, Kelleher, Barth, & Landsverk, 2006). Data from the first cohort of the National Survey of Child and Adolescent Well-Being (NSCAW I), a nationally representative study of children and families referred to CPS for alleged child abuse and/or neglect, found that a quarter of parents whose children remained at home following a maltreatment report had experienced IPV in the previous 12 months (Casanueva, Ringeisen, Smith, & Dolan, 2013). Other studies indicate that children in

the CWS are exposed to IPV at more than double the rate (30-45%) of children in the general population (Casanueva et al., 2013; Edleson, 1999; Hazen et al., 2006). However, exposure to IPV among children in the CWS is relatively understudied, especially with respect to its effect on children's trauma and depression.

High rates of co-occurrence between exposure to IPV and other types of child maltreatment, such as physical or sexual abuse of children, suggest that frequently IPV does not occur in isolation (Appel & Holden, 1999; Osofsky, 1999; Zolotor, Theodore, Coyne-Beasley, & Runyan, 2007). Ososfky (1999) concluded that children exposed to IPV are 15 times more likely to be physically abused or neglected than children without exposure. Studies examining the co-occurrence of IPV exposure and experiencing physical abuse report high rates of overlap, ranging from 30-60% (Appel & Holden, 1998; Beeman, Hagenmeister, & Edleson, 2001; Edleson, 1999; Osofsky, 2003), with rates upwards of 45% for children in the CWS (Casanueva, Martin, & Runyan, 2009). Estimated rates of co-occurrence vary depending on the types of samples used, how researchers define child physical abuse and/or IPV exposure, and by reporting source (e.g., parent, caseworker or child). Co-occurrence rates are generally lower among community samples than high-risk samples and when more conservative or restrictive definitions of child abuse are employed (Appel & Holden, 1998). For example, Appel and Holden's (1998) review found a six percent co-occurrence rate for community samples compared to a 20-80% co-occurrence rate among clinical samples of either battered women or physically abused children. Furthermore, when conservative estimates of physical abuse were used, median co-occurrence rates were 40%; but when criteria such as "slap" or "spank" were used in definitions of physical abuse, co-

occurrence rates ranged upwards of 70% (Appel & Holden, 1998). Although rates of overlap fluctuate, there is considerable evidence that IPV and child maltreatment often co-occur.

Effects of Child Exposure to IPV

Children exposed to IPV experience a range of developmental consequences, including psychological, behavioral, social, academic and cognitive difficulties (Evans et al., 2008; Holt et al., 2008). Two meta-analyses reveal that children exposed to IPV typically have worse developmental, academic and mental health outcomes than non-exposed children (Kitzmann et al., 2003; Wolfe, Crooks, Lee, McIntyre-Smith, & Jaffee, 2003). Kitzmann and colleagues' (2003) meta-analysis of 118 studies found that children 18 years and younger who were exposed to IPV had greater internalizing, externalizing, psychological, social and academic problems compared to non-exposed children. Smaller effect sizes were seen with Wolfe and colleagues' (2003) meta-analysis, likely due to their stringent inclusion criteria and use of studies that adequately controlled for cofounding variables. Their analysis of 41 studies of children between the ages of 4 and 14 found that exposure to IPV was related to emotional and behavioral problems, albeit at a small overall effect (Wolfe et al., 2003).

School-aged children exposed to IPV are particularly at risk for development of psychological problems, including anxiety (Kernic et al., 2003), Post Traumatic Stress Disorder (PTSD) (Chemtob & Carlson, 2004; Rossman & Ho, 2000) and depression (Kitzmann et al., 2003; Litrownik, Newton, Hunter, English, & Everson, 2003; McFarlane, Groff, O'Brien, & Watson, 2003). In fact, children exposed to IPV are more likely to be diagnosed with PTSD than children in the general population, with rates of

PTSD diagnoses ranging from 15-60% for IPV-exposed children (Chemtob & Carlson, 2004; Graham-Bermann, DeVoe, Mattis, Lynch, & Thomas, 2006; Graham-Bermann & Levendosky, 1998; Lehmann, 1997; McCloskey & Walker, 2000) compared to 4-7% for children and adolescents in the general population (Kilpatrick et al., 2003). Furthermore, Kennedy and colleagues (2010) found that children exposed to IPV over a two-year period displayed two times more depression symptoms than children not exposed to IPV.

Similar to what has been documented with community samples of IPV-exposed children, research utilizing samples of children in the CWS finds that IPV exposure during school years is associated with the development of both trauma and depressive symptoms (Campbell, Thomas, Cook, & Keenan, 2013; Hazen et al., 2006; Kolko et al., 2010). For example, Hazen and colleagues' (2006) study of female caregivers involved in the CWS for alleged abuse/neglect determined that severe IPV exposure was related to greater internalizing problems among children, including depression and anxiety symptoms. Similarly, data from the first cohort of NSCAW suggests that exposure to violence in the home is strongly associated with heightened PTSD symptoms for CWS-supervised children aged 8 to 11(Kolko et al., 2010). Moreover, Campbell and colleagues' (2013) study of school-aged children involved with the CWS found that 19% of the children exhibited internalizing behavior symptoms.

Although research clearly documents that exposure to IPV is related to psychological problems in childhood (Kitzmann et al., 2003; Wolfe et al., 2003), few studies have examined the relationship between children's exposure to IPV and their success at school. The few that do explore this relationship find that children exposed to IPV are academically vulnerable. They are more likely than their peers to act out in the

classroom and to be frequently absent from school (Kernic et al., 2003; Kiesel, Piescher, & Edleson, 2013; Lundy & Grossman, 2005). Their grades are often lower than non-exposed children and they are more likely to be retained or 'held back' in school (Kernic et al., 2003). Children exposed to IPV may also score lower than non-exposed children on standardized academic achievement tests, both in reading and math (Kiesel et al., 2013; Peek-Asa et al., 2007); however, findings are mixed on whether IPV affects academic achievement above and beyond experiencing child abuse alone. In particular, Kiesel and colleagues (2013) found that children exposed to IPV in the CWS scored lower on reading and math standardized tests when compared to non-exposed children (Kiesel et al., 2013). Similarly, Peek-Asa and colleagues (2007) found that children exposed to IPV scored significantly lower on reading and math standardized tests than non-IPV exposed children, although they did not control for child maltreatment. In contrast, Kernic and colleagues' (2003) study did not find a significant relationship between IPV exposure and cumulative GPA after controlling for child abuse and/or neglect.

Moderators of the Effect of IPV Exposure on Child Trauma, Mental Health and Academic Achievement

Although research establishes a clear link between IPV exposure and several deleterious developmental outcomes, not all children are negatively affected. Outcomes often vary based on the chronicity, severity and frequency of IPV to which children are exposed, as well as on the number of child, caregiver or community risk factors present. Several studies suggest that exposure to more frequent and severe IPV exacerbates children's psychological and behavioral problems (English et al., 2005; Jouriles et al.,

1998; Kitzmann et al., 2003). For example, greater internalizing and externalizing problems have been found in children exposed to physical rather than verbal IPV (Kitzmann et al., 2003), as well as those exposed to IPV involving knives and guns rather than IPV without weapons (Jouriles et al., 1998). English and colleagues' (2005) study found that violence that was more frequent and chronic in nature, and that occurred across multiple developmental periods, increased children's risk of depression and poor socialization skills in adolescence. In the only study using a CWS sample to consider these factors, Garrido, Culhane, Petrenko, and Taussig (2011) observed that a combination of IPV frequency, proximity and severity predicted psychosocial problems among youth in out-of-home (OOH) care over and above IPV occurrence alone.

Gender may also be an important factor when considering the effect of IPV exposure on children's psychological problems. Studies document gender differences in outcomes of IPV-exposed children, with boys exhibiting greater externalizing problems and girls developing more internalizing difficulties (Buckner, Bearslee, & Bassuk, 2004; Edleson, 1999; Evans et al., 2008; McIntosh, 2003). Several researchers hypothesize that boys experience a high level of threat from IPV exposure resulting in increased externalizing behavior, while girls feel a higher level of self-blame leading to an increase in internalizing problems (Kerig, 1998; McIntosh, 2003).

Additionally, there is preliminary evidence to suggest that child race/ethnicity may moderate outcomes for IPV-exposed children in the general population. For example, Graham-Bermann and colleagues (2006) found that white children were more likely to met criteria for PTSD following IPV exposure and had greater re-experiencing, avoidance/numbing and arousal symptoms than African American children. There is also

some evidence to suggest that white children develop more behavioral and social problems from IPV exposure than African American or Hispanic children (O'Keefe, 1994). However, other studies of children residing in battered women's shelters have not found a moderating effect of race/ethnicity on IPV exposure and child outcomes (Grych, Jouriles, Swank, McDonald, & Norwood, 2000), particularly with respect to internalizing behavior problems (O'Keefe, 1994).

Exposure to child maltreatment is also important to examine when considering the effect of IPV on children's depression, trauma and academic achievement. Children exposed to IPV are more likely to be physically or sexually abused and neglected than children without exposure (Ososfky, 1999; Zolotor, Theodore, Coyne-Beasley, & Runyan, 2007). Importantly, exposure to multiple traumatic events has been associated with higher levels of psychological difficulties than exposure to one traumatic event (Finkelhor et al., 2009). For example, a recent meta-analysis found that school-aged children exposed to both IPV and child maltreatment had two times more internalizing problems than children exposed to one form of the violence alone (Sternberg, Baradaran, Abbott, Lamb, & Guterman, 2006). Children exposed to co-occurring IPV and maltreatment are also more likely to score lower on reading and math scores than children not dually exposed (Kiesel et al., 2013). Therefore, research on the impact of IPV exposure should control for the potential cofounding effects of child maltreatment.

Age may also play a role in the development of poor outcomes among children exposed to IPV. Preliminary evidence suggests that the effects of IPV vary depending on the developmental stage of the child when exposure occurs (Holmes, 2013b; Katz, Hessler, & Annest, 2007), with older exposed children exhibiting greater aggression and

social problems than younger children (Katz et al., 2007). Holmes (2013b) hypothesizes a delayed effect of IPV exposure on children's behavior problems, where aggression manifests as age increases and children more frequently interact with peers. Despite this, research that has examined the moderating effect of age on the relationship between IPV and children's depression and trauma symptoms did not find age to be a moderating factor (Sternberg et al., 2006).

Several caregiver characteristics, including poor mental health and alcohol/drug use, may be important to consider when assessing the effect of IPV exposure on children's development. A secure attachment with a non-violent mother has been associated with decreased trauma and stress in children exposed to IPV (Mullender et al., 2002; Skopp, McDonald, Jouriles, & Rosenfield, 2007), although the mother-child relationship may be compromised in families experiencing IPV (Levendosky & Graham-Bermann, 2001). One factor that may affect parenting among female victims of IPV is mental health. Female victims of IPV are more likely than non-victims to experience depression (Bonomi et al., 2006; Casanueva, et al, 2008) and PTSD (Gleason, 1993; Golding, 1999), and are also at an increased risk of abusing drugs and alcohol (Holmes, 2013a; Salomon, Bassuk, & Huntington, 2002). Poor maternal mental health and alcohol/drug use has been linked to depression (Gerwitz, DeGarmo, & Medhanie, 2011), PTSD symptoms (Bogat, DeJonghe, Levendosky, Davidson, & von Eye, 2006) and severe adjustment problems among school-aged children exposed to IPV (Graham-Bermann, Gruber, Howell, & Girz, 2009). Additionally, caregiver education level and age may play a role in children's development, as it has been noted that female victims of IPV are more likely to be younger and less educated than non-victims (Sorenson,

Upchurch, & Shen, 1996), and these maternal characteristics may be associated with increased trauma among children (Skopp et al., 2007).

Further, household poverty level and neighborhood quality may also be important predictors to examine in the relationship between IPV exposure and children's psychological and academic outcomes. Caregivers with IPV in the home are at risk of experiencing high levels of stress (Holmes, 2013a). When compared to caregivers in the general population, caregivers who experience IPV often have lower household incomes and are more likely to live in impoverished, urban areas with greater community violence (Sorenson et al., 1996). Children exposed to both IPV and other types of violence, such as violence within their communities, often exhibit worse outcomes than children who experience one form of violence (Turner, Finkelhor, & Ormrod, 2010). These outcomes can include higher rates of psychological and academic problems.

Theoretical Frameworks Guiding Child Exposure to IPV Research

Research on childhood exposure to IPV is often guided by a number of theoretical frameworks and models, such as Social Learning Theory (Bandura, 1977), Attachment Theory (Bowlby, 1969), the Emotional Security Hypothesis (Davies & Cummings, 1994), the Ecological Perspective (Bronfenbrenner, 1977), and Trauma Theory (Briere, 1992; Perry, 2000). Some researchers argue that many commonly used theories are not well suited to explain the effects of exposure to IPV on child development (Kitzmann et al., 2003; Levendosky, Bogat, & von Eye, 2007). It is believed that these theories may not be comprehensive enough to explain the range of effects of IPV exposure on children (Levendosky Bogat, & von Eye, 2007), and are too vague to describe the mechanisms involved with the development of psychological problems (Herrenkohl, Sousa, Tajima,

Herrenkohl, & Moylan, 2008). Because of this, some researchers have called for the development of more sophisticated theories that account for the variation in children's outcomes and amount of IPV witnessed (Levendosky Bogat, & von Eye, 2007). The following section discusses theories that are commonly used in research on childhood exposure to IPV and highlights their strengths and limitations. It also presents the conceptual framework used in this dissertation.

Social Learning Theory

Social Learning Theory (Bandura, 1977) is often used to explain how children are exposed to aggression in the form of IPV between caregivers, learn the behavior and subsequently re-enact the behavior with peers. The main premise of this theory is that young children learn behaviors by observing the actions of others, including their parents, and often model learned behaviors (Bandura, 1977). This theory hypothesizes that children exposed to IPV learn that aggression is an appropriate conflict resolution tactic and that physical violence is acceptable to use in peer relationships. These learned behaviors may be adopted and modeled by the children in their own social and peer situations.

Many empirical studies have used Social Learning Theory to demonstrate that exposure to IPV in childhood is linked to heightened aggression (Christopolous et al., 1987; Milhalic & Elliott, 1997). For example, Christopolous and colleagues (1987) found that children residing in battered women's shelters exposed to IPV exhibited more externalizing behavior problems than children in the general population. They concluded that children learned aggressive behavior from exposure to violent episodes between parents, and subsequently modeled this behavior with peers. Similarly, Mihalic and

Elliott (1997) used Social Learning Theory to explain high levels of anti-social behavior and the intergenerational transmission of violence among adults exposed to IPV as children. They found that adults exposed to IPV during childhood exhibited high levels of aggression and anti-social behavior with peers throughout adolescence, and were more likely to engage in martial violence as adults. They hypothesized that exposure to IPV in homes during childhood reinforced aggressive ways of resolving conflict both in adolescence and adulthood (Mihalic & Elliott, 1997). While Social Learning Theory is a commonly utilized framework in many studies, critics argue that it is limited, as it may only be used to explain an increase in aggressive behavior exhibited by IPV-exposed children and does little to hypothesize the development of other problems, including depression or anxiety (Levendosky, Bogat, & vonEye, 2007) or academic failure.

Attachment Theory

Another commonly used framework, Attachment Theory (Bowlby, 1969), hypothesizes that the child-caregiver relationship is disrupted in homes with IPV, which ultimately impacts a child's psychological and emotional development. According to this theory, deep and enduring emotional bonds between caregivers and their children are formed in early infancy and provide a feeling of safety and security for the child. Bowlby (1969) posits that children develop "internal working models" based on the caregiver relationship in early infancy/childhood, which are defined as children's expectations of how the caregiver will respond in future situations. Children then apply these internal representations to other social and peer relationships. Attachment Theory asserts that caregivers who are more attuned to their child's needs establish a greater sense of trust, and thus foster the development of a healthy and "secure attachment"

relationship. If caregivers do not meet a child's needs, they are more likely to develop an "insecure attachment" and the child may show signs of maladjustment later in life (Bowlby, 1969).

Attachment Theory suggests that children who are raised in homes with IPV are less able to bond to their adult caregivers because IPV victims are more likely to exhibit inconsistent protection and comforting parenting behavior due to the abuse they are experiencing. Because of this compromised parent-child relationship, children are less able to develop a sense of basic trust and security needed for their healthy development, and may be more susceptible to psychological and emotional difficulties (Katz, Hessler, & Annest, 2007). Several studies show that the quality of the attachments between caregivers and children are diminished in homes with IPV (Levendosky & Graham-Bermann, 2001; Levendosky, Huth-Bocks, & Semel, 2002), and that this in turn disrupts children's social and emotional development (Sousa et al., 2011). While this theory is commonly used in studies that examine the moderating effect of the caregiver attachment on the relationship between IPV exposure and poor developmental outcomes, critics argue that its use is limited (Levendosky et al., 2007). Attachment Theory may only explain variation in children's outcomes as a result of the quality of the caregiver-child relationship, and does little to hypothesize other risk factors in the child's environment that may lead to psychological problems.

Emotional Security Hypothesis

The Emotional Security Hypothesis (Davies & Cummings, 1994) builds on Attachment Theory, suggesting that children from violent homes are distressed because exposure to IPV threatens their sense of emotional security and/or wellbeing. These

researchers hypothesize that children are negatively affected by IPV exposure through three primary responses to it: 1) children's emotional reactivity to the conflict, 2) children's regulation after exposure to conflict, and 3) children's internal representations of family relationships in the context of conflict. The first component, emotional reactivity, suggests that children may be negatively affected when they experience sadness, anger, fear or guilt in response to IPV between their parents. In relation to the second component, it is hypothesized that children attempt to regulate their exposure to parental conflict and that this regulation response determines whether or not they develop psychological or behavioral problems (Davies & Cummings, 1994). For example, children may become overinvolved in marital disputes, such as misbehaving to distract parents in order to minimize their exposure to it, which may lead to behavioral problems over time (Cummings, Schermerhorn, Davies, Goekey-Morey, & Cummings, 2006). Alternatively, children may attempt to avoid parental conflict by disconnecting emotionally to temporarily relieve distress, and thus increasing the likelihood of depression in the long term (Davies & Cummings, 1994). The last component hypothesizes that children will be impacted based on their interpretation of the marital conflict in terms of its threat to their wellbeing and family relationships. Some children may feel that they are the cause of the conflict between parents, others may worry that their parents will get divorced, while others may not interpret the violence as threatening to family relationships. Davies and Cummings (1994) suggest that these interpretations will determine a child's risk for maladjustment in the long term.

Researchers have tested these hypotheses and found that children's emotional security mediates the relationship between IPV exposure and poor developmental

outcomes, including internalizing and externalizing problems (Cummings et al., 2006; Katz et al., 2007). Specifically, Katz and colleagues (2007) found that children exposed to IPV were more emotionally dysregulated, less able to self-soothe and less aware of their emotions than non-IPV exposed children. They also found that children's ability to regulate their emotions following IPV exposure determined whether or not they experienced psychological problems later in childhood (Katz et al., 2007). Similarly, Cummings and colleagues (2006) found that emotional security was an explanatory mechanism for internalizing and externalizing behaviors among school-aged children exposed to IPV. Although this hypothesis has shed new light on how IPV exposure affects development by acknowledging the critical role of perceived emotional security in children's outcomes, it does not explore the impact of other risk factors, specifically in regards to children's environmental context.

Ecological Perspective

Another commonly used theoretical framework is Bronfenbrenner's Ecological Perspective (Bronfenbrenner, 1977). This theory suggests that multiple, nested systems interact to play a role in child development. The first system, the *microsystem*, refers to the child's immediate environment and is comprised of processes that directly influence the child such as family, school and peers. The second system, the *mesosystem,* encompasses bidirectional relationships between microsystems and includes factors such as how family experiences at home are related to experiences at school. This framework also accounts for more distal systems, such as the *exosystem* (e.g., caregivers work experiences that may impact a child), *macrosystem* (e.g., cultural context) and *chronosystem* (e.g., changes over time such as death or divorce), which do not interact

with the child directly but may influence development (Bronfenbrenner, 1977).

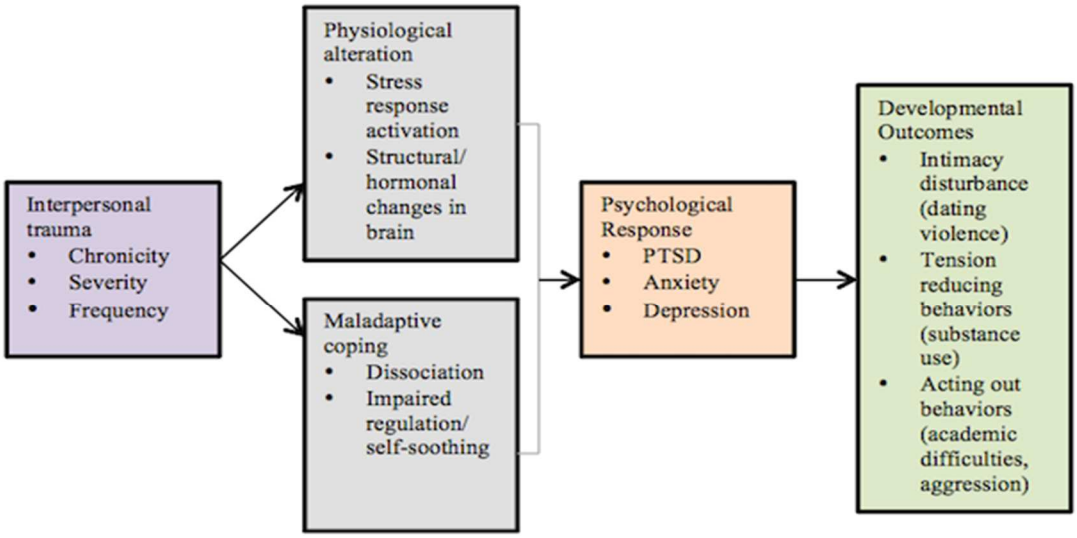
This perspective suggests that factors in multiple nested systems interact over time to contribute to negative outcomes among children exposed to IPV. For example, research has found that if the child's microsystem includes the presence of IPV in great frequency and severity, they are more likely to experience trauma (Chemtob & Carlson, 2004), depression (Kennedy, Bybee, Sullivan, & Greeson, 2011) and to struggle academically (Peek-Asa et al., 2007). Additionally, a number of risk factors at the microsystem level have been associated with negative outcomes among children exposed to IPV, including an insecure attachment with a caregiver (Mullender et al., 2002), poor neighborhood quality and increased household poverty (Turner et al., 2010). Alternatively, this model suggests that children who have protective factors in any system, such as those who have supportive role models, including relatives (Cox, Kotch, & Everson, 2003) or positive peer supports (Guille, 2004), may excel in school and suffer fewer negative developmental outcomes.

Conceptual Framework for Current Study: Trauma Theory

The current study is guided by Trauma Theory (Briere, 1992; Perry, 2000) and assesses the effects of exposure to IPV on trauma, depression and academic achievement among children in the CWS. *Figure 1* uses Trauma Theory to illustrate the pathway through which IPV exposure affects children's psychological and academic functioning. According to Trauma Theory (Briere, 1992; Perry, 2000), children who directly or indirectly experience interpersonal trauma, including exposure to IPV, develop coping mechanisms that help them detach from the emotional and physical pain of the trauma. For example, children exposed to IPV may cope by dissociating or restricting their

processing of the traumatic event (Child Welfare Information Gateway, 2015; Perry, 2000). As a result, they may have difficulty regulating their emotions, managing stress, and self-soothing, placing them at risk for developing PTSD and depression (Cook et al., 2005).

Figure 1. *Trauma Theory: Exposure to IPV and Psychological/Developmental Outcomes*



Trauma theorists also posit that exposure to IPV during childhood causes chronic activation of the body's stress response system, referred to as "toxic stress" (Perry, 2000; Shonkoff, 2012). Elevated levels of cortisol, which are characteristic of chronic activation of the stress response system, result in physiologic and structural changes in a child's brain (Shonkoff, 2012). Children exposed to severe and frequent trauma are often in a persistent 'fight' or 'flight' fear state and may lose their ability to differentiate between danger and safety (Perry, 2000; Shonkoff, 2012). This generalized fear response combined with structural and chemical changes in the areas of the brain involved in

emotion and stress regulation increase the likelihood that IPV-exposed children experience psychological problems (Perry, 2000), some of which may persist well into adulthood (Shonkoff, 2012). Importantly, Trauma Theory hypothesizes that exposure to traumatic events that are more chronic, severe and frequent in nature have greater effects on physiologic and psychological development (Perry, 2000; Shonkoff, 2012). In other words, children who are exposed to frequent and severe IPV are more likely to exhibit maladaptive coping strategies which, when coupled with structural brain changes, places them at a great risk for experiencing depression, PTSD and anxiety.

Trauma Theory also suggests that exposure to interpersonal trauma may lead to negative, long-term developmental outcomes, including tension-reducing and acting-out behaviors, such as substance use or academic difficulties (Briere, 1992). In the case of children exposed to IPV, Trauma Theory hypothesizes that poor developmental outcomes may stem in part from the effect that IPV exposure has on children's psychological functioning (Cook et al., 2005). In fact, childhood exposure to IPV has been linked to an increase in emotional and psychological problems including depression and anxiety (Evans et al., 2008; Kitzmann et al., 2003; Wolfe et al., 2003); researchers have also found an association between depression and substance use (King, Iacono, & McGu, 2003), especially among youth with trauma histories (Kilpatrick et al., 2003). Some studies indicate that youth who have a depression and/or anxiety problem are at a substantially higher risk of developing a substance use disorder than non-depressed youth (Rao et al., 1999), mainly because they attempt to self-medicate.

Depression is also associated with concentration difficulties (Manly, Cicchetti, & Barnett, 1994) and poorer motivation in school settings (Shonk & Cicchetti, 2001), all of

which can affect academic performance. Trauma Theory purports that IPV-exposed children may experience greater academic difficulties than their counterparts because of their high rates of emotional and psychological problems, which likely influence their performance on various school tasks necessary for optimal learning. These tasks can include concentration in the classroom, adherence to behavioral norms in school and motivation to complete homework assignments. In fact, longitudinal data suggest a developmental cascade model, with toxic stress leading to psychological problems that, in turn, affect academic performance and lead to additional problems over the lifespan (Romano, Babchishin, Marquis, & Frechette, 2015; Vaillancourt, Brittain, McDougall, & Duku, 2013). Importantly, this trauma framework indicates that many contextual factors outside of toxic stress alone, including individual (e.g., age, race/ethnicity, gender) and community (e.g., neighborhood crime, poverty) characteristics, can impact children's psychological and developmental functioning (Briere, 1992).

Significance of the Current Study

Children involved with the CWS are an important population to examine because they represent a particularly vulnerable group. They often experience multiple traumas including physical abuse by caregivers (Font & Maguire-Jack, 2013), exposure to parental violence (Casanueva et al., 2008; Casanueva et al., 2013; Hazen et al., 2006), and many live in poor neighborhoods with high rates of crime and violence (U.S. Department of Health and Human Services, 2012). They are also at heightened risk for psychological problems (Casanueva, Dolan, Smith, & Ringeisen, 2012) and poor school outcomes (Pecora et al., 2006; Stone, 2007). Compared to children not involved with the

CWS, children in the CWS are more likely to be placed in special education and are less likely to graduate high school (Courtney, Terao, & Bost, 2004; Pecora et al., 2006).

Some states are now treating IPV exposure as child maltreatment, even if it does not co-occur with direct child victimization, and sometimes without attention to the severity or frequency of such exposure (see Edleson, Gassman-Pines, & Hill, 2006; Goodmark, 2010; Jaffe, Crooks, & Wolfe, 2003). To assess the appropriateness of this policy approach, it is important to understand whether IPV exposure has a significant negative effect on children in the CWS over and above child abuse and/or neglect. It is also critical to understand whether exposure to less severe or frequent IPV exposure modulates harmful effects for children in the CWS. The present study, utilizing a nationally representative sample of children in the CWS, seeks to increase our understanding of the independent effects of frequency and severity of IPV exposure on trauma, depression and academic achievement.

Although research on the effects of IPV exposure among children in the CWS and the general community has become increasingly sophisticated over the past 10 years, it is fraught with methodological limitations and several key questions remain unanswered. The majority of studies use the mother as the main and sole informant, despite research indicating low agreement between parents and their children. Mothers have been shown to underestimate the degree to which children are exposed to IPV (Jaffe, Wolfe, & Wilson, 1990) and to overestimate their children's overall functioning (Koverola et al., 2005). Another issue within the literature is that many studies draw on shelter populations to assess the effects of IPV exposure on children. Shelter populations may not be representative of all or even most families experiencing IPV. Women residing in

shelters may be more recently and severely affected, more socially isolated, and are often disproportionately from low socio-economic backgrounds (Holt et al., 2008). Reliance on shelter samples prevents researchers from disentangling the effects of IPV exposure from other factors unique to living in a shelter that are likely to impair child development, such as poverty and being forced to leave the home (Levendosky et al., 2007). Future research is needed on children from non-help seeking families to gain a more accurate picture of the effects of IPV exposure on community children (Clements, Oxtoby, & Ogle, 2008).

Another methodological concern is that exposure to IPV is generally defined by the researcher and varies substantially across studies. Many studies define exposure to IPV as a dichotomous variable (i.e., the child was exposed to IPV vs. the child was not exposed to IPV) by using the Conflict Tactics Scale (CTS) (Clements et al., 2008). This is particularly true with respect to children in the CWS. In fact, only one study to date examines the frequency and severity of IPV exposure on psychosocial problems among children in the CWS. Comparing children exposed to IPV with those who were not exposed, without attention to severity or frequency, ignores the effect that varying levels of exposure can have on child outcomes (Holt et al., 2008).

An additional weakness in the existing literature is that many studies use cross-sectional designs (e.g., Christopoulos et al., 1987; Fantuzzo, Boruch, Beriama, Atkins, & Marcus, 1997), making it difficult to assess how IPV exposure varies at different developmental stages and over time (Edleson, 1999). The reliance on cross-sectional design is most likely due to the fact that subjects come from lower socio-economic backgrounds and may move around frequently, making it difficult to track them over

time. Longitudinal studies generally have greater internal validity than cross-sectional designs as they discern changes in the sample at both the individual and group level, and can establish whether a sequence of events conforms with causal hypotheses.

Moreover, only a few studies that examine IPV exposure on children consider racial/ethnic outcome differences. Extant research on racial/ethnic differences has primarily been conducted with small samples of children in the general population (e.g., Graham-Bermann et al., 2006), and of children residing in battered women's shelters (e.g., Grych et al., 2000; O'Keefe, 1994). No studies to date have explored racial/ethnic differences in IPV exposure outcomes utilizing a representative sample of children in the CWS. As such, we know little about whether child race/ethnicity moderates the relationship between exposure to IPV and poor psychological problems among children in the CWS.

Additionally, few studies explore the effect of IPV exposure on school-aged children's academic performance. Despite the plethora of studies that have examined academic outcomes of maltreated children (Coohey, Renner, Hua, Zhang, & Whitney, 2011; Crozier & Barth, 2005) and children in foster care (Pecora et al., 2006; Stone, 2007), limited research exists on the relationship between child-reported IPV and standardized test performance among children in the CWS. The few existing studies that examine academic outcomes among children exposed to IPV share important methodological limitations, including failure to adequately control for potential confounders, such as child maltreatment (e.g., Peek-Asa et al., 2007) and utilization of small sample sizes (e.g., Kernic et al., 2003). Further, these studies do not examine the independent effect of IPV frequency and severity on children's academic outcomes.

Finally, these studies have failed to test specific hypotheses about why children exposed to IPV may experience trouble academically, and whether this relationship is mediated by psychological impacts of IPV exposure, such as depression.

This dissertation extends existing research on child exposure to IPV in the following ways. First, it uses the child as a main informant of his/her exposure to IPV. Exposure to IPV is measured using a child self-report measure, the Violence Exposure Scale for Children (VEX-R) (Fox & Leavitt, 1995), in all three studies. Second, this dissertation assesses the independent effects of frequency and severity of IPV exposure on children's psychological and academic outcomes. The measure of IPV severity used in this dissertation distinguishes between minor IPV exposure (e.g., witness an adult push/shove another adult, witness an adult slap another adult) and severe IPV exposure (e.g., witness an adult point a knife or gun at another adult, witness an adult stab another adult). Third, this dissertation utilizes a nationally representative sample of children referred to CWS for alleged child abuse and/or neglect in order to examine the effect of IPV exposure on this high-risk sub-population.

Furthermore, this study uses advanced statistical techniques coupled with a longitudinal sample that assesses IPV exposure at three time points. Specifically, the first manuscript (Chapter Two) conducts multilevel modeling to explore the effect of IPV exposure across 18 months on children's psychological functioning. The second manuscript (Chapter Three) examines the moderating effect of race/ethnicity on trauma symptoms utilizing a nationally representative sample of children in the CWS. This study is the first to date to explore whether differential predictors exist in the development of trauma for children in the CWS exposed to IPV by race/ethnicity. The

third manuscript (Chapter Four) uses structural equation modeling (SEM) to assess the separate effects of frequency of exposure to minor and severe IPV on children's reading and math scores three years later. This study also investigates whether this relationship is moderated by children's depression. Importantly, this is the first study to date to examine the effects of IPV exposure on school outcomes over time among a nationally representative sample of children in the CWS.

Organization of the Dissertation

This dissertation examines the long-term effects of exposure to IPV on trauma, depression and academic achievement among a sample of school-aged children referred to Child Protective Services (CPS) for alleged child abuse and/or neglect. All three manuscripts describe secondary data analysis of data from the second National Survey of Child and Adolescent Well-Being (NSCAW II), a national probability sample of children in the Child Welfare System (CWS). Specifically, the first manuscript (Chapter Two) investigates the independent effect of IPV frequency and severity on children's trauma and depression over time using multilevel modeling. The second manuscript (Chapter Three) follows previous empirical research by Graham-Bermann and colleagues (2006) and explores the moderating effect of child race/ethnicity on the relationship between exposure to IPV and trauma. This study also examines whether differential predictors of trauma exist for white and minority children exposed to IPV. The third manuscript (Chapter Four) examines the direct and indirect effects of exposure to minor and severe IPV on children's academic outcomes. It also explores the mediating relationship of depression on IPV exposure and children's math and reading scores. Guided by Trauma Theory (Briere, 1992; Perry, 2000) and previous empirical literature (Graham-Bermann

et al., 2006), this dissertation is among the first research efforts to examine the effect of IPV exposure on trauma, depression and academic achievement, as well as to explore racial/ethnic differences in outcomes, using a nationally representative sample of school-aged children in the Child Welfare System (CWS).

The final chapter of the dissertation (Chapter Five) provides a summary of findings from all three manuscripts and details implications for social work practice and policy. It also provides direction for future research on child exposure to IPV.

CHAPTER TWO: MANUSCRIPT 1

THE EFFECTS OF EXPOSURE TO INTIMATE PARTNER VIOLENCE (IPV) ON SCHOOL-AGED CHILDREN'S TRAUMA AND DEPRESSIVE SYMPTOMS: EVIDENCE FROM A NATIONALLY REPRESENTATIVE CHILD WELFARE SAMPLE

Abstract

Exposure to intimate partner violence (IPV) in childhood has been linked to the development of trauma and depression. Despite this, limited research has examined the effect of IPV exposure on trauma and depression among children in the Child Welfare System (CWS). Furthermore, although IPV exposure can involve a range of experiences, including direct witnessing and non-direct exposure, the majority of studies assess IPV as a one-dimensional construct measuring occurrence only, ignoring the impact of severity or frequency. This longitudinal study extends existing literature by examining the differential effects of frequency and severity of IPV exposure on trauma and depression scores among a nationally representative sample of school-aged children (ages 11-13 years) investigated for child abuse and/or neglect (n = 728). Multilevel modeling (level 1 = primary sampling unit (i.e., Child Protective Services (CPS) agency), level 2 = child, level 3 = observations at each Wave) revealed that IPV frequency and severity predicted greater trauma and depression scores over time for this population. Specifically, children in the CWS exposed to severe IPV, but not minor IPV, had higher trauma and depression scores over time than non-IPV exposed children. These findings highlight the importance of assessing both the presence of IPV within families referred to the CWS, as well as the frequency and severity of IPV exposure among children. Interventions for children exposed to IPV in the CWS should be based on the frequency and severity of

exposure, and may include referrals to trauma informed mental health treatment and/or domestic violence services for caregivers.

Introduction

It is estimated that approximately 3 to 10 million children are exposed to adult partner-on-partner violence within their homes, referred to as intimate partner violence (IPV), each year in the U.S. (Straus, Gelles, & Steinmetz, 1980; Straus, 1992). This exposure can be direct, such as witnessing one parent assault the other parent, or indirect, such as hearing one parent threaten the other (Edleson, 1999). Data from the National Survey of Children's Exposure to Violence (NatSCEV), the most comprehensive nationwide survey of the incidence and prevalence of children's IPV exposure to date, found that 16% of children ages 17 and younger were exposed to physical assault between caregivers in their lifetime (Finkelhor et al., 2009; Hamby et al., 2011). Moreover, research suggests that children are often exposed to the most severe forms of IPV such as witnessing parents being choked, burned or threatened with a knife (McDonald, Jouriles, Ramisetty-Mikler, Caetano, & Green, 2006). High rates of IPV exposure among children in the U.S. are alarming considering that IPV exposure in childhood is associated with heightened psychological, emotional and social problems (Kitzmann, et al, 2003).

Research indicates that exposure to IPV is experienced even more frequently by children in the child welfare system (CWS) than by children in the general population. The prevalence of IPV in households involved with the CWS may be six-fold higher than households not involved with CWS, with a third of caregivers investigated for child abuse and/or neglect experiencing IPV in the previous 12 months (Casanueva, Martin,

Runyan, Barth & Bradley, 2008; Hazen, et al, 2006). Data from the first cohort of the National Survey of Child and Adolescent Well-Being (NSCAW I) found that a quarter of parents whose children remained in the home following a maltreatment report had experienced IPV during the past 12 months (Casanueva et al., 2013). Other studies suggest that children in the CWS are exposed to IPV at more than double the rate (30-45%) of children in the general population (Casanueva et al., 2013; Edleson, 1999; Hazen et al., 2006).

Children involved with the CWS are an important population to examine because they represent an at-risk group experiencing multiple types of trauma. They are exposed to high rates of IPV (Casanueva et al., 2008; Casanueva et al., 2013; Hazen et al., 2006), experience physical abuse and other maltreatment by caregivers (Font & Maguire-Jack, 2013), and are often exposed to high rates of violence in their communities (U.S. Department of Health and Human Services, 2012). They are also at an increased risk for psychological problems (Casanueva, Dolan, Smith, & Ringeisen, 2012) and poor school outcomes (Pecora et al., 2006; Stone, 2007). Although research with non-child welfare samples suggests that children may not be universally affected by IPV exposure, with more severe forms of IPV exposure leading to greater difficulties (English et al., 2005; Garrido, et al, 2001), few studies of children in the CWS consider the frequency or severity of exposure when examining its impact.

Some states are now treating IPV exposure as child maltreatment, even if it does not co-occur with direct child victimization, and sometimes, without attention to the severity or frequency of such exposure (see Edleson et al., 2006; Goodmark, 2010; Jaffe, et al., 2003). To assess the appropriateness of this policy approach, it is important to

understand whether IPV exposure has a significant negative effect on children in the CWS over and above child abuse and/or neglect. It is also critical to understand whether exposure to less severe or frequent IPV exposure modulates harmful effects for children in the CWS. The present study, utilizing a nationally representative sample of children in the CWS, seeks to increase our understanding of the independent effects of frequency and severity of IPV exposure on trauma and depression symptoms.

Background

Children exposed to IPV experience a range of developmental consequences including psychological, behavioral, social and cognitive difficulties (Evans, Davies, & DiLillo 2008). Two meta-analyses indicate that IPV-exposed children have worse emotional and behavioral outcomes than non-exposed children (Kitzmann et al., 2003; Wolfe et al., 2003). Kitzmann and colleagues (2003) meta-analysis of 118 studies found that children 18 years and younger who were exposed to IPV had poorer internalizing and psychological problems than non-exposed children. Wolfe et al.'s (2003) meta-analysis found similar patterns, albeit effect sizes were smaller, likely due to their stringent inclusion criteria and use of studies that adequately control for confounding variables.

Exposure to IPV can have a varied impact at different developmental stages. As such, school-age children may be uniquely affected. During school years, children begin to develop emotional awareness of themselves and others, and have the ability to think about the effects of abuse (Daniel, Wassell, & Gilligan, 1999). As they enter the early stages of concrete thinking, they also develop the capacity to think in more complexity about the violence. Younger children in this group think egocentrically, and may internalize guilt and blame for the abuse of their parent (Holt et al., 2008) resulting in low

self-esteem or shame. Older school-aged children are better able to grasp the consequences of the violence, and may try to prevent violent episodes, sometimes increasing their risk of physical injury (Holt et al., 2008). They may also attempt to rationalize the perpetrator's violent behavior by blaming it on drinking or stress (Holt et al., 2008). Between the ages of 6 and 12, the child's world expands beyond the family and s/he begins to develop relationships with friends, teachers and others (Daniel et al., 1999). Social relationships and academic success become a key component of a school-aged child's self-concept and worth (Holt et al., 2008). Because of this, children exposed to parental violence may be shamed and embarrassed by the violence and may try to hide it from others (Holt et al., 2008).

School-aged children exposed to IPV are particularly at risk for development of psychological problems, including anxiety (Kernic et al., 2003), Post Traumatic Stress Disorder (PTSD) (Chemtob & Carlson, 2004; Rossman & Ho, 2000), and depression (Kitzmann et al., 2003; Litrownik et al, 2003; McFarlane et al., 2003). IPV exposure in childhood has also been associated with an increase in trauma symptoms (Graham-Bermann et al., 2006; Kilpatrick & Williams, 1997; McCloskey & Walker, 2000) and PTSD diagnoses (Chemtob & Carlson, 2004). In fact, children exposed to IPV are more likely to be diagnosed with PTSD than children in the general population, with rates of PTSD diagnoses ranging from 15-60% for IPV-exposed children (Chemtob & Carlson, 2004; Graham-Bermann et al., 2006; Graham-Bermann & Levendosky, 1998; Lehmann, 1997; McCloskey & Walker, 2000) compared to 4-7% for children and adolescents in the general population (Kilpatrick et al., 2003). Some of the variability in prevalence rates of PTSD among studies of IPV-exposed children may be due to the use of different samples,

with children coming from shelter populations experiencing higher rates of PTSD (Lehmann, 1997) than children living in community settings (Graham-Bermann & Levendosky, 1998).

Furthermore, children exposed to IPV are also at risk of experiencing depression symptoms (Litrownik et al., 2003) and being diagnosed with Major Depressive Disorder (Kitzmann et al., 2003; McFarlane et al., 2003). Kennedy and colleagues (2010) found that children exposed to IPV over a two-year period displayed two times more depression symptoms than children not exposed to IPV. Similar to what has been documented with community samples of IPV-exposed children, research utilizing samples of children in the CWS find that IPV exposure during school years is associated with the development of both trauma and depressive symptoms (Campbell, Thomas, Cook, & Kennan, 2013; Hazen et al., 2006; Kolko et al., 2010).

Researchers have provided several possible explanations for why children exposed to IPV are at risk for poor psychological problems. Some have hypothesized that repetitive experiences of multiple traumas cause children to feel helpless and incompetent, increasing self-blaming and decreasing help-seeking behavior, leading to depression (Cook et al., 2005). According to Trauma Theory (Briere, 1992; Perry, 2000), children who experience trauma, including exposure to IPV, develop coping mechanisms that help them detach from the emotional and physical pain of the trauma. For example, children exposed to unpredictable family violence, such as IPV, may cope by dissociating or restricting their processing of the traumatic event (Child Welfare Information Gateway, 2015; Perry, 2000). As a result, they may have difficulty regulating their

emotions, managing stress and self-soothing, placing them at risk for developing PTSD and depression (Cook et al., 2005).

Trauma theorists also posit that exposure to IPV during childhood causes chronic activation of the body's stress response system, also known as toxic stress (Perry, 2000; Shonkoff, 2012). Elevated levels of cortisol, which are characteristic of chronic activation of the stress response system, result in physiologic and structural changes in a child's brain (Child Welfare Information Gateway, 2015; Shonkoff, 2012). Children exposed to severe and frequent trauma are often in a persistent 'fight' or 'flight' fear state and may lose their ability to differentiate between danger and safety (Perry, 2000). This generalized fear response coupled with structural and chemical changes in the areas of the brain involved in emotion and stress regulation may lead IPV-exposed children to develop psychological problems, including depression and anxiety (Perry, 2000), some of which may persist well into adulthood (Shonkoff, 2012).

Importantly, not all children exposed to IPV are universally affected. Preliminary research suggests that the frequency and severity of the IPV exposure may influence outcomes for children (English et al., 2005; Garrido et al., 2011). Exposure to IPV can involve a range of experiences. For example, children may be directly involved in physical assaults that occur between caregivers and may attempt to intervene and stop the abuse. Alternatively, exposure may be indirect. Children may overhear arguments or see results of the abuse, such as bruises on the mother's body or broken furniture (Cunningham & Baker, 2004). They may also experience the aftermath of the violence such as being told about the violence, see their mother's expressed fear of the partner, or be present when police respond to the incident (Edleson, 1999; Evans et al., 2008).

Several researchers have suggested that a significant proportion of children exposed to IPV have experienced these less direct forms of exposure (Fantuzzo & Mohr, 1999; Holden, 2003). Despite this, the majority of studies that examine consequences of IPV exposure have assessed IPV as a one-dimensional construct measuring IPV occurrence only (Evans et al., 2008). This is especially the case with respect to children in the CWS.

Studies that have assessed IPV frequency and severity suggest that exposure to more frequent and severe IPV exposure exacerbate children's psychological problems. Greater internalizing and externalizing problems have been found in children exposed to physical rather than verbal IPV (Kitzmann et al., 2003), as well as in those exposed to IPV involving knives and guns rather than IPV without weapons (Jouriles et al., 1998). DeJonge, von Eye, Bogat, and Levendosky (2011) found that children who directly witnessed IPV had greater externalizing problems when compared to children who did not directly witness, but lived in homes where IPV was present. Furthermore, English et al.'s (2005) study found that violence that was more frequent and chronic in nature, and occurred across multiple developmental periods, increased children's risk of depression and was associated with poorer socialization skills. In the only study using a CWS sample to consider these factors, Garrido and colleagues (2011) found that a combination of IPV frequency, proximity and severity was related to psychosocial problems over and above IPV occurrence alone among youth in out-of-home (OOH) care. This above-mentioned research is consistent with Trauma Theory, which hypothesizes that exposure to traumatic events that are more chronic, severe, and frequent in nature have greater effects on physiologic and psychological development (Perry, 2000; Shonkoff, 2012).

Current Study

The current study uses Trauma Theory (Briere, 1992; Perry, 2000) as a conceptual framework to examine the relationship between exposure to IPV over time and the development of trauma and depression symptoms among children in the CWS. Current studies that assess the effect of IPV exposure on children's trauma and depression symptoms share important methodological limitations. Extant research is mainly conducted with cross-sectional designs (Christopoulos et al., 1987; Fantuzzo et al., 1997), making it difficult to assess how IPV exposure varies at different developmental stages and over time (Edleson, 1999). Previous studies are also primarily conducted with samples from battered women's shelters. Women residing in shelters may be more recently and severely affected, more socially isolated, and are often disproportionately from low socio-economic backgrounds (Holt et al., 2008). Because of this, many existing studies are not generalizable to larger community samples of children. Additionally, only a few studies examine the effect of IPV exposure on trauma and depression among school-aged children in the CWS (e.g., Campbell et al., 2013; Hazen et al., 2006; Kolko et al., 2010), and these studies do not consider the frequency and severity of IPV exposure when examining its impact. The only study to date to assess the frequency, proximity and severity of IPV exposure on psychosocial problems among children in the CWS was restricted to a small sample of youth in OOH care (Garrido et al., 2011).

The current study extends the existing research by examining the differential effects of IPV frequency and severity on the development of trauma and depression over time among children in the CWS. It is the only study of which the author is aware that

utilizes a national probability sample of children referred to the CWS for alleged child abuse and/or neglect when assessing the effect of IPV frequency and severity on children's psychological functioning. Additionally, it uses multilevel modeling to examine how exposure to IPV affects children's depression and trauma over the course of 18 months. It addresses the following research questions:

1) Does IPV exposure affect the development of trauma symptoms among school-aged children in the CWS over time (across 18 months)?
2) Does IPV exposure affect the development of depression among school-aged children in the CWS over time (across 18 months)?

It is hypothesized that more frequent IPV exposure will be related to higher trauma and depression scores over time. Similarly, it is hypothesized that exposure to more severe forms of IPV, when compared to exposure to minor forms of IPV or no exposure to IPV, will be associated with higher trauma and depression scores over time.

Methods

Sample Design

Secondary data analysis is conducted using data from Waves 1 and 2 of the second National Survey of Child and Adolescent Well-Being (NSCAW II). NSCAW II is a nationally representative, longitudinal study designed to assess the functioning, service needs and service use of children who come into contact with the CWS. The target population for NSCAW II includes all children in the U.S. who were subjects of child abuse or neglect investigations conducted by Child Protective Services (CPS) between February 2008 and April 2009 (Dowd et al., 2012). The study sample includes 5,872 children ranging in age from birth to 17.5 years old investigated by CPS for a case

of child abuse or neglect during the study investigation period. Both infants and children in OOH care were oversampled to obtain a representative sample of these two high-risk groups (Dowd et al., 2012).

NSCAW II employed a two-stage stratified sampling design built on the sampling frame used in the earlier NSCAW I (Dowd et al., 2012). For the first stage, the U.S. was divided into nine sampling strata. Eight of the strata corresponded to the eight states with the largest child welfare caseloads and the ninth stratum consisted of the remaining 38 states and the District of Columbia. Within the nine strata, primary sampling units (PSUs) were formed. PSUs were defined as geographic areas containing a population served by a single CPS agency. These PSUs, which in most cases corresponded to a single county, served as the basis from which a sample of children was drawn. A total of 86 PSUs were used in NSCAW II, representing 81 counties in 30 states. Children who fit the general target population criteria (i.e., were subjects of a CPS investigation during the study period) and who had not been part of the NSCAW I study or had a sibling in the study were randomly sampled from the PSUs for participation in NSCAW II (Dowd et al., 2012).

Data Collection Methods

Data collection for NSCAW II occurred across three time points over the course of four years. Baseline interviews (Wave 1) were conducted over 15 months beginning in March 2008 and ending in September 2009. Wave 2 interviews occurred 18 months after the close of the baseline investigation, beginning in October 2009 and ending in January 2011. Wave 3 interviews occurred approximately 36 months after the close of the baseline investigation, beginning in June 2011 and ending in December 2012.

Children, adult caregivers (i.e., birth and adoptive parents, foster parents, kin caregivers and group home supervisors) and CPS caseworkers were interviewed or assessed face-to-face by trained research staff.

Participants

This study examines the effect of exposure to IPV on children's trauma and depression symptoms using data from Wave 1 (baseline) and Wave 2 (18 months later). The Violence Exposure Scale for Children (VEX-R), which measured IPV exposure in the study, was only administered to children eight years of age and older. Therefore, children 8 years of age and older with complete IPV data at Wave 1 and 2 were retained (n = 1,134). The VEX-R scale asks children to report on violence witnessed between two adults in a home they currently live in. Because there was no way to know whether the violence reported by the child occurred in the birth family home or foster home, and because witnessing violence between foster parents might affect children differently than witnessing violence between caregivers, children in OOH care (i.e., kinship care, foster care, a group home setting) at Wave 1 or 2 were also excluded. Application of these inclusion criteria yielded a final analytic sample of 728 children.

A power analysis conducted using Optimal Design Software Version 3.0 (Raudenbush et al., 2011) determined that the analytic sample in this study (n = 728) was sufficient to detect a small effect size as outlined by Cohen (1988). Common assumptions of the power analysis included the level of statistical significance at .05, the statistical power to detect an effect at .80, and Cohen's d effect size of .45 (Cohen, 1988). The power analysis revealed that a minimum sample size of 715 must be utilized to achieve correct power in a multi-level model.

Measures

Exposure to IPV. Children's exposure to violent and criminal events in the home was measured using the Violence Exposure Scale for Children (VEX-R) (Fox & Leavitt, 1995). VEX-R is a 23-item self-report measure administered to children eight years of age and older to assess children's frequency of victimization and exposure to violent acts in their home. The VEX-R is comprised of 2 subscales: 1) the witnessing subscale (12 items) and 2) the victimization subscale (11 items). To measure IPV exposure in the current study, the witnessing subscale of the VEX-R was used. Children were asked to describe the frequency of their exposure to mild violence (six items) (e.g., seen an adult push or shove another person, seen an adult throw something at another person, seen an adult slap another person) and severe violence (six items) (e.g., seen an adult point a knife or gun at another person, seen an adult stab another person) on a 4-point scale (*1* = 'never,' *2* = 'one time,' *3* = 'a few times,' *4* = 'lots of times'). The VEX-R scale demonstrated good internal consistency for the current sample, with the mild violence scale ranging from 0.81 – 0.83 and the severe violence scale ranging from 0.67 – 0.75 across Waves 1 and 2.

Two variables were created from the witnessing subscale of the VEX-R to assess IPV exposure for the current study: 1) IPV frequency and 2) IPV severity. To measure IPV frequency, response options for the 12 items of the witnessing subscale including 'never,' 'one time,' 'a few times,' and 'lots of times' (*1, 2, 3, 4*) were recoded (0, 1, 2, 3). Items were then summed, with higher raw scale scores indicating greater frequency of exposure. A categorical variable was created to measure IPV severity. Children who reported no mild or severe violence exposure were coded as 0; children who reported at

least one mild exposure but no severe exposure were coded as 1; children who reported at least one severe violence exposure were coded as 2. Categories were mutually exclusive; children who reported severe and mild exposure were included in the severe category only.

Trauma. Children's trauma scores were measured using the Post-Traumatic Stress (PTS) subscale (ten items) of the Trauma Symptom Checklist for Children (TSCC; Briere, 1996). The TSCC was administered to children eight years and older to assess distress and trauma related symptoms. Children were asked to indicate how often they experienced ten items (e.g., intrusive thoughts of painful events; nightmares; fears; cognitive avoidance of painful feelings) using a 4-point scale (*0* = 'never,' *1*= 'sometimes,' *2* = 'lots of times,' *3* = 'almost all the time'). Items of the raw score were summed and used in the analytic models. Higher sum scores indicated greater presence of trauma symptoms. Clinically significant trauma was calculated for descriptive purposes. Clinically significant trauma was indicated by a T-score of 65 or higher on the standardized scale. This equated to the 90^{th} percentile and above for the age and gender group (National Data Archive on Child Abuse and Neglect (NDACAN), 2011). The PTS scale demonstrates good internal consistency for the current sample in Wave 1 ($\alpha = 0.83$) and Wave 2 ($\alpha = 0.84$).

Depression. The Children's Depression Inventory (CDI) was administered to children ages seven and older to assess the severity of children's depression symptoms (Kovacs, 1992). The CDI is a 27-item self-report measure that asks children about their engagement in certain activities or their experience of certain feelings (e.g., enjoying being around other people). Each item is measured with a 3-point response (*0* = 'absence

of symptom,' *1* = 'mild symptom,' *2* = 'definite symptom'). Five subscales (Negative Mood, Interpersonal Problems, Ineffectiveness, Anhedonia and Negative Self-Esteem) were summed to create a total raw score, with higher scores indicating greater presence of depression symptoms. The total sum score was used in the analytic models. Clinically significant depression was calculated for descriptive purposes. Clinically significant depression was indicated by a T-score of 66 or higher on the standardized scale. This equated to the 90th percentile and above for the age and gender group (Kovacs, 1992; NDACAN, 2011). In non-clinical school-aged children, the measure has demonstrated high levels of internal consistency, test-retest reliability, predictive utility, and construct validity (Carey, Faulstich, Gresham, Ruggiero, & Enyart, 1987; Saylor, Finch, Spirito, & Bennett, 1984). The CDI has also demonstrated good internal consistency (0.81 - 0.87) with the NSCAW I sample (NDACAN, 2011) and excellent internal consistency with the current sample in both Wave 1 (α = 0.97) and Wave 2 (α = 0.97).

Control variables. Because Trauma Theory suggests that factors outside of IPV presence alone may account for differences in outcomes exhibited by exposed children, the current study controlled for child (i.e., age, sex, race/ethnicity, previous maltreatment), caregiver (i.e., age, education, depression, alcohol/drug problem), and community characteristics (i.e., poverty, neighborhood quality) previously correlated with independent and dependent variables of interest, including IPV exposure, trauma and depression (Finkelhor et al., 2009; Gerwitz et al., 2011; Gleason, 1993; Graham-Bermann et al., 2006; Holmes, 2013a; McIntosh, 2003; Sorenson et al., 1996).

Child demographics. Child variables as reported by current caregivers included age in years, sex, and race/ethnicity. NSCAW researchers coded child race/ethnicity into

four groups: non-Hispanic white, non-Hispanic African American, Hispanic, and non-Hispanic other race. The other race category included American Indian, Alaskan Native, Asian, Native Hawaiian or Pacific Islander.

Previous child maltreatment. The psychological-aggression, physical assault, child neglect, and sexual abuse subscales of the Parent-Child Conflict Tactics Scales (CTS-PC) were used to measure previous child maltreatment (Straus et al., 1998). Current caregivers rated the extent to which they engaged in certain parenting practices with the child on an 8-point Likert scale over the past 12 months ('1 time,' '2 times,' '3 to 5 times,' '6 to 10 times,' '11 to 20 times,' 'more than 20 times,' 'not in the past 12 months but it has happened before,' and 'never'). For psychological aggression, caregivers reported how often they engaged in five parenting practices (e.g., shouted, yelled, screamed at child; cursed at child; threatened to have child sent away). For physical assault, caregivers reported how often they engaged in 13 parenting practices (e.g., beat child; choked child; punched or kicked child). For child neglect, caregivers reported how often they engaged in five items (e.g., leaving child home alone; not providing child with food; not providing medical care). For sexual abuse, caregivers reported how often their child experienced four items (e.g., been forced to have sex with an adult or older child; been touched in a sexual way by an adult or older child). Dichotomous variables were created to indicate children who had experienced psychological abuse, physical abuse, sexual abuse and child neglect in their lifetimes. Children were considered to have experienced previous maltreatment if caregivers selected '1 time,' '2 times,' '3-5 times,' '6-10 times,' '11-20 times,' 'more than 20 times,' or 'not in the past 12 months but it has happened before' for at least one item on

each respective subscale (coded as 1). If caregivers selected 'never' children were not considered to have experienced previous maltreatment and were coded as 0. The CTS-PC demonstrated excellent internal consistency with the NSCAW I study (α = 0.92) (NDACAN, 2011).

Caregiver demographics. Caregiver variables as reported by current caregivers included age in years and education level. Caregivers reported their highest level of education completed (less than high school degree, high school degree or GED, or more than high school degree).

Caregiver depression. Current caregiver depression was measured using the Composite International Diagnostic Interview Short Form (CIDI-SF) scale (Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998). The CIDI-SF provides major depressive diagnoses based on criteria established in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (Kessler et al., 1998). Per recommendations of the manual, caregivers who endorsed three or more of seven possible symptoms of a major depressive episode (e.g., losing interest in pleasurable activities; trouble with sleep; change in weight; thoughts about death) in the past 12 months were classified as depressed (coded as 1). Caregivers who experienced fewer than three symptoms were considered non-depressed (coded as 0). The CIDI has demonstrated good psychometric properties with high-risk populations, including good to excellent test-retest and inter-rater reliability (Wittchen, 1994) and good concordance with clinical diagnoses (Janca, Robins, Bucholz, Early, & Shayka, 1992).

Caregiver alcohol/drug problem. The Alcohol Use Disorders Identification Test (AUDIT), developed by the World Health Organization, was used to measure the

presence of an alcohol problem in caregivers in the previous 12 months (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). The AUDIT is a ten-item measure designed to quickly screen for excessive drinking and alcohol problems. Current caregivers were asked to rank the frequency of ten behaviors (e.g., having six or more drinks in one setting; experiencing blackouts; feeling guilty after drinking) on a 4-point scale. Per recommendations of the manual, a score of eight or higher distinguishes caregivers who may have an alcohol problem (coded as 1) from those with no evidence of an alcohol problem (coded as 0) in the past year (Babor et al., 2001; NDACAN, 2011). AUDIT demonstrated excellent internal consistency for the current sample for Wave 1 ($\alpha = 0.96$) and Wave 2 ($\alpha = 0.96$). The Drug Abuse Screening Test (DAST-20) was used to assess the presence of a drug problem in current caregivers (Skinner, 1982). The DAST-20 is a 20-item measure intended to identify individuals with drug dependence. Caregivers were asked to report on the extent of using drugs in the past 12 months (e.g., abused prescription drugs; neglect family due to drug use; lost a job due to drug use) with a "yes" or "no" response. Per recommendations of the manual, a cutoff score of six or greater was used to distinguish caregivers with drug dependence (coded as 1) from those without a drug problem (coded as 0) in the study (Skinner, 1982). DAST-20 scores are highly correlated with DSM-IV diagnoses of drug dependence (NDACAN, 2011). Internal consistency for the DAST-20 was 0.99 for the current study in Waves 1 and 2.

Poverty level. Caregivers were asked to report on their total household income in the past 12 months and the number of household members. The household poverty rate was calculated by NSCAW researchers based on U.S. Department of Health and Human Services poverty guidelines for 2009 and 2010 (NDACAN, 2011). Household poverty

rate was coded into four groups: *1* = '<50% Federal Poverty Level (FPL),' *2* = '50% - <100% FPL,' *3* = '100% - 200% FPL,' *4* = '>200% FPL.'

Neighborhood quality. Neighborhood quality was assessed using the community environment scale adapted from the Philadelphia Family Management Study, Parent Interview Schedule (Furstenburg, 1990). The scale consists of nine items designed to measure community environment and perceived neighborhood safety. In the first five questions, caregivers were asked to rate the extent to which the following are a problem in their neighborhood: assaults and muggings, delinquent/drug gangs, open drug use and dealing, unsupervised children and adolescents hanging out in public places on a 3-point scale (*1* = 'not a problem,' *2* = 'somewhat of a problem,' *3* = 'a big problem'). The last four questions ask current caregivers to report on perceived neighborhood quality/safety (e.g., how safe the neighborhood is compared to other neighborhoods, support provided by neighbors, parental involvement with children) on a 3-point scale. Responses to the items were summed and averaged, with higher scores reflecting poorer perceived neighborhood quality and safety. The community environment scale demonstrated high internal consistency for the current sample in Wave 1 ($\alpha = 0.96$) and Wave 2 ($\alpha = 0.93$).

Data Analysis

Analysis weights. All analyses in the current study were conducted with weighted data to account for NSCAW's complex sampling design. Analysis weights were constructed in stages by NSCAW research staff, first accounting for probability of county selection and then accounting for probability of child selection within a county (Biemer, Christ, Wheeless, & Wiesen, 2008). Weights were further adjusted to compensate for nonresponse and under-coverage (Biemer et al., 2008).

Missing data. Multiple imputation was used to address missing data. Twenty-one percent of children in the analytic sample had at least one missing value on study variables across either Wave 1 or 2. The majority of missing data came from the caregiver variables: caregiver depression at Wave 1 (117 missing cases, ~16% of analytic sample), caregiver depression at Wave 2 (85 missing cases, ~12% of analytic sample), caregiver drug problem at Wave 1 (63 missing cases, ~9% of analytic sample) and caregiver drug problem at Wave 2 (54 missing cases, ~7% of analytic sample). All other variables had less than 5% missing. Both dependent variables in the study, child trauma and depression scores, were declared missing if more than 15% of items in the scale were missing. This resulted in less than 1% of cases missing for child depression scores at Wave 1 (7 missing cases) and Wave 2 (6 missing cases) and child trauma scores at Wave 1 (7 missing cases). Child trauma scores at Wave 2 had no missing values.

Because other methods of handling missing data such as list-wise deletion or setting missing values to the mean are associated with a risk of bias (Croy & Novins, 2005), missing data was imputed using Royston's (2005) method of multiple imputation by chained equations (ICE). ICE uses an iterative regression switching procedure to estimate missing values (Royston, 2005). Under ICE, incomplete variables are estimated using observed values in the predictive model. Incomplete continuous variables are estimated using linear regression and incomplete categorical or dichotomous variables are estimated using logistic regression (Royston, 2005). Five fully imputed datasets were created using ICE. Analyses were performed separately for each imputed data set and coefficients and standard errors were averaged using Stata's 'MI estimate' command (StataCorp. 2013).

Statistical model. Descriptive statistics were generated to examine demographics and clinical symptoms for the study population at Waves 1 and 2. Bivariate correlations were conducted for all study variables. The main research question assessed the long-term effect of IPV exposure on two outcomes of interest: children's trauma and depression symptoms. To examine this research question, multilevel modeling with a three-level nested structure was used. Level 1 represented the PSU (CPS agency), level 2 represented the child and level 3 represented observations at each wave.

Multilevel modeling was used for this study because of the nested structure of the NSCAW II data. In NSCAW II, children are nested within PSUs (CPS agency). NSCAW II data is also nested across time, since observations are taken on the same child across waves. Because of the multilevel sample design, data is likely to be correlated and independence cannot be assumed (West et al., 2007). For example, children who are sampled from the same CPS agency may be more alike than children chosen at random from the population at large, possibly because they live in similar communities. The longitudinal nature of NSCAW II also poses a problem because children's responses over time are correlated with each other.

Multilevel models account for this correlation by examining both the fixed effects (predictors) and the random effects associated with each sampling unit at each level (West et al., 2007). This testing is not possible using traditional ordinary least squares (OLS) regression, which treats each unit of analysis as an independent observation. When data has a multilevel structure, using OLS regression will lead to biased standard errors and alpha inflation (West et al., 2007). Multilevel modeling can be thought of as an extension of OLS, where both fixed and random effects are examined at all levels,

explicitly accounting for the non-independence of children within the same group (Hofmann, 1997). Importantly, multilevel modeling produces an Intraclass Correlation Coefficient (ICC), or an estimate of the level of variance in the outcome that can be explained from the nesting.

Four multilevel models are examined using the following equation:

$$Y_{ijt} = \beta_0 + \beta_1 X_{ijt} + B_2 X_{ijt} \ldots + E_{ijt}$$

Time is included as a fixed predictor in all models to account for changes in trauma and depression from Wave 1 to Wave 2. An interaction of IPV exposure by time is also included as a fixed predictor to assess the relationship between trauma and depression on IPV exposure and time. All models include child, caregiver and community variables as covariates. The four models are described below:

1) A multilevel model of IPV exposure (frequency) on trauma.
2) A multilevel model of IPV exposure (severity) on trauma.
3) A multilevel model of IPV exposure (frequency) on depression.
4) A multilevel model of IPV exposure (severity) on depression.

All analyses for the current study were performed using Stata 13's "mixed" command (StataCorp, 2013). The Institutional Review Board (IRB) at Michigan State University approved this secondary data analysis.

Results

Descriptive Statistics

Table 1-1 provides descriptive statistics of the study sample at Waves 1 and 2. The majority of children were female (59%). At Wave 1, children were on average 12 years of age ($M = 11.76$; $SD = 0.11$) and the majority were non-Hispanic white (41%)

and Hispanic (33%). A high percentage of children were exposed to IPV in Waves 1 (87%) and 2 (84%), with the majority experiencing severe forms of IPV across both Waves (52%; 46%, respectively). Frequency of IPV exposure decreased from Wave 1 ($M = 5.75$; $SD = 0.32$) to Wave 2 ($M = 4.87$; $SD = 0.25$). Thirteen percent of children in Wave 1 and 7% of children in Wave 2 met criteria for clinically significant trauma. Ten percent of children in Wave 1 and 6% of children in Wave 2 met criteria for clinically significant depression.

Table 1-2 presents bivariate correlations of study variables. Most of the significant correlations demonstrated a weak relationship. A small number of variables were moderately correlated. Most notably, trauma scores at Waves 1 and 2 ($r = 0.52$, $p < 0.001$) and depression scores at Waves 1 and 2 ($r = 0.53$, $p < 0.001$) were positively correlated. Trauma scores and depression scores at Wave 1 ($r = 0.59$, $p < 0.001$) and trauma scores and depression scores at Wave 2 ($r = 0.58$, $p < 0.001$) were also positively correlated. IPV frequency at Waves 1 and 2 were positively correlated ($r = 0.49$, $p < 0.001$). Two variables were highly correlated. Minor IPV exposure and severe IPV exposure Wave 1 ($r = -0.79$, $p < 0.001$) and minor IPV exposure and severe IPV exposure at Wave 2 ($r = -0.74$, $p < 0.001$) were negatively correlated. Because these variables were highly correlated, the variance inflation factor (VIF) was calculated to rule out any issues of multicollinearity. VIF is often considered a more precise indicator of multicollinearity than Pearson correlation in regression analysis (Belsley, 1991; Fox, 1997). VIF is an index that measures how much variance of an estimated beta coefficient is inflated because of multicollinearity. Commonly used cut-offs for VIF values range from 5-10 (Belsley, 1991; Fox, 1997), and conservative estimates suggest that VIFS <4

indicate low collinearity (O'Brien, 2007). The VIF for minor IPV exposure was 3.69 and the VIF for severe IPV exposure was 4, indicating that their associated coefficients are not inflated due to collinearity.

Multilevel Model of IPV Exposure on Trauma

The results of the multilevel model of IPV exposure (measured in both frequency and severity) on trauma scores are displayed in *Table 1-3*. In the Frequency Model, greater frequency of IPV was associated with an increase in trauma scores over time (β = 0.39, $p < 0.001$). Time was not significantly associated with trauma in the Frequency Model (β = -0.70, p = n.s.), indicating that the mean of trauma scores did not significantly change from Wave 1 to Wave 2. In the Severity Model, exposure to minor forms of IPV, compared to no IPV exposure, was not significantly associated with trauma (β = 1.27, p = n.s.). However, exposure to severe forms of IPV, when compared to no IPV exposure, was significantly related with an increase in trauma scores (β = 4.07, $p <$ 0.001). Time was also significantly related to trauma in the Severity Model (β = -1.38, $p < 0.05$), indicating that the overall mean of trauma scores decreased from Wave 1 to Wave 2.

In both models, younger children were more likely to have higher trauma scores (β = -0.30, $p < 0.01$; β = -0.30, $p < 0.01$, respectively). Children who had experienced sexual abuse in their lifetimes compared to those who had not were also more likely to have higher trauma scores in both models (β = 1.47, $p < 0.05$; β = 1.87, $p < 0.01$, respectively). Caregiver education level was also associated with trauma in both models. Children with caregivers who had less than a high school education compared to children with caregivers who had high school and greater educations had higher trauma scores (β

= 1.47, $p < 0.05$; $\beta = 1.45$, $p < 0.05$, respectively). The ICC for the Frequency Model indicated that approximately 21% of the variance in trauma scores resulted from individual child differences, while the ICC for the Severity Model indicated that approximately 27% of the variance in trauma scores resulted from individual child differences.

Multilevel Model of IPV Exposure on Depression

Table 1-4 displays results of the multilevel model of IPV exposure (measured in frequency and severity) on depression. In the Frequency Model, greater IPV frequency was associated with an increase in depression ($\beta = 0.44$, $p < 0.001$). Time was a significant negative predictor of depression in the Frequency Model ($\beta = -1.05$, $p < 0.05$) indicating that depression scores significantly decreased from Wave 1 to Wave 2. In the Severity Model, minor IPV exposure, compared to no IPV exposure, was not significantly associated with depression ($\beta = 1.72$, $p =$ n.s.), however severe IPV exposure, compared to no IPV exposure, was related to an increase in depression scores ($\beta = 5.07$, $p < 0.001$). Time did not significantly predict depression scores in the Severity Model ($\beta = -1.91$, $p =$ n.s), indicating that depression scores did not change from Wave 1 to Wave 2.

Hispanic children had higher depression scores when compared to non-Hispanic white children in the Frequency Model ($\beta = 2.01$, $p < 0.05$). Children with caregivers who were depressed had higher depression scores than children with non-depressed caregivers in the Frequency Model ($\beta = 1.20$, $p < 0.05$). In the Severity Model, females had higher depression scores than males ($\beta = 1.50$, $p < 0.05$). Children who were 'Other' race had lower depression scores than non-Hispanic white children ($\beta = -2.42$, $p < 0.05$)

in the Severity Model. In the Frequency Model, the ICC of 29% indicated that over a quarter of variance in depression scores resulted from child differences. In the Severity Model, the ICC indicated that 30% of variance in depression scores was attributed to child level differences.

Discussion

The purpose of this study was to assess the effect of IPV exposure on trauma and depression scores among a nationally representative sample of school-aged children investigated for child abuse and neglect. This study extends existing literature by utilizing multilevel modeling and a longitudinal sample with IPV exposure assessed at two time-points to examine the psychological effect of IPV exposure among children in the CWS. Importantly, this is the first study to date to consider both the severity and frequency of exposure to IPV on children's trauma and depression utilizing a nationally representative sample of children in the CWS.

A large percentage of children in this CWS sample (over 80%) were exposed to IPV, with many experiencing the most severe forms of IPV such as witnessing an adult point a knife or gun or stab another adult. Furthermore, 13% of children met criteria for clinically significant trauma and 10% met criteria for a major depressive diagnosis. Although research indicates that children in the CWS experience IPV at greater rates than children in the general population (Casanueva et al., 2013; Edleson, 1999; Hazen et al., 2006), this study found that children in the CWS are exposed at even higher rates than previously documented. In fact, children were exposed to IPV in both waves at more than double the rate that has been found with other CWS samples (35-45%) (Casanueva et al., 2013; Hazen et al., 2006). It is possible that the higher rates found in this study are

a result of the way IPV exposure was measured. This study uses the child as the main informant of his/her IPV exposure, whereas the majority of other studies on child welfare populations use the mother, or main caregiver, as the sole informant (e.g., Casanueva et al., 2008; Casanueva et al., 2013; Edleson, 1999; Hazen et al., 2006). It is possible that mothers underestimate the degree to which children are exposed to IPV (Jaffe et al., 1990) and overestimate their children's overall functioning (Koverola et al., 2005). The high rates of exposure found in this study indicate that the vast majority of children investigated by CPS for alleged child abuse and/or neglect who remain in their parents' care live in homes with IPV. These children are not only exposed to multiple adversities, including IPV and child maltreatment, but many are also experiencing psychological problems including depression and trauma potentially as a result of the exposure.

The high rates of IPV exposure and subsequent trauma and depression among children in the sample highlight the importance of effective screening and identification of IPV in families involved with the CWS. Over the past decade, a number of child welfare policy groups have issued recommendations to routinely screen and assess for IPV exposure among children referred to CPS. Recommendations have also been made to increase training for caseworkers to assess and identify IPV among families (Casanueva et al., 2014; National Association of Public Child Welfare Administrators, 2001; National Council of Juvenile and Family Court Judges, 1999). Federally, the U.S. Department of Health and Human Services recommends that assessment for IPV occurs in the initial screening process for every child abuse or neglect investigation (Bragg, 2003). Findings from the current study support these recommendations, and further suggest that IPV exposure should be assessed at regular contact points within the CPS

process. Because rates of IPV exposure were consistently high in Wave 2, well after the initial CPS investigation (18 months post Wave 1), it is recommended that caseworkers regularly screen for IPV. If IPV presence is confirmed in a home, caseworkers should determine whether the child was exposed, the frequency and severity of the exposure and other potential child and caregiver risk factors.

Child welfare workers should receive training in identifying IPV. Existing research shows that caseworkers often under-identify IPV. Using data from the first cohort of the National Survey of Child and Adolescent Wellbeing (NSCAW) I, Kohl, Barth, Hazen and Landsverk (2005) found that 31% of caregivers involved with the CWS reported experiencing IPV, but caseworkers identified this violence in only 12% of those families. Furthermore, Casanueva and colleagues (2014) found no significant changes in the past decade (from NSCAW I in 2000 to NSCAW II in 2009) in caseworkers' identification of active IPV among mothers of children investigated by CWS who are victims of IPV. In their research, caseworkers under-identified active IPV in about two-thirds of cases (Casanueva et al., 2014). Given high rates of IPV exposure among children in our sample, the under-identification of IPV in the CWS reported by other studies (Casanueva et al., 2014), and the pivotal role caseworkers can play in linking children with trauma-informed mental health treatment, additional training may be needed for CPS caseworkers that focuses on identifying and assessing the nature of IPV exposure among children (Kohl et al., 2005).

This study also found that greater IPV frequency and severity were predictive of trauma and depression over time. These findings are consistent with previous research on samples of school-aged children in the general population (English et al., 2005) and of

children placed in OOH care (Garrido et al., 2011), and suggest that the number of occurrences of IPV exposure also impact the development of trauma and depression among children in the CWS who remain in their parents' care. Additionally, this study found that the severity of IPV exposure was a risk factor for trauma and depression among children in the CWS. Interestingly, minor IPV exposure, such as seeing an adult push another adult, seeing an adult throw something or push/shove another person, was not a significant predictor of trauma or depression. However, the most severe forms of IPV exposure, including seeing an adult use a knife or gun, or punch another adult, were related to an increase in trauma and depression symptoms across time.

These findings stress the need for caseworkers to move beyond screening for IPV presence. Instead, caseworkers need to assess the frequency and severity of IPV exposure among children who come into contact with the CWS. A multidimensional assessment, which considers the severity and frequency of IPV exposure among children, as well as other caregiver and child risk factors that may exacerbate negative outcomes, should be conducted at every CPS investigation to inform case planning and treatment. This is critical, especially considering that many states are now treating IPV exposure as child maltreatment in the form of child neglect, i.e., 'failure to protect', even when it does not co-occur with direct victimization and possibly without attention to its severity or frequency (Goodmark, 2010). Because minor forms of IPV exposure may not negatively affect a child's psychological development, as documented in this study, blanket policies that classify IPV exposure as maltreatment without regard to severity, frequency or chronicity could be detrimental, potentially bringing more children into a system that may be unequipped to handle their needs (Edleson, 1999).

Instead, a modulated response, which factors in the severity and frequency of exposure as well other factors specific to a child (developmental period, other maltreatment experiences), such as differential response (DR), may be more appropriate for children exposed to IPV. Under DR, families referred to CPS for alleged abuse and/or neglect receive a traditional investigation or an alternative assessment response (Child Welfare Information Getaway, 2014). When IPV is present, this response could include alternatives to traditional CPS investigation, such as referrals to trauma-informed mental health treatment for children and/or domestic violence services for caregivers. Moving beyond a one-system type of response may be critical for children exposed to IPV, considering that those exposed to less frequent and severe types may not benefit from traditional CPS investigation. Although it is important for caseworkers to assess the frequency and severity of IPV exposure among children in the CWS and to respond accordingly, this requires a level of sensitivity on the caseworkers part. Children may be reluctant to disclose IPV to caseworkers in fear that they will be removed from their home, particularly if IPV occurs in great severity and frequency. Caseworkers must be aware of the sensitivity surrounding this issue when screening for IPV exposure among children in the CWS.

Lastly, this study found several control variables to be significant in predicting trauma and depression among children in the CWS. Child age was negatively related to trauma symptoms over time. Children who had past histories of sexual abuse compared to those without histories of sexual abuse, and those with caregivers who had less than a high school education had significantly more trauma symptoms. Additionally, children with caregivers who were depressed were more likely to have higher depression scores

than children with non-depressed caregivers. These findings suggest that both children and caregivers' risk factors should be examined during CPS investigation (potentially using a proper risk assessment tool) and addressed in case plans along with IPV exposure using a non-traditional alternative response. For example, caseworkers can refer children with sexual abuse histories to appropriate trauma-informed counseling and link caregivers who have depression to proper mental health treatment. Overall, caseworkers should work to facilitate the healthy development of children in care by providing trauma-informed treatment approaches, which address the needs of families in the CWS.

Limitations

The study findings should be viewed within the context of the following limitations. First, the way in which IPV was defined and measured was imperfect. Children's exposure to IPV in the home was measured using the VEX-R, a child self-report standardized measure (Fox & Leavitt, 1995). This measure asks children to describe the frequency of their exposure to adult-on-adult violence within the home. It is possible that this adult-on-adult violence may extend beyond violence between a caregiver and his/her romantic partner to include non-romantically involved family members or non-family visitors to the home. This could be the reason our study found higher rates of IPV exposure than other previous studies of children in the CWS. However, it should be noted that this study adds to existing literature by using the child as a main and sole informant of his/her exposure to IPV, as other studies only use the mother's report of her IPV experiences.

Second, this study found that only a small percentage of caregivers had an alcohol (4%) or drug problem (2%) in both Waves 1 and 2. This is surprising given existing

literature that documents higher rates of substance and alcohol use among caregivers who retained custody of their children following CPS investigation (~6-35%) (Gibbons, Barth, & Martin, 2005; Jones, 2005; Libby et al., 2006). The lower than anticipated rates found in this study may be attributable in part to the fact that the AUDIT (Babor et al., 2001) and DAST-20 (Skinner, 1982), which measured alcohol and substance dependence in this study, are a narrower category than alcohol/substance abuse. Additionally, the measurements were limited to the prior 12 months as opposed to lifetime use/dependence. It is also possible that caregivers were reluctant to disclose alcohol and/or illicit drug use, even to researchers, in fear that their children would be removed from their care. In fact, other studies utilizing CWS samples have found that caregivers report less alcohol and substance use than what is documented by CPS caseworkers (Gibbons et al., 2005).

Lastly, because multilevel modeling was the analytic approach for the current study, data from Waves 1 and 2 was used for all variables, even ones that were time invariant, such as child race/ethnicity or gender. Although theoretically child race/ethnicity should not vary across time, analysis revealed that some respondents answered differently across waves, which could bias results. For example, a small percentage of children identified by caregivers as non-Hispanic white (2%, $n = 8$) in Wave 1 were not identified as non-Hispanic white by caregivers in Wave 2. Similarly, 4% children ($n = 8$) identified by caregivers as African American in Wave 1 were not identified as African American by caregivers in Wave 2. Larger discrepancies were seen with Hispanic and other race children. Thirty percent ($n = 22$) of children identified by caregivers as other race in Wave 1 were identified as non-Hispanic white in Wave 2. The

same trend was seen with Hispanic children, where 18% (n = 37) of children identified by caregivers as Hispanic in Wave 1 were reported to be non-Hispanic white in Wave 2.

Conclusion

Despite the aforementioned limitations, the current study extends the existing research on childhood exposure to IPV. It is the first study to date to examine the long-term, differential effect of IPV frequency and severity on children's trauma and depression, utilizing a nationally representative sample of children in the CWS. This study found that IPV frequency predicted greater trauma and depression over time. Additionally, severe IPV exposure, but not minor, was related to greater psychological problems. These findings highlight the need for CPS caseworkers to examine the frequency and severity of IPV exposure among all children in the CWS upon initial investigation. Traditional CPS investigation and assessment may not be relevant for children exposed to multiple traumas in the CWS, including those exposed to IPV. Other types of non-traditional intervention, such as differential response, which may include linking children to mental health services and addressing caregivers' needs, provide an alternative for children exposed to IPV in the CWS.

CHAPTER THREE: MANUSCRIPT 2

RACIAL/ETHNIC DIFFERENCES IN PREDICTORS OF POSTTRAUMATIC STRESS SYMPTOMS AMONG CHILDREN EXPOSED TO INTIMATE PARTNER VIOLENCE (IPV): EVIDENCE FROM A NATIONALLY REPRESENTATIVE CHILD WELFARE SAMPLE

Abstract

Exposure to intimate partner violence (IPV) in childhood is related to the development of Post Traumatic Stress Disorder (PTSD) symptoms. Preliminary research suggests that white children exposed to IPV in the general population are more likely to experience PTSD symptoms than African American children; however, few studies consider racial/ethnic differences in outcomes of IPV-exposed children, especially among children in the child welfare system (CWS). This study extends existing literature by examining whether race/ethnicity moderates the relationship between IPV exposure and trauma symptoms, and whether differential predictors of trauma exist for white and minority children exposed to IPV utilizing a nationally representative sample of children investigated for child abuse and/or neglect (n = 784). Multivariate regression revealed that child race/ethnicity did not moderate the relationship between IPV exposure and trauma, although differential predictors of trauma emerged by child race/ethnicity. White children's trauma was predicted by caregiver's depression, while African American and Hispanic children's trauma was predicted by community-level factors, such as neighborhood quality and poverty. These findings suggest that child race/ethnicity may be an important factor to consider when designing and implementing interventions for abused and neglected children exposed to IPV in the CWS.

Introduction

It is estimated that approximately 3 to 10 million U.S. children are exposed to adult-on-adult partner violence, referred to as intimate partner violence (IPV) each year in the U.S. (Straus, Gelles, & Steinmetz, 1980; Straus, 1992). This exposure can be direct such as witnessing one parent assault the other parent, or indirect such as hearing one parent threaten the other (Edleson, 1999). Data from the National Survey of Children's Exposure to Violence (NatSCEV) conducted in 2008, the most comprehensive nationwide survey of the incidence and prevalence of children's IPV exposure to date, found that 16% of children ages 17 and younger were exposed to physical assault between caregivers in their lifetime with 7% exposed in the past year (Finkelhor et al., 2009; Hamby et al., 2011). Moreover, children are often not spared from exposure to the most severe forms of IPV, such as witnessing a parent being choked, burned or threatened with a knife (Hazen et al., 2006; McDonald et al., 2006). High rates of IPV exposure among children are concerning, considering IPV exposure has been associated with psychological, behavioral, social and emotional problems in childhood (Holt et al., 2008; Kitzmann et al., 2003; Wolfe et al., 2003), which may persist well into adulthood (Evans et al., 2008).

Extant research suggests that exposure to IPV is experienced even more frequently by children in the Child Welfare System (CWS) than children in the general population (Hazen et al., 2006; Casanueva et al., 2013). The prevalence of IPV in households involved with Child Protective Services (CPS) may be six-fold higher than in households not involved with CPS, with a third of caregivers investigated for child abuse and/or neglect reporting that they have experienced IPV during the previous 12 months

(Casanueva, et al, 2008). Other studies of children in the CWS also confirm high rates of IPV exposure and report exposure rates ranging from 30-45% (Casanueva et al., 2013; Edleson, 1999; Hazen et al., 2006). Additionally, high rates of co-occurrence between exposure to IPV and other types of child maltreatment, such as physical abuse of children, suggest that IPV rarely occurs in isolation (Appel & Holden, 1998; Beeman et al., 2001; Osofsky, 2003), particularly among children in the CWS (Casanueva, Martin, & Runyan, 2009). Despite this, exposure to IPV among children in the CWS is relatively understudied, especially with respect to its effect on child outcomes.

Children involved with the CWS are an important population to examine because they represent a particularly vulnerable group, often experiencing multiple types of traumatic events. Not only are they exposed to high rates of IPV (Casanueva et al., 2008; Casanueva et al., 2013; Hazen et al., 2006), but they also experience physical abuse and other maltreatment by caregivers (Font & Maguire-Jack, 2013), and are often exposed to high rates of violence in their communities (U.S. Department of Health and Human Services, 2012). Not surprisingly, they are at a heightened risk for psychological problems (Casanueva et al., 2012) and poor school outcomes (Pecora et al., 2006; Stone, 2007). Given the policy trend toward treating IPV exposure as child maltreatment in some states, even when it does not co-occur with direct victimization (see Edleson et al., 2006; Goodmark, 2010; Jaffe et al., 2003), it is important to understand if IPV exposure has a significant negative impact among children in the CWS over and above experiencing child abuse and/or neglect alone. Furthermore, it is critical in terms of practice and intervention implications to understand how IPV exposure impacts children of varying racial/ethnic groups, and whether different risk factors exist for the

development of trauma among minority children and white children in the CWS. Racial/ethnic differences are important to examine in the general population, but may be even more so in the CWS due to high rates of racial disproportionality (Fluke, Yuan, Hedderson, & Curtis, 2003). The present study seeks to increase our understanding of the effects of IPV exposure on the development of trauma symptoms among a diverse racial/ethnic group of children referred to CPS for alleged child abuse and/or neglect. It also examines whether differential predictors of trauma exist for minority and white children exposed to IPV in the CWS.

Background

Children exposed to IPV often experience a range of developmental consequences including psychological, behavioral, social, academic and cognitive difficulties (Evans et al., 2008; Holt et al., 2008). Kitzmann and colleagues' (2003) meta-analysis of 118 studies found that IPV-exposed children had poorer internalizing, externalizing, psychological, social and academic problems compared to non-exposed children (Kitzmann et al., 2003). Wolfe and colleagues' (2003) meta-analysis also found that IPV exposure was related to emotional and behavior problems among children aged 4 to 14 years, albeit at a smaller overall effect size (Wolfe et al., 2003).

Children exposed to IPV are at a heightened risk for developing trauma symptomatology (Saltzman, Holden, & Holahan, 2005) and being diagnosed with Post Traumatic Stress Disorder (PTSD) (Chemtob & Carlson, 2004; Rossman & Ho, 2000). Saltzman and colleagues (2005) found that IPV-exposed children often exhibit a different physiological presentation with higher heart rates and cortisol levels than non-exposed children. They hypothesize that such physiological elevations reflect a chronic state of

hypervigilance increasing children's vulnerability to psychological problems (Saltzman et al., 2005). In fact, children exposed to IPV are more likely to be diagnosed with PTSD than non-exposed children. Although studies report varying rates of PTSD diagnoses among IPV-exposed children, with estimates ranging from 15-60% (Chemtob & Carlson, 2004; Graham-Bermann et al., 2006; Graham-Bermann & Levendosky, 1998; Lehmann, 1997; McCloskey & Walker, 2000), diagnosis rates are substantially higher for IPV-exposed children than for school-aged children and adolescents in the general population (4 - 7%) (Kilpatrick et al., 2003).

Similar to what has been documented with community samples of IPV-exposed children, research utilizing samples of children in the CWS find that IPV exposure is associated with the development of traumatic stress symptoms (Campbell et al., 2013; Hazen et al., 2006; Kolko et al., 2010). Furthermore, preliminary research suggests that children in the CWS exposed to IPV exhibit higher rates of PTSD than children in the general population (Campbell et al., 2013; Kolko et al., 2010). For example, data from the first cohort of the National Survey of Child and Adolescent Well-Being (NSCAW I) found that 11.7% of children met criteria for clinically significant trauma (Kolko et al., 2010). Another study of children involved in the CWS found that 19% of IPV-exposed children exhibited internalizing behavior symptoms, including depression and trauma symptoms (Campbell et al., 2013).

Importantly, not all children exposed to IPV exhibit trauma symptoms or meet diagnostic criteria for PTSD. Differences in prevalence rates may be due to the use of varying samples of IPV-exposed children, with children coming from shelter populations experiencing higher rates of PTSD (Lehmann, 1997) than children living in community

settings (Graham-Bermann & Levendosky, 1998). The frequency and severity of the IPV exposure may also influence outcomes for children exposed to IPV. Greater internalizing and externalizing behavioral problems have been found for children in the general population exposed to physical rather than verbal IPV (Kitzmann et al., 2003), as well as those exposed to IPV involving knives and guns rather than IPV without weapons (Jouriles et al., 1998). DeJonge and colleagues (2011) found that children who directly witnessed IPV had greater externalizing problems than children who did not directly witness but lived in homes where IPV was present. In the only study using a CWS sample to consider these factors, Garrido and colleagues (2011) found that a combination of IPV frequency, proximity and severity was related to psychosocial problems over and above IPV occurrence alone. However, this study was restricted to a small sample of youth in out-of-home (OOH) care in one state, and did not explore racial/ethnic differences in outcomes among the IPV-exposed children (Garrido et al., 2011). As such, no studies to date have utilized a nationally representative sample of children in the CWS to examine the severity or frequency of IPV exposure on adjustment, particularly in respect to the development of trauma symptoms.

Moderating Impact of Race/Ethnicity

There is preliminary evidence to suggest that child race/ethnicity may also influence outcomes for children exposed to IPV from non-child welfare samples. Graham-Bermann and colleagues (2006) found that white children in the general population were more likely to meet criteria for PTSD following IPV exposure, and had greater re-experiencing, avoidance/numbing and arousal symptoms than African American children exposed to IPV. Similarly, O'Keefe (1994) found that white children

develop more externalizing, but not internalizing, problems from IPV exposure than African American or Hispanic children. However, Grych and colleagues' (2000) study of 228 IPV-exposed children residing in battered women's shelters found no discernable differences in profiles of adjustment, including internalizing disorders, among African American, Hispanic and white children. It is unknown whether racial/ethnic differences are more likely to exist among children in the general population exposed to IPV than children living in domestic violence shelters, and whether these racial/ethnic differences would emerge for children exposed to IPV in the CWS.

It is unclear why some research documents that African American and Hispanic children are less likely to develop internalizing and externalizing disorders than white children following IPV exposure. Some researchers hypothesize that white children may be more dependent on their mothers and/or more isolated from other adults than minority children, and thus are more impacted by their mother's mental state (Graham-Bermann et al., 2006), which may be compromised by partner abuse (Gleason, 1993; Golding, 1999). This hypothesis follows other studies that document a heightened risk for psychological and emotional problems among IPV-exposed children with depressed caregivers (Gerwitz et al., 2011; Graham-Bermann, Gruber, Howell, & Girz, 2009). In support of this theory, the only study that has examined whether different pathways exist for the development of trauma symptoms in white and African American children exposed to IPV found that mother's depression was the strongest, significant predictor of children's level of traumatic stress for white children. Although mother's depression was a significant predictor of trauma among African American children exposed to IPV, the effect was not as strong (Graham-Bermann et al., 2006).

Additionally, this study found that family income and amount of witnessed violence were significant predictors of traumatic stress among African American children exposed to IPV, but not for white children exposed to IPV (Graham-Bermann et al., 2006). It is unclear why African American children's trauma symptoms would be highly associated with family income and amount of IPV exposure. Research shows that African American and Hispanic children's neighborhoods are disproportionately impoverished (Gerwitz et al., 2011) and, on average, contain more threats to optimal child development than white children's neighborhoods (Graham-Bermann et al., 2006). It could be, as speculated by Graham-Bermann et al. (2006), that minority children are more often exposed to trauma in the form of community violence, arrests and possibly racism which, when combined with poor neighborhood context, may heighten the effects of IPV exposure. Future studies that include measures of these potentially confounding factors are needed to determine what may be accounting for these differences, and to examine whether similar racial/ethnic patterns would emerge with children in the CWS.

Current Study

Guided by the empirical work of Graham-Bermann and colleagues (2006), this study seeks to explore racial/ethnic differences in trauma symptoms among children exposed to IPV in the CWS. Only a few studies have examined racial/ethnic outcome differences among children exposed to IPV; however these have been conducted with small samples of children residing in battered women's shelters (i.e., Grych et al., 2000; O'Keefe, 1994) and children in the general population (i.e., Graham-Bermann et al., 2006). No studies to date have explored racial/ethnic differences in trauma among children involved with the CWS. As such, we know little about the risk factors that tend

to exacerbate the effects of exposure to IPV among children in the CWS, or whether these vary by child race/ethnicity. Research is needed among children in the CWS given their high rates of IPV exposure (Casanueva et al., 2013; see also Manuscript #1, above), their heightened risk for developing trauma symptomatology (Campbell et al., 2013), and especially considering the disproportionate representation of certain racial/ethnic groups, particularly African Americans, in the CWS (McRoy, 2005). This gap in the literature may stem from the fact that large research samples are needed in order to have sufficient statistical power to detect potential differences in the racial/ethnic impact of IPV exposure on children (Graham-Bermann et al., 2006). This study intends to fill this gap by utilizing a large, nationally representative sample (n = 784) of children exposed to IPV in the CWS. The current study also examines the effect of IPV frequency and severity on children's trauma symptoms. It seeks to answer the following research questions:

1) Do rates of trauma vary by child race/ethnicity for children in the CWS?
2) Does child race/ethnicity moderate the relationship between exposure to IPV and children's trauma symptoms for children in the CWS?
3) Are there differential predictors of trauma for minority children (African American and Hispanic children) in the CWS exposed to IPV than for white children in the CWS exposed to IPV?

To assess these research questions, the proposed model will be tested three times. First, the total sample will be analyzed using predictors of IPV frequency and severity. Then, the total sample will be analyzed with interactions of race/ethnicity by IPV frequency and severity. Finally, separate within-group analyses will be undertaken only

for children exposed to IPV by child race/ethnicity (white, African American and Hispanic).

It is hypothesized that white children will have greater trauma symptoms than African American and Hispanic children. It is also hypothesized that child race/ethnicity will moderate the relationship between exposure to IPV and children's trauma symptoms. Specifically, the author posits that the relationship between frequent IPV exposure and trauma will be stronger for white children than for minority children (African American and Hispanic). It is further anticipated that the relationship between severe IPV exposure and trauma will be also stronger for white children than for minority children (African American and Hispanic). Consistent with Graham-Bermann and colleagues' (2006) findings, it is hypothesized that the mother's mental state will be a stronger predictor of trauma symptoms for white children in the CWS exposed to IPV than for minority children in the CWS exposed to IPV (African American and Hispanic). It is also expected that community-level factors (i.e., neighborhood quality, poverty level) will predict trauma symptoms among IPV-exposed minority children (African American and Hispanic), but not among IPV-exposed white children.

Methods

Sample Design

Secondary data analysis was conducted using data from Wave 2 of the second National Survey of Child and Adolescent Well-Being (NSCAW II). NSCAW II is a nationally representative, longitudinal study designed to assess the functioning, needs and service use of children who come into contact with the U.S. CWS. The target population for NSCAW II includes all children in the U.S. who were subjects of child abuse or

neglect investigations conducted by CPS between February 2008 and April 2009 (Dowd et al., 2012). NSCAW II employed a two-stage stratified sampling design built on the sampling frame used in NSCAW I. For the first stage, the U.S. was divided into nine sampling strata. Eight of the strata corresponded to the eight states with the largest child welfare caseloads, and the ninth stratum consisted of the remaining 38 states and the District of Columbia. Within the nine strata, primary sampling units (PSUs) were formed. PSUs were defined as geographic areas containing a population served by a single CPS agency. These PSUs, which in most cases corresponded to a single county, served as the basis from which a sample of children was drawn. A total of 86 PSUs were used in NSCAW II, representing 81 counties in 30 states. Children who fit the general target population criteria, (i.e., were subjects of a CPS investigation during the study period) and who had not been part of the NSCAW I study or had a sibling in the study, were randomly sampled from the PSUs for participation in NSCAW II (Dowd et al., 2012).

NSCAW II's sample includes 5,872 children ranging in age from birth to 17.5 years old whose parents were investigated by CPS for a case of child abuse and/or neglect during the study investigation period. Both infants and children in OOH placement were oversampled to obtain a representative sample of these two high-risk groups (Dowd et al., 2012).

Data Collection Methods

Data collection occurred across three time-points over the course of four years. Baseline interviews (Wave 1) were conducted over 15 months beginning in March 2008 and ending in September 2009. Children, adult caregivers (i.e., birth and adoptive

parents, foster parents, kin caregivers and group home supervisors) and CPS caseworkers were interviewed or assessed face-to-face by trained research staff. Wave 2 interviews occurred 18 months after the close of the baseline investigation beginning in October 2009 and ending in January 2011. Follow-up interviews (Wave 3) occurred approximately 36 months after the close of the baseline investigation beginning in June 2011 and ending in December 2012. Waves 2 and 3 data collection procedures mirrored those used in Wave 1.

Participants

This study assesses the moderating effect of race/ethnicity on the relationship between exposure to IPV and children's trauma symptoms using data from Wave 2 of NSCAW II. The Violence Exposure Scale for Children (VEX-R), which measured IPV exposure in the study, was administered to children eight years of age and older. Therefore, the sample for this study was restricted from the complete NSCAW II sample (N = 5,872) to include children older than eight years of age who had complete IPV data (n = 1,134). The VEX-R scale asks children to report on violence witnessed between two adults in a home they currently live in. Because there was no way to know whether the violence reported by the child occurred in the birth family home or foster home, and because witnessing violence between foster parents might affect children differently than witnessing violence between caregivers, children in OOH placement (i.e., kinship care, foster care, a group home setting) at Wave 2 were also excluded (n = 827). Finally, the sample was further redacted to include only children in the three largest racial/ethnic groups: 1) non-Hispanic white, 2) African American, and 3) Hispanic. Children classified as non-Hispanic other race (n = 43) were removed because they constituted too

small a sub-sample for reliable analysis. Application of these criteria yielded a final analytic sample of 784 children.

To test the third research question regarding whether differential predictors of trauma exist among IPV-exposed children by racial/ethnic group, analysis was conducted on a subsample of the 784 children. Children who were exposed to IPV in the study with complete race data were included (n = 629) (n = 325 for non-Hispanic white children, n = 179 for African American children, n = 125 for Hispanic children).

A power analysis was conducted using Optimal Design Software Version 3.0 (Raudenbush et al., 2011) to confirm that the analytic sample in this study was sufficient to detect a small effect size as outlined by Cohen (1988). Common assumptions of the power analysis include the level of statistical significance at .05, the statistical power to detect an effect at .80 and Cohen's d effect size of .45 (Cohen, 1988). Power analysis revealed that a minimum sample size of 99 must be utilized to achieve correct power on a cross sectional analysis with 19 predictors.

Measures

Exposure to IPV. Children's exposure to violent events in the home was measured using the Violence Exposure Scale for Children (VEX-R) (Fox & Leavitt, 1995). VEX-R is a 23-item child self-report measure administered to children eight years of age and older to assess children's frequency of exposure to mild and severe violent acts in their home. The VEX-R is comprised of 2 subscales: 1) the witnessing subscale (12 items) and 2) the victimization subscale (11 items). To measure IPV exposure in the current study, the witnessing subscale of the VEX-R was used. Children were asked to describe the frequency of their exposure to mild violence (six items) (e.g., seen an adult

push or shove another person, seen an adult throw something at another person, seen an adult slap another person), and severe violence (six items) (e.g., seen an adult point a knife or gun at another person, seen an adult stab another person) on a 4-point scale (*1* = 'never,' *2* = 'one time,' *3* = 'a few times,' *4* = 'lots of times'). The VEX-R demonstrated good internal consistency with the current sample for the mild violence (α = 0.83) and severe violence subscales (α = 0.75).

Two variables were created to assess IPV exposure for the current study: 1) IPV frequency and 2) IPV severity. To measure IPV frequency, response options for the 12 items of 'never,' 'one time,' 'a few times,' and 'lots of times' (*1, 2, 3, 4*) were recoded (0, 1, 2, 3) and summed, with higher scale scores indicating greater frequency of exposure (theoretical range 0-36). A categorical variable was created to measure IPV severity. Children who reported no mild or severe violence exposure were coded as 0; children who reported at least one mild exposure but no severe exposure were coded as 1; children who reported at least one severe exposure were coded as 2. Categories were mutually exclusive; children who reported severe and mild exposure were included in the severe category only.

Trauma. Children's trauma scores were measured using the Post-Traumatic Stress (PTS) subscale (ten items) of the Trauma Symptom Checklist for Children (TSCC; Briere, 1996). The TSCC was administered to children eight years and older to assess distress and trauma related symptoms. Children were asked to indicate how often they experienced ten items (e.g., intrusive thoughts of painful events, nightmares, fears, cognitive avoidance of painful feelings) using a 4-point scale (*0* = 'never,' *1*= 'sometimes,' *2* = 'lots of times,' *3* = 'almost all the time'). Items of the raw score were

summed and used in the analytic models, with higher scores reflecting greater presence of trauma symptoms. Clinically significant trauma was calculated for descriptive purposes. Clinically significant trauma was indicated by a T-score of 65 or higher on the standardized scale. This equated to the 90th percentile and above for the age and gender group (National Data Archive on Child Abuse and Neglect (NDACAN), 2011). The PTS scale demonstrated high internal consistency for the current sample (α = 0.84).

Control variables. This study controlled for child (i.e., age, gender, previous maltreatment), caregiver (i.e., age, education, depression, alcohol/drug problem), and community (i.e., poverty, neighborhood quality) risk factors that previous research suggests are highly correlated with IPV exposure and trauma (Finkelhor et al., 2009; Gerwitz et al., 2011; Graham-Bermann et al., 2009; Holmes, 2013a; McIntosh, 2003; Skopp et al., 2007; Sorenson et al., 1996; Sternberg et al. 2006). Child, caregiver and community predictors are important to consider because they can directly affect children's trauma symptoms, or exacerbate the IPV experience and lead to greater difficulties. All control variables are measured at Wave 2.

Child demographics. Child variables as reported by current caregivers included age, gender and race/ethnicity. NSCAW researchers coded child race/ethnicity into four groups: 1) non-Hispanic white, 2) non-Hispanic African American, 3) Hispanic and 4) non-Hispanic other race.

Previous child maltreatment. The psychological-aggression, physical assault, child neglect and sexual abuse subscales of the Parent-Child Conflict Tactics Scales (CTS-PC) were used to measure previous child maltreatment (Straus et al., 1998). Current caregivers rated the extent to which they engaged in certain parenting practices

with the child on an 8-point Likert scale over the past 12 months ('1 time,' '2 times,' '3 to 5 times,' '6 to 10 times,' '11 to 20 times,' 'more than 20 times,' 'not in the past 12 months but it has happened before,' and 'never'). For psychological aggression, caregivers reported how often they engaged in five parenting practices (e.g., shouted, yelled or screamed at child, cursed at child, threatened to have child sent away), and for physical assault, caregivers reported how often they engaged in 13 parenting practices (e.g., beat child, choked child, punched or kicked child). For child neglect, caregivers reported how often they engaged in five items (e.g., leaving child home alone, not providing child with food, not providing medical care). For sexual abuse, caregivers reported how often their child experienced four items (e.g., been forced to have sex with an adult or older child, been touched in a sexual way by an adult or older child). Dichotomous variables were created to indicate children who had experienced psychological abuse, physical abuse, sexual abuse and child neglect in their lifetimes. Children were considered to have experienced previous maltreatment if caregivers selected '1 time,' '2 times,' '3-5 times,' '6-10 times,' '11-20 times,' 'more than 20 times,' or 'not in the past 12 months but it has happened before' for at least one item on each respective subscale (coded as 1). If caregivers selected 'never' children were not considered to have experienced previous maltreatment and were coded as 0. The CTS-PC has demonstrated good internal consistency with the NSCAW I study (α = 0.92) (NDACAN, 2011), with Cornbach's alphas ranging from 0.97 for the psychological aggression subscale, 0.99 for the physical abuse subscale, 0.99 for the neglect subscale and 0.99 for the sexual abuse subscale for the current sample.

Caregiver demographics. Current caregivers reported their age and education level. Caregivers also reported their highest level of education completed (less than high school degree, high school degree or GED, more than high school degree).

Caregiver depression. Current caregiver depression was measured using the Composite International Diagnostic Interview Short Form (CIDI-SF) scale (Kessler et al., 1998). The CIDI-SF provides major depressive diagnoses based on criteria established in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (Kessler et al., 1998). Per recommendations of the manual, caregivers who endorsed three or more of seven possible symptoms (e.g., losing interest in pleasurable activities, trouble with sleep, change in weight, thoughts about death) of a major depressive episode in the past 12 months were classified as depressed (coded as 1). Caregivers who experienced less than three symptoms were considered non-depressed (coded as 0). The CIDI has demonstrated good psychometric properties among high-risk populations, including good to excellent test-retest and interrater reliability (Wittchen, 1994) and concordance with clinical diagnoses (Janca et al., 1992). The CIDI has also demonstrated high levels of reliability in different settings and cultures, and is considered appropriate for use among racial/ethnic minorities (Robins et al., 1988; Wittchen, 1994).

Caregiver alcohol/drug problem. The Alcohol Use Disorders Identification Test (AUDIT) developed by the World Health Organization was used to measure the presence of an alcohol problem in caregivers in the previous 12 months (Babor et al. 2001). The AUDIT is a ten-item measure designed to quickly screen for excessive drinking and alcohol problems. Current caregivers were asked to rank the frequency of ten items (e.g., having six or more drinks in one setting, experiencing blackouts, feeling guilty after

drinking) on a 4-point scale. Per recommendations of the manual, a score of eight or higher distinguishes caregivers who may have an alcohol problem (coded as 1) from those with no evidence of an alcohol problem in the past year (coded as 0) (Babor et al., 2001; NDACAN, 2011). The Drug Abuse Screening Test (DAST-20) was used to assess the presence of a drug problem in current caregivers (Skinner, 1982). The DAST-20 is a 20-item measure intended to identify individuals with drug dependence. Caregivers were asked to report on the extent of using drugs in the past 12 months (e.g., abused prescription drugs, neglect family due to drug use, lost a job due to drug use) with a "yes" or "no" response. Per recommendations of the manual, a cutoff score of six or greater was used to distinguish caregivers with drug dependence (coded as 1) from those without a drug problem in the study (coded as 0) (Skinner, 1982). DAST-20 scores are highly correlated with DSM-IV diagnoses of drug dependence (NDACAN, 2011).

Poverty level. Caregivers were asked to report on their total household income in the past 12 months and the number of household members. The household poverty rate was calculated by NSCAW researchers based on U.S. Department of Health and Human Services poverty guidelines for 2009 and 2010 (NDACAN, 2011). Household poverty rate was coded into four groups: *1* = '<50% Federal Poverty Level (FPL),' *2* = '50% - <100% FPL,' *3* = '100% - 200% FPL,' *4* = '>200% FPL.'

Neighborhood quality. Neighborhood quality was assessed using the community environment scale adapted from the Philadelphia Family Management Study, Parent Interview Schedule (Furstenburg, 1990). The scale consists of nine items designed to measure community environment and perceived neighborhood safety. In the first five questions, caregivers were asked to rate the extent to which the following are a problem

in their neighborhood: assaults and muggings, delinquent/drug gangs, open drug use and dealing, unsupervised children and adolescents hanging out in public places on a 3-point scale (*1* = 'not a problem,' *2* = 'somewhat of a problem,' *3* = 'a big problem'). The last four questions ask current caregivers to report on perceived neighborhood safety/quality (e.g., how safe the neighborhood is compared to other neighborhoods, support provided by neighbors, parental involvement with children) on a 3-point scale. Responses to the items were summed and averaged per recommendations of the manual, with higher scores reflecting poorer perceived neighborhood quality and safety. The community environment scale demonstrates high internal consistency for the current subsample (α = 0.93).

Data Analysis

Analysis weights. All analyses in the current study were conducted with weighted data to account for NSCAW's complex sampling design. Analysis weights were constructed in stages by NSCAW research staff, first accounting for probability of county selection and then accounting for probability of child selection within a county (Biemer, et al., 2008). Weights were further adjusted to compensate for nonresponse and under-coverage (Biemer et al., 2008).

Missing data. Multiple imputation was used to address missing data. Twelve percent of children in the analytic sample had at least one missing value on study variables. Since other methods of handling missing data such as list-wise deletion or setting missing values to the mean are associated with a risk of bias (Croy & Novins, 2005), missing data was imputed using Royston's (2005) method of multiple imputation by chained equations (ICE). ICE uses an iterative regression switching procedure to

estimate missing values. Under ICE, incomplete variables are estimated using observed values in the predictive model. Incomplete continuous variables are estimated using linear regression and incomplete categorical or dichotomous variables are estimated using logistic regression (Royston, 2005).

The dependent variable (trauma scores) had no missing values. The variable with the most missing data was caregiver depression which had 97 missing cases, followed by caregiver drug problem with 71 missing cases and child race/ethnicity with 51 missing cases. Other variables had low rates of missing data (e.g., neighborhood quality and caregiver age had < 1% missing). Five fully imputed datasets were created using ICE. Analyses were performed separately for each imputed data set and coefficients and standard errors were automatically averaged using Stata's 'Mi Estimate' commands (StataCorp, 2013).

Statistical model. All analyses were cross-sectional and conducted with data from Wave 2 of NSCAW II. Descriptive statistics were conducted to examine demographics for the study population. Pearson correlations were conducted to measure correlations between all study variables. To examine racial/ethnic differences in rates of IPV frequency and trauma symptoms, two one-way analysis of variance (ANOVA) tests were conducted. The first ANOVA examined between group differences in IPV frequency by child race/ethnicity and the second ANOVA examined between group differences in trauma scores by child race/ethnicity.

To test the second research question regarding whether child race/ethnicity moderates the relationship between exposure to IPV and children's trauma symptoms, multivariate regression was conducted on the total analytic sample (n = 784). The first

model included a regression of IPV exposure (measured in frequency and severity) on trauma symptoms. The second model added interactions of IPV exposure and child race/ethnicity to the model.

To test the third research question regarding differential predictors of trauma among minority (African American and Hispanic) and white children exposed to IPV, three separate analyses were conducted for each of these racial/ethnic groups drawn from the subsample of children exposed to IPV with race data (n = 629). Specifically, three multivariate regressions were examined:

1) Model 1 is a regression of IPV exposure (measured in frequency and severity) on trauma scores among *non-Hispanic white* children (n = 325).
2) Model 2 is a regression of IPV exposure (measured in frequency and severity) on trauma scores among *African American* children (n = 179).
3) Model 3 is a regression of IPV exposure (measured in frequency and severity) on trauma scores among *Hispanic* children (n = 125).

All models included the previously mentioned child, caregiver and community variables. All analyses for the current study were performed using Stata 13.0 (StataCorp, 2013). This research was approved by the Institutional Review Board (IRB) at Michigan State University.

Results

Descriptive Statistics

Table 2-1 provides descriptive statistics of the study sample. The majority of children were female (59%), non-Hispanic white (53%) and middle school aged (age M = 12.9 years; SD = 0.11). Most children experienced IPV in the past year (84%), with close

to half (46%) experiencing the most severe forms. A one-way between- subjects ANOVA revealed that IPV frequency did vary significantly by child race/ethnicity [F(*2*, 730) = 3.35, $p < 0.05$], with non-Hispanic white children exposed to more frequent IPV ($M = 5.89$; $SD = 0.31$) than African American children ($M = 5.06$; $SD = 0.34$) and Hispanic children ($M = 4.64$; $SD = 0.42$). Many children had experienced psychological (84%) and physical abuse (50%), yet only a small percentage of children met criteria for clinically significant trauma (7%), and mean of trauma symptoms experienced by the children was fairly low ($M = 7.47$; $SD = 0.30$, range 0-25). A one-way between-subjects ANOVA revealed that trauma symptoms did not significantly vary by child race/ethnicity [F(*2*, 730) = 1.15, p = n.s.].

Table 2-2 presents the Pearson correlation of study variables. Only two variables, severe IPV exposure and minor IPV exposure, were significantly correlated at a high level (0.7 and higher) ($r = -0.74$, $p < 0.001$). A few variables were significantly correlated at a moderate level, including child race/ethnicity (African American and white ($r = -0.56$, $p < 0.001$); white and Hispanic ($r = -0.47$, $p < 0.001$)) and caregiver education level (caregiver education less than high school (HS) and caregiver education HS ($r = -0.48$, $p < 0.001$); caregiver education HS and caregiver education HS plus ($r = -0.63$, $p < 0.001$)). Most variables demonstrated a weak correlation.

Multivariate Regression of IPV Exposure on Trauma

The results of the multivariate regression of IPV exposure (Frequency Model and Severity Model) on trauma are displayed in *Table 2-3*. In the Frequency Model, greater frequency of IPV was associated with an increase in trauma scores ($\beta = 0.39$, $p < 0.001$). In the Severity Model, exposure to minor IPV was significantly associated with greater

trauma scores when compared to no IPV exposure ($\beta = 2.46$, $p < 0.001$). Similarly, exposure to severe IPV was significantly related to greater trauma scores when compared to no IPV exposure in the Severity Model ($\beta = 4.95$, $p < 0.001$).

In both models, younger children were significantly more likely to have higher trauma scores ($\beta = -0.24$, $p < 0.001$; $\beta = -0.38$, $p < 0.01$, respectively). Child race/ethnicity was significantly associated with trauma scores in both models. Hispanic children had greater trauma scores compared to African American children ($\beta = 2.34$, $p < 0.05$; $\beta = 2.61$, $p < 0.05$, respectively). In the Frequency Model, children with caregivers who had a drug problem compared to children with caregivers who did not have a drug problem had lower trauma scores ($\beta = -4.00$, $p < 0.01$).

Multivariate Regression of IPV Exposure on Trauma with Race/Ethnicity Interaction

The results of the multivariate regression model of IPV exposure on trauma with the race/ethnicity interaction are displayed in *Table 2-4*. In the Frequency Model, IPV frequency was not significantly associated with trauma scores ($\beta = 0.23$, $p =$ n.s.). The interactions of IPV frequency with race/ethnicity (IPV frequency x white; IPV frequency x Hispanic) were not significant in the Frequency Model ($\beta = 0.19$, $p = n.s.$; $\beta = 0.20$, $p = n.s.$, respectively). In the Severity Model, exposure to minor IPV and severe IPV, compared to no IPV exposure, were significantly associated with an increase in trauma scores ($\beta = 2.89$, $p < 0.05$; $\beta = 4.87$, $p < 0.01$, respectively). The interactions of IPV exposure with race/ethnicity were not significant in the Severity Model.

In both models, younger children were significantly more likely to have higher trauma scores ($\beta = -0.43$, $p < 0.001$; $\beta = -0.38$, $p < 0.01$, respectively). In the Frequency

Model, children with caregivers who had a drug problem compared to children with caregivers who did not have a drug problem had significantly lower trauma scores (β = -4.04, $p < 0.01$). Child race/ethnicity was significantly associated with trauma scores in the Severity Model. Hispanic children had greater trauma scores when compared to African American children ($\beta = 3.17$, $p < 0.05$).

Multivariate Regression of Predictors of Trauma by Child Race/Ethnicity Subgroups

The results of the multivariate regression models of IPV exposure (frequency and severity) on trauma scores by race/ethnicity subgroups (*non-Hispanic white, Hispanic, African American*) among children exposed to IPV are displayed in *Table 2-5*.

For *non-Hispanic white* children exposed to IPV, IPV frequency was associated with greater trauma scores ($\beta = 0.37$, $p < 0.001$). Severe IPV exposure was also significantly associated with higher trauma scores when compared to minor IPV exposure for *non-Hispanic white* children ($\beta = 2.81$, $p < 0.01$). In both the Frequency and Severity Models for *non-Hispanic white* children, child age, history of sexual abuse and caregiver depression were associated with trauma symptoms. Younger children had greater trauma scores than older children in both models ($\beta = -0.63$, $p < 0.001$; $\beta = -0.58$, $p < 0.001$, respectively). Children with histories of sexual abuse had greater trauma scores when compared to children without histories of sexual abuse in both models ($\beta = 2.39$, $p < 0.05$; $\beta = 2.33$, $p < 0.05$, respectively). Children with depressed caregivers also had greater trauma scores than children with non-depressed caregivers in both models ($\beta = 2.04$, $p < 0.05$; $\beta = 1.85$, $p < 0.05$, respectively).

For *African American* children exposed to IPV, IPV frequency was not significantly associated with trauma scores ($\beta = 0.18$, p = n.s.); however, severe IPV exposure was significantly associated with trauma symptoms when compared to minor IPV exposure ($\beta = 2.99$, $p < 0.001$). In both the Frequency and Severity Models for *African American* children, caregiver age and poverty level were associated with trauma symptoms. Children with caregivers less than 35 years old had lower trauma scores than children with caregivers greater than or equal to 35 years old in both models ($\beta = -2.97$, $p < 0.05$; $\beta = -2.98$, $p < 0.01$, respectively). Children that lived in households with a FPL less than 50% had lower trauma scores than children who lived in households with higher FPL (<200% below poverty level) in both models ($\beta = -3.04$, $p < 0.05$; $\beta = -2.91$, $p < 0.05$, respectively).

For *Hispanic* children exposed to IPV, IPV frequency was associated with higher trauma scores ($\beta = 0.27$, $p < 0.05$), but severe IPV exposure was not significantly associated with trauma scores ($\beta = 0.22$, p = n.s). In the Frequency Model for *Hispanic* children, neighborhood quality and safety was significantly associated with trauma scores. Poor neighborhood quality and safety was related to higher trauma symptoms ($\beta = 2.67$, $p < 0.05$). In both the Frequency and Severity Models for *Hispanic* children, FPL was associated with trauma. Children that lived in households with a FPL less than 50% had lower trauma scores than children who lived in households with higher FPL (<200% below FPL) in both models ($\beta = -7.16$, $p < 0.05$; $\beta = -8.03$, $p < 0.01$, respectively). Similarly, children that lived in households with a FPL of 100-200% had lower trauma scores than children who lived in households with higher FPLs (<200% below FPL) in both models ($\beta = -4.80$, $p < 0.05$; $\beta = -5.05$, $p < 0.05$, respectively).

Discussion

The purpose of this study was to assess the moderating effect of child race/ethnicity on posttraumatic stress symptoms among children in the CWS. This study also examined whether differential predictors of trauma exist for white and minority children in the CWS who have been exposed to IPV. This study is the first to date to explore racial/ethnic differences in outcomes of IPV exposed children utilizing a nationally representative sample of children referred to the CWS for alleged child abuse and/or neglect. This study also considers the effect of IPV frequency and severity on the development of children's posttraumatic stress symptoms.

Over 80% of children in this study were exposed to violence in their homes, with close to half (46%) witnessing severe and minor forms of IPV, including seeing an adult point a knife or gun or stab another person. Although research has found that children from the CWS are exposed to IPV at higher rates than children in the general population (Edleson, 1999; Hazen et al., 2006), the rates of IPV exposure in this sample are substantially higher than rates documented in other studies utilizing CWS samples. For example, Hazen et al. (2006) found that 45% of children involved with the CWS had caregivers that experienced IPV, while other research reports IPV exposure rates ranging from 30-40% (Edleson, 1999; English et al., 2005; Jones, Gross, & Becker, 2002). It is unclear why children in this sample were exposed to IPV at much higher rates than what has been previously documented in other studies utilizing samples of children in the CWS. It is possible that the higher rates found in this study are a result of the way IPV exposure was measured, including the use of the child as the main informant of exposure. The majority of studies of IPV exposure in the child welfare population use the mother,

or main caregiver, as the main and sole informant (e.g., Casanueva et al., 2008; Casanueva et al., 2013; Edleson, 1999; Hazen et al., 2006), despite research indicating low agreement between parents and their children (Jaffe, Wolfe, & Wilson, 1990; Koverola et al., 2005). Mothers have been shown to underestimate the degree to which children are exposed to IPV (Jaffe et al., 1990), and to overestimate their children's overall functioning (Koverola et al., 2005). The results of the current study suggest that children, not just caregivers, should be consulted when determining IPV exposure in order to accurately capture the amount of violence witnessed.

This study also found that non-Hispanic white children were exposed to more frequent IPV than African American and Hispanic children. This is an interesting finding given previous evidence that racial minorities in the general population are more likely to experience IPV than whites (Catalano et al., 2009; Tjaden & Thoennes, 2000). Graham-Bermann and colleagues (2006) assessed racial/ethnic differences in rates of IPV exposure among a community sample of children and found no racial group differences in amount of violence witnessed by the children. It is unclear whether the findings reflect that white children in the CWS are more likely to be present while violence between parents occurs, or more likely to witness the aftermath of violent episodes than African American or Hispanic children in the CWS. It is also possible that the disparate findings reflect variations in the way IPV is measured. This analysis used the VEX-R (Fox & Leavitt, 1995) to assess children's exposure to IPV, while other studies that examine racial/ethnic differences in IPV victimization among adults primarily use variations of the Conflict Tactics Scale (CTS) (Straus, Hamby, Boney-McCoy, & Sugarman, 1996) (e.g., Tjaden & Thoennes, 2000) or explore rates of criminal IPV acts (e.g., Catalano et al.,

2009; Rennison & Planty, 2003). It is possible that racial minorities are more likely than whites to experience criminal acts of IPV, or are more likely to be the victim of coercive IPV behaviors which are represented in greater detail on the CTS compared to the VEX-R. Additional studies are needed to assess whether racial/ethnic differences exist in the frequency and severity of IPV exposure among children in the CWS to see if trends in the current study hold true.

Not only did the children in this study have high rates of IPV exposure, but 7% also met criteria for clinically significant trauma. Although this estimate is lower than what has been documented with other samples of children exposed to IPV in the CWS (Kolko et al., 2010; McCloskey & Walker, 2000), it is slightly higher than estimates found with school-aged children and adolescents in the general population (e.g., 4-6.7%) (Kilpatrick et al., 2003). Despite what has been documented in an existing study of community children exposed to IPV (Graham-Bermann et al., 2006), trauma symptoms did not vary by child race/ethnicity for IPV-exposed children in this child welfare sample. It is interesting that white children did not exhibit greater trauma symptoms than African American or Hispanic children, especially considering they were exposed to more frequent IPV. These findings suggest that IPV exposure may lead to poor psychological outcomes for children in the CWS regardless of race/ethnicity.

The high rates of IPV exposure and trauma among children in the sample, irrespective of race/ethnicity, indicate the prevalence of IPV among families in the CWS, and highlight the need for a system-wide effort of screening for IPV exposure among all children referred to CPS. At the federal and state level, child welfare policy groups have issued recommendations to routinely screen for IPV at every child abuse or neglect

investigation (Bragg, 2003; National Association of Public Child Welfare Administrators, 2001; National Council of Juvenile and Family Court Judges, 1999). Findings from this study support these recommendations and suggest that caseworkers also need to assess the frequency and severity of such exposure. In fact, this study found that when predictors of trauma were tested for the whole sample, children who experienced more frequent or more severe IPV had greater trauma symptoms. These findings are consistent with other research utilizing samples of children in the general population (English et al., 2005) and children in the CWS (Garrido et al., 2011; see also Manuscript 1, above), and indicate that number of occurrences and severity of IPV in which children are exposed to matters for their psychological development. It is therefore essential that caseworkers screen for IPV presence within a family, as well as for the nature, frequency and severity of the violence at each CPS investigation, and at regular contact points thereafter.

Despite the hypothesis, child race/ethnicity did not moderate the relationship between IPV exposure and trauma symptoms. This suggests that white children exposed to frequent and more severe IPV are not more likely to develop trauma symptoms than minority children. These findings are interesting given that previous research is mixed on whether child race/ethnicity moderates the relationship between IPV exposure and poor psychological outcomes. For example, Graham-Bermann et al.'s (2006) study on children in the general population found that white children exposed to IPV exhibited more trauma than African American children. However, Grych et al.'s (2000) study of IPV-exposed children residing in battered women's shelters found no racial/ethnic differences in rates of internalizing disorders. It could be that race/ethnicity may not influence the development of trauma and other internalizing disorders among at-risk

children exposed to IPV, such as those residing in domestic violence shelters and those involved in the CWS, in the same way that it does for children in the general community. Additional studies are needed to test the relationship of race/ethnicity and IPV exposure on trauma among children in the CWS to see whether current trends in this study hold true.

Perhaps the most important practical findings of the current study are related to the racial/ethnic differences in predictors of trauma among IPV-exposed children. Specifically, this study found that frequency and/or severity of IPV exposure significantly predicted trauma symptoms for all racial/ethnic groups. However, white children's trauma symptoms were significantly influenced by the caregiver's emotional well-being, while minority children's trauma symptoms were influenced by community and household variables. For non-Hispanic white children exposed to IPV in the CWS, history of sexual abuse and caregiver depression emerged as the strongest, significant predictors of trauma symptoms after IPV severity. This did not hold true for African American or Hispanic children. Caregiver depression did not significantly predict trauma for minority children exposed to IPV, even though there were no significant differences in rates of depression between white, African American and Hispanic caregivers. This is consistent with Graham-Bermann and colleagues' (2006) study of children in the general population, which found that white children, but not African American children, exposed to IPV were at increased risk of traumatic stress when their mothers' mental health was compromised (Graham-Bermann et al., 2006). The current study adds to this finding by showing that caregiver mental state is not a significant factor in accounting for trauma symptoms among other minority groups (e.g., Hispanic children) exposed to IPV. It also

shows that caregiver depression is important for the development of trauma among white children exposed to IPV in the CWS.

It is unclear why white children may be more affected by their caregiver's mental state than African American or Hispanic children. Looking at Graham-Bermann and colleagues' (2006) empirical work, it could be that white children are more isolated from other adults or kin than minority children, and perhaps are therefore more impacted by their caregiver's mental state. It is well documented that African American families often have larger kin networks and receive more practical support, such as help with child care, relative to white families (Kasturirangan, Krishnan, & Riger, 2004), in part because of strong traditions of shared responsibility among mothers, daughters and sisters in the African American community (Sarkisian & Gerstel, 2004). Perhaps kin networks provide additional support for minority children exposed to IPV, thereby lessening the impact of maternal depression on trauma.

For minority children exposed to IPV in our sample, community and household factors, including poverty and neighborhood quality, emerged as the strongest, significant predictors of trauma symptoms. In particular, younger caregiver age and higher rates of household poverty were associated with trauma symptoms for African American children exposed to IPV, while poorer neighborhood quality and higher rates of household poverty were related to greater trauma for Hispanic children exposed to IPV. Interestingly, poverty and neighborhood quality did not significantly predict trauma for white children exposed to IPV. This may be the case because white children in the sample were significantly more likely to reside in higher quality and safer neighborhoods than African American children, and particularly Hispanic children. Hispanic children exposed to IPV

in this study resided in the poorest quality neighborhoods, followed by African American and white children.

Other research has documented that minority children disproportionately reside in impoverished neighborhoods when compared to white children (Costello, Keeler, & Angold, 2001). These poor neighborhoods can pose significant threats to children's development placing them at risk for experiencing community violence (Costello et al., 2001). For minority children exposed to IPV in this sample, it is likely that living in poor, unsafe neighborhoods creates an environment that increases the risk of negative developmental outcomes in the context of IPV exposure. This may not be the case for white children exposed to IPV because they are less likely to live in poor and unsafe neighborhoods, and potentially may not be exposed to other forms of violence within their communities. White families may also have greater access to social services within their communities, and may be more likely to use these services when compared to minority families. In fact, studies have found that high poverty neighborhoods have less access to social services than low-poverty neighborhoods do (Allard, 2009), and that even when services are available and proximate in a neighborhood, they are often underutilized by minorities because they are perceived as being for "white families" (Kissane, 2010).

Overall, these findings suggest that child race/ethnicity may be an important factor to consider when designing and implementing interventions for children exposed to IPV in the CWS. To reduce negative outcomes for this population, it is critical that caseworkers holistically address both the needs of children as well as their families in their treatment plans. For white children, improving the caregiver relationship and

linking caregivers to mental health treatment may be crucial in preventing trauma for their children. Caseworkers can also work with families to identify extended kin or other positive adult role models and help to broaden the network of social support for white children. For minority children, caseworkers should address the effects of poverty and poor neighborhood context, as well as IPV exposure, to prevent poor developmental outcomes. Caseworkers can develop collaborative relationships with outside agencies to link parents with effective housing and poverty services, including providing assistance with Section 8 low-income housing. Caseworkers may also consider linking children to after-school community-based programs specifically developed for at-risk children. These programs often provide children with education, resources and mentorship, which can work to promote academic success and positive youth development.

Limitations

The study findings should be viewed within the context of the following limitations. First, there are some limitations regarding the way IPV was measured and defined. IPV exposure in the home was measured using the witnessing subscale of the Violence Exposure Scale for Children (VEX-R), a child-self report standardized measure (Fox & Leavitt, 1995). This measure asks children to describe the frequency of their exposure to adult-on-adult violence within their home. It is possible that this adult-on-adult violence may not include violence between a caregiver and his/her romantic partner, and may extend to violence between a caregiver and other adult family members or visitors to the home. Therefore, it is unknown if the violence children report experiencing in this study actually represents IPV between two caregivers. Despite this, it should be noted that this study adds to literature by using the child as a main and sole

informant of his/her exposure to IPV, since the majority of existing studies use only the mother's report of her IPV experiences.

Additionally, the analyses of the current study are based on a cross-sectional design precluding statements about the causal and temporal associations between variables. Furthermore, this study precluded children from 'other races,' including American Indian, Alaskan Native, Native Hawaiian or Pacific Islander, because they constituted too small a sample size for reliable analysis. Future studies that examine racial/ethnic differences in outcomes of IPV-exposed children in the CWS should consider other races.

Conclusions

Notwithstanding these limitations, this study extends the existing literature on racial/ethnic differences in psychosocial outcomes among children exposed to IPV. Up until now, little attention has been given to racial/ethnic differences among IPV-exposed children in the CWS. This study found that differential predictors of trauma emerged for white and minority children exposed to IPV, indicating that race/ethnicity may be relevant in understanding the pathways to poor outcomes for IPV-exposed children. The results of this study have implications for both the prevention and intervention of children exposed to IPV in the CWS. CPS case plans should consider racial/ethnic differences in the development of trauma among children exposed to IPV, and caseworkers should attempt to address the needs of these high-risk families. Efforts should include, but not be limited to, linking caregivers to affordable mental health treatment, connecting families with housing and poverty advocacy services and enhancing support systems for children, both within the family as well as in the community.

CHAPTER FOUR: MANUSCRIPT 3

THE MEDIATING EFFECT OF DEPRESSION ON THE RELATIONSHIP BETWEEN EXPOSURE TO INTIMATE PARTNER VIOLENCE (IPV) AND CHILDREN'S ACADEMIC ACHIEVEMENT AMONG A NATIONALLY REPRESENTATIVE CHILD WELFARE SAMPLE

Abstract

Research indicates that children in the Child Welfare System (CWS) academically underperform compared to their peers. Although numerous studies have explored the effect of child abuse and/or neglect on academic outcomes, little research exists on the effect of children's exposure to intimate partner violence (IPV) on academic performance among abused or neglected children. This study fills this gap by exploring the association between the frequency of children's exposure to minor and severe IPV and their academic test scores over time. It also investigates whether this relationship is mediated by children's depression. Using the National Survey of Child and Adolescent Well-Being (NSCAW-II), structural equation modeling (SEM) is conducted to explore the direct and indirect pathways of exposure to IPV (Wave 1) on academic outcomes approximately three years later (Wave 3). Participants included children 8-18 years old referred to the CWS who remained in the physical custody of their parents during the period of study (n = 736). Severe IPV exposure at Wave 1 was related to poorer reading, but not math, scores at Wave 3 even after controlling for previous child abuse and/or neglect. This relationship was mediated by depression, such that greater frequency of exposure to severe IPV predicted more depression symptoms, and more depression symptoms predicted poorer reading scores. Exposure to minor IPV was not significantly associated with reading or math scores over time. These results suggest that the frequency of children's exposure to severe, but not minor, forms of IPV affects reading

aptitude over time both directly and indirectly by way of depression. To improve reading outcomes for children involved in the CWS, early identification of IPV exposure is warranted and interventions should target children's depression.

Introduction

A substantial number of children in the U.S. are exposed to adult partner-on-partner violence within their homes, referred to as intimate partner violence (IPV). It is estimated that approximately 3 to 10 million children are exposed to IPV (i.e., witness one parent assault the other parent, hear a parent threaten the other, experience the aftermath of a violent assault) each year (Straus, Gelles, & Steinmetz, 1980; Straus, 1992). Data from the National Survey of Children's Exposure to Violence (NatSCEV) found that 16% of children ages 17 and younger were exposed to physical assault between caregivers in their lifetime, with one in 15 (7%) exposed in the past year (Finkelhor et al., 2009; Hamby et al., 2011). High rates of IPV exposure among children in the U.S. are alarming considering that IPV exposure in childhood interferes substantially with healthy development. Exposure to IPV has been linked to psychological, behavioral, social and cognitive difficulties in childhood (Holt et al., 2008; Kitzmann et al., 2003; Wolfe et al., 2003), some of which may persist into adulthood (Evans et al., 2008).

Children in the Child Welfare System (CWS) are exposed to IPV more frequently than children in the general population (Casanueva et al., 2013; Hazen et al., 2006). In fact, research indicates that children investigated by Child Protective Services (CPS) for alleged child abuse and/or neglect are two times more likely to experience IPV than children not investigated by CPS, with exposure rates ranging from 30-45% (Casanueva

et al., 2008; Edleson, 1999; Hazen et al., 2006). Many children exposed to IPV also experience other types of violence, including physical abuse by caregivers (Appel & Holden, 1998; Beeman, Hagenmeister, & Edleson, 2001; Osofsky, 2003). This is particularly true among children in the CWS (Casanueva, Martin, & Runyan, 2009). Thus, IPV exposure among children in the CWS is a concern both because of its direct, negative effects on children, and also because it so often co-occurs with other types of victimization. Despite this, few studies examine the effect of exposure to IPV on children in the CWS.

Children involved with the CWS are an important population to examine because they represent a particularly vulnerable group. They often experience multiple traumas including physical abuse by caregivers (Font & Maguire-Jack, 2013), exposure to parental violence (Casanueva et al., 2008; Casanueva et al., 2013; Hazen et al., 2006), and many live in poor neighborhoods with high rates of crime and violence (U.S. Department of Health and Human Services, 2012). They are also at heightened risk for psychological problems (Casanueva et al., 2012) and poor school outcomes (Pecora et al., 2006; Stone, 2007). Compared to children not involved with the CWS, children in the CWS are more likely to be placed in special education and are less likely to graduate high school (Courtney et al., 2004; Pecora et al., 2006).

Child welfare professionals may assume that the consequences of IPV exposure on children's development pales in comparison to the consequences of direct victimization. However, studies indicate that exposure to IPV has a significant and independent effect on at least some areas of development, even after controlling for previous or current child physical abuse and/or neglect (Kitzmann et al., 2003; Moylan et

al., 2010). Furthermore, researchers have posited a "double whammy" effect, in which children exposed to both IPV and child abuse and/or neglect fare worse in terms of psychological and socio-emotional development than children exposed to child abuse and/or neglect alone (Herrenkohl et al., 2008; Sternberg et al., 2006). Given the policy trend toward treating IPV exposure as a type of child maltreatment in some states, even when it does not co-occur with direct victimization (see Edleson et al., 2006 and Goodmark, 2010 for a review), it is important to understand how IPV exposure effects children over and above experiencing child abuse and/or neglect alone. The present study seeks to increase our understanding of the independent effects of exposure to minor and severe IPV on academic outcomes among children in the CWS, and to illuminate child depression as a potential driver of these effects. No studies to date have utilized a nationally representative sample of children in the CWS to explore the effect of IPV exposure on educational outcomes.

Background

The relatively few studies that examine school outcomes in relationship to IPV exposure found that children exposed to IPV are academically vulnerable. IPV-exposed children are more likely than their peers to act out in the classroom and to be frequently absent from school (Kernic et al., 2002; Kiesel, Piescher, & Edleson, 2013; Lundy & Grossman, 2005). They are also more likely than non-exposed children to be suspended or expelled and retained or 'held back' in school (Kernic et al., 2002). Exposure to IPV may also hinder children's academic performance (Kiesel et al., 2013; Peek-Asa et al., 2007), however, study results are mixed on whether and how IPV, above and beyond experiencing child abuse alone, effects academic achievement. For example, Peek-Asa

and colleagues (2007) found that children exposed to IPV scored significantly lower on reading and math standardized tests than non-IPV exposed children, although they did not control for child maltreatment. Kernic and colleagues' (2003) study did not find a significant relationship between IPV exposure and cumulative GPA after controlling for child abuse and/or neglect. However, children exposed to both IPV and child abuse had significantly lower grades than children who were not exposed to either type of violence. The most comprehensive, longitudinal study to date on academic performance among maltreated children exposed to IPV involved children in the Minnesota CWS. It found that IPV-exposed children scored lower on reading and math standardized tests than non-exposed children (Kiesel et al., 2013). Interestingly, children exposed to IPV in this study also had significantly lower reading and math scores than children who experienced maltreatment alone or children who experienced both co-occurring maltreatment and IPV (Kiesel et al., 2013). This study suggests that IPV exposure may affect educational outcomes for children in the CWS above and beyond, and perhaps in a different way, than experiencing direct victimization alone.

However, these studies have not examined the independent effects of IPV frequency and severity on children's academic outcomes. Frequency and severity of IPV exposure is important to examine in terms of its effect on poor developmental outcomes, including academic achievement, as studies suggest that exposure to more frequent and severe IPV exposure can exacerbate children's psychological and behavioral problems (English et al., 2005; Kitzmann et al., 2003). Greater internalizing and externalizing problems have been found in children exposed to physical rather than verbal IPV (Kitzmann et al., 2003), as well as those exposed to IPV involving knives and guns rather

than IPV without weapons (Jouriles et al., 1998). DeJonge and colleagues (2011) reported that children who directly witnessed IPV had greater externalizing problems than children who did not directly witness, but lived in homes where IPV was present. Furthermore, English et al.'s (2005) study found that violence that was more frequent and chronic in nature, and occurred across multiple developmental periods increased children's risk of depression and was associated with poorer socialization skills. Garrido and colleagues (2011) observed that a combination of IPV frequency, proximity and severity was related to psychosocial problems over and above IPV occurrence alone among youth in out-of-home (OOH) care. Similarly, Manuscript 1 (Chapter 2) of this dissertation found that IPV in greater frequency and severity predicted more trauma and depression among a nationally representative sample of children referred to the CWS. Specifically, children exposed to severe, but not minor, IPV had greater trauma and depression scores over time. This research suggests that frequency and severity moderate the effect of IPV exposure on children's psychological and behavioral problems. Because research on the relationship between IPV exposure and academic success among children in the CWS is in its earliest stages, future studies that consider frequency and severity of IPV are warranted.

There are several probable explanations for why IPV-exposed children struggle in school. Some researchers have hypothesized that frequent school absences, possibly caused by children staying home to protect their abused parent (typically mothers), leads to poor academic achievement (Cunningham & Baker, 2004). Others have suggested that stresses associated with IPV may reduce parents' ability to support their children's academic activities, such as reading or helping with homework (Peek-Asa et al., 2007).

Alternatively, IPV-exposed children may be less likely than children who experience physical abuse and/or neglect to come to the attention of authorities who serve as gatekeepers to interventions that may support positive academic trajectories (Edleson, 2006; Kiesel et al., 2013).

Trauma theorists suggest that children exposed to IPV start school with a cognitive disadvantage because exposure to stress in childhood, such as IPV, suppresses children's development and could possibly lead to lower intelligence (Koenen, Moffitt, Caspi, Taylor, & Purcell, 2003). This cognitive disadvantage may compromise children's learning potential in early life leading to a long-term, negative effect on children's academic achievement, including impaired verbal or reading skills (Koenen et al., 2003; Moore & Pepler, 1998). According to Trauma Theory (Briere, 1992; Perry, 2000), exposure to IPV in great frequency and severity during childhood can cause chronic activation of the stress response system, known as toxic stress (Shonkoff, 2012). Elevated levels of cortisol, which are characteristic of toxic stress, can cause physiologic changes in children's brain development (Shonkoff, 2012). Consequences often include the inability to concentrate, decreased brain functioning and the development of psychological problems, such as depression or anxiety, all of which effect academic performance. In fact, a number of studies have found diminished verbal abilities in preschool-aged children exposed to IPV (Graham-Bermann, Howell, Miller, Kwek, & Lilly, 2010; Huth-Bocks, Levendosky, & Semel, 2001), although research has not demonstrated an association between this effect and subsequent academic problems in elementary or middle school.

The presence of depression and other psychological problems likely play a role in IPV-exposed children's poor academic achievement. Childhood exposure to IPV has been linked to an increase in emotional and psychological problems, including depression (Evans et al., 2008; Kitzmann et al., 2003; Wolfe et al., 2003). Depression is associated with concentration difficulties (Manly, Cicchetti, & Barnett, 1994) and poorer motivation in school settings (Shonk & Cicchetti, 2001). According to Trauma Theory (Briere, 1992; Perry, 2000), children exposed to IPV may experience greater educational difficulties than their counterparts because of their higher rates of emotional and psychological problems, which likely influence their performance on various school tasks necessary for optimal learning. These tasks can include concentration in the classroom, adherence to behavioral norms in school and motivation to complete homework assignments. This may place them at an increased risk for poor academic performance. Although this trauma-informed pathway has been hypothesized and studied for physically abused and neglected children (Slade & Wissow, 2007), no studies to date have examined this relationship in children exposed to IPV. Importantly, Trauma Theory recognizes that exposure to traumatic events that are more severe and frequent in nature have more harmful effects on physiologic and psychological development (Perry, 2000; Shonkoff, 2012), which over time may directly or indirectly impair children's academic success.

Current Study

Guided by Trauma Theory (Briere, 1992; Perry, 2000), this study explores the independent effects of exposure to minor and severe IPV on academic outcomes (specifically reading and math test scores) among children in the CWS, and investigates whether this relationship is mediated by children's depression. The few existing studies

that examine academic outcomes among children exposed to IPV share important methodological limitations, including failure to adequately control for potential confounders such as child maltreatment (e.g., Peek-Asa et al., 2007), reliance on clinical samples and help-seeking families (e.g., Lundy & Grossman, 2005), and utilization of small sample sizes (e.g., Kernic et al., 2003). Existing studies are also subject to reporter bias since they predominately use caregiver or caseworker report of children's exposure to IPV, despite research indicating that these reporting sources underestimate the degree to which children are exposed to IPV (Jaffe et al., 1990). For example, Peek-Asa and colleagues (2007) and Lundy and Grossman (2005) use mother's report of IPV within the home. Kernic and colleagues (2002) use citywide data on police reported IPV incidents, and Kiesel and colleagues (2013) use Child Protective Services (CPS) caseworker's report of IPV in the home. Additionally, to date only one study has examined academic outcomes among IPV-exposed children in the CWS (Kiesel et al., 2013). This study's sample was drawn from one state, and the researchers did not test mediating hypotheses about why IPV-exposed children may have poor academic outcomes (Kiesel et al., 2013). Furthermore, no studies to date have assessed the independent effects of IPV frequency and severity on academic outcomes among children in the CWS.

The current study extends existing research on academic outcomes among IPV-exposed children in the CWS in the following ways. First, it examines the separate effects of exposure to minor and severe IPV on academic outcomes, utilizing a longitudinal design with a national probability sample of children referred to CPS for alleged child abuse and/or neglect. Second, it uses a child self-report standardized instrument to measure exposure to IPV. Finally, it examines whether depression

mediates the relationship between exposure to IPV and children's success at school while controlling for previous child abuse and/or neglect. It addresses the following research questions:

1) Does exposure to minor forms of IPV predict poor academic achievement (i.e., lower reading and math scores) among children in the CWS?
2) Does exposure to severe forms of IPV predict poor academic achievement (i.e., lower reading and math scores) among children in the CWS?
3) Does children's depression mediate the relationship between exposure to IPV and poor academic achievement (i.e., children's reading and math scores)?

Consistent with results from Manuscript 1 of this dissertation, which documented that severe IPV, but not minor IPV, predicted negative outcomes for children in the CWS, it is hypothesized that exposure to severe IPV, but not minor IPV, will be related to poorer reading and math over time. Specifically, it is hypothesized that exposure to *severe* IPV in greater frequency at Wave 1 (baseline, mean child age = 12 years) will be associated with poorer reading and math scores at Wave 3 (~3 years post baseline, mean child age = 15 years). It is also expected that exposure to *minor* IPV at Wave 1 (baseline, mean child age = 12 years) will be *not* be related to poorer reading and math scores at Wave 3 (~3 years post baseline, mean child age = 15 years). Furthermore, it is hypothesized that depression symptoms will mediate the relationship between severe IPV exposure and poor reading and math achievement scores, such that exposure to severe IPV at Wave 1 will be associated with increased depression at Wave 2 and increased depression at Wave 2 will be associated with poorer reading and math scores at Wave 3.

Methods

Sample Design

Secondary data analysis was conducted using the second National Survey of Child and Adolescent Well-Being (NSCAW II). NSCAW II is a nationally representative, longitudinal study designed to assess the functioning, needs and service use of children who come into contact with the CWS. The target population for NSCAW II includes all children in the U.S. who were subjects of child abuse or neglect investigations conducted by CPS between February 2008 and April 2009 (Dowd et al., 2012). NSCAW II employed a two-stage stratified sampling design (Dowd et al., 2012). For the first stage, the U.S. was divided into nine sampling strata. Eight of the strata corresponded to the eight states with the largest child welfare caseloads and the ninth stratum consisted of the remaining 38 states and the District of Columbia. Within the nine strata, primary sampling units (PSUs) were formed. PSUs were defined as geographic areas containing a population served by a single CPS agency. A total of 86 PSUs were used, representing 81 counties in 30 states.

Children who fit the general target population criteria, (i.e., were subjects of a CPS investigation during the study period) and who had not been part of the NSCAW I study or had a sibling in the study, were randomly sampled from the PSUs for participation in NSCAW II (Dowd et al., 2012). Infants and children in OOH placement were oversampled to obtain a representative sample of these two high-risk groups. NSCAW II's sample includes 5,872 children ranging in age from birth to 17.5 years old investigated by CPS for a case of child abuse or neglect during the study investigation period (Dowd et al., 2012).

Data Collection Methods

Data collection occurred across three time-points over the course of four years. Baseline interviews (Wave 1) were conducted over 15 months beginning in March 2008 and ending in September 2009. Children, adult caregivers (i.e., birth and adoptive parents, foster parents, kin caregivers and group home supervisors) and CPS caseworkers were interviewed or assessed face-to-face by trained research staff. Computer-assisted personal interviewing (CAPI) methods were also used for sensitive questions with adult caregivers and children older than 11 years of age. Wave 2 interviews occurred 18 months after the close of the baseline investigation beginning in October 2009 and ending in January 2011. Wave 3 interviews occurred approximately 36 months after the close of the baseline investigation beginning in June 2011 and ending in December 2012. Wave 2 and 3 data collection procedures mirrored those used in Wave 1; current caregivers, children and CPS caseworkers were interviewed in-person using identical measures as those used in Wave 1 (as long as Wave 1 measures remained developmentally appropriate for children at time of interview).

Participants

The initial NSCAW II sample of 5,872 was restricted. The Violence Exposure Scale for Children (VEX-R), which assessed IPV exposure in the study, was only administered to children 8 years of age and older, so children 8 years of age and older with complete IPV data at Wave 1 were retained (n = 1,134). Because there was no way to know whether the violence reported by the child occurred in the birth family home or foster home, and because witnessing violence between foster parents might affect children differently than witnessing violence between caregivers, children in OOH

placement (i.e., kinship care, foster care, a group home setting) at Wave 1 also were excluded (n = 784). Finally, 48 of the remaining children were not retained in Wave 3 and thus, were excluded. Application of these criteria yielded a final analytic sample of 736 children.

A power analysis using Optimal Design Software Version 3.0 (Raudenbush et al., 2011) determined that the analytic sample in this study (n = 736) was sufficient to detect a small effect size as outlined by Cohen (1988). Specifically, power analysis with common assumptions, including the level of statistical significance at 0.05, the statistical power to detect an effect at 0.80, and Cohen's d effect size of 0.45 (Cohen, 1988), revealed that a minimum sample size of 718 is required to achieve power in a longitudinal analysis.

Measures

Exposure to IPV. Children's exposure to violent events in the home at Wave 1 was measured using the witnessing subscale (12 items) of the Violence Exposure Scale for Children (VEX-R) (Fox & Leavitt, 1995). VEX-R is a 23-item child self-report measure that was administered to children eight years of age and older. The VEX-R is comprised of 2 subscales: 1) the witnessing subscale (12 items) and 2) the victimization subscale (11 items). To measure IPV exposure in the current study, the witnessing subscale of the VEX-R was used. Children were asked to describe the frequency of their exposure to minor violence (six items) (e.g., seen an adult yell at another adult, seen an adult push or shove another adult, seen an adult throw something at another adult, seen an adult slap another adult), and severe violence (six items) (e.g., seen an adult beat up another adult, seen an adult point a knife or gun at another adult, seen an adult shoot

another adult, seen an adult stab another adult) on a 4-point scale (*1* = 'never,' *2* = 'one time,' *3* = 'a few times,' *4* = 'lots of times').

Two variables were created from the witnessing subscale of the VEX-R: 1) minor IPV frequency and 2) severe IPV frequency. To measure minor IPV frequency, response options for the 6 minor items on the witnessing subscale including 'never,' 'one time,' 'a few times,' and 'lots of times' (*1, 2, 3, 4*) were recoded (0, 1, 2, 3). Items were then summed, with higher scale scores indicating greater frequency of exposure to minor IPV (theoretical range 0-18). To measure severe IPV frequency, response options for the 6 severe items on the witnessing subscale including 'never,' 'one time,' 'a few times,' and 'lots of times' (*1, 2, 3, 4*) were recoded (0, 1, 2, 3). Items were summed, with higher scores indicating greater frequency of exposure to severe IPV (theoretical range 0-18). The VEX-R scale demonstrated good internal consistency for the current sample, for both the minor IPV scale ($\alpha = 0.71$) and the severe IPV scale ($\alpha = 0.81$).

Academic achievement. Academic achievement at Wave 3 was assessed using the Woodcock-Johnson III (W-J) Tests of Achievement (Woodcock, McGrew, & Mather, 2001). The W-J is a brief, standardized measure designed to assess school-aged children's basic skills and knowledge, including skills in reading, mathematics, writing and factual knowledge (NDACAN, 2011). Two subscales were used with this sample. Reading skills were assessed using the letter-word identification standardized test, which includes 76 items that measure a child's ability to name letters and read words of increasing difficultly aloud from a list. Math skills were assessed using the applied problems standardized test, which measures a child's ability to use math reasoning to solve oral word problems. Raw scores were computed as the sum of correct items in

each subtest and were calculated into standardized scores per the W-J scoring software (Woodcock et al., 2001). Higher scores reflect greater skills in reading and math respectively (NDACAN, 2011). This measure is used widely in national longitudinal studies and has good psychometric properties, with reliabilities ranging from 0.78 – 0.94 for school-aged children (Woodcock & Johnson, 1990).

Depression. The Children's Depression Inventory (CDI) was administered to children ages seven and older to assess the severity of children's depression symptoms in Wave 2 (Kovacs, 1992). The CDI is a 27-item self-report measure that asks children about their engagement in certain activities or experience of certain feelings (e.g., enjoying being around other people). Each item is measured with a 3-point response (*0* = 'absence of symptom,' *1* = 'mild symptom,' *2* = 'definite symptom'). Five subscales (Negative Mood, Interpersonal Problems, Ineffectiveness, Anhedonia and Negative Self-Esteem) were summed to create a total raw score, with higher scores indicating greater presence of depression symptoms. In non-clinical school-aged children, the measure has high levels of internal consistency, test-retest reliability, predictive utility, and construct validity (Carey et al., 1987; Saylor et al., 1984). The CDI demonstrated good internal consistency with the NSCAW I sample (0.81 - 0.87) (NDACAN, 2011), and excellent reliability with the current sample (α = 0.97).

Control variables. This study controlled for child (i.e., age, gender, race/ethnicity, previous child abuse or neglect, poverty) and caregiver (i.e., depression, alcohol/drug problem) risk factors that previous research suggests are correlated with the dependent and independent variables of interest (Gerwitz et al., 2011; Graham-Bermann, et al., 2006; McIntosh, 2003; Sternberg et al., 2006). Child and caregiver risk factors are

important to consider because they can directly affect children's depression symptoms or academic performance, or exacerbate the IPV experience and lead to greater academic and psychological difficulties. All control variables are measured at Wave 2.

Child demographics. Child variables included age, gender and race/ethnicity and were reported by current caregivers. NSCAW coded child race/ethnicity into four groups: 1) non-Hispanic white, 2) African American, 3) Hispanic and 4) non-Hispanic other race. NSCAW researchers created the non-Hispanic other race category due to small sample sizes of each racial/ethnic subgroup. This other category included American Indian, Alaskan Native, Asian, Native Hawaiian or Pacific Islander.

Child abuse and/or neglect. The physical assault and child neglect subscales of the Parent-Child Conflict Tactics Scales (CTS-PC) were used to measure previous child abuse and/or neglect (Straus et al., 1998). Current caregivers rated the extent to which they engaged in certain parenting practices in the past 12 months with the current child on an 8-point Likert scale ('1 time,' '2 times,' '3 to 5 times,' '6 to 10 times,' '11 to 20 times,' 'more than 20 times,' 'not in the past 12 months but it has happened before,' and 'never'). For physical assault, caregivers reported how often they engaged in 13 parenting practices (e.g., beat child, choked child, punched or kicked child) and for neglect caregivers reported how often they engaged in five items (e.g., leaving child home alone, not providing child with food, not providing medical care). A dichotomous variable was created to indicate children who had experienced at least one incident of child physical abuse and/or neglect in their lifetime (coded as 1). If caregivers selected 'never' children were not considered to have experienced previous child abuse and/or

neglect and were coded as 0. The CTS-PC has demonstrated excellent internal consistency with the NSCAW I study ($\alpha = 0.92$) (NDACAN, 2011).

Poverty level. Caregivers were asked to report on their total household income in the past 12 months and the number of household members. The household poverty rate was calculated by NSCAW researchers based on U.S. Department of Health and Human Services poverty guidelines for 2009 and 2010 (NDACAN, 2011). Household poverty rate was coded into two groups: *1* = '<100% federal poverty level (FPL),' *2* = ≥ 100% FPL.'

Caregiver depression. Current caregiver depression was measured using the Composite International Diagnostic Interview Short Form (CIDI-SF) scale (Kessler et al., 1998). The CIDI-SF provides major depressive diagnoses based on criteria established in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (Kessler et al., 1998). Per recommendations of the manual, caregivers who endorsed three or more of seven possible symptoms (e.g., losing interest in pleasurable activities, trouble with sleep, change in weight, thoughts about death) of a major depressive episode in the past 12 months were classified as depressed (coded as 1). Caregivers who experienced fewer than three symptoms were considered non-depressed (coded as 0). The CIDI has demonstrated good psychometric properties with varying populations and cultures, including good to excellent test-retest and inter-rater reliability (Robins et al., 1988; Wittchen, 1994).

Caregiver alcohol/drug problem. The Alcohol Use Disorders Identification Test (AUDIT) developed by the World Health Organization was used to measure the presence of an alcohol problem in caregivers in the previous 12 months (Babor et al., 2001). The

AUDIT is a ten-item measure designed to quickly screen for excessive drinking and alcohol problems. Current caregivers were asked to rank the frequency of ten items (e.g., having six or more drinks in one setting, experiencing blackouts, feeling guilty after drinking) on a 4-point scale. Per recommendations of the manual, a score of eight or higher distinguishes caregivers who may have an alcohol problem from those with no evidence of an alcohol problem (Babor et al., 2001; NDACAN, 2011). The Drug Abuse Screening Test (DAST-20) was used to assess the presence of a drug problem in current caregivers (Skinner, 1982). The DAST-20 is a 20-item measure intended to identify individuals with drug dependence. Caregivers were asked to report on the extent of using drugs in the past 12 months (e.g., abused prescription drugs, neglected family due to drug use, lost a job due to drug use) with a "yes" or "no" response. Per the DAST-20 developer's recommendation, a cutoff score of six or greater was used to distinguish caregivers with drug dependence from those without a drug problem (Skinner, 1982). A dichotomous variable was created to distinguish caregivers with an alcohol and/or drug problem (coded as 1) from caregivers with no alcohol or drug problem (coded as 0).

Data Analysis

Analysis weights. All analyses in the current study were conducted with weighted data to account for NSCAW's complex sampling design. Analysis weights were constructed in stages by NSCAW research staff, first accounting for probability of county selection and then accounting for probability of child selection within a county (Biemer et al., 2008). Weights were further adjusted to compensate for nonresponse, under-coverage and attrition (Biemer et al., 2008).

Missing data. Multiple imputation was used to address missing data. Fourteen

percent of children in the analytic sample had at least one missing value on study variables. The majority of the missing data came from the dependent variables: reading scores (102 missing cases, ~14% of analytic sample) and math scores (100 missing cases, ~13% of analytic sample). Caregiver depression and caregiver alcohol and/or drug problem had 85 missing cases (~12% of analytic sample). The other variables had lower rates of missing data ranging from 42 missing cases for previous child abuse and/or neglect (~6% of analytic sample) to 29 missing cases for poverty level (~4%) and 2 missing cases for children's depression (~0.2% of analytic sample). Minor IPV frequency, severe IPV frequency, children's age and gender had no missing values.

Since other methods of handling missing data such as list-wise deletion or setting missing values to the mean are associated with a risk of bias (Croy & Novins, 2005), missing data was imputed with Stata version 13 (StataCorp, 2013) using Royston's (2005) method of multiple imputation by chained equations (ICE). ICE uses an iterative regression switching procedure to estimate missing values (Royston, 2005). Under ICE, incomplete variables are estimated using observed values in the predictive model. Incomplete continuous variables are estimated using linear regression and incomplete categorical or dichotomous variables are estimated using logistic regression (Royston, 2005). Five fully imputed datasets were created using ICE. Analyses were performed separately for each imputed data set, and coefficients and standard errors were automatically averaged using Stata's 'Mi Estimate' command (StataCorp, 2013).

Statistical model. Descriptive statistics and bivariate correlations were conducted to examine demographics and correlations of primary study variables for the sample. The first and second research question examined the direct effect of IPV

exposure (both minor IPV and severe IPV) at Wave 1 on children's reading and math scores at Wave 3 while controlling for child and caregiver risk factors at Wave 2. The third research question examined the mediating effect of children's depression (Wave 2) on the relationship between exposure to IPV (Wave 1) and reading and math scores (Wave 3) (see *Figure 3-1* for conceptual model). To test these research questions, structural equation modeling (SEM) was conducted. SEM allows for the simultaneous testing of the direct and indirect (i.e., mediating) effects of the model while also examining the magnitude and significance of the relationship between predictor and mediator/outcome variables. This testing is not possible using traditional ordinary least squares regression (Stage, Carter, & Nora, 2004), which is poorly suited for longitudinal data with time varying variables (Grogan-Kaylor, Ruffolo, Ortega, & Clarke, 2008; Singer & Willett, 2003). This study includes four SEM models:

1) The direct and indirect path of minor IPV frequency on child depression and reading scores;
2) The direct and indirect path of severe IPV frequency on child depression and reading scores;
3) The direct and indirect path of minor IPV frequency on child depression and math scores; and
4) The direct and indirect path of severe IPV frequency on child depression and math scores.

The analytic modeling for the current study follows the Baron and Kenny (1986) approach to mediation, which assumes a three-variable system with two casual paths to the outcome of interest: 1) the direct path of the independent variable on the outcome,

and 2) the direct path of the mediator on the outcome. There is also a path from the independent variable to the mediator (Baron & Kenny, 1986). Following the Baron and Kenny (1986) framework, this study uses SEM statistical techniques to test the four analytic models with the following equation:

$$Y = BY + \Gamma X + \alpha + \varsigma$$

Model fit was examined with two goodness-of-fit indices, the standardized root mean squared residual (SRMR) and the Coefficient of Determination (CD). CD values close to 1 and SRMR values less than .05 indicate good fit (Hu & Bentler, 1999). While the comparative fit index (CFI) and root mean square error of approximation (RMSEA) are often used as fit indices for SEM models in social science, it is suggested that these commonly used indices are not appropriate to use with weighted complex survey data (Bollen, Tueller, & Oberski, 2013), as they may not reliably detect mis-specified SEM models (Wu & Kwok, 2012).

Results

Descriptive Statistics

Table 3-1 presents sample demographics for all study variables by wave. The majority of children were female and either non-Hispanic white or Hispanic. Children ranged in age from 8 to 18 years. Eighty-six percent of children in the sample were exposed to IPV in at least one study wave. Sixty-two percent of children experienced co-occurring IPV and child abuse and/or neglect during at least one study wave. The number of minor IPV occurrences to which children were exposed (M = 4.45; SD = 0.15, theoretical range 0-18) and the number of severe IPV occurrences to which they were exposed (M = 1.51; SD = 0.08, theoretical range 0-18) were relatively low in Wave 1,

and remained low through subsequent waves. Children in the sample tended to perform poorly on standardized reading and math tests, with scores ranging from the 56-58 percentile for math and the 63-64 percentile for reading across waves.

Table 3-2 presents the bivariate correlation of study variables. Most of the significant correlations demonstrated a weak relationship. A small number of variables were moderately correlated. Most notably, frequency of minor IPV and frequency of severe IPV at Wave 1 were positively correlated ($r = 0.64$, $p < 0.001$). Reading and math scores at Wave 3 were positively correlated ($r = 0.62$, $p < 0.001$). Non-Hispanic white child race/ethnicity and African American child race/ethnicity ($r = 0.56$, $p < 0.001$), as well as non-Hispanic white child race/ethnicity and Hispanic child race/ethnicity ($r = 0.50$, $p < 0.001$), were positively correlated. No variables were strongly correlated.

Path Mediation Analysis: Reading Scores

The first model addressed the direct and indirect pathways by which children's exposure to IPV (minor IPV frequency and severe IPV frequency) affects their reading scores over time. *Table 3-3* presents the standardized direct and indirect path estimates of IPV exposure and children depression on reading scores by IPV severity (minor IPV frequency and severe IPV frequency). For the minor IPV frequency model, the SRMR of 0.03 and the CD of 0.19 indicated a good fit of the data. Minor IPV exposure at Wave 1 was not directly associated with reading scores at Wave 3 ($\beta = 0.13$, p = n.s.). However, the adjoining path from minor IPV exposure at Wave 1, through depression scores, to reading scores at Wave 3 was significant ($\beta = -0.38$, $p < 0.01$), indicating that depression mediated some of the influence of minor IPV exposure on children's reading scores over time. Greater frequency of exposure to minor IPV at Wave 1 was associated with more

depression symptoms at Wave 2 ($\beta = 0.32$, $p < 0.001$), and depression at Wave 2 was negatively associated with reading scores at Wave 3 ($\beta = -0.37$, $p < 0.01$).

For the severe IPV frequency model, the SRMR of 0.03 and the CD of 0.17 indicated good fit of the data. *Figure 3-2* presents the severe IPV frequency model with standardized estimates of the path coefficients for readings scores at Wave 3. As expected, severe IPV exposure at Wave 1 was significantly associated with reading scores at Wave 3 ($\beta = -0.77$, $p < 0.05$), such that greater frequency of exposure to severe IPV was related to poorer reading scores over time. The adjoining path from severe IPV exposure at Wave 1, through depression scores, to reading scores at Wave 3 was also significant ($\beta = -0.45$, $p < 0.01$), indicating that depression mediated some of the influence of IPV exposure on children's reading scores over time. Greater frequency of exposure to severe IPV Wave 1 predicted more depression symptoms at Wave 2 ($\beta = 0.98$, $p < 0.001$), and more depression at Wave 2 predicted poorer reading scores at Wave 3 ($\beta = -0.46$, $p < 0.001$).

Additionally, a number of control variables were significant in both the minor IPV frequency and severe IPV frequency models. Child age was negatively associated with reading scores at Wave 3 in the minor IPV frequency ($\beta = -1.93$, $p < 0.001$) and severe IPV frequency model ($\beta = -1.93$, $p < 0.001$). African American children had lower reading scores on average at Wave 3 in the minor IPV frequency ($\beta = -6.86$, $p < 0.01$) and severe IPV frequency model ($\beta = -6.39$, $p < 0.01$) when compared to Hispanic, non-Hispanic white and other race children. Other race children had greater reading scores on average at Wave 3 in the minor IPV frequency ($\beta = 5.56$, $p < 0.05$) and severe

IPV frequency model ($\beta = 5.28$, $p < 0.05$) when compared to African American, Hispanic and non-Hispanic white children.

Path Mediation Analysis: Math Scores

The second model addressed the direct and indirect pathways by which children's exposure to IPV (minor IPV frequency and severe IPV frequency) affects their math scores over time. *Table 3-4* presents the standardized direct and indirect path estimates of IPV exposure and children's depression on math scores by IPV severity (minor IPV frequency and severe IPV frequency). For the minor IPV frequency model, the SRMR of 0.02 and the CD of 0.19 indicated a good fit of the data. Minor IPV exposure at Wave 1 was not directly related to math scores at Wave 3 ($\beta = 0.46$, p = n.s.). However, the adjoining path from minor IPV exposure at Wave 1, through depression scores, to math scores at Wave 3 was significant ($\beta = -0.27$, $p < 0.001$), indicating that depression mediated some of the influence of minor IPV exposure on children's math scores over time. Greater frequency of exposure to minor IPV at Wave 1 was related to more depression symptoms at Wave 2 ($\beta = 0.71$, $p < 0.001$), and depression at Wave 2 was associated with poorer math scores at Wave 3 ($\beta = -0.38$, $p < 0.001$).

For the severe IPV frequency model, the SRMR of 0.02 and the CD of 0.14 indicated good fit of the data. Contrary to the hypothesis, severe IPV exposure at Wave 1 was not significantly related to math scores at Wave 3 ($\beta = 0.12$, *p = n.s)* (see *Table 3-4*). However, the adjoining path from severe IPV exposure at Wave 1, through depression scores, to math scores at Wave 3 was significant ($\beta = -0.36$, $p < 0.01$), indicating that depression mediated some of the influence of IPV exposure on children's math scores over time. Greater frequency of severe IPV exposure at Wave 1 significantly predicted

more depression symptoms at Wave 2 ($\beta = 0.98$, $p < 0.001$), and depression at Wave 2 predicted lower math scores at Wave 3 ($\beta = -0.34$, $p < 0.001$).

Additionally, child age was negatively associated with math scores at Wave 3 in the minor IPV frequency ($\beta = -1.24$ $p < 0.001$) and severe IPV frequency model ($\beta = -1.14$, $p < 0.001$). On average, African American children had poorer math scores in the minor IPV frequency ($\beta = -4.14$, $p < 0.01$) and severe IPV frequency model ($\beta = -4.07$, $p < 0.01$) when compared to Hispanic, non-Hispanic white and other race children.

Discussion

This study sought to explore the direct and indirect effect of the frequency of exposure to minor and severe IPV on standardized reading and math scores over time, using a nationally representative sample of children in the CWS. Of particular note, it explored whether IPV exposure has a unique and independent effect on academic outcomes among children in the CWS above and beyond experiencing child abuse and/or neglect alone. It also examined whether depression mediated the relationship between exposure to minor and severe IPV and children's math and reading scores. This study adds to the nascent literature on children's exposure to IPV and their academic performance, and is the first study to date that explores this relationship using a nationally representative sample of children in the CWS.

It was hypothesized that frequent exposure to severe forms of IPV, such as seeing a caregiver stab another adult or threaten another adult with a knife, would be associated with lower reading and math scores over time, but that this relationship would not be significant for minor forms of IPV. This hypothesis was partially confirmed. Greater frequency of severe IPV exposure was related to poorer reading scores over time for

children in this sample. This result is consistent with previous research that documents that IPV-exposed children in the general population (Peek-Asa et al., 2007) and in the CWS (Kiesel et al., 2013) score lower on standardized reading tests than non-IPV-exposed children. This study adds additional support for the negative effect of IPV exposure on children's reading scores by utilizing a nationally representative sample of children in the CWS and by controlling for previous child maltreatment as reported by caregivers. Previous research on the relationship between IPV exposure and academic achievement has failed to adequately control for child maltreatment. Some studies do not consider child maltreatment history at all (e.g., Peek-Asa et al., 2007), while others only capture maltreatment detected by the CWS (e.g., Kiesel et al., 2013). For example, Kiesel and colleagues' (2013) comparison group study, which found that IPV-exposed children in the CWS performed worse on reading tests than children exposed to both IPV and maltreatment, only accounted for children who were substantiated victims of child maltreatment. The current study, however, used parental report of past physical discipline and neglectful parenting to measure child abuse and/or neglect independent of CWS investigation and case disposition. Therefore, this study may capture a wider net of abused and/or neglected children by revealing instances of child abuse and/or neglect not discovered by the CWS and/or that do not meet legal definitions of child maltreatment. Overall, these findings suggest that being exposed to severe IPV has additional detrimental effects for children involved with the CWS above and beyond their direct experience of child maltreatment in terms of their performance on standardized reading tests.

Interestingly, exposure to severe IPV was not related to poor math scores over time for children in this sample. It is unclear why IPV exposure would predict poor reading scores, but this relationship would not be significant for math. These findings are in contrast to existing research that highlights a strong relationship between IPV exposure and both poor math and reading performance for children in the CWS (Kiesel et al., 2013). However, previous research, such as Kiesel and colleagues' (2013) study, are limited to small samples children in the CWS often from one state, and thus are not as generalizable as the current study. It is possible that exposure to severe IPV may affect math and reading differently for children in the CWS. Future research with nationally representative child welfare samples (e.g., the anticipated third NSCAW cohort) is needed to examine the relationship between IPV exposure and math scores to see whether this finding is an anomaly or a replicable phenomenon. There is a particular need for analyses that explore the simultaneous effects of IPV exposure frequency and severity on these outcomes.

As expected, this study did not find a significant relationship between minor IPV exposure and reading or math scores over time. Manuscripts 1 and 2 of this dissertation, as well as other studies utilizing samples of children in the CWS (Garrido et al., 2011), suggest that the severity, as well as the frequency, of the IPV to which children are exposed affect child outcomes. This study extends these findings and is the first to add support that exposure to severe IPV, but not exposure to minor forms of IPV, affects children's academic achievement. This study also found that the adjoining path from severe IPV exposure, through child depression, to reading scores was significant, indicating that IPV exposure has an indirect effect on children's academic performance

by way of child depression. Specifically, greater frequency of exposure to severe IPV at Wave 1 predicted more depression at Wave 2, and depression at Wave 2 predicted lower reading scores at Wave 3. These results suggest that the pathway to poor educational outcomes among IPV-exposed children may result from the effect that IPV has on the development of psychological problems, specifically depression, in children. Although this pathway has been proposed for children who experience child abuse and/or neglect (Slade & Wissow, 2007), this study is the first to provide evidence that depression also plays a mediating role in school outcomes, particularly reading scores, among children exposed to IPV.

These findings highlight the importance of effective screening for presence of IPV in the home of all families referred to CPS. In fact, 86% of the children in this sample were exposed to IPV during at least one time-point in the study. Initial assessments should be comprehensive in nature and not only assess the allegation under investigation but also examine the frequency and severity of IPV exposure. When conducting a CPS assessment, workers should screen for the presence of IPV within the home, assess the frequency and severity with which children have been exposed, and examine children's level of psychological distress. Given corroborating research documenting high rates of IPV exposure among children in the CWS (Casanueva et al., 2013), and the fact that only half of the families investigated by CPS may be screened for IPV (Hazen et al., 2006), additional training may be needed for CPS workers to increase their skill in identifying IPV among families involved with CWS.

Caseworkers may also benefit from a comprehensive screening tool that accurately identifies trauma experiences and assesses the severity of these experiences

among children in the CWS. This screening tool should be universally administered to every child upon initial contact with the CWS. It should be designed to detect exposure to traumatic experiences and assess psychological symptoms or reactions from exposure, including PTSD and/or depression (Conradi, Wherry, & Kisiel, 2011). These screenings should also include child self-report measures when developmentally appropriate. Manuscripts 1 and 2 of this dissertation show that when child self-report is used, estimates of IPV exposure among children are higher than what is previously documented in other studies using caregivers as the sole informant (e.g., Casanueva et al., 2008; Casanueva et al., 2013; Edleson, 1999; Hazen et al., 2006). This suggests that child self-report may more accurately capture the amount of IPV witnessed by children in the CWS.

If the screening process determines that a child has been exposed to IPV, he/she should be automatically referred for a trauma-focused psychological assessment, including a comprehensive depression screening, by a trained mental health professional. Recently, policymakers at the federal level have recognized the importance of screening for trauma and its effects among children in the CWS. The Child and Family Services Improvement and Innovation Act of 2011 (PL 112-34) amended Title IV-B to require states to screen for "emotional trauma associated with a child's maltreatment" and to address trauma in case plans (Conradi et al., 2011). The results of this study suggest that this federal policy should be expanded to include screening for other forms of trauma, including IPV exposure, and its subsequent effect on psychological development. This screening process should be mandated at entry into the CWS to identify children affected by IPV exposure as early as possible. This screening also must consider the severity of

IPV children are exposed to given that exposure to more minor forms of IPV may not have a negative effect on children's academic success.

Effective screening of IPV could inform case planning and help CPS workers facilitate appropriate trauma-informed care, including linking children to trauma-informed mental health services. This may decrease psychosocial effects of IPV exposure and ultimately enhance educational outcomes for children involved with the CWS. There are several trauma-screening tools that exist which can be utilized by CPS workers, such as the Child Welfare Trauma Referral Tool (Taylor, Steinberg, & Wilson, 2006) (see Conradi et al. 2011 for a review); however, these tools have not been universally adopted by the U.S. CWS in a formalized manner, and require proper training in administration, scoring and interpretation. Furthermore, these tools are rarely child self-report.

It is also crucial that CWS caseworkers collaborate with school social workers to carefully monitor the academic progress of children in the CWS, particularly those known to have been exposed to severe IPV, to ensure timely mental health testing and treatment at the first signs of academic struggle. Because this study found that depression mediated some of the relationship between severe IPV exposure and children's reading scores, receiving proper mental health treatment may improve academic outcomes among IPV-exposed children in the CWS. A strong relationship between child welfare professionals and schools is critical in meeting the academic needs of children involved with the CWS. Although federal law mandates that child welfare agencies obtain educational records of children in care and regularly review and update these records in their case plans (Casey Family Programs, 2009), confidentiality concerns

often interfere with this information-sharing. In particular, The Family Education Rights and Privacy Act (FERPA) requires that children's educational records are kept confidential until parental consent of disclosure. This may prohibit caseworkers from obtaining educational records for children in care (Casey Family Programs, 2009). It is therefore crucial that CPS workers seek parental consent to release educational records and comply with FERPA immediately when children enter care to increase collaboration between the two systems. Once this information is shared in a confidential manner, child welfare and educational professionals can work together to identify academic problems and ensure children are receiving timely mental health testing. Linking children with trauma-informed mental health counseling and providing proper academic support can foster positive educational outcomes, especially in reading, among children in care.

Limitations

The findings of this study should be viewed within the context of the following limitations. First, the way in which IPV was defined and measured was imperfect. Children's exposure to IPV in the home was measured using child self-report of the standardized measure, the Violence Exposure Scale for Children (VEX-R) (Fox & Leavitt, 1995). This measure asks children to describe the frequency of their exposure to minor and severe adult-on-adult violence within their home. It is possible that this adult-on-adult violence may extend beyond violence between a caregiver and his/her romantic partner to include non-romantically involved family members or non-family visitors to the home. Despite this, it should be noted that this study adds to literature by using the child as a main and sole informant of his/her exposure to IPV. The majority of existing studies use only the mother's report of her IPV experiences.

Additionally, the current study uses standardized measures to assess children's academic knowledge in reading and math. Standardized test scores are a flawed indicator of academic performance and may reflect pre-existing student characteristics, the quality of instruction, as well as children's academic knowledge. Future studies should assess other indicators of academic performance, including student engagement and motivation to learn, student attendance, retention/drop-out rates and graduation rates to gain a more accurate and comprehensive picture. Finally, this sample only includes children in the CWS who remain in their parents' custody. Children living in OOH placement may experience greater threats to academic performance than children in the CWS who remain at home, due to high rates of school transfers and placement in poor performing schools (Fries, Klein, & Ballantyne, 2014). Future research should examine the independent effect of IPV frequency and severity on reading and math scores among foster children in OOH placement.

Conclusions

Not withstanding these limitations, the current study adds to the dearth of knowledge about exposure to IPV and school outcomes among children in the CWS through the use of a nationally representative sample and rigorous methods. Exposure to severe IPV, but not minor, was associated with poorer reading scores over time even after controlling for previous child abuse and/or neglect. Additionally, depression mediated the relationship between severe IPV exposure and poor reading scores, indicating that severe IPV exposure has an indirect effect on academic outcomes among children in the CWS. These findings suggest that exposure to IPV in greater frequency, particularly severe forms of IPV, can lead to poor academic outcomes (specifically reading scores),

stemming in part from the effect IPV exposure has on child depression. Practice implications of these findings include the need to screen for IPV exposure among all children in the CWS. Screenings should be comprehensive in nature and assess the severity and frequency of IPV exposure as well as children's psychological problems. CWS workers can play a pivotal role in ensuring the academic success of children in care by screening for IPV exposure, collaborating with school social workers to identify depression and/or early academic problems, and linking children with mental health practitioners for assessment and treatment.

CHAPTER FIVE

CONCLUSION

This dissertation examined the long-term effects of exposure to IPV on trauma, depression and academic achievement among a nationally representative sample of children referred to CPS for alleged child abuse and/or neglect. Specifically, the first manuscript (Chapter Two) investigated the independent effects of IPV frequency and severity on children's trauma and depression symptoms over time. The second manuscript (Chapter Three) explored the moderating effect of child race/ethnicity on the relationship between exposure to IPV and trauma, and examined whether differential predictors of trauma exist for African American, Hispanic and non-Hispanic white children exposed to IPV. The third manuscript (Chapter Four) examined the direct and indirect effect of exposure to minor and severe IPV on children's reading and math scores, and investigated whether this relationship was mediated by depression. Guided by Trauma Theory (Briere, 1992; Perry, 2000) and previous empirical literature (Graham-Bermann et al., 2006), this study is one of the first to examine the effects of IPV exposure on trauma, depression and academic achievement, as well as to explore racial/ethnic differences in outcomes, using a nationally representative sample of school-aged children in the CWS. The current chapter will summarize each manuscript and discuss how findings inform social work practice and policy.

Summary of Findings

Major findings of the study include:

1) Exposure to more frequent IPV predicted greater trauma and depression symptoms over time. Specifically, children in the CWS exposed to frequent IPV

during Wave 1 (baseline; mean age = 12 years) and 2 (18 months later; mean age = 13 years) had greater trauma and depression scores.

2) The level of severity of IPV exposure influenced whether children developed trauma and depression symptoms over time. Specifically, exposure to the most severe forms of IPV (such as witnessing an adult point a knife at another adult or stab another adult) was related to greater trauma and depression scores over time, but exposure to minor forms of IPV (such as overhearing an adult scream at another adult) was not significantly associated with trauma or depression.
3) Rates of trauma symptomatology did not vary significantly by child race/ethnicity. In other words, non-Hispanic white children in the CWS were not more likely to experience trauma than African American or Hispanic children in CWS.
4) Predictors of trauma among children in the CWS exposed to IPV varied by race/ethnicity. Specifically, caregiver depression and previous sexual abuse significantly predicted trauma for non-Hispanic white children but not for African American and Hispanic children, while poverty level was significantly associated with trauma for African American and Hispanic children but not for non-Hispanic white children. Neighborhood quality/safety was significantly related to trauma for Hispanic children exposed to IPV but not for African American or non-Hispanic white children.
5) IPV exposure was directly related to poor reading scores. Specifically, frequent exposure to severe forms of IPV, such as seeing a caregiver stab another adult or threaten another adult with a knife, predicted lower reading scores over time for

children in the CWS. This relationship was not significant for math scores. Additionally, exposure to minor IPV was not significantly associated with math or reading over time.

6) IPV exposure had a significant, negative indirect effect on reading scores. Specifically, depression mediated the relationship between exposure to severe IPV and reading scores, such that greater frequency of exposure to severe IPV at Wave 1 (baseline; mean age = 12 years) predicted more depression at Wave 2 (18 most post baseline; mean age = 13 years), and greater depression at Wave 2 predicted poorer reading scores at Wave 3 (3 years post baseline; mean age = 15 years).

The first manuscript of this dissertation (Chapter Two) assessed the effects of exposure to IPV on the development of trauma and depression symptoms over time among school-aged children in the CWS. Multilevel modeling (level 1 = PSU, level 2 = child, level 3 = observations at each wave) was used to examine the independent effect of IPV frequency and severity on children's trauma and depression scores while controlling for child (i.e., age, sex, race/ethnicity, previous maltreatment), caregiver (i.e., education level, depression, alcohol/drug use), and community (i.e., poverty, neighborhood quality) risk factors. Children in the sample were exposed to high rates of IPV in both Wave 1 and 2. Results from the multilevel models confirmed hypotheses and revealed that IPV frequency and severity predicted greater trauma and depression scores over time after controlling for risk factors. Specifically, severe IPV exposure, but not minor IPV, was related to higher trauma and depression scores among children in the CWS.

The second manuscript of this dissertation (Chapter Three) was an extension of the first paper and examined racial/ethnic differences in outcomes of CWS-involved children exposed to IPV. Specifically, this study explored whether child race/ethnicity moderated the relationship between exposure to IPV and trauma. Following the work of Graham-Bermann and colleagues (2006), this study also explored differential predictors of trauma by child race/ethnicity (non-Hispanic white, African American, Hispanic). Contrary to the hypothesis, rates of trauma did not vary by child race/ethnicity. Multivariate regression models revealed that child race/ethnicity did not significantly moderate the relationship between IPV exposure and trauma, but differential predictors of trauma emerged by child race/ethnicity. Non-Hispanic white children's trauma symptoms were predicted by caregiver's emotional wellbeing, while minority children's (e.g., African American and Hispanic) trauma symptoms were predicted by community and household variables. History of child sexual abuse and caregiver depression were the strongest, significant predictors of trauma symptoms for non-Hispanic white children exposed to IPV, but not for African American or Hispanic children. Poverty level and neighborhood quality were the strongest, significant predictors of trauma for minority children exposed to IPV, but not for non-Hispanic white children.

The third manuscript of this dissertation (Chapter Four) assessed the separate effects of the frequency of exposure to minor and severe IPV on children's academic achievement over time. It also investigated whether the relationship between IPV exposure and academic achievement was mediated by children's depression. Specifically, structural equation modeling (SEM) was conducted to explore the direct and indirect pathway of frequency of exposure to minor and severe IPV (Wave 1) on

children's reading and math scores approximately three years later (Wave 3). The direct path of severe IPV exposure to reading scores was significant after controlling for previous child abuse and/or neglect and other covariates, such that greater frequency of exposure to severe IPV predicted poorer reading scores over time. This relationship was mediated by depression. Greater frequency of exposure to severe IPV at Wave 1 predicted more depression symptoms at Wave 2, and more depression symptoms at Wave 2 predicted poorer reading scores at Wave 3. However, the direct path of severe IPV exposure to math scores was not significant. Similarly, exposure to minor IPV was not significantly associated with reading or math scores over time.

Implications for Social Work Practice and Policy

1) *Assure that CPS caseworkers are informed that the majority of children investigated for alleged child abuse and/or neglect are exposed to IPV in their homes, and these children often experience high rates of trauma and depression.*

In particular, this study found that nearly 80% of children in the sample were exposed to IPV, with many witnessing severe forms of IPV between caregivers. These results indicate that the majority of children investigated by CPS for alleged child abuse and/or neglect live in homes with IPV, and consequently, the CWS may be functioning as a de facto IPV response system. When compared to children in the general population, children in the CWS are not only exposed to multiple traumas, including IPV and child maltreatment, but are also at a heightened risk for experiencing psychological problems, such as depression and trauma, as a result of exposure. In fact, children in this CWS sample had higher rates of depression (10%) and trauma symptomatology (7-13%) than

what has previously been reported of children in the general population (4-7%) (Kilpatrick et al., 2003).

2) *Mandate screening of IPV among all families in the CWS upon entry into the system and at subsequent points of contact. Multidimensional assessments should also be conducted on all children at initial CPS investigations to inform treatment case plans. These assessments should investigate the frequency and severity of IPV exposure, the presence of mental health problems, as well as other risk factors present in the home.*

The high rates of IPV exposure and subsequent trauma and depression among children in the sample highlight the importance of effective screening and identification of IPV in families involved with the CWS. Increasingly at the federal and state level, child welfare policy groups have issued recommendations to routinely screen and assess for IPV exposure among children referred to CPS. Federally, the U.S. Department of Health and Human Services recommends that assessment for IPV occur in the initial screening process for every child abuse or neglect investigation (Bragg, 2003; National Association of Public Child Welfare Administrators, 2001; National Council of Juvenile and Family Court Judges, 1999). The findings in the current dissertation support these state and federal recommendations and offer further guidance regarding the value of caseworkers assessing IPV exposure on an ongoing basis at regular contact points. Because rates of IPV exposure were consistently high across all waves in the study, caseworkers should screen for IPV at initial CPS investigation and at regular intervals thereafter (at least annually). If presence of IPV is confirmed within the home, caseworkers should determine whether the child was exposed, and if so, the frequency

and severity of that exposure should be assessed as these factors may modulate the negative effect on children.

This dissertation also found that more frequent and severe IPV predicted greater psychological problems and poorer academic outcomes, specifically in reading, among children in the CWS. These findings suggest that the number of occurrences and severity of IPV exposure matter for the development of negative outcomes among children in the CWS who remain in their parents' care. It is therefore essential that caseworkers conduct a multidimensional assessment at initial CPS investigation. This multidimensional assessment should consider the severity and frequency of IPV exposure among children, as well as other caregiver and child factors that may exacerbate negative outcomes. This assessment can help dictate the course of treatment for children exposed to IPV in the CWS. If the screening process determines that a child has been exposed to IPV, he/she should be automatically referred for a trauma-focused psychological assessment, including a comprehensive depression screening, by a trained mental health professional. Effective assessment can help CPS workers facilitate appropriate trauma-informed care, and may decrease psychosocial effects of IPV exposure ultimately enhancing educational outcomes for children involved with the CWS.

Furthermore, there may be value in using child self-report measures, if developmentally appropriate, when screening for IPV among this population. Manuscripts 1 and 2 of this dissertation show that when child self-report is used, estimates of IPV exposure among children are higher than what is previously documented in other studies using caregivers as the sole informant (e.g., Casanueva et al., 2008; Casanueva et al., 2013; Edleson, 1999; Hazen et al., 2006). This suggests that child self-

report may more accurately capture the amount of IPV witnessed by children in the CWS (see Manuscript 2 of this dissertation).

3) *Increase training opportunities for CPS caseworkers to enhance their skills in identifying and assessing IPV exposure among children.*

Given that the majority of children were exposed to IPV in this study, that other studies have documented the under-identification of IPV in the CWS as a whole (Casanueva et al., 2014), and the pivotal role caseworkers can play in linking children with trauma-informed mental health treatment, additional training for caseworkers may be needed. This training should focus on enhancing caseworkers knowledge of the detrimental effects of toxic stress and IPV exposure. It should also focus on increasing their ability to identify and assess the frequency and severity of IPV exposure among children.

4) *State and local CPS agencies should not have blanketed policies that treat childhood exposure to IPV as maltreatment without attention to severity and frequency of IPV.*

Some states and local CPS agencies are now treating IPV exposure as child maltreatment in the form of child neglect through 'failure to protect,' even if it does not co-occur with direct victimization and sometimes without attention to the severity or frequency of such exposure (Edleson, 2004; Goodmark, 2010). The findings of this dissertation suggest that minor forms of IPV exposure may not negatively affect a child's psychological development or academic achievement. Consequently, blanketed policies that classify IPV exposure as maltreatment without regard to frequency or severity could be detrimental, potentially bringing more children into a system that may be unequipped

to handle their needs (Edleson, 2004). If exposure to IPV is written into state maltreatment statue, CPS workers will have little leeway in dealing with parent victims and their children and may unnecessarily remove children who have been exposed to IPV from their home (Goodmark, 2010). Removing children is likely to cause additional harm. Out-of-home placements may lead to further disruption and stress (Zink et al., 2004), as positive relationships with a non-abusive caregiver have been associated with decreased trauma and depression in IPV-exposed children (Skopp et al., 2007). Instead, a modulated response, which factors in the severity and frequency of the IPV exposure, as well as other factors specific to the child (i.e., developmental period, maltreatment experiences), may be more appropriate for children exposed to IPV. One option is differential response (DR), which includes alternatives to traditional CPS investigation such as referrals to trauma-informed mental health treatment and/or domestic violence services.

5) *Assure that CWS interventions for children exposed to IPV consider racial/ethnic differences. CPS caseworks should work to develop racially and culturally sensitive case plans for all children in the CWS.*

This study found that different risk factors were predictive of trauma for non-Hispanic white children (e.g., caregiver depression, sexual abuse history) exposed to IPV than for African American or Hispanic children (e.g., poverty level, neighborhood quality/safety) exposed to IPV. These findings suggest that CPS caseworkers should consider child race/ethnicity when developing case plans for children in the CWS. Caseworkers must holistically address both the needs of children as well as their families in a racially and culturally sensitive way. For non-Hispanic white children, improving

the caregiver relationship and linking caregivers to mental health treatment may be crucial in preventing IPV-related trauma. Caseworkers can also help broaden the network of social support for non-Hispanic white children by assisting families in identifying extended kin and other role models. For minority children, caseworkers should particularly address the effects of poverty and poor neighborhood context to prevent negative developmental outcomes. Caseworkers can develop collaborative relationships with agencies to facilitate housing and poverty services for parents, such as linking families to agencies that provide assistance with Section 8 low-income housing. Caseworkers may also consider referring children to after-school community based programs specifically developed for at-risk children. These programs can provide children with education, resources and mentorship, and can work to promote academic success and positive youth development. Developing treatment plans for children exposed to IPV in the CWS through a racially and culturally diverse lens may reduce psychological effects of exposure.

6) *Strengthen collaboration between child welfare professionals and school social workers to carefully monitor the academic progress of CWS children, particularly those known to have been exposed to severe IPV, and ensure timely mental health testing and treatment at first signs of academic struggle.*

This dissertation found that greater frequency of exposure to severe IPV was associated with poor reading scores over time for children in the CWS. Additionally, depression mediated this relationship, such that greater frequency of exposure to severe IPV predicted more depression and greater depression predicted poorer reading scores. These findings suggest that receiving proper mental health treatment may improve

academic outcomes, specifically in reading, among children exposed to severe IPV in the CWS. A strong relationship between child welfare professionals and schools may be critical in meeting the academic needs of children involved with the CWS. Although federal law mandates that child welfare agencies obtain educational records of children in care and regularly review and update these records in their case plans (Casey Family Programs, 2008), confidentiality concerns often interfere with this information-sharing. In particular, The Family Education Rights and Privacy Act (FERPA) requires that children's educational records are kept confidential until parental consent of disclosure. This may prohibit caseworkers from obtaining educational records for children in care (Casey Family Programs, 2008). CPS workers must therefore seek parental consent to release educational records and comply with FERPA immediately when children enter care to increase collaboration between the two systems. Once educational information is shared in a confidential manner, child welfare and school professionals can work together to identify academic problems and ensure children are receiving timely mental health testing. Linking children in the CWS who struggle academically with trauma-informed mental health counseling and providing other academic support, such as tutoring, may foster positive educational success.

Directions for Future Research

1) *Future studies on children in the CWS should use child report, not just caregiver report, to measure IPV exposure when developmentally appropriate and feasible.*

The results of this dissertation suggest that children, not just caregivers, should be consulted when determining IPV exposure in order to accurately capture the amount of violence witnessed. The majority of studies of IPV exposure in the child welfare

population use the mother, or main caregiver, as the main or sole informant (e.g., Casanueva et al., 2008; Casanueva et al., 2013; Edleson, 1999; Hazen et al., 2006), despite research indicating low agreement between parents and their children. Mothers have been shown to underestimate the degree to which children are exposed to IPV (Jaffe et al., 1990) and to overestimate their children's overall functioning (Koverola et al., 2005). The current study found higher rates of IPV exposure (>80%) than what has been previously documented in other studies utilizing CWS samples (30-40%) (Edleson, 1999; English et al., 2005; Jones et al., 2002). It is unclear why children in our sample were exposed to IPV at much higher rates than other studies with samples of children in the CWS. It is possible that the higher rates found in this study are a result of capturing more children exposed to IPV by using the child as the main informant of exposure. Future studies should use child and caregiver report measures when assessing IPV exposure.

2) *Additional studies are needed to test the effect of child race/ethnicity on the relationship between IPV exposure and trauma among children in the CWS.*

Despite the hypothesis proposed in Manuscript Two (Chapter Three), child race/ethnicity did not moderate the relationship between IPV exposure and trauma. This suggests that non-Hispanic white children exposed to frequent and severe IPV are not more likely to develop trauma symptoms than African American or Hispanic children exposed to IPV. These findings are in contrast to what has been documented in an existing study of children in the general population (Graham-Bermann et al., 2006), and indicate that race/ethnicity may not influence the development of trauma among IPV exposed children in the CWS the same way it does for children in the general community. Additional research is needed to examine the effect of race/ethnicity on the relationship

of IPV exposure and trauma among children in the CWS to corroborate findings of the current study.

3) *Future research is needed to examine the effect of IPV exposure on academic achievement, specifically in math, among children in the CWS, while controlling for previous child abuse and/or neglect. Future research should also explore other indicators of academic performance when assessing the effect of IPV exposure.*

This dissertation found that exposure to severe IPV was associated with poor reading scores, but not math scores, over time for children in the CWS. It is unclear why IPV exposure would predict poor reading scores, but this relationship would not be significant for math. These findings are in contrast to existing research that highlights a strong relationship between IPV exposure and both poor math and reading performance for children in the CWS (Kiesel et al., 2013). However, it should be noted that Kiesel and colleagues' (2013) study was limited to children in the CWS from one state, and thus is not as generalizable as the current study. It is possible that exposure to severe IPV may affect math and reading differently for children in the CWS. Future research with nationally representative child welfare samples (e.g., the anticipated third NSCAW cohort) is needed to examine the relationship between IPV exposure math scores to see if this finding is an anomaly or a replicable phenomenon. There is a particular need for analyses that explore the simultaneous effects of IPV exposure frequency and severity on these outcomes.

Additionally, the current study uses standardized measures to assess children's academic knowledge in reading and math. It should be noted that standardized test

scores are a flawed indicator of academic performance and may reflect pre-existing student characteristics, the quality of instruction, as well as children's academic knowledge. Future studies should assess other indicators of academic performance, including student engagement and motivation to learn, student attendance, retention/drop-out rates, and graduation rates to gain a more accurate and comprehensive picture of the impact of IPV exposure on children in the CWS.

Conclusion

This dissertation is one of the first efforts to examine the long-term effect of IPV exposure on trauma, depression and academic achievement among a nationally representative sample of school-aged children in the CWS. Findings from this study suggest that the majority of children investigated by CPS for alleged child abuse and/or neglect live in homes where IPV is present. This is concerning, especially considering that IPV exposure was related to heightened trauma and depression, as well as poorer reading scores, over time for children in this sample. Consequently, the CWS can be viewed as a de facto IPV response system, where caseworkers are presented with ample opportunity to identify many children exposed to IPV. It is crucial that CPS caseworkers screen for IPV exposure among children, assess the frequency and severity of this exposure, and tailor case treatment plans accordingly. Interventions for children exposed to IPV in the CWS should be targeted toward decreasing psychological effects, such as depression and trauma, to foster healthy development and enhance educational outcomes.

APPENDICES

APPENDIX A

Manuscript 1

Table 1-1. *Sample Demographics by Study Wave (n= 728)*

Variable	Wave 1		Wave 2	
	n	Weighted % or *M* (SD)	*n*	Weighted % or *M* (SD)
Trauma (0-25)	726	9.13(0.31)	728	7.44(0.32)
Clinically significant trauma				
Yes	75	13%	50	7%
No	651	87%	678	93%
Depression (0-45)	721	10.13(0.48)	722	8.25(0.37)
Clinically significant depression				
Yes	62	10%	46	6%
No	659	90%	676	94%
IPV Frequency (0-36)	728	5.75(0.32)	728	4.87(0.25)
IPV Severity				
None	87	13%	107	16%
Minor only	247	36%	268	39%
Severe	394	52%	353	46%
<u>Child variables</u>				
Child age in years	728	11.76(0.11)	728	12.96(0.11)
Child sex				
Male	330	41%	330	41%
Female	398	59%	398	59%
Child race/ethnicity				
African American	167	18%	181	21%
White	287	41%	328	49%
Hispanic	201	33%	141	23%
Other race	72	7%	39	7%
Child maltreatment				
Psychological abuse				
Yes	615	85%	608	83%
No	90	15%	112	17%
Physical abuse				
Yes	406	57%	378	49%
No	299	43%	342	51%
Neglect				
Yes	274	40%	254	34%
No	431	60%	466	66%
Sexual abuse				
Yes	109	13%	101	12%
No	593	87%	617	88%

Note. IPV = Intimate Partner Violence; A.A. = African American; mns = months; HS = high school; FPL = Federal poverty level.

Table 1-1 (cont'd)

Variable	Wave 1		Wave 2	
	n	Weighted % or *M* (SD)	*n*	Weighted % or *M* (SD)
Caregiver variables				
Caregiver age				
< 35 years	324	42%	270	36%
≥ 35 years	395	58%	454	64%
Caregiver educational level				
Less than HS	182	31%	164	27%
HS	304	39%	320	43%
HS plus	231	30%	238	30%
Caregiver depression				
Yes	214	30%	176	25%
No	397	70%	467	75%
Caregiver alcohol problem				
Yes	33	4%	28	4%
No	673	96%	690	96%
Caregiver drug problem				
Yes	17	2%	12	2%
No	648	98%	662	98%
Household variables				
Neighborhood quality (0-3)	719	1.55(0.04)	724	1.53(0.03)
Poverty level of family				
< 50% FPL	162	23%	123	16%
50 - <100% FPL	226	33%	251	38%
100 - 200% FPL	204	27%	233	33%
> 200% FPL	106	17%	94	12%

Note. IPV = Intimate Partner Violence; A.A. = African American; mns = months; HS = high school; FPL = Federal poverty level.

Table 1-2. *Correlation of Study Variables (n = 728)*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	--														
2	0.52***	--													
3	0.59***	0.36***	--												
4	0.35***	0.58***	0.53***	--											
5	0.37***	0.32***	0.39***	0.30***	--										
6	0.20***	0.38***	0.22***	0.32***	0.49***	--									
7	-0.13**	-0.12**	-0.16***	-0.17***	-0.32***	-0.19***	--								
8	-0.08*	-0.07	-0.10**	-0.07*	-0.13**	-0.30***	0.23***	--							
9	0.24***	0.23***	0.26***	0.25***	0.55***	0.34***	-0.79***	-0.19***	--						
10	0.15**	0.24***	0.14**	0.19***	0.31***	0.57***	-0.25***	-0.74***	0.35***	--					
11	-0.06	-0.06	0.04	0.08*	0.04	0.09*	-0.01	-0.02	0.06	0.06	--				
12	0.13**	0.14**	0.12*	0.15**	0.09*	0.14**	-0.08*	-0.01	0.07	0.07	0.08*	--			
13	-0.02	-0.01	-0.07	-0.01	0.04	0.03	0.03	0.02	-0.04	-0.00	-0.07*	-0.03	--		
14	0.04	0.02	0.06	0.00	0.05	0.07	0.07	0.05	-0.00	0.00	0.08*	0.03	-0.44***	--	
15	0.00	0.01	0.03	-0.00	-0.10*	-0.10**	-0.07	-0.05	-0.01	-0.02	-0.05	0.01	-0.34***	-0.50***	--
16	-0.03	-0.04	-0.03	0.00	0.03	-0.00	-0.05	-0.04	0.07*	0.03	0.05	-0.02	-0.18***	-0.27***	-0.21***
17	0.05	0.02	0.06	-0.01	0.01	0.00	0.06	0.03	0.02	0.04	-0.01	-0.04	0.05	0.06	-0.14**
18	0.07	0.11*	0.11*	0.01	0.10*	0.06	-0.02	-0.04	0.09*	0.08*	-0.15***	-0.03	0.05	0.01	-0.07
19	0.02	0.01	0.03	0.03	-0.00	0.08*	-0.03	-0.04	0.04	0.11*	0.16***	0.06	0.00	0.03	-0.04
20	0.15**	0.16***	0.11**	0.08*	0.04	0.04	-0.01	0.08*	0.02	0.02	0.05	0.16***	-0.07	0.07	0.00
21	-0.09*	-0.02	0.02	0.09*	0.02	-0.02	-0.03	-0.01	0.06	0.04	0.37***	0.01	-0.12**	0.09*	-0.02
22	0.03	0.00	0.06	0.02	-0.06	-0.02	-0.06	-0.05	0.02	-0.02	0.07	-0.02	-0.05	-0.13**	0.23***
23	0.04	0.08*	-0.00	0.07	0.07*	0.03	0.04	0.04	-0.01	-0.02	-0.08*	-0.04	0.02	0.12*	-0.11*
24	-0.07	-0.09*	-0.05	-0.08*	-0.02	-0.02	0.02	0.00	-0.00	0.03	0.03	0.06	0.03	-0.00	-0.11*
25	0.11*	0.04	0.15**	0.07	0.05	0.06	-0.04	-0.08	0.10*	0.10*	0.04	-0.01	-0.08*	0.03	-0.05
26	0.09*	0.08*	0.06	0.07	0.06	0.10*	-0.08*	-0.06	0.10*	0.08*	0.06	0.04	0.01	-0.06	-0.00
27	-0.01	0.04	-0.02	0.03	0.08*	0.05	-0.09*	0.01	0.09*	0.03	-0.07	0.01	-0.02	-0.03	0.01
28	0.03	0.01	0.06	0.04	0.04	0.00	0.02	-0.06	-0.03	0.02	0.12*	-0.02	0.17***	-0.18***	0.05
29	-0.01	-0.02	0.02	-0.04	0.03	0.05	-0.02	0.06	0.02	-0.03	-0.03	-0.02	0.10*	-0.09*	0.04
30	-0.01	-0.06	-0.03	-0.05	-0.05	-0.07	-0.05	-0.00	-0.02	-0.03	-0.04	-0.04	0.01	-0.04	0.04
31	-0.00	0.02	0.02	0.06	-0.01	0.05	0.03	-0.05	-0.03	0.05	0.09*	0.08*	-0.06	0.07	-0.03
32	0.02	0.06	-0.01	0.04	0.04	-0.03	0.05	0.01	0.03	0.00	-0.03	-0.03	-0.07	0.08*	-0.05

Note. 1 = trauma scores at Wave 1; 2 = trauma scores at Wave 2; 3 = depression scores at Wave 1; 4 = depression scores at Wave 2; 5 = IPV frequency at Wave 1; 6 = IPV frequency at Wave 2; 7 = minor IPV at Wave 1; 8 = minor IPV at Wave 2; 9 = severe IPV at Wave 1; 10 = severe IPV at Wave 2; 11 = child age in years; 12 = child sex (0=male, 1 = female), 13 = child race African American; 14 = Child race non-Hispanic white; 15 = child race Hispanic; 16 = child other race; 17 = previous psychological abuse; 18 = previous physical abuse; 19 = previous neglect; 20 = previous sexual abuse; 21 = caregiver age (0 = < 35 years, 1 = ≥ 35 years); 22 = caregiver education < high school; 23 = caregiver education high school; 24 = caregiver education high school plus; 25 = caregiver depression; 26 = caregiver alcohol problem; 27 = caregiver drug problem; 28 = neighborhood quality; 29 = poverty level <50%; 30 = poverty level 50-100%; 31 = poverty level 100-200%; 32 = poverty level >200%; *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$.

Table 1-2 (cont'd)

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
17	0.04	--														
18	0.01	0.34***	--													
19	0.02	0.20***	0.18***	--												
20	-0.02	-0.03	0.01	0.05	--											
21	0.05	-0.04	-0.09*	0.11*	0.01	--										
22	-0.07	-0.10**	-0.07	-0.01	-0.03	-0.06	--									
23	-0.06	0.00	-0.05	-0.07	0.01	-0.06	-0.50***	--								
24	0.12**	0.09*	0.12*	0.08*	0.02	0.12**	-0.40***	-0.59***	--							
25	0.13*	0.11*	0.16**	0.22***	0.18***	0.02	0.05	-0.06	0.02	--						
26	0.02	0.02	0.04	0.09*	0.02	0.11*	0.03	-0.00	-0.02	0.07	--					
27	0.08*	0.03	0.02	0.10*	0.01	-0.03	-0.05	0.04	0.01	0.13**	0.10*	--				
28	-0.02	0.08*	0.02	0.14**	0.03	0.06	0.10**	-0.01	-0.08*	0.17***	0.06	-0.03	--			
29	-0.06	-0.00	0.00	-0.02	-0.01	-0.11*	0.11**	0.04	-0.14**	-0.00	0.06	0.03	0.06	--		
30	-0.00	-0.06	-0.07	0.04	-0.02	-0.10*	0.14**	-0.10**	-0.02	0.07	-0.01	0.02	0.01	-0.38***	--	
31	0.02	0.03	-0.02	-0.04	0.04	0.13**	-0.11**	0.09*	0.01	0.01	0.00	-0.02	0.01	-0.35***	-0.44***	--
32	0.04	0.04	0.10*	0.01	-0.00	0.08*	-0.16***	-0.02	0.18***	-0.11**	-0.06	-0.04	-0.10**	-0.23***	-0.29***	-0.27***

Note. 1 = trauma scores at Wave 1; 2 = trauma scores at Wave 2; 3 = depression scores at Wave 1; 4 = depression scores at Wave 2; 5 = IPV frequency at Wave 1; 6 = IPV frequency at Wave 2; 7 = minor IPV at Wave 1; 8 = minor IPV at Wave 2; 9 = severe IPV at Wave 1; 10 = severe IPV at Wave 2; 11 = child age in years; 12 = child sex (0=male, 1 = female), 13 = child race African American; 14 = Child race non-Hispanic white; 15 = child race Hispanic; 16 = child other race; 17 = previous psychological abuse; 18 = previous physical abuse; 19 = previous neglect; 20 = previous sexual abuse; 21 = caregiver age (0 = < 35 years, 1 = ≥ 35 years); 22 = caregiver education < high school; 23 = caregiver education high school; 24 = caregiver education high school plus; 25 = caregiver depression; 26 = caregiver alcohol problem; 27 = caregiver drug problem; 28 = neighborhood quality; 29 = poverty level <50%; 30 = poverty level 50-100%; 31 = poverty level 100-200%; 32 = poverty level >200%; *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$.

Table 1-3. *Multilevel Model of Intimate Partner Violence (IPV) Exposure (Frequency and Severity) on Trauma Scores (n=728)*

	IPV Frequency		IPV Severity	
	β (Beta)	S.E.	β (Beta)	S.E.
Child variables				
Age in years	**-0.30****	0.10	**-0.30****	0.11
Sex[a]	0.47	0.50	0.74	0.50
Race/ethnicity[b]				
African American	-0.58	0.69	-0.72	0.69
Hispanic	1.26	0.84	0.99	0.77
Other	-0.56	1.07	-0.68	1.05
Previous maltreatment				
Psychological aggression	0.28	0.63	-0.02	0.71
Physical abuse	0.47	0.57	0.65	0.55
Neglect	-0.14	0.46	0.02	0.47
Sexual abuse	**1.47***	0.69	**1.87****	0.70
Caregiver variables				
Age[c]				
<35 years old	-0.31	0.49	-0.40	0.50
Education level[d]				
Less than HS	**1.47***	0.68	**1.45***	0.68
HS	0.57	0.52	0.62	0.56
Depression	0.57	0.56	0.48	0.58
Alcohol problem	0.42	1.21	0.37	1.20
Drug problem	-1.72	1.32	-1.88	1.65
Community variables				
Neighborhood quality	0.90	0.57	0.83	0.55
Poverty level[e]				
<50%	-0.32	0.82	-0.18	0.84
50-100%	-0.32	0.80	0.05	0.79
100-200%	0.65	0.72	0.74	0.70
IPV Exposure Frequency				
IPV Frequency	**0.39*****	0.05		
Time	-0.70	0.46		
IPV Frequency*Time	-0.02	0.07		
IPV Exposure Severity [f]				
Minor IPV			1.27	1.01
Severe IPV			**4.07*****	1.02
Time			**-1.83***	0.84
Minor IPV*Time			1.51	1.02
Severe IPV*Time			0.66	0.97
Level 1 (PSU) variance	2.43	0.26	2.51	0.21
Level 2 (child) variance	2.43	0.25	2.51	0.21
Residual variance	4.17	0.23	4.21	0.22

Note. [a] 0=male, 1=female; [b] comparison group=white; [c] comparison group= $\geq$ 35 years old; [d] comparison group=HS plus; [e] comparison group= >200%; [f] comparison group = No IPV exposure; *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$.

Table 1-4. *Multilevel Model of Intimate Partner Violence (IPV) Exposure (Frequency and Severity) on Depression Scores (n=728)*

	IPV Frequency		IPV Severity	
	β (Beta)	S.E.	β (Beta)	S.E.
Child variables				
Age in years	-0.09	0.14	-0.09	0.15
Sex[a]	1.17	0.64	**1.50***	0.65
Race/ethnicity[b]				
African American	-0.29	0.83	-0.61	0.95
Hispanic	**2.01***	0.94	1.57	0.94
Other	-1.69	1.13	**-2.42***	1.10
Previous maltreatment				
Psychological aggression	0.27	0.88	-0.01	0.92
Physical abuse	0.61	0.54	0.79	0.51
Neglect	-0.35	0.58	-0.11	0.56
Sexual abuse	0.57	0.94	1.15	0.99
Caregiver variables				
Age[c]				
<35 years old	0.24	0.62	0.18	0.61
Education level[d]				
Less than HS	1.11	0.82	0.87	0.79
HS	0.01	0.67	-0.18	0.67
Depression	**1.20***	0.61	0.91	0.69
Alcohol problem	0.44	1.15	0.07	1.29
Drug problem	-0.65	1.67	-0.37	1.56
Community variables				
Neighborhood quality	0.16	0.63	0.07	0.64
Poverty level[e]				
<50%	0.75	1.02	1.15	1.06
50-100%	0.40	1.05	1.10	1.06
100-200%	1.14	0.84	1.31	0.91
IPV Exposure Frequency				
IPV Frequency	**0.44*****	0.06		
Time	**-1.05***	0.52		
IPV Frequency*Time	-0.04	0.07		
IPV Exposure Severity[f]				
Minor IPV			1.72	1.00
Severe IPV			**5.07*****	0.99
Time			-1.91	1.01
Minor IPV*Time			1.80	1.24
Severe IPV*Time			-0.42	1.15
Level 1 (PSU) variance	3.34	0.23	3.57	0.35
Level 2 (child) variance	3.34	0.23	3.57	0.35
Residual variance	4.79	0.24	4.72	0.24

Note. [a] 0=male, 1=female; [b] comparison group=white; [c] comparison group= $\geq$ 35 years old; [d] comparison group=HS plus; [e] comparison group= >200%; [f] comparison group = No IPV exposure; *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$.

APPENDIX B

Manuscript 2

Table 2-1. *Demographics of Study Sample (n= 784)*

Variable (range of scale)	*n*	Weighted % or *M* (SD)
Trauma (0-25)	784	7.47 (0.30)
Clinically significant trauma		
Yes	50	7%
No	734	93%
IPV Frequency (0-36)	784	4.80 (0.24)
IPV Severity		
None	115	16%
Minor only	283	38%
Severe	386	46%
Child variables		
Age in years (8-17)	784	12.9 (0.11)
Sex		
Male	359	42%
Female	425	58%
Race/ethnicity		
African American	208	22%
White	367	53%
Hispanic	158	25%
Previous maltreatment		
Psychological abuse		
Yes	650	84%
No	120	16%
Physical abuse		
Yes	393	50%
No	377	50%
Neglect		
Yes	270	34%
No	500	66%
Sexual abuse		
Yes	104	11%
No	662	89%
Caregiver variables		
Age		
< 35 years	289	37%
≥ 35 years	491	63%
Educational level		
Less than HS	176	27%
HS	351	44%
HS plus	250	29%
Depression		
Yes	190	24%
No	502	76%

Note. IPV = Intimate Partner Violence; A.A. = African American; mns = months; HS = high school.

Table 2-1 (cont'd)

Variable (range of scale)	*n*	Weighted % or *M* (SD)
Alcohol problem		
Yes	32	96%
No	736	4%
Drug problem		
Yes	16	2%
No	701	98%
Household variables		
Neighborhood quality (1-3)	780	1.53 (0.03)
Poverty level of family		
< 50%	138	17%
50 - <100%	266	37%
100 - 200%	251	34%
> 200%	98	12%

Note. IPV = Intimate Partner Violence; A.A. = African American; mns = months; HS = high school.

Table 2-2. *Correlation of Study Variables (n = 784)*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	--														
2	0.39***	--													
3	-0.08*	-0.30***	--												
4	0.26***	0.57***	-0.74***	--											
5	-0.03	0.10**	-0.02	0.08*	--										
6	0.14**	0.14**	-0.00	0.05	0.10**	--									
7	-0.05	-0.02	0.05	-0.04	-0.07*	-0.05	--								
8	0.04	0.12**	-0.01	0.07	0.05	0.00	-0.56***	--							
9	0.01	-0.05	-0.08*	0.01	0.16***	0.07*	-0.30***	-0.47***	--						
10	0.09*	.09*	-0.05	0.10**	-0.04	-0.05	0.01	0.09*	-0.10**	--					
11	0.11**	0.12**	-0.00	0.06	-0.17***	-0.02	0.02	0.09*	-0.11**	0.34***	--				
12	0.03	0.06	-0.07	0.09**	0.11**	0.04	0.00	-0.03	0.04	0.25***	0.24***	--			
13	0.15**	0.09*	0.04	0.01	0.03	0.15**	-0.07*	0.08*	-0.03	0.09*	0.05	0.05	--		
14	-0.02	0.05	-0.01	0.04	0.35***	0.01	-0.11**	0.11**	0.01	-0.01	-0.02	0.09*	0.03	--	
15	0.01	-0.07	-0.02	-0.06	-0.02	-0.01	-0.07*	-0.17***	0.21***	-0.05	-0.05	-0.01	-0.05	-0.09*	--
16	0.02	0.03	0.02	-0.02	-0.05	-0.01	-0.05	0.13**	-0.10**	-0.03	0.01	-0.04	0.05	0.01	-0.48***
17	-0.03	0.03	-0.01	0.08*	0.06	0.02	0.13**	0.01	-0.08*	0.08*	0.03	0.05	-0.01	0.08*	-0.37***
18	0.06	0.07	-0.12**	0.11**	0.03	-0.01	-0.05	0.05	-0.02	0.18***	0.11**	0.19***	0.12**	0.01	-0.00
19	0.01	0.02	0.01	0.02	0.08*	0.04	0.09**	-0.05	-0.01	0.05	0.05	0.03	0.05	0.04	0.03
20	-0.05	0.05	-0.08*	0.08*	0.04	0.01	-0.01	-0.01	-0.00	0.06	0.05	0.09*	-0.01	-0.02	0.01
21	0.09*	-0.02	-0.01	0.02	0.06	0.04	0.05	-0.12**	0.09**	0.07	-0.00	0.06	0.11**	0.02	0.10**
22	-0.04	-0.05	-0.07	0.04	-0.06	-0.05	0.07*	-0.12**	0.04	0.00	-0.05	0.01	-0.05	-0.07	0.13**
23	-0.00	0.00	-0.00	-0.01	-0.02	0.00	0.01	-0.01	0.01	-0.05	0.04	-0.02	0.01	-0.04	0.11**
24	0.03	0.03	0.01	0.00	0.06	0.05	-0.08	0.10**	-0.02	0.05	0.01	0.07	0.06	0.06	-0.11**
25	0.03	0.03	0.02	0.03	0.03	-0.00	0.01	0.06	-0.05	0.00	0.00	-0.06	-0.06	0.04	-0.13**

Note. 1 = trauma scores; 2 = IPV frequency; 3 = minor IPV; 4 = severe IPV; 5 = child age in years; 6 = child sex (0 = male, 1 = female); 7 = child race African American; 8 = child race non-Hispanic white; 9 = child race Hispanic; 10 = previous psychological abuse; 11 = previous physical abuse; 12 = previous neglect; 13 = previous sexual abuse; 14 = caregiver age (0 = < 35 years, 1 = ≥ 35 years); 15 = caregiver education < high school; 16 = caregiver education high school; 17 = caregiver education high school plus; 18 = caregiver depression; 19 = caregiver alcohol problem; 20 = caregiver drug problem; 21 = neighborhood quality; 22 = poverty level <50%; 23 = poverty level 50-100%; 24 = poverty level 100-200%; 25 = poverty level >200%. *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$.

Table 2-2 (cont'd)

	16	17	18	19	20	21	22	23	24
17	-0.63***	--							
18	-0.01	0.01	--						
19	0.03	-0.06	-0.01	--					
20	0.01	-0.02	0.11**	0.20***	--				
21	-0.05	-0.03	0.09*	0.06	0.01	--			
22	0.03	-0.15***	0.05	0.04	-0.02	0.05	--		
23	0.03	-0.12**	0.09*	0.00	0.07	0.06	-0.33***	--	
24	-0.00	0.11**	-0.08*	-0.01	-0.00	-0.04	-0.40***	-0.49***	--
25	-0.06	0.18***	-0.05	-0.04	-0.06	-0.08*	-0.17***	-0.27***	-0.26***

Note. 1 = trauma scores; 2 = IPV frequency; 3 = minor IPV; 4 = severe IPV; 5 = child age in years; 6 = child sex (0 = male, 1 = female); 7 = child race African American; 8 = child race non-Hispanic white; 9 = child race Hispanic; 10 = previous psychological abuse; 11 = previous physical abuse; 12 = previous neglect; 13 = previous sexual abuse; 14 = caregiver age (0 = < 35 years, 1 = ≥ 35 years); 15 = caregiver education < high school; 16 = caregiver education high school; 17 = caregiver education high school plus; 18 = caregiver depression; 19 = caregiver alcohol problem; 20 = caregiver drug problem; 21 = neighborhood quality; 22 = poverty level <50%; 23 = poverty level 50-100%; 24 = poverty level 100-200%; 25 = poverty level >200%. *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$.

Table 2-3. *Multivariate Regression of Intimate Partner Violence (IPV) Exposure (Frequency and Severity) on Trauma Scores (n=784)*

	IPV Frequency		IPV Severity	
	β (Beta)	S.E.	β (Beta)	S.E.
Child variables				
Age in years	**-0.24*** **	0.11	**-0.38** **	0.12
Sex[a]	0.21	0.55	0.62	0.55
Race/ethnicity[b]				
White	0.34	0.95	0.65	0.90
Hispanic	**2.34***	1.10	**2.61***	1.07
Previous maltreatment				
Psychological aggression	0.26	0.90	0.27	0.89
Physical abuse	0.07	0.59	0.24	0.60
Neglect	0.23	0.68	0.13	0.64
Sexual abuse	1.32	0.81	1.31	0.84
Caregiver variables				
Age[c]				
<35 years	0.62	0.60	0.47	0.60
Education level[d]				
Less than HS	0.71	0.79	1.02	0.83
HS	0.66	0.66	0.84	0.65
Depression	0.68	0.62	0.58	0.65
Alcohol problem	1.38	1.76	1.38	1.69
Drug problem	**-4.00** **	1.38	-3.55	2.00
Community variables				
Neighborhood quality	1.30	0.75	1.12	0.72
Poverty level[e]				
<50%	-0.62	1.04	-0.78	1.07
50-100%	-0.96	0.94	-0.72	0.93
100-200%	0.57	0.93	0.68	0.90
IPV Exposure Frequency				
IPV Frequency	**0.39*** **	0.05		
IPV Exposure Severity[f]				
Minor IPV			**2.46*** **	0.68
Severe IPV			**4.95*** **	0.77

Note. [a] 0=male, 1=female; [b] comparison group=African American; [c] comparison group= $\geq$ 35 years old; [d] comparison group=HS plus; [e] comparison group= >200%; [f] comparison group = No IPV exposure; *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$.

Table 2-4. *Multivariate Regression of Intimate Partner Violence (IPV) Exposure (Frequency and Severity) on Trauma Scores with Child Race/Ethnicity Interaction (n =784)*

	IPV Frequency		IPV Severity	
	β (Beta)	S.E.	β (Beta)	S.E.
Child variables				
Age in years	**-0.43*** **	0.11	**-0.38** **	0.12
Sex[a]	0.26	0.54	0.59	0.54
Race/ethnicity[b]				
White	-0.54	1.24	0.36	1.15
Hispanic	1.53	1.42	**3.17***	1.44
Previous maltreatment				
Psychological aggression	0.30	0.89	0.28	0.89
Physical abuse	0.11	0.59	0.24	0.60
Neglect	0.22	0.67	0.13	0.64
Sexual abuse	1.34	0.82	1.26	0.85
Caregiver variables				
Age[c]				
<35 years	0.65	0.60	0.47	0.61
Education level[d]				
Less than HS	0.76	0.80	1.01	0.84
HS	0.68	0.65	0.83	0.66
Depression	0.71	0.61	0.56	0.65
Alcohol problem	1.29	1.83	1.50	1.69
Drug problem	**-4.04** **	1.41	-3.61	1.95
Community variables				
Neighborhood quality	1.29	0.74	1.10	0.72
Poverty level[e]				
<50%	-0.68	1.05	-0.77	1.07
50-100%	-1.00	0.94	-0.76	0.94
100-200%	0.62	0.92	0.66	0.89
IPV Exposure Frequency				
IPV Frequency	0.23	0.14		
IPV Frequency * white	0.19	0.15		
IPV Frequency * Hispanic	0.20	0.19		
IPV Exposure Severity[f]				
Minor IPV			**2.89***	1.07
Minor IPV * white			-0.17	1.48
Minor IPV * Hispanic			-0.48	1.83
Severe IPV			**4.87** **	1.54
Severe IPV * white			0.78	2.06
Severe IPV * Hispanic			-0.89	2.21

Note. [a] 0=male, 1=female; [b] comparison group=African American; [c] comparison group= $\geq$ 35 years old; [d] comparison group=HS plus; [e] comparison group= >200%; [f] comparison group = No IPV exposure; *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$.

Table 2-5. *Multivariate Regression of IPV Exposure (Frequency and Severity) on Trauma Scores by Child Race/Ethnicity Subgroups among Children Exposed to IPV (n = 629)*

	White Children (n = 325)				African American Children (n = 179)				Hispanic Children (n = 125)			
	IPV Frequency		IPV Severity		IPV Frequency		IPV Severity		IPV Frequency		IPV Severity	
	β (Beta)	S.E.	β (Beta)	S.E.	β (Beta)	S.E.	β (Beta)	S.E.	β (Beta)	S.E.	β (Beta)	S.E.
Child variables												
Age	**-0.63*** **	0.13	**-0.58*** **	0.15	0.13	0.27	0.13	0.26	-0.73	0.37	-0.65	0.37
Sex[a]	0.50	0.68	1.15	0.71	-0.11	1.10	-0.16	1.01	1.27	1.15	1.43	1.15
Previous maltreatment												
Psychological aggression	0.59	1.03	1.56	0.97	2.11	1.83	1.71	1.79	-1.95	2.41	-2.75	2.46
Physical abuse	0.85	0.74	0.89	0.79	0.45	1.21	0.59	1.18	0.65	1.30	1.29	1.35
Neglect	-0.75	0.75	-1.04	0.81	0.02	1.25	-0.02	1.21	1.97	1.37	2.49	1.54
Sexual abuse	**2.39***	1.02	**2.33***	1.04	-0.52	2.03	-0.30	2.27	-0.63	1.55	-0.53	1.68
Caregiver variables												
Age[b]												
<35 years	1.41	0.83	0.83	0.95	**-2.97***	1.25	**-2.98** **	1.14	0.03	1.72	-0.21	1.79
Education level[c]												
Less than HS	0.58	1.19	0.99	1.31	1.37	1.72	1.36	1.58	0.13	1.72	0.25	1.47
HS	0.08	0.94	0.36	0.95	2.14	1.44	2.25	1.37	-1.06	1.60	-0.38	1.71
Depression	**2.04***	0.81	**1.85***	0.90	1.00	1.76	0.62	1.64	-0.76	1.46	-1.01	1.56
Alcohol problem	2.29	2.64	3.19	2.51	2.52	2.15	2.57	2.09	-2.68	2.85	-0.84	2.83
Drug problem	-2.37	2.05	1.06	2.15	-4.50	3.04	-6.19	3,47	-2.71	3.39	-4.86	3.22
Community variables												
Neighborhood quality	-0.08	1.04	-0.13	1.10	2.26	1.50	2.63	1.38	**2.67***	1.24	2.43	1.26
Poverty level[d]												
<50%	1.86	1.47	1.57	1.51	**-3.04***	1.48	**-2.91***	1.47	**-7.16***	3.07	**-8.03** **	2.92
50-100%	-0.27	1.18	-0.52	1.17	-2.14	1.52	-1.70	1.47	-4.51	2.51	-4.52	2.53
100-200%	1.47	1.07	1.52	1.07	0.64	1.70	0.39	1.60	**-4.80***	2.40	**-5.05***	2.34

Note. [a] 0=male, 1=female, [b] comparison group = ≥ 35 years old, [c] comparison group=HS plus, [d] comparison group= >200%, [e] comparison group = Minor IPV exposure; *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$

Table 2-5 (cont'd)

	White Children (n = 325)				African American Children (n = 179)				Hispanic Children (n = 125)			
	IPV Frequency		IPV Severity		IPV Frequency		IPV Severity		IPV Frequency		IPV Severity	
	β (Beta)	S.E.	β (Beta)	S.E.	β (Beta)	S.E.	β (Beta)	S.E.	β (Beta)	S.E.	β (Beta)	S.E.
IPV Exposure Frequency												
IPV Frequency	**0.37*** **	0.05			0.18	0.17			**0.27***	0.13		
IPV Exposure Severity[e]												
Severe IPV			**2.81** **	0.81			**2.99** **	1.05			0.22	1.21

Note. [a] 0=male, 1=female, [b] comparison group = $\geq$ 35 years old, [c] comparison group=HS plus, [d] comparison group= >200%, [e] comparison group = Minor IPV exposure; *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$

APPENDIX C

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Table 3-1. *Demographics of Study Sample (n= 736)*

	Wave 1		Wave 2		Wave 3	
Variable (range of scale)	*n*	Weighted % or *M* (SD)	*n*	Weighted % or *M* (SD)	*n*	Weighted % or *M* (SD)
Reading Scores (1-144)	723	92.35 (2.23)	721	93.94 (0.93)	704	90.77 (0.96)
Math Scores (1-154)	724	87.22 (2.04)	729	90.82 (0.81)	706	88.06 (0.64)
Depression (0-45)	734	10.12 (0.50)	734	8.22 (0.36)	564	7.55 (0.40)
Minor IPV (0-18)	736	4.45 (0.15)	736	3.93 (0.20)	553	3.64 (0.14)
Severe IPV (0-18)	736	1.51 (0.08)	736	1.25 (0.09)	553	1.03 (0.07)
Child variables						
Age in years (8-18)	736	11.80 (0.11)	736	13.0 (0.11)	736	15.04 (0.15)
Sex						
Male	331	41%	330	42%	331	43%
Female	405	59%	406	58%	405	57%
Race/ethnicity						
African American	163	19%	174	22%	155	18%
White	299	41%	336	49%	256	45%
Hispanic	197	33%	145	23%	170	33%
Other	76	7%	39	6%	35	4%
Previous child abuse/neglect						
Yes	495	70%	445	63%	271	59%
No	215	30%	249	37%	217	41%
Poverty level of family						
< 100% FPL	385	56%	358	53%	263	51%
≥ 100% FPL	318	44%	349	47%	243	49%
Caregiver variables						
Depression						
Yes	223	30%	147	24%	92	17%
No	398	70%	477	76%	405	83%
Drug or alcohol problem						
Yes	47	5%	34	5%	15	2%
No	620	95%	617	95%	424	98%

Note. IPV = Intimate Partner Violence; FPL = federal poverty level.

Table 3-2. *Correlation of Study Variables (n = 736)*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	--													
2	0.62***	--												
3	-0.02	0.05	--											
4	-0.08	-0.05	0.64***	--										
5	-0.18***	-0.25***	0.38***	0.31***	--									
6	-0.21***	-0.19***	0.07	0.06	0.09*	--								
7	0.01	-0.11**	0.06	0.06	0.15***	0.10**	--							
8	-0.05	-0.03	0.02	0.06	-0.04	-0.15**	-0.05	--						
9	0.07	0.05	0.02	-0.00	0.04	0.01	-0.01	-0.56***	--					
10	-0.07	-0.07	-0.06	-0.05	0.03	0.15**	0.04	-0.30***	-0.50***	--				
11	0.07	0.07	0.01	-0.01	-0.06	0.01	0.05	-0.14**	-0.24***	-0.13**	--			
12	0.00	0.01	0.08*	0.06	0.01	-0.03	0.02	0.03	-0.03	0.02	-0.03	--		
13	0.05	0.06	0.05	0.02	0.08*	0.09*	0.04	-0.07	0.09*	-0.06	0.04	0.02	--	
14	-0.01	-0.02	0.05	0.00	0.05	0.04	0.01	-0.04	0.05	0.01	-0.03	0.12*	-0.12**	--
15	0.01	0.00	0.04	0.05	0.03	0.06	0.06	0.01	-0.03	0.02	0.00	0.03	-0.05	0.07

Note. 1 = reading scores at Wave 3; 2 = math scores at Wave 3; 3 = minor IPV at Wave 1; 4 = Severe IPV at Wave 1; 5 = Depression scores at Wave 2; 6 = child age in years; 7 = child sex (0 = male, 1 = female); 8 = child race African American; 9 = child race non-Hispanic white; 10 = child race Hispanic; 11 = child race other; 12 = previous child abuse and/or neglect; 13 = poverty ≥ 100%; 14 = caregiver depression; 15 = caregiver alcohol and/or drug problem; *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$.

Table 3-3. *Standardized Direct and Indirect Path Estimates of Intimate Partner Violence (IPV) and Child Depression on Reading Scores, by IPV severity (n = 736)*

	Minor IPV Frequency		Severe IPV Frequency	
	B	S.E.	*B*	S.E.
Direct effects				
IPV to reading	0.13	0.25	**-0.77***	0.31
Depression to reading	**-0.52*****	0.12	**-0.46*****	0.11
IPV to depression	**0.72*****	0.14	**0.98*****	0.24
Child age to reading	**-1.93*****	0.33	**-1.93*****	0.32
Sex to reading	1.38	2.03	1.40	2.00
Child African American to reading	**-6.86****	2.49	**-6.39****	2.35
Child Hispanic to reading	-2.15	2.52	-2.26	2.56
Child race other to reading	**5.56***	2.59	**5.28***	2.49
Child abuse/neglect to reading	-0.77	1.80	-0.41	1.78
Poverty to reading	4.28	3.78	2.49	1.81
Cgr depression to reading	2.26	1.69	2.23	1.70
Cgr alcohol/drug to reading	4.28	3.78	4.98	3.68
Indirect effects				
IPV to reading through depression	**-0.38****	0.12	**-0.45****	0.16

Note. cgr = caregiver; *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$.

Table 3-4. *Standardized Direct and Indirect Path Estimates of Intimate Partner Violence (IPV) Frequency and Child Depression on Math Scores, by IPV Severity (n = 736)*

	Minor IPV Frequency		Severe IPV Frequency	
	B	S.E.	*B*	S.E.
Direct effects				
IPV to math	0.46	0.23	0.12	0.33
Depression to math	**-0.38*** **	0.07	**-0.34*** **	0.08
IPV to depression	**0.71*** **	0.15	**0.98*** **	0.24
Child age to math	**-1.24*** **	0.22	**-1.14*** **	0.25
Sex to math	-2.69	1.46	-1.90	1.43
Child African American to math	**-4.14** **	1.25	**-4.07** **	1.20
Child Hispanic to math	-1.37	2.18	-2.72	2.00
Child race other to math	2.10	2.01	0.43	1.99
Child abuse/neglect to math	1.14	1.35	1.02	1.40
Poverty to math	2.18	1.61	1.80	1.37
Cgr depression to math	0.84	1.07	-0.13	1.15
Cgr alcohol/drug to math	1.15	2.21	1.49	2.09
Indirect effects				
IPV to math through depression	**-0.27** **	0.07	**-0.36** **	0.12

Note. cgr = caregiver; *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$.

Figure 3-1. *Conceptual Model of the Effect of Intimate Partner Violence (IPV) Frequency and Child Depression on Child's Academic Achievement*

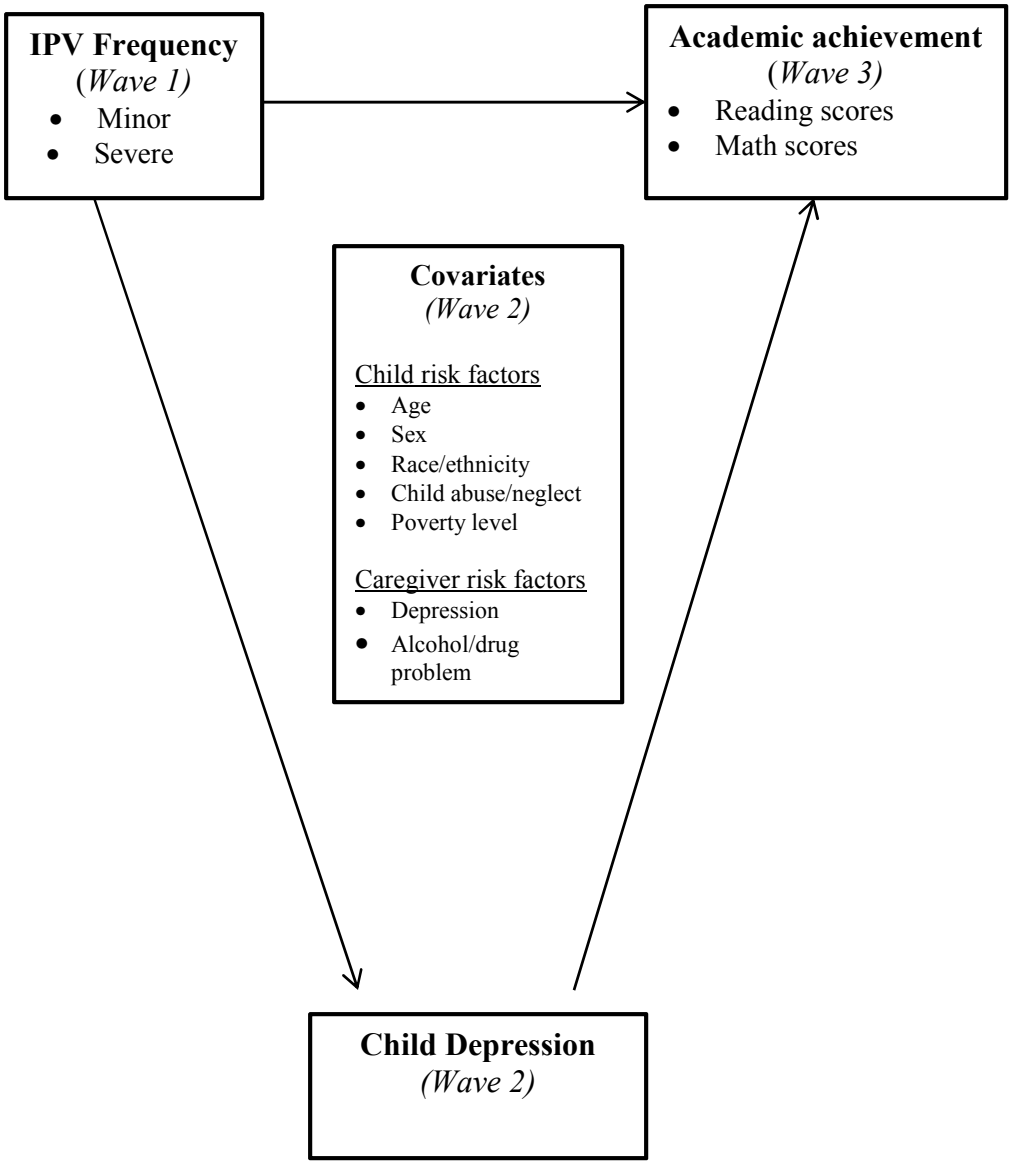
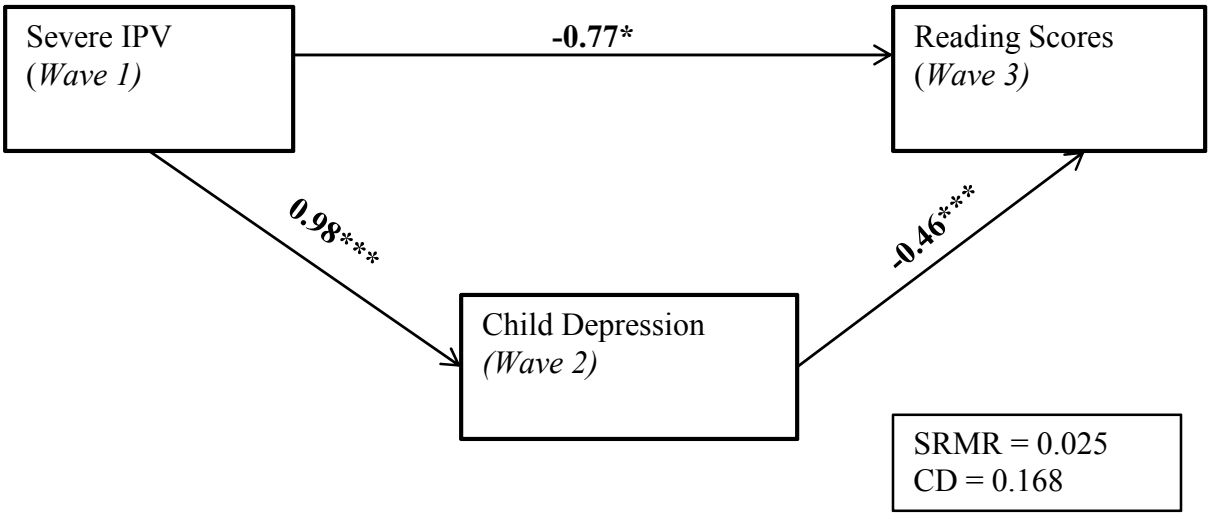


Figure 3-2. *Structural Equation Model Path Estimates of the Effect of Severe Intimate Partner Violence (IPV) Frequency and Child Depression on Children's Reading Scores (n = 736)*



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