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Developmental Consequences of Intimate Partner Violence on Children

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Abstract

Numerous studies associate childhood exposure to intimate partner violence (IPV) with adverse adjustment in the domains of mental health, social, and academic functioning. This review synthesizes this literature and highlights the critical role of child self-regulation in mediating children's adjustment outcomes. We discuss major methodological problems of the field, including failure to consider the effects of prenatal IPV exposure and the limitations of variable-oriented and cross-sectional approaches. Finally, we present a comprehensive theoretical model of the effects of IPV on children's development. This model includes three mechanistic pathways—one that is unique to IPV (maternal representations) and two that are consistent with the effects of other stressors (maternal mental health and physiological functioning). In our model, the effects of these three pathways on child adjustment outcomes are mediated through parenting and child self-regulation. Future research directions and clinical implications are discussed in the context of the model.

Contents

INTRODUCTION

Intimate partner violence (IPV) is defined as physical, sexual, and/or psychological violence and stalking perpetrated by a current or former romantic partner (Smith et al. 2018). Numerous meta-analyses and systematic literature reviews find that IPV negatively affects children's adjustment outcomes, including the development of psychopathology, academic functioning, and social functioning. Exposure to IPV during childhood also confers risk for negative long-term outcomes in adolescence and adulthood, including the likelihood of engaging in violent peer and romantic relationships—the intergenerational transmission of violence.

The most recent data from the National Intimate Partner and Sexual Violence Survey by the Centers for Disease Control and Prevention found a lifetime prevalence of IPV victimization of 43.6 million (36.4%) for women and 37.3 million (33.6%) for men. These statistics reflect that most psychological and physical violence between couples is mutual; however, men are more likely to engage in sexual abuse and stalking. In addition, when physical aggression occurs, women are more likely to experience serious injury than are men (Catalano 2013). Importantly, the rates of IPV experienced by women remain high during pregnancy (Gürkan et al. 2020), indicating that many children are exposed to IPV prenatally. By the time children are 14–17 years of age, they have had lifetime exposures to psychological/emotional and physical IPV of 25.4% and 27.7%, respectively (Hamby et al. 2011).

Most research on IPV and children is based on a developmental psychopathology perspective; that is, early life adversity can impede later developmental trajectories as a result of individual developmental plasticity based on physiological and affective reactivity. Equifinality suggests that there are different developmental pathways that can lead to the same outcome, whether positive or negative. Multifinality suggests that various factors or a specific factor may have different

effects on individuals' development depending on the context in which those factors occur. Thus, a specific risk factor, such as IPV, can result in significantly different developmental pathways and outcomes. In addition to multi- and equifinality, individual developmental adaptive plasticity in the context of stressors, such as IPV, results in varying levels of self-regulatory functioning in young children. In support of this developmental psychopathology framework, a recent meta-analysis found that higher levels of both family support and self-regulation were protective factors for children exposed to violence, including IPV (Yule et al. 2019).

Deficits in early self-regulation are thought to be precursors of later adjustment outcomes (Bridgett et al. 2015, Eisenberg et al. 2010). Self-regulation is defined as the intrinsic processes through which individuals experience and modulate their cognition, affect, and behavior (Eisenberg et al. 2010). Self-regulation develops from infancy to early childhood and includes both cortically mediated top-down processes, such as executive function, and subcortically mediated bottom-up processes, such as physiological stress reactivity. Both components display typical developmental patterns beginning during prenatal life and, thus, may be vulnerable to prenatal insults such as maternal stress related to IPV. Additionally, during the first 3 years of life, children rely heavily on caregivers for assistance with regulation, and it is in part through coregulatory interactions with caregivers that children learn how to self-regulate effectively during times of distress. If sensitive caregiving is absent or inconsistently available during early life, children are at risk for developing insecure and disorganized attachments, which may result in deficits in affective and behavioral self-regulation (Mikulincer & Shaver 2019). Therefore, because of the deleterious effects of exposure to IPV on parenting, IPV may also indirectly disrupt the development of children's self-regulation (Chiesa et al. 2018).

While extant research documents that IPV causes significant and pervasive problems in children's functioning, it suffers from numerous methodological problems and fails to offer a comprehensive understanding of the mechanisms by which IPV affects children. In this article, we rely mainly on meta-analyses and systematic literature reviews, when available, to briefly summarize the research on the consequences of children's exposure to IPV and discuss the methodological problems with this research. We then propose a comprehensive and theoretically grounded model for future research and implementation of clinical interventions.

LITERATURE REVIEW

On the basis of the important role that self-regulation plays in children's adjustment, the literature review is organized into two parts. The first highlights recent findings regarding the effects of IPV on the development of children's self-regulation, including children's physiological development, executive function/cognitive development, and attachment. The second focuses on the effects of IPV on children's longer-term adjustment outcomes, each of which is thought to be mediated by self-regulation: social functioning, academic functioning, and behavioral and mental health outcomes.

Self-Regulation: Physiological Functioning

Exposure to IPV affects the regulation and development of children's physiological stress-response systems. Of these, the most studied is the hypothalamic-pituitary-adrenal axis (HPA axis), whose end product, cortisol, functions to mobilize the energetic resources needed to cope with physical or psychological stressors. Similar to other forms of child maltreatment, exposure to IPV is most associated with increased basal cortisol levels (Hibel et al. 2020). The association between IPV exposure and cortisol reactivity has been more mixed. For example, IPV exposure had a sensitizing effect on trajectories of infants' HPA axis reactivity over the first 2 years of life (Hibel et al.

2011). However, blunted cortisol reactivity has also been reported in older children exposed to IPV (Cochran et al. 2022), perhaps reflecting an eventual downregulation of the HPA axis as an adaptation to chronic stress.

The specific effects that IPV has on children's HPA axis functioning may also depend on child- and family-level characteristics such as temperament, sex, genetic status, and parenting. For example, Davies et al. (2011) reported that among toddlers exposed to IPV, cortisol reactivity increased from age 2 to 3 years specifically for children with more inhibited, vigilant temperaments, whereas cortisol reactivity decreased over time for children with bold, aggressive temperaments. Both physiological profiles were differentially associated with later adjustment outcomes. Children with increasing reactivity between ages 2 and 3 had higher levels of internalizing symptoms and lower levels of attention and hyperactivity at age 3, while those with decreasing cortisol reactivity had no changes in internalizing behavior, but increases in attention and hyperactivity at age 3.

IPV exposure also affects the autonomic nervous system (ANS). Atypical basal and stress-reactive autonomic responses have been reported among infants (Moore 2010), preschoolers and toddlers (Davies et al. 2011), and school-age children exposed to interparental aggression (El-Sheikh & Hinnant 2011). For example, among 6-month-old infants, exposure to elevated levels of nonviolent parent conflict was associated with lower respiratory sinus arrhythmia (RSA) at baseline and reduced RSA suppression in response to a social stressor (still-face paradigm; Moore 2010), a pattern of parasympathetic activity thought to reflect emotional dysregulation. However, findings regarding the associations between ANS activity and behavioral phenotypes are quite complex. For example, among school-age children, low resting RSA was associated with trajectories of increasing externalizing behavior for boys but increasing internalizing for girls (El-Sheikh & Hinnant 2011).

Finally, despite the evidence from both the human and animal literatures suggesting that prenatal stress confers long-lasting programming effects on children's HPA axis functioning, relatively few human studies have examined associations between prenatal IPV exposure and children's physiological regulation (for exceptions, see Levendosky et al. 2016, Martinez-Torteya et al. 2016).

Self-Regulation: Executive Functioning

Executive functioning is an early developmental marker linked to both socioemotional competencies and academic success later in childhood. Recent meta-analytic findings suggest that childhood experiences of threat and deprivation are associated with reduced executive functioning abilities (Johnson et al. 2021). For example, a recent population-based study found that exposure to IPV within the first year of life was significantly negatively associated with general cognitive ability and executive functioning at age 10 (Savopoulos et al. 2022). These effects were significant over and above the effects of maternal education and recent IPV exposure.

As brain regions responsible for executive functioning develop rapidly during the toddler and preschool years, they may be especially sensitive to environmental input during this time period. Controlling for a host of sociodemographic factors, exposure to physical IPV exposure in toddlerhood negatively predicted executive functioning at age 5 (Gustafsson et al. 2015). This association was mediated by less sensitive maternal parenting behavior. Another longitudinal study found that children's IPV exposure during the preschool years indirectly predicted decreased speeded control performance (a component of executive functioning) in middle childhood through early maternal depression and harsh parenting (Clark et al. 2021). These findings suggest that the effect of IPV on children's executive functioning operates at least in part through its detrimental impact on maternal mental health and parenting. There is also preliminary evidence that genetic factors related to differential susceptibility to stress may play a role in determining the strength of the effect of IPV on children's executive functioning and cognitive abilities (Halldorsdottir et al. 2019).

Children's executive functioning can also be affected by prenatal stress, as maternal pregnancy-specific anxiety has been linked to school-age children's executive functioning outcomes (Buss et al. 2011).

Self-Regulation: Attachment

IPV negatively affects children's attachment security, and its effects can begin during pregnancy. During the second trimester of pregnancy, women begin to develop internal representations of their unborn infants and how they will parent (Stern 1995). In a manner analogous to attachment categories, prenatal representations can be either balanced (i.e., the woman views her unborn child warmly and realistically and has realistic representations of herself as a mother) or one of two types of nonbalanced: disengaged (i.e., the woman has a lack of interest in her unborn child and herself as a mother) or distorted (i.e., the woman distorts qualities of her unborn child and herself as a mother). In the Mother-Infant Study, a longitudinal study conducted by the first two authors that began during pregnancy and followed women and the target child through age 10 years, women who experienced IPV during pregnancy, compared with those who had not, were more likely to have unbalanced representations (Huth-Bocks et al. 2004b). After birth, these women engaged in more negative parenting (Dayton et al. 2010), and their children were more likely to be insecurely attached at age 1 (Huth-Bocks et al. 2004a). In the same sample, women who left the abusive relationship after the child was born were more likely to demonstrate balanced postpartum maternal representations (Theran et al. 2005), and their children were then more likely to become securely attached by age 4 (Huth-Bocks et al. 2011).

Postnatal exposure to IPV also affects child attachment. A recent meta-analysis found that IPV was associated with reduced attachment security among 12–60-month-olds (McIntosh et al. 2021). However, this may only be the case for families in which IPV is more severe. For example, in the Mother-Infant Study, Levendosky et al. (2011b) assessed IPV during pregnancy and yearly through age 4. They found that low levels of IPV, or levels that started low and then decreased, were related to positive stable patterns of attachment (secure–secure) or changes in a positive direction (insecure–secure).

Disorganized attachment is the most serious and problematic attachment style, and a relationship between perinatal IPV and disorganized child attachment has been reported (Zeanah et al. 1999). However, the context in which IPV occurs may matter. For example, only those infants exposed to IPV and living in neighborhoods characterized by disadvantage showed disorganized attachment (Martinez-Torteya et al. 2021).

A recent meta-analysis found that the effects of IPV on attachment seem to lessen as children age (Noonan & Pilkington 2020), perhaps because of the greater mobility and out-of-home activities older children engage in. Unfortunately, there are no longitudinal studies that assess exposure to IPV from pregnancy through age 18 and its effects on attachment. However, there is evidence that attachment styles persist throughout life, although they can be modified by various life experiences (Gillath et al. 2016). Sensitive/positive parenting can lead to secure attachment even when IPV is present, but problematic attachment creates a cascading effect, resulting in later socioemotional problems, including difficult peer relationships.

Adjustment Outcomes: Social Functioning

Children exposed to IPV have poorer emotion regulation capacity (Bender et al. 2022), which leads to poor prosocial skills and subsequently hinders their peer relationships and general social functioning. Overall, problems in self-regulation are associated with childhood aggressive behavior (Röll et al. 2012), and a substantial literature indicates that IPV-exposed children often engage in

aggressive behavior with their peers (e.g., Bauer et al. 2006). However, there may not be a straightforward relationship between IPV exposure and childhood aggression. In a longitudinal study of families reported to Child Protective Services (CPS) for child abuse and neglect, Holmes et al. (2015) found that among preschoolers, IPV exposure was not associated with concurrent prosocial skill deficits; however, IPV was associated with aggressive behavior during preschool, which then was associated with reduced prosocial skills during the early school years. These findings differed by gender. Using a person-oriented approach, Bowen (2015) found that most children exposed to IPV had positive peer relations, although this was truer for girls than boys. Maternal depression and life events affected resilience.

Adjustment Outcomes: Academic Functioning

Recent reviews of the literature conclude that IPV is associated with poorer academic functioning in childhood (Supol et al. 2021). For example, children who were exposed to IPV alone or in combination with other forms of childhood maltreatment (based on substantiated CPS records) had lower school attendance and poorer academic performance in the 3 years following investigation compared with matched controls (Kiesel et al. 2016). In a study of elementary, middle, and high school students, parental physical IPV was associated with lower standardized test performance over the next 5 years, with the strongest effects observed for younger children (age 12 and below) and girls (Peek-Asa et al. 2007). Mediators of the effects of IPV on academic functioning have rarely been examined but may include negative parent–child relationships and children's self-blame.

Adjustment Outcomes: Behavioral and Mental Health Problems

There is a strong link between IPV and children's behavioral functioning, characterized by a dose–response relationship, clearly established in four meta-analyses (Chan & Yeung 2009, Evans et al. 2008, Kitzmann et al. 2003, Wolfe et al. 2003). In addition, there are high rates of PTSD/PTSS (posttraumatic stress disorder/posttraumatic stress symptoms) and depression in children exposed to IPV. Below, we discuss the effects of IPV on children's behavioral functioning, focusing on internalizing and externalizing behavior, and children's mental health.

Internalizing and externalizing behavior. Evans et al. (2008) found moderate effect sizes for internalizing and externalizing behaviors, but a large effect size for trauma symptoms. Notably, in contrast to the meta-analyses that found no moderation by sex, this meta-analysis found that, at all ages, boys showed higher levels of externalizing behaviors than did girls. There were no sex effects for internalizing problems. Age did not moderate the relationship between IPV and either internalizing or externalizing problems. Importantly, the vast majority of the studies examined in all four meta-analyses were cross-sectional.

Vu et al. (2016) conducted a meta-analysis of longitudinal studies that examined the effects of IPV on children's behavior problems. Timing of IPV was assessed from infancy through age 18 years, and child adjustment was measured from 9 months to 27 years, with an average lag of 4 years between assessment of IPV and child outcomes. IPV prospectively predicted adjustment problems, and the strength of this effect increased across development. This is often referred to as a sleeper effect. That is, even if few children show negative outcomes early in life, many are likely to develop those problems over time. Neither age nor sex was a moderator of the effects. However, the age of the child when adjustment and IPV were assessed did affect correlations between the two variables.

The research in all four meta-analyses was based on variable-oriented analyses. In contrast, three person-oriented studies found that the majority of children are resilient in the face of IPV (see Grych et al. 2000 and McDonald et al. 2017, both cross-sectional studies, and Martinez-Torteya et al. 2009, a longitudinal study). Increased years of exposure to IPV and not being the biological child of the abusive partner predicted membership in a severe maladjustment group compared with the resilient group (McDonald et al. 2017). Longitudinal analyses found a more complex picture. Martinez-Torteya et al. (2009) found that only constant (not intermittent) exposure to IPV from age 2 to 4 years was related to the development of internalizing and externalizing symptoms at age 4. A child's easy temperament and absence of maternal depression contributed to resilience.

Maternal and child characteristics have been examined as mediators between IPV and internalizing and externalizing behavior. Only a handful of studies have examined paternal mental health and parenting. The research on mothers finds a relationship between maternal PTSD (Greene et al. 2018) and problematic parenting (Carter et al. 2022, Fong et al. 2019). Positive parenting can also serve as a moderator (Carter et al. 2022). Positive parenting had both additive and buffering effects on children's behavioral adjustment in children exposed to violence, including IPV, in a comprehensive meta-analysis of 118 cross-sectional and longitudinal studies (Yule et al. 2019). Child temperament (e.g., fearful reactivity, avoidance, emotional insecurity) mediated the relationship between IPV exposure and internalizing and externalizing behavior (Davies et al. 2016), and children's emotion regulation mediated or moderated the effects of IPV on behavioral adjustment (Carter et al. 2022, Yule et al. 2019).

Understanding whether the timing of exposure to IPV affects child development is crucial and can be done only through longitudinal methods. For example, IPV in the child's first year of life indirectly affected behavioral problems at age 10 through maternal depressive symptoms when children were 4 years old (Skinner et al. 2019). Past-year IPV was a significant predictor of behavior problems at age 10 (Gartland et al. 2021, Martinez-Torteya et al. 2016); however, in one study, prenatal IPV predicted behavior problems over and above recent IPV (Martinez-Torteya et al. 2016). These studies highlight the importance of exposure to IPV on the early sensitive periods (prenatal and early postnatal) and the importance of examining recent exposure.

Mental health. Multiple studies find high rates of PTSD/PTSS in children exposed to IPV (Ehrensaft et al. 2017, Galano et al. 2021). PTSD/PTSS may manifest differently across development, and timing of exposure may matter. For example, in an 8-year longitudinal study, beginning when children were 4–6 years of age, exposure to IPV in the year prior to the study was a significant predictor not only of baseline trauma symptoms but also of a trajectory of continuing trauma symptoms (Galano et al. 2021). The other predictors of a worsening trajectory of PTSS were severity of exposure and additional exposure to IPV during the 8 years of the study.

Infants whose mothers suffer from PTSD as a result of IPV are also at risk for developing trauma symptoms. This condition, termed relational PTSD (Scheeringa & Zeanah 2001), is hypothesized to occur because the mother's PTSD leads to less responsive parenting, which disrupts the normal coregulatory maternal function for the developing infant. Maternal PTSD related to IPV was significantly related to emotional dysregulation in children between 12 and 42 months old (Bogat et al. 2006, Lannert et al. 2014, Suardi et al. 2020). Notably, this relationship between maternal and infant symptoms is specific to maternal PTSD symptoms, as maternal depressive symptoms were unrelated to infant PTSD symptoms (Bogat et al. 2006). However, in the context of IPV, relational PTSD may not be limited to infants. Galano et al. (2020) found that when mothers and children are mutually exposed to an environment in which IPV occurs, the regulatory capacity of children is derailed, and relational PTSD remains a concern throughout the school-age years.

IPV is also related to childhood depression. In a large cohort study, both IPV exposure and maternal mental health problems were associated with depression in school-age children (Silva et al. 2021). Exposure to IPV and maternal mental health problems in the first year of life had the strongest effect on childhood depressive symptoms. In a longitudinal study, IPV was associated with initial levels of depressive symptoms and increases in IPV were associated with increases in symptoms over 2 years in school-age children (Kennedy et al. 2010). Mediators of these effects of IPV on children's depressive symptoms include parenting (Ferrajão 2020) and child emotion regulation (Katz & Gurtovenko 2015).

Overall, studies indicate that there can be serious developmental consequences when children are exposed to IPV. There are also indications that some children are resilient. In the next section, we enumerate some of the methodological problems in the literature that limit our understanding of the mechanisms by which children are negatively affected by or are resilient to IPV exposure.

METHODOLOGICAL ISSUES

We identify three important methodological issues in the literature. One of these—the omission of assessment of IPV during pregnancy—is unique to IPV research. The other two—variable-oriented versus person-oriented methods and cross-sectional versus longitudinal designs—can be issues in research on any topic, but they have specific implications for understanding how IPV affects child development.

Prenatal Intimate Partner Violence

Researchers typically fail to assess prenatal exposure to IPV. Stress during the prenatal period can influence the development of fetal stress systems in utero, and these effects may be mediated by maternal HPA axis functioning (e.g., Krontira et al. 2020). High levels of prenatal stress may increase the permeability of the placental barrier to glucocorticoids (e.g., O'Donnell et al. 2012); thus, stress-induced changes in maternal cortisol levels can exert programming effects on the fetal HPA axis via alterations in neural growth and function as well as epigenetic changes (Szyf 2013).

Prenatal IPV also has long-lasting effects on children's physiology and mental health. It significantly positively predicted 12-month-olds' cortisol reactivity and behavioral problems (Levendosky et al. 2016) as well as 10-year-olds' elevated cortisol secretion following a stress induction and greater self-reported internalizing and externalizing problems (Martinez-Torteya et al. 2016). In addition, women's experiences of IPV during pregnancy, but not preconception or postnatal IPV, was associated with increased methylation of the glucocorticoid receptor gene among their adolescent children (Radtke et al. 2011). Finally, as noted above and as we discuss below (in the section titled Proposed Comprehensive and Integrative Model), prenatal IPV influences the mother's internal representations of her child and herself as a mother, both of which have negative downstream effects on parenting and child attachment. Thus, overlooking the effects of prenatal IPV exposure may lead researchers to draw incorrect conclusions about the mechanisms by which IPV affects children's adjustment and could result in missed opportunities for intervention and prevention strategies.

Person-Oriented Versus Variable-Oriented Methods

Most research uses variable-oriented approaches. That is, researchers make assumptions that relationships among variables explain phenomena (e.g., exposure to IPV is significantly correlated with child depression), and analytic approaches typically aggregate data across individuals. Unfortunately, such approaches say little about an individual child. For example, variable-oriented data

analytic techniques cannot identify the profiles of children exposed to IPV who are not depressed. Person-oriented approaches are concerned with heterogeneity within samples. Patterns or profiles of individuals are established from a constellation of variables, and a determination is made as to whether subgroups of interest exist within the sample.

Research that employs person-oriented approaches has tremendous value for understanding how IPV affects child development. For example, physiological profiles among children exposed to IPV have considerable heterogeneity. Profiles of hyper- and hypocortisolism have both been reported in the literature and found to predict divergent adjustment outcomes, findings that traditional variable-oriented approaches would be likely to miss. For example, in a study of first-graders, a growth-mixture modeling approach revealed three distinct profiles of cortisol reactivity in response to a staged marital dispute (Koss et al. 2013). Children who exhibited a sensitized profile characterized by rising cortisol levels had higher levels of internalizing and externalizing behaviors compared with the other two groups. The subgroup of children characterized by attenuated cortisol reactivity had parents who used more destructive conflict tactics (e.g., verbal aggression), leading the authors to suggest that this profile may reflect an adaptive downregulation of the HPA axis in the context of high levels of parental aggression.

Person-oriented research can also aid our understanding of children's socioemotional development after exposure to IPV (Martinez-Torteya et al. 2009). In addition, person-oriented approaches have identified those individuals who may or may not go on to perpetrate IPV after childhood exposure (Narayan et al. 2017).

Cross-Sectional Versus Longitudinal Research Designs

The dominant research design in the literature is cross-sectional. Cross-sectional designs are unable to identify which children are likely to develop various behavioral and mental health problems, whether there are trajectories of resilience and psychopathology, and the mechanisms by which exposure to IPV leads to problems for some children. Research on IPV has specific shortcomings when cross-sectional methods are employed.

Cross-sectional designs fail to assess the stability of IPV in the household. Measuring it at one point in time confounds whether it was the only episode of IPV (e.g., the woman may leave the abusive relationship) or whether the IPV is ongoing. For example, women who experienced physical IPV before pregnancy reported decreases (48.5%), increases (20.8%), and stability (30.8%) of IPV during pregnancy (Saltzman et al. 2003). Because exposure to IPV may not be consistent and stable across a child's life, researchers should assess it regularly to understand its effects, and the effects of timing of exposure, on children.

Psychopathology also cannot be studied cross-sectionally. A snapshot of a child's behavior at a specific age cannot elucidate whether that particular child's problems will be stable or short-lived. For example, Carbonneau et al. (2016) found three trajectories of disruptive behavior among children from 1.5 to 5 years of age—low, moderate, or high frequency. Children with low and moderate trajectories had stable behavior, whereas the high-frequency trajectory increased until age 3.5 and then slightly decreased. Each type of disruptive behavior had specific risk factors associated with the different trajectories (Carbonneau et al. 2022). In other words, trajectories of problematic behavior change over time, and catching a snapshot of a child's behavior at any one point in time will not necessarily represent who that child is throughout development.

Importantly, longitudinal research can help identify patterns of resilience and psychopathology. Although a child exposed to IPV might be resilient at one point in time, problems might emerge later (Vu et al. 2016). Collecting longitudinal data is labor and cost intensive, and it is not clear when or how often assessment should occur. Lag times between assessments may well affect

the strength of the outcomes examined (Vu et al. 2016). At this point, what seems important is collecting more frequent and intensive measurements during sensitive periods in the life of the child in order to understand the complex relationship between IPV and child development.

In summary, the research on the effects of IPV on child development is beset with significant problems. In the following section, we present a comprehensive model that offers solutions to these methodological problems and can help guide future research and clinical interventions.

PROPOSED COMPREHENSIVE AND INTEGRATIVE MODEL

To date, research has failed to offer a comprehensive model that explains the mechanisms by which IPV exerts its pernicious effects on children's development and, in turn, why some children are resilient in the face of IPV exposure. Most research focuses on parenting, maternal mental health, attachment, and child temperament as the mechanisms by which exposure to IPV leads to child outcomes. Although important, these mechanisms do not account for physiological pathways, especially those that are affected during pregnancy, or the intersection among physiology, the child's environment (e.g., poverty), individual parental factors (e.g., mental health, maternal representations), and individual child factors (e.g., physiological stress responsivity). Additionally, most research does not examine whether or not IPV exerts a unique effect on child development, over and above other stressors. This is especially important given that multiple types of stressors may have common effects on children's physiology, mental health, and behavior (i.e., equifinality).

Based on the empirical findings and situated in a developmental psychopathology framework, we propose a comprehensive and integrative model of the effects of IPV on children's adjustment, such that its effects are mediated by the development of self-regulatory capacities especially during the two sensitive periods—the prenatal period and the first year of life (**Figure 1**). Our proposed model addresses the methodological critiques presented above by emphasizing the importance of

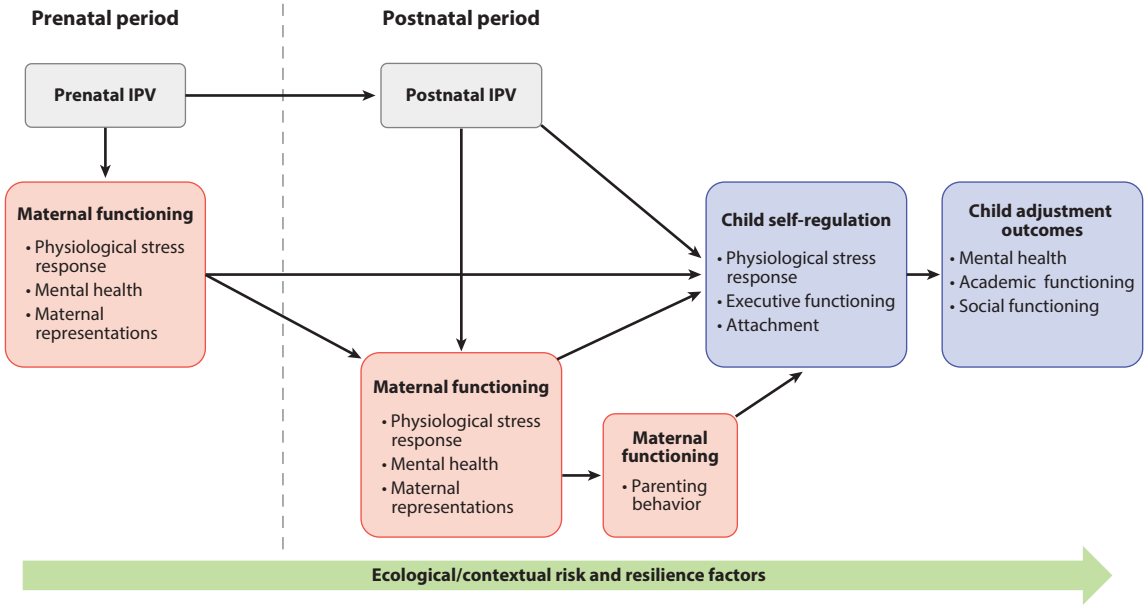

Figure 1

Ecological/contextual risk and resilience factors. Abbreviation: IPV, intimate partner violence.

assessment during the prenatal period and following children developmentally over time. This model is amenable to both variable-oriented and person-oriented approaches. For example, it is likely that there are multiple subgroups of children with different trajectories of functioning, perhaps on the basis of exposure to varying levels of IPV prenatally or postnatally, and/or due to varying levels of early self-regulatory capacities.

The model traces three mechanistic pathways through which IPV in the two sensitive periods may exert its effects—maternal representations, maternal/fetal physiological stress-response systems, and maternal mental health. The three pathways link maternal functioning in pregnancy and postpartum and then converge in affecting parenting behavior and child self-regulatory functioning. Child self-regulatory functioning, characterized by physiological stress response, attachment, and executive functioning, affects child adjustment outcomes, such that deficits in one or more areas of child self-regulation may lead to deficits in one or more areas of adjustment. The model also includes important ecological/contextual factors that must be considered in understanding the effects of IPV on children.

Mechanistic Pathways

The model includes three mechanistic pathways to explain the effects of prenatal and early postnatal IPV on children's functioning—maternal representations, maternal mental health, and maternal physiological stress response across the perinatal period—which then affect parenting behavior and child self-regulation. The mechanistic pathway through maternal representations is unique to IPV.

IPV is a trauma that involves betrayal by an intimate other—someone to whom the pregnant woman has an adult attachment relationship. This betrayal can damage the mother's own attachment system during pregnancy, such that her developing attachment relationship with her child can be negatively affected (Kobayashi et al. 2021b, Levendosky et al. 2011a). After birth, prenatal and postnatal internal representations affect the mother's parenting behaviors postnatally (Dayton et al. 2010) and, thus, affect the infant's developing attachment relationship with the mother (Huth-Bocks et al. 2004a, Levendosky et al. 2011a, Theran et al. 2005). Although maternal depression has been associated with insecure child attachment, when both IPV and depression are measured, current IPV and other childhood traumas, but not maternal depression, are associated with insecure child attachment at 12 months postpartum (Galbally et al. 2022).

The child's attachment system develops through early interactions with the caregivers. As a result of these interactions, the child develops a template for whether relationships are predictable or unpredictable (an internal working model). The child's (and later the adult's) attachment system is activated under stress. Children who live with IPV are more likely to have insecure attachments early in life (e.g., Noonan & Pilkington 2020). Some research indicates that, over and above traumatic experiences (including but not limited to IPV), the quality of the relational health a child experiences in infancy is the strongest predictor of later relationships and various childhood outcomes (Hambrick et al. 2018). Attachment insecurity is linked to the development of later academic, behavioral, and socioemotional problems (Madigan et al. 2013). Children also experience threats to their emotional security directly (e.g., Cummings & Miller-Graff 2015) as well as indirectly through the effects IPV has on parenting. Repeated exposure to stressors such as IPV may lead to adverse outcomes, including psychopathology, through the inflexible adoption of self-regulatory responses that are effective at regaining emotional security in the short term but that may be maladaptive in the long term or when contexts change (e.g., Kelly & El-Sheikh 2013).

There are two mechanistic pathways through which the effects of IPV are consistent with the effects of other stressors. The first common stress pathway conceptualizes IPV as a traumatic

stressor that may lead to higher rates of maternal depressive, anxious, and PTSD symptoms (Bacchus et al. 2018, Spencer et al. 2019), and hence less sensitive parenting (Bernard et al. 2018). A recent meta-analysis found empirical support for parenting as a mediator of maternal depression on children's adjustment (Goodman et al. 2020). PTSD also negatively affects parenting, in particular, harsh and controlling behaviors and poor parent–child relationships (Christie et al. 2019). In addition, children of parents (fathers and mothers) with mental health problems are more likely to develop deficits in self-regulation and their own mental health problems (Swales et al. 2022).

The second common pathway focuses on IPV as a significant interpersonal stressor that may dysregulate maternal physiological functioning through its effects on the HPA axis and the ANS. Dysregulation of maternal physiological stress-response systems during pregnancy influences fetal brain development in utero, which manifests as individual differences in stress reactivity and regulation in infancy and across childhood. Individuals vary in their susceptibility and/or plasticity to environmental influences, for better and for worse (e.g., Ellis & Del Giudice 2019). Individual developmental adaptive plasticity results from the interactions of environmental input during sensitive periods. Individual differences in genetics or physiological reactivity predict whether an individual thrives in or is vulnerable to specific environments, the consequence of which predicts differential development of self-regulation and psychopathology.

In addition, maternal HPA axis and ANS dysregulation in the mother during and after pregnancy affect her parenting behavior (Oosterman et al. 2019). Thus, the maternal HPA axis during pregnancy may mediate the relationship between her experiences of IPV and maternal and infant functioning (Thomas-Argyriou et al. 2021).

All three of these pathways (maternal representations, maternal mental health, and maternal stress system dysregulation) converge in affecting parenting behavior postpartum, as described above. A recent systematic review found that IPV is related to reduced positive parenting and increased parenting aggression and neglect by both mothers and fathers (Chiesa et al. 2018). Notably, parenting is negatively affected by not only IPV experienced postnatally but also that experienced prenatally (Lannert et al. 2014). For example, one study found that prenatal IPV was associated with higher self-reported levels of positive parenting but lower levels of observed positive parenting (Kobayashi et al. 2021a). We propose that the effects of IPV (pre- and postnatal) on parenting behavior found in these studies are likely mediated by one or more of the pathways described in our model.

Notably, paternal parenting in the context of IPV is rarely assessed. Extant studies find that fathers who perpetrate IPV show more negative and fewer positive parenting behaviors (Adhia & Jeong 2019, Jeong et al. 2020, Low et al. 2022, Margolin et al. 2004, Taylor et al. 2010). Two of these studies also found that paternal parenting behavior mediated the negative effects of IPV on children's developmental outcomes (Jeong et al. 2020, Low et al. 2022). Although few such studies exist, three used data from large longitudinal or epidemiological databases, lending more weight to the findings that paternal parenting also contributes to the pathways through which IPV affects children's self-regulation and adjustment outcomes.

Parenting in the context of IPV demonstrates to children via observation and modeling that aggression and violence are acceptable ways of solving interpersonal conflicts (e.g., Adams et al. 2019). In addition, children living in homes where IPV occurs are primed to view others' behavior as aggressive (hostile attribution bias), whether or not this is the case (e.g., Ziv 2012). In part, this occurs because harsh parenting (and child abuse) is more common in households where IPV occurs (e.g., Hamby et al. 2011); thus, children expect that others (besides caregivers) will behave aggressively toward them. Children who learn that violence is an acceptable way to respond to frustration, stress, or aggression may then go on to behave this way toward others. In addition,

these templates for violence are likely to lead to involvement in violent relationships later in life, both as a victim and as a perpetrator (e.g., Ehrensaft et al. 2003).

These three pathways also converge on affecting the developing self-regulation of the child. Consistent with the broader literature on the role of the development of self-regulation (Bridgett et al. 2015), we propose that child self-regulation is a primary mediator of external influences, including IPV and maternal functioning, on child adjustment outcomes. For example, there is considerable evidence from meta-analyses that parenting behavior is a primary factor in helping children develop self-regulation (Bridgett et al. 2015, Samdan et al. 2020). During the first 3 years of life, a child relies primarily on caregivers for assistance with regulation, often called coregulation (Eisenberg et al. 2010). In these early years, day-to-day experiences with parents shape children's self-regulatory capacities and entrain their ability to self-regulate in times of external and internal distress (Bridgett et al. 2015). If these parental experiences are suboptimal (e.g., due to IPV, depression, and/or life stress), the child's self-regulatory capacity may be deficient and becomes the precursor for subsequent psychopathology (Bridgett et al. 2015, Eisenberg et al. 2010) as well as peer and academic functioning problems.

Importantly, not all children exposed to IPV, either prenatally or postnatally, show problems in functioning (Grych et al. 2000, Martinez-Torteya et al. 2009, McDonald et al. 2016). Our model accounts for these resilient outcomes through mechanistic pathways leading to parenting and self-regulation as the most proximal mediators for child adjustment. For example, IPV does not affect all systems described (i.e., maternal representations, physiological functioning, mental health) in all pregnant or postpartum women due to positive ecological/contextual factors such as the woman's own social supports, secure attachment, and other factors; thus, parenting is not always disrupted. Similarly, children's self-regulation is not always dysregulated by exposure to IPV or poor parenting, due to individual variability in physiological stress response, executive functioning, and attachment as well as ecological/contextual factors such as the child's own social supports. Thus, studies find that a significant proportion of children exposed to IPV demonstrate resilience in one or more areas of adjustment outcomes (31%, Grych et al. 2000; 54%, Martinez-Torteya et al. 2009; 66%, McDonald et al. 2017). Our model highlights pathways that reflect individual differences which may account for both problematic and resilient outcomes.

Sensitive Periods

Developmental psychopathology perspectives focus on the importance of sensitive periods when development can be enhanced or derailed; these periods are tied closely to normal brain development. Our comprehensive model focuses on the prenatal and early postnatal periods (i.e., first year of life) and their importance for the child's developmental adaptation in the context of the three mechanistic pathways.

Gestation is considered a sensitive period due to rapid fetal brain development, rendering it particularly vulnerable to environmental insults. Prenatal stress can result in epigenetic to physiological systems–level changes, commonly referred to as prenatal programming (e.g., Glover et al. 2010). Rodent studies suggest that elevated maternal cortisol passes through the placenta to affect the fetus directly by disrupting normal fetal neural growth and function (Huang et al. 1999); increasing brain susceptibility to excitotoxicity and cell damage; and epigenetically modifying genes in brain regions involved in the HPA axis, attention, memory, and self-regulation (Szyf 2013).

The ANS also appears to be "programmable" by early stress (Monk et al. 2003). In animal research, maternal sympathetic nervous system (SNS) function influences development of the offspring SNS prenatally in various ways (Young 2002), all of which activate a fetal stress response (Giannakoulopoulos et al. 1999).

Thus, the mechanisms that are probably responsible for altering fetal brain development in humans are maternal stress-response hormones that affect the neural substrates involved in later attention, memory, and emotion (Krontira et al. 2020). The impact on these neural substrates then derails development of infant and child stress regulation (Lannert et al. 2014) and puts children at risk for a host of problematic outcomes (Van den Bergh et al. 2008).

The first year of life is also a sensitive period, primarily for the same reason as gestation—the developing brain is vulnerable to environmental influences, especially the quality of parenting. The amount and type of attention that caregivers provide to the infant can have a significant influence on brain development and, hence, socioemotional development. For example, in concert with the medial prefrontal cortex, the amygdala supports the development of self-regulation, a process that begins in the first year and continues throughout childhood and adolescence as the connections between the amygdala and the medial prefrontal cortex become better established. The amygdala may be vulnerable to stressors such as harsh parenting because it has a high density of glucocorticoid receptors known to mediate stress.

Of course, there are strong connections between the two sensitive periods (prenatal and first year of life). Subsequent experiences during the first year of life can amplify or mute prenatal programming effects (including physiological and epigenetic influences) depending on the similarity of the pre- and postnatal psychological and physical environment. Children vary considerably in their environmental responsivity—a between-person difference. Children also vary in their exposure to environmental inputs during prenatal and early postnatal life—a within-person difference. This environmental responsivity plays an important role in childhood functioning as well as mental health problems across the life span (Ellis et al. 2011).

Components of the Model: Ecological/Contextual Factors

Numerous ecological/contextual factors might affect the developing fetus whose mother experiences IPV or the child living in a home where IPV occurs. We discuss four of these—interpersonal violence, socioeconomic status (SES), social support, and racial discrimination. However, some of the findings may be relevant to stressors other than IPV, and many of the findings are mixed as to whether these factors affect children's adjustment. In part, this might be because the research is rarely longitudinal and rarely uses person-oriented methods.

Interpersonal violence. There is a significant co-occurrence between IPV and child maltreatment, another form of interpersonal violence, in violent households (Margolin et al. 2003), and the negative effects of both are similar. For example, young children who experience maltreatment are more likely to have problems with aggression, low self-esteem, delayed language, and poor self-regulation (Naughton et al. 2013). In addition, many children who live in households where IPV occurs live in violent neighborhoods, yet another form of interpersonal violence (Gracia et al. 2018). Witnessing community violence is associated with higher levels of internalizing problems in young children (Fowler et al. 2009).

Exposure to multiple forms of violence is termed polyvictimization. Because children who are exposed to polyvictimization have more negative outcomes than children who are not (e.g., Chan et al. 2017), some researchers have suggested that, rather than disentangling the effects of each type of violence, determining subgroups related to polyvictimization status might better reflect the experience of these children (Rosen et al. 2018).

Socioeconomic status. Socioeconomic disadvantage is associated with deleterious developmental outcomes in a variety of domains, including children's physical health, cognitive and academic outcomes, and social and emotional competencies (Bradley & Corwyn 2002, Letourneau et al.

2013). While some of the effects of family SES on child outcomes may represent distinct developmental pathways (e.g., the influence of food insecurity on the development of eating disorders), others are likely to be mediated by similar processes through which IPV and other family stressors influence children's adjustment, for example, increased parental financial stress leading to less effective parenting (e.g., Kohen et al. 2008). In addition, socioeconomically disadvantaged children, compared with those from high-SES families, are at increased risk for exposure to traumatic events including community violence, child maltreatment, and IPV (Finkelhor et al. 2011). To date, the data on whether SES is a moderator of IPV on children's adjustment are mixed (El-Sheikh et al. 2008, Martinez-Torteya et al. 2021). While children from low-SES backgrounds may be at greater risk for IPV exposure, the effects of low SES on children may be related to what outcomes are measured and the age of the child.

Social support. Much research has focused on women in relationships where IPV occurs and how social support can be a protective factor for their mental health and, thus, the well-being of their children (e.g., Pinto et al. 2019). However, social support can also be beneficial for children. In a recent meta-analysis, Yule et al. (2019) found that various types of social support were protective for children exposed to IPV and other types of violence. In other research, social support mediated the relationship between exposure to IPV and later PTSS (Haj-Yahia et al. 2019). However, there is evidence in other contexts (e.g., social support and depression in childhood) that social support may not always provide a stress buffer for children (Rueger et al. 2016).

Racial discrimination. Racial discrimination and its well-documented negative effects on mental health (Carter et al. 2017) can be particularly pernicious during pregnancy and early parenting, as they directly affect the mother and her fetus/young child. During pregnancy, Black women in particular suffer from racial discrimination in the medical setting, a phenomenon that has been linked to both delayed prenatal care (Slaughter-Acey et al. 2019) and adverse birth outcomes (Alhusen et al. 2016). In addition, there is growing evidence that discrimination during pregnancy leads to negative physiological changes in women's cardiovascular, immune, and neuroendocrine systems, consistent with exposure to chronic stress (Chaney et al. 2019). Finally, negative effects continue in the postpartum period, such that parenting and maternal mental health are affected in women (Condon et al. 2022), and mental health and well-being are affected in children (Priest et al. 2013).

Summary

Our model integrates physiological, psychological, and ecological/contextual factors that affect development when children are exposed to IPV. IPV is a stressor and as such affects children in ways that other stressors do—through maternal mental health and the maternal–infant stress system dysregulation. But IPV also exerts a unique effect on the child by affecting maternal representations of the unborn infant and the early life of the child, which can then translate into significant parenting and attachment problems.

We propose that child self-regulation is a key mediator of the effects of IPV on children's adjustment outcomes, including mental health as well as social and academic functioning. This proposition is consistent with the attention that self-regulation has received in recent years as a transdiagnostic factor underlying numerous clinical disorders as well as influencing overall well-being, cognition, and social relationships (e.g., Moffitt et al. 2011). Again, consistent with the understanding that young children's ability to self-regulate begins with the scaffolding that early sensitive parenting provides, we propose parenting as another key mediator in our model.

We argue that two sensitive periods in child development (the prenatal period and the first year of life) are important to consider when attempting to understand the interplay of physiology,

maternal factors, child factors, and the ecological context in which the child and mother live. Most research fails to measure, even in a retrospective fashion, whether the mother experiences IPV during pregnancy.

Finally, our model emphasizes the importance of longitudinal research to better understand which children are negatively affected by IPV and which are resilient. Cross-sectional methods provide only a snapshot of a developmental moment; some children will remain on that trajectory, whereas others may change. Understanding these subgroups of children through longitudinal research that employs, when necessary, person-oriented methods is a foundation of our model.

FUTURE DIRECTIONS FOR RESEARCH

Ostensibly, the two most underresearched components of our comprehensive model are prenatal IPV and self-regulation, with an emphasis on how psychology and physiology interact in establishing trajectories of child development. Future research should focus on understanding how these two factors potentiate or reduce negative developmental consequences for children.

Regarding prenatal IPV, it is likely that an important mechanism for prenatal programming is through the modification of epigenetic markers in offspring DNA (Cao-Lei et al. 2020), typically measured as DNA methylation (DNAm). DNAm is one of several epigenetic factors that regulate gene expression and are responsive to environmental inputs (Sweatt 2013). Two studies found that prenatal IPV showed differential DNAm patterns in children (Radtke et al. 2011, Serpeloni et al. 2019). In addition to prenatal programming, other research suggests that sensitive periods in child development themselves may be regulated by genetic factors (i.e., genetic variants and gene expression), which may influence the development of psychopathology (Zhu et al. 2022). How the effects of IPV during pregnancy and early childhood on psychopathology and functioning may be mediated through genetic variants and epigenetic markers is an important direction for future research.

In addition, there are probably sensitive periods within the sensitive period of gestation that are more or less deleterious for the developing fetus, but no research to date has examined the timing of IPV stress during pregnancy and its effects on the child. However, the timing of stressors other than IPV during pregnancy affects child physiological and behavioral outcomes in infancy through adolescence (Van den Bergh et al. 2020), but this research has numerous methodological problems. Understanding the timing of IPV stress is important for clinicians hoping to engage in timely interventions in the lives of pregnant mothers.

Also important is for researchers to focus on multisystemic studies that examine the coordination between various physiological stress-response systems. Such research is currently sparse but has the potential to yield additional insights (El-Sheikh et al. 2009, Martinez-Torteya et al. 2017). It is increasingly clear that modeling only one stress system does not fully account for the many ways in which stress changes brains and behavior. Much of the stress physiology research focuses on the HPA axis due to the ease of collecting salivary cortisol. Future research on IPV should integrate additional stress-response systems, including the ANS and immune functioning, in order to more fully understand how stress may affect maternal and child regulatory functioning.

The field must attend more closely to definitions and measurement of IPV. Our proposed model is agnostic as to the measurement of IPV; however, we advocate for more attention to this issue in future studies. These measurement issues include what type of violence is assessed, who reports IPV exposure, and how the child is exposed to IPV.

Most research assesses physical violence (see the meta-analysis by Vu et al. 2016); however, stronger associations between IPV and various adjustment indicators exist when additional forms of IPV are considered (Vu et al. 2016). Importantly, exposure to different types of IPV may affect specific child outcomes (e.g., Gonzalez et al. 2014). Research must also be concerned with who reports the presence and type of IPV in the household. Most research relies on mothers to

report whether or not children were exposed to IPV, although as children get older, research is more likely to query their experiences directly (Latzman et al. 2017). Shared method variance bias often becomes a problem when mothers are the sole reporters of the children's exposure to IPV, their own parenting and mental health, and their children's social and emotional standing. Research shows that maternal and child report of exposure to IPV (e.g., Knutson et al. 2009) as well as maternal and child report of specific child outcomes (Martinez-Torteya et al. 2016) can vary considerably.

In addition, research should attend to how the child is exposed to IPV. Holden (2003) presented an exposure taxonomy that included prenatal exposure, direct involvement of the child, direct eyewitness by the child, and indirect exposure (e.g., the child heard the argument). A systematic review of only research that explicitly asked about how children were exposed to IPV found that most studies do not assess the child's direct involvement in an episode of IPV (Latzman et al. 2017), and as we have noted, prenatal exposure to IPV is almost never assessed. Importantly, few studies have compared children who were exposed to IPV in different ways (e.g., DeJonghe et al. 2011).

Finally, there is a paucity of research on the role of paternal parenting in families with IPV. Paternal parenting may affect children's development of self-regulation directly as well as indirectly through its negative effects on maternal parenting and mental health. Understanding these mechanistic pathways is crucial. One important reason that fathers are rarely represented in IPV research is that researchers are concerned about threats by the father to the well-being of mothers and children. Careful assessment of the mother's and child's risk should be undertaken if fathers are to be involved in the research.

TREATMENT IMPLICATIONS

The literature reviewed above focused on the pernicious effects that exposure to IPV can have on the social, psychological, and behavioral outcomes of children. Our proposed pathways offer support for various clinical interventions.

In order to be truly preventive, clinical interventions should focus on the prenatal period. Our model highlights one unique mechanism by which IPV affects child development—maternal representations during pregnancy. Thus, interventions during pregnancy might focus on increasing the maternal–fetal bond and thus child attachment after birth. For example, Perinatal Child–Parent Psychotherapy has been successfully implemented with pregnant women exposed to IPV (Lieberman et al. 2011), and interpersonal psychotherapy for depressed pregnant women (Spinelli & Endicott 2003) might be modified for pregnant women experiencing IPV.

Higher sensory sensitivity during pregnancy may be associated with more negative maternal–fetal attachment (Branjerdporn et al. 2021); therefore, interventions have been developed to increase the mother's physical awareness of the fetus [e.g., the mother stroking her own body to identify and touch parts of the fetus (Leopold maneuvers), fetal movement counting]. Fetal movement counting appears to have a positive influence on maternal–fetal bonding (Demirkan et al. 2020), but results for the woman touching her body in specific ways are more mixed. More general psychoeducational approaches during pregnancy also show positive influences on maternal–fetal attachment (Yuen et al. 2022). To date, women with IPV have not been the focus of these interventions.

Not all IPV begins during pregnancy, and not all women experiencing IPV during pregnancy might be identified. Thus, postnatal and postpartum interventions are also important to implement. Parents provide the template for the relationships the child develops with intimate, significant others. But when parents are violent with each other or with their children, there is a heightened chance of intergenerational transmission of IPV (Evans et al. 2022). Thus, intervening

early on with families where IPV occurs can prevent or mitigate problems during childhood and possibly well into adulthood.

To date, only a few interventions have focused primarily on mothers experiencing IPV and have been administered systematically using experimental or quasi-experimental designs (Austin et al. 2019). Project Support (McDonald et al. 2006) and Mom's Empowerment Program (Graham-Bermann & Miller-Graff 2015) are both effective in creating more positive parenting behavior.

Interventions that either are attachment focused or have integrated components related to attachment theory (e.g., an emphasis on improving sensitive parenting) might be adopted for families experiencing IPV (see Steele & Steele 2018). Video-feedback Intervention to Promote Positive Parenting and Sensitive Discipline (van IJzendoorn et al. 2022), Attachment and Biobehavioral Catch-up (Dozier et al. 2018), child–parent psychotherapy (Lieberman et al. 2011), Mom Power (Rosenblum et al. 2017) and reminiscing and emotion training (Valentino et al. 2019) are evidence-based interventions that improve parenting and/or child attachment. Given the importance of physiological regulation for children's emotion regulation capacities, the evaluations of some programs demonstrated improvement in children's diurnal cortisol regulation (Valentino et al. 2021), autonomic regulation (Tabachnick et al. 2019), and executive functioning (Korom et al. 2021).

Our model emphasizes the importance of children's self-regulation as an important mediator of exposure to IPV and negative child outcomes. In populations other than those exposed to IPV, interventions that specifically target parenting practices related to emotion regulation in children have been developed. A recent review identified three widely employed "emotion socialization parenting programs" (England-Mason & Gonzalez 2020). All three interventions are effective at training parents in procedures to facilitate child emotion regulation; however, the effects on children's actual emotion regulation are mixed. Only one intervention has focused specifically on teaching emotion regulation to women experiencing IPV. Katz et al. (2020) developed a 12-week emotion coaching parenting intervention that focused specifically on emotion regulation and parent–child relationships. IPV-exposed children (ages 6–12 years) whose mothers received the intervention evidenced greater increases in resting RSA, a biomarker of emotion regulation, from pre- to posttreatment compared with a waitlist control group.

Thus, multiple existing interventions address parts of our comprehensive model, for example, those that focus on the prenatal period and attempt to increase bonding or reduce maternal depression, while others focus on parenting and/or attachment. We suggest, based on our model, that an intervention to reduce the effects of IPV should begin during pregnancy and follow the family through the early years postpartum. Ideally this intervention would work to first establish safety (i.e., end the IPV), and then focus on the mother to reduce maternal mental health problems and physiological dysregulation, build healthy maternal representations of the child, and then continue postpartum to support and promote sensitive parenting to best facilitate development of child self-regulatory functioning, leading to healthy child adjustment. This kind of long-term family-based intervention could be facilitated through a home visiting program that begins during pregnancy and then responsively puts into place the types of mental health and supportive interventions needed for each family, across these sensitive periods of child development.

CONCLUSION

A vast amount of research over the last two decades has documented the pernicious effects that IPV has on child outcomes. We have learned a considerable amount; however, a comprehensive model by which IPV conveys its negative effects is still lacking. In this article, we have presented a comprehensive, theoretical model as a road map for future research. The model emphasizes the

importance of assessing IPV during pregnancy (even if this is retrospective report). Assessments should be multimethod and include parent and child physiology, psychology, and behavior observations. We also argue for the importance of longitudinal research methods and person-centered approaches to data analysis that will help us better understand the trajectories of risk and resilience among children exposed to IPV. Finally, our model proposes three theoretically driven, testable mechanistic pathways to understand the effects of prenatal and postnatal IPV on children's functioning. Studies testing these mechanisms can provide important evidence to aid the development of effective interventions for children experiencing IPV, beginning with the earliest exposure in utero.

SUMMARY POINTS

1. Intimate partner violence (IPV) affects children's self-regulation and adjustment outcomes, including psychopathology; however, many children who are exposed to IPV are resilient.
2. IPV during pregnancy and during the first year of the child's life occurs in crucial sensitive periods that affect child outcomes.
3. Prenatal IPV during pregnancy is a unique stressor affecting women's conceptions of the unborn child and their sense of themselves as parents.
4. Prenatal IPV during pregnancy also has effects common to other stressors such that it affects maternal mental health and maternal physiological stress response.
5. Prenatal IPV affects parenting after birth.
6. Parenting and child self-regulation mediate the relationship between IPV exposure and child outcomes.

FUTURE ISSUES

1. Use person-oriented methods to understand characteristics of children who are resilient when exposed to IPV.
2. Examine how prenatal IPV and child self-regulation affect developmental outcomes for children.
3. Examine the potential mediating effects of genetic and epigenetic markers for the relationship between IPV during pregnancy and early childhood and later child outcomes.
4. Study how the timing of IPV during pregnancy may affect child outcomes, including child emotion regulation.
5. Develop standard definitions of IPV.
6. Assess the manner in which children are exposed to IPV and the type of IPV exposure.
7. Study how paternal parenting in households with IPV influences child outcomes.
8. Develop clinical interventions focused on the pregnancy experiences of women who also experience IPV.

DISCLOSURE STATEMENT

The authors are not aware of any affiliations, memberships, funding, or financial holdings that might affect the objectivity of this review.

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