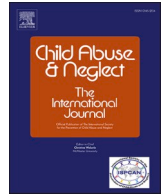




ELSEVIER

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

## Child Abuse &amp; Neglect

journal homepage: [www.elsevier.com/locate/chiabuneg](https://www.elsevier.com/locate/chiabuneg)

## Exploring the complex links between childhood exposure to intimate partner violence, maltreatment, and self-regulation: A three-wave cross-lagged study<sup>☆</sup>

Ying Zhang<sup>a,\*</sup>, Fei Shen<sup>b</sup>, Jean Paredes<sup>a</sup>, Danielle Lindsay<sup>a</sup>, Qingyang Liu<sup>c</sup>,  
Nabiha Madre<sup>a</sup>, Alan Penna<sup>a</sup>, Tatum Morris<sup>a</sup>

<sup>a</sup> Clarkson University, United States of America

<sup>b</sup> Kean University, United States of America

<sup>c</sup> Syracuse University, United States of America

## ARTICLE INFO

## Keywords:

Intimate partner violence exposure  
Child maltreatment  
Behavioral self-regulation

## ABSTRACT

**Background:** Intimate partner violence (IPV) often co-occurs with childhood maltreatment and negatively impacts children's development. While previous research has shown a direct link between these experiences and children's self-regulation, less is known about the potential unique effect and bidirectional associations between them.

**Objective:** The present study aims to investigate the bidirectional effects among maternal IPV experiences, child maltreatment, and children's behavioral self-regulation.

**Participants and setting:** 4,402 participants from three waves of the longitudinal study of the Future of Families and Child Wellbeing Study (FFCWS) were included in the study.

**Methods:** Cross-lagged path analyses were conducted to examine the longitudinal reciprocal relationships among IPV, child maltreatment, and children's behavioral regulation when children were 3, 5, and 9 years old.

**Results:** IPV exposure at ages 3 and 5 was negatively associated with levels of behavioral self-regulation at ages 5 and 9, even after accounting for physical maltreatment, psychological maltreatment, or neglect. Neglect at ages 3 and 5 was found to be associated with lower levels of behavioral self-regulation at later ages, when IPV exposure was considered in the models. Lower levels of behavioral self-regulation at age 3 were found to be linked with higher levels of psychological maltreatment, physical maltreatment, neglect, and IPV exposure at age 5.

**Conclusion:** This study revealed bidirectional effects between maternal IPV experiences, child maltreatment, and children's behavioral self-regulation. Furthermore, the study demonstrated that exposure to IPV during early childhood significantly predicts long-term behavioral self-regulation difficulties, even after controlling for the effects of child maltreatment.

<sup>☆</sup> Author note: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. Secondary data used from this study was supported by the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) of the National Institutes of Health under award numbers R01HD036916, R01HD039135, and R01HD040421, as well as a consortium of private foundations. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

\* Corresponding author.

E-mail address: [yinzhang@clarkson.edu](mailto:yinzhang@clarkson.edu) (Y. Zhang).

<https://doi.org/10.1016/j.chiabu.2023.106507>

Received 6 April 2023; Received in revised form 27 August 2023; Accepted 6 October 2023

Available online 24 October 2023

0145-2134/© 2023 Elsevier Ltd. All rights reserved.

Intimate partner violence (IPV) has broad impacts on millions of victims in the United States; over 16.3 % of U.S. households have children who have witnessed IPV between caregivers in their lifetime (Finkelhor et al., 2009). Over 5 million children every year in the U.S. are exposed to IPV, which is associated with maladaptive behavioral development, including aggression and delinquency (Easterbrooks et al., 2018). Longitudinal research suggests that exposure to IPV has long-lasting impacts on children's behavioral problems, particularly in the lack of adequate maternal care (Manning et al., 2014). Children who live in a family with IPV are at greater risk of experiencing abuse and neglect. For instance, mothers who experienced IPV were twice as likely to physically abuse children than mothers who did not experience IPV (Casaneva et al., 2009). These associations could be partially attributed to the consequences of IPV on parenting. Banyard et al. (2003) found that higher rates of trauma exposure in mothers were associated with decreased parenting capacity and more incidents of child abuse and neglect. Historically, child maltreatment and IPV have been examined and treated separately (Slep and O'leary, 2001). Recent research has shown that co-occurrence of child maltreatment and IPV within families increases the risk of abuse, ranging from 3 to 15 times (Herrenkohl et al., 2008). In light of the co-occurrence between IPV and child maltreatment, examining cumulative effects is vital to inform abuse prevention and treatment.

Cumulative trauma was also found to predict increased under-controlled behavioral problems in school-age children, including attention problems, aggressiveness, and disruptiveness (Holmes, 2013). Therefore, cumulative experiences of relational trauma not only impact mother victims, but are also likely to have deleterious consequences on their children. The Transactional model (Sameroff, 1975) provides a foundation for explaining psychopathological behaviors as a function of the bidirectional process between children and their environment. In the context of family violence, studies focused on the bidirectional process between mother's IPV experiences, maternal child maltreatment, and children's behavioral self-regulation are scarce and have demonstrated mixed results. In a two-wave longitudinal study of father-perpetrated IPV, mother-perpetrated physical aggression, as well as their relative influences on child behaviors, findings indicated that IPV and mother's physical aggression contributed to child's disruptive behaviors equally across the early stage of child development (Gustafsson et al., 2015). In recent study of children aged 3 to 9 exposed to IPV and mother's physical aggression, IPV appears to be weaker than mother's physical aggression in predicting child behaviors (Maneta et al., 2017). Both of the studies have simultaneously considered co-occurrence of IPV and child abuse and tested whether there are longitudinal and bidirectional relations among these variables, but they only tested one aspect of child maltreatment-physical abuse. To bridge the gap in the literature, the current study investigates the ways in which maternal IPV experience impacts child maltreatment (e.g., neglect, physical abuse, emotional abuse) and children's behavioral self-regulation through parent-effects pathways. Furthermore, this study examines the potential for a child-effects pathway, wherein children's behavioral self-regulation predicts maternal IPV experiences and maltreatment. Studying bidirectionality in the context of family trauma allows us to understand the reciprocal influences between parents and children, recognizing that their interactions and experiences can mutually influence each other over time. This approach builds upon past theoretical perspectives and research by emphasizing the dynamic interconnections between family members and examining the reciprocal nature of their experiences (Stith et al., 2009). Furthermore, it helps us move beyond solely examining the impact of trauma on individuals and delves deeper into the complexities of family dynamics, offering a more nuanced perspective on the long-term effects of trauma and potential avenues for intervention and support.

## 1. Intimate partner violence and children's self-regulation

IPV is a serious issue that can cause physical, sexual, or psychological harm to a current or former partner or spouse (Breiding et al., 2015). Children who are exposed to IPV are at risk of experiencing negative psychological outcomes and behavioral problems, as well as delays in various domains of development, especially cognitive and social-emotional development (Carpenter & Stacks, 2009). Research has shown that self-regulation is a key mechanism that can mediate the links between IPV exposure and child outcomes (Harding et al., 2013). Self-regulation is generally defined as the degree to which individuals control their attention, emotions, activity, and reactivity to environmental stimuli (Kopp, 1982). Development of this self-regulatory skill set is particularly significant during early childhood, which coincides with the highest rate of IPV exposure (Charles & Perreira, 2007). As suggested by the developmental psychopathology framework, which emphasizes the timing of children's experiences, early experiences are theorized to be the foundation for later development and behavioral manifestation (Holmes, 2013). Therefore, it is essential to study the timing of IPV exposure during early childhood to understand how it affects children's development of self-regulation over time.

Previous studies have investigated the relationship between IPV exposure and various aspects of self-regulation in children, in which facets of self-regulation are intercorrelated and embedded within the self-regulation universal domain (Blair & Ku, 2022). Among these, disrupted emotional regulation has been explored the most (Cummings et al., 2009; Harding et al., 2013; Katz et al., 2007). Some studies have also examined the links between IPV exposure and children's physiological reactivity and regulation (Cummings et al., 2009) and found that children who experienced IPV presented less incremental changes in emotional regulation (as measured by vagal tone) over time compared to non-exposed children (Rigterink et al., 2010). Compared to emotional regulation, limited findings were reported for behavioral self-regulation (for a systematic review, see Zhang et al., 2023). Behavioral self-regulation refers to a child's ability to deliberately apply multiple component processes of attentional and cognitive flexibility and inhibitory control to manage their behaviors in social contexts (McClelland & Tominey, 2014). One cross-sectional study found a link between exposure to marital conflict and lack of behavioral regulation among preschool children (Martin & Clements, 2002). Another study found that both physical and psychological IPV exposure were associated with greater behavior problems among toddlers (Easterbrooks et al., 2018). Behavioral self-regulation is a key skill that enables children to manage their behaviors in social contexts, make appropriate decisions, and achieve their goals. It is a critical component of cognitive and social-emotional development and is essential for success in academic and social domains (McClelland & Tominey, 2014). Therefore, studying the relationship between IPV

exposure and behavioral self-regulation is crucial as it can inform our understanding of the developmental pathways that may lead to negative outcomes associated with IPV exposure.

## 2. Child maltreatment and children's self-regulation

Child maltreatment refers to any intentional harm, abuse, or neglect of a child by an adult or caregiver, which can cause physical or emotional harm and have long-term negative consequences for the child's development (World Health Organization, 2016). Child maltreatment includes but is not limited to physical abuse, sexual abuse, emotional abuse, neglect, and exploitation. The source of maltreatment can vary, but research has shown that the majority of child maltreatment is perpetrated by parents or caregivers; in the U.S., parents are responsible for 72 % of physical abuse, 73 % of emotional abuse, and 92 % of neglect (NSCAW, 2010).

Child maltreatment is associated with deficits across multiple domains of functioning, including self-regulation (Cicchetti & Toth, 2005). Early and chronic adverse experiences can reduce children's capacity in multiple self-regulatory domains (Kim-Spoon et al., 2013). Notably, maltreated children show poorer adaptive emotion regulation and heightened lability/negativity compared with demographically similar non-maltreated children (Kim-Spoon et al., 2013; Shipman et al., 2005). Unfortunately, abuse and neglect are most prevalent during early childhood, and early victimization is linked with more deleterious effects across the lifespan (Cicchetti & Rizley, 2005). Parents and caregivers play a significant role in the learning process. As children grow from infants to toddlers and their minds develop, they rely more on their parents and caregivers to provide support and comfort when they are in distress (Valentino et al., 2022). Adapting to their inner emotions becomes critical in children's development when they are around five to seven years old (Schatz et al., 2008). Through everyday interactions with their parents, children develop a better understanding of their emotions and learn how to manage their behavior accordingly (Valentino et al., 2022). Unfortunately, child maltreatment can have a detrimental effect on children's emotional regulation, hindering their ability to manage their feelings and behavior. Studies have shown that maltreated children exhibit poorer performance on tasks that require behavioral self-regulation, such as delay of gratification tasks and attention tasks (Cicchetti & Rizley, 2005; Kim-Spoon et al., 2013). Furthermore, deficits in behavioral self-regulation have been found to mediate the relationship between child maltreatment and negative outcomes such as aggression, anxiety, and depression (Kim-Spoon et al., 2013; Shields & Cicchetti, 1998).

## 3. IPV and child maltreatment, co-occurrence, and self-regulation

IPV and child maltreatment are distinct but interconnected concepts, with co-occurrence and entangled effects often observed. Children who witness IPV are more likely to suffer from various types of maltreatment, such as physical, emotional, and neglect, compared to children who have not witnessed IPV (Chan, 2011). A population-based sample study in Hong Kong found that 46.5% of families involved in IPV were also involved in child physical maltreatment in the preceding year (Chan, 2011). Similarly, in the U.S., the National Survey of Child and Adolescent Well-Being reported that children whose mothers experienced IPV were twice as likely to be physically abused than children whose mothers did not experience IPV (Casanueva et al., 2009).

The frequent co-occurrence of IPV and child maltreatment has led to many studies attempting to understand their effects on children by examining both together (Brown et al., 2021; Renner, 2021; Skafida et al., 2022). Researchers have identified a "dual exposure effect" where the combined effects of IPV and other forms of abuse have more significant and long-lasting impacts on children (Herrenkohl et al., 2008), while some studies have shown that exposure to IPV alone in childhood has limited long-lasting impacts. Although IPV and child maltreatment are often studied together to understand their interrelated effects, it is important to disentangle them to analyze and address them separately to better understand their distinct impacts on children's well-being. This may help to guide targeted interventions and treatments that are tailored to the specific needs of children who have experienced IPV or child maltreatment. Additionally, disentangling these two forms of abuse can help to identify pre-existing conditions or other contextual factors that may be associated with either IPV or child maltreatment and to account for these factors in analysis and intervention design.

Furthermore, the occurrence and impact of maltreatment in the context of IPV may vary depending on the type of maltreatment experienced. For instance, the emotional and physical distress resulting from experiencing IPV may exacerbate maternal stress and frustration, which can manifest in negative parenting behaviors, such as irritability and harsh language (Assink et al., 2018; Martin & Clements, 2002). These "spilled over" effects may lead to a reduction in constructive modeling of behaviors and an increase in negative cues given to the child (Sijtsema et al., 2020). Additionally, the stress and frustration from the marital conflict may result in mothers expecting more self-regulation from their children, resulting in less patience, inconsistent responses to their children's needs, and even neglect (Egeland et al., 2002; Herbell et al., 2020). There may be shared risk factors for both IPV and child abuse, such as poverty, substance abuse, and mental health issues (Levendosky & Graham-Bermann, 2001). Parents experiencing IPV may engage in abusive and/or neglectful behaviors as a way of exerting control or punishment (Awada et al., 2020). Therefore, to disentangle the impact of different types of maltreatment on self-regulation in children within the context of IPV, it is necessary to examine the effects of each type of maltreatment separately.

## 4. Bidirectional nature of behavior and influences in parent-child interactions

The relationships among experiencing IPV, maltreatment, and behavioral self-regulation in children may be bidirectional in nature, meaning that there is a process of mutual influence between parent and child, where both parties can influence each other as well as the relationship between them (Paschall & Mastergeorge, 2016). The transactional model of development (Sameroff, 1975)

emphasizes recurrent reciprocal influences between parent and child, with both parent and child characteristics as influences in a continuous process of development. In other words, the relationship between the individual and the environment is bidirectional, with both entities constantly influencing each other in a series of transactions that occur over time. This means that the individual's behavior and characteristics can impact the environment around them, while at the same time, the environment can shape and mold the individual's development. The bidirectional nature of parent-child interaction and development can greatly impact a child's behavior when they are exposed to IPV or maltreatment. Children who experience IPV and maltreatment are at greater risk of emotional and behavioral problems (Sijtsema et al., 2020), which can also affect their self-regulation capabilities, leading to difficulties regulating their emotions and behaviors. These difficulties with self-regulation may then elicit more harsh discipline and even conflict between caregivers (Cicchetti & Rizley, 2005).

The bidirectional relationship between maltreatment and children's self-regulation implies that parenting can impact a child's future behavior, and in turn, the child's behavior can elicit certain parenting behaviors. For instance, Shaffer et al. (2013) examined the bidirectional effects between parenting practices and child externalizing behavior, finding that parents who use harsh parenting and timid discipline have a more difficult time managing their children's behavior. The study utilized a sample of children who participated in a modular treatment protocol for early onset behavioral disorders. Intervention mechanisms used in this study helped improve the bidirectional relationship between the children and their parents and could potentially be used to help children's self-regulation later in life. In addition, other empirical studies assessed the bidirectional association between parenting and behavioral self-regulation and indicated similar results. According to Eisenberg et al. (2015), intrusive parenting behaviors in 30-month-old children were associated with lower levels of effortful control in 42-month-olds (a manifest domain of behavioral regulation); furthermore, lower levels of effortful control at 42 months predicted greater levels of intrusive parenting at 54 months. Similarly, Tiberio et al. (2016) suggested that poor parenting disciplines in year 3 directly contributed to lower levels of effortful control in year 5, which in turn linked to further poor discipline in year 7. However, literature has scarcely identified the association between poor behavioral self-regulation and elicited various types of maltreatment. Family Systems Theory views families as interconnected systems where the behavior of one family member can impact and influence the behavior of other family members (Brown, 1999; Grodner, 1977; Murray, 2006). In the context of the proposed study, Family Systems Theory suggests that a child's behavioral self-regulation, or lack thereof, may trigger certain reactions or responses from the parent, leading to an escalation of conflicts and potentially increasing the risk of IPV and maltreatment. When faced with challenging child behaviors, parents may experience frustration, anger, or stress. If parents have limited self-regulation skills themselves, they may react impulsively or aggressively, leading to potential conflict. As conflicts intensify, the risk of IPV and maltreatment may increase. This theoretical framework emphasizes the importance of understanding the reciprocal nature of family interactions and how individual behaviors can impact the overall functioning of the family system. The meta-analysis conducted by Stith et al. (2009) examined several empirical articles that investigated child social competence and externalizing behaviors (may consider as the indicators of lack of behavioral regulation) as predictors of physical abuse victimization. The findings from these articles exhibited mixed significance and the direction of causality in this associations remains uncertain, emphasizing the need for further investigation. Therefore, a longitudinal design study that specifically explores the mutual influence between parents and children is needed. By adopting such an approach, we can better understand the reciprocal dynamics and underscore the importance of addressing both sides of the parent-child relationship to promote healthy development (Paschall & Mastergeorge, 2016).

The aim of this longitudinal cross-lagged study was to investigate the interplay between maternal IPV experiences, maternal child maltreatment, and children's behavioral self-regulation. Data were collected at three time points over a 6-year period when children were aged 3, 5, and 9, and the bidirectional effects among the three constructs were examined. Early childhood (infancy to 5) and middle childhood (6 to 12 years old) are sensitive periods characterized by emerging vulnerabilities to adverse experiences (McClelland & Cameron, 2012). Research has shown that the period between ages 3 and 5 is particularly sensitive for the development of self-regulation (Morrison et al., 2010; Sektan et al., 2010). During this time, children become more cognitively and emotionally aware, which can potentially make them more susceptible to the negative consequences of IPV and maltreatment. By examining these specific time points, this study aims to capture shifts or changes in the proposed variables that may coincide with significant developmental transitions. Understanding how IPV and maltreatment affect self-regulation during these formative years can provide valuable insights into intervention strategies and support systems that can positively impact children's well-being. Based on previous research and theoretical arguments, we hypothesized that: (1) maternal IPV experiences would predict lower levels of children's behavioral self-regulation at the following time points, with a stronger impact in early childhood (measured at ages 3 and 5); (2) children's experiences of maltreatment (physical, psychological, and neglect) would predict lower levels of behavioral self-regulation at the following time points, with a stronger impact in early childhood (measured at ages 3 and 5); (3) maternal IPV experiences would predict higher levels of child maltreatment (physical, psychological, and neglect) at the following time points; (4) children's lower levels of behavioral self-regulation would predict maternal IPV experiences at the following time points; and (5) children's lower levels of behavioral self-regulation would predict maternal child maltreatment (physical, psychological, and neglect) at the following time points.

## 5. Methods

### 5.1. Participants and sampling procedures

This study drew participants from the publicly-used data of the Future of Families and Child Wellbeing Study (FFCWS). The present study applied secondary data analyses falling under the exemption category for ethical board review and approval. FFCWS a

longitudinal cohort study tracking the development of 4898 children born between 1998 and 2000 across 20 large U.S. cities. These cities were purposefully selected to represent U.S. cities with a population of 200,000 or more. The FFCWS oversampled children born to unmarried mothers ( $N = 3711$ ) compared to those born to married parents ( $N = 1187$ ). Mothers were interviewed in the hospital within 48 h of their child's birth. Follow-up telephone interviews were conducted with mothers when their children were 3, 5, and 9 years old (Reichman et al., 2001).

The analytic sample consisted of 4,402 participants who had participated in three waves of data collection and met the following study requirements: (1) families needed to have maternal data from at least one wave of data on IPV and one wave of behavioral self-regulation; (2) the sample only included mothers who had lived with the focal children when they were aged 3, 5, and 9 years old and had contact with the children; families where mothers reported that the focal children had never lived with them ( $N = 35$ ) were excluded; and (3) families with multiple births were excluded ( $N = 95$ ). Table 1 presents the demographics of the analytic sample, which mainly comprised individuals from socioeconomically disadvantaged backgrounds, with a significant proportion of individuals had not completed high school education (33.8%) and earning household incomes below \$40,000 (71.6%).

## 5.2. Measurement

### 5.2.1. Intimate partner violence exposure at ages 3, 5, and 9

IPV was assessed in various forms, including physical violence, sexual violence, emotional/psychological abuse, and economic abuse using the same sets of 7 items in three waves. These items were adapted from the Conflict Tactics Scale (CTS-2) for adults, which is the most common research tool used to measure IPV (Straus & Douglas, 2004). Mothers self-reported their victimization experiences from intimate partners on a 3-point scale ("never", "sometimes", or "often"), indicating how often fathers carried out violent and abusive behaviors against them during the last month prior to reporting (Awada et al., 2020). The Cronbach's alpha values for the IPV scales were .81 (age 3), .68 (age 5), and .64 (age 9). Three latent scores were generated for IPV victimization across three waves (detailed information available in the supplemental material, including the procedure and factor loadings). These latent scores are indicative of levels of exposure to IPV against mothers, with higher scores representing higher levels of such exposure.

### 5.2.2. Maltreatment

Mothers were asked to report their own parenting behaviors, including instances of physical maltreatment, psychological maltreatment, and neglect. Items were drawn from the Conflict Tactics Scale for Parent and Child (CTSPC; Straus et al., 1998). Physical maltreatment was assessed with 4 items about hitting, shaking, slapping, or pinching the child. Psychological maltreatment was assessed with 5 items about shouting, cursing, threatening, or name-calling. Neglect was evaluated by 5 items, which represented instances of reflecting emotional neglect (e.g., encountered difficulties in expressing love or affection due to personal challenges) and supervisory neglect (e.g., instances where a child was left alone despite requiring adult supervision). Also, these items encompassed ensuring the child's access to basic needs, such as adequate food provision and timely medical attention. Responses were recorded with the frequencies of the abuse and neglect incidents over the past year using a scale from *never* (1), *once* (2), *twice* (3) to *>20 times* (6). Responses were recoded to their midpoint values, and the average was calculated across all items according to the recommendations of the instrument developers (Straus et al., 1998). For example, a response of "3–5 times" was assigned a value of 4, which represents the

**Table 1**  
Demographic information ( $N = 4402$ ).

Variable	Sample frequency
Child sex	Boy = 2,295 (52.1%)
Mother's age in years	25.01 (SD = 5.98)
Mother relationship with father (Child at age 3)	Married = 1,329 (30.2%) Romantic no visiting = 130 (3%) Friends = 705 (16%) No relationship = 714 (16.2%) Father unknown = 5 (0.1%)
Household income at age 3	
<\$40,000	71.6%
\$40,000–60,000	11.6%
\$60,000–80,000	7.2%
\$80,000–100,000	3.4%
>100,000	5%
Mother race/ethnicity	
Black	2,077 (47.2%)
Latino/a	1,207 (27.4%)
White	941 (21.4%)
Others	167 (3.8%)
Mother education at year 1 (%)	
<High school	1,490 (33.8%)
High school or equivalent	1,333 (30.3%)
Some college	1,093 (24.8%)
College or graduate and above	481 (10.9%)

midpoint between 3 and 5. The Cronbach’s alpha values for the maltreatment scales were .76 (age 3), .76 (age 5), and .79 (age 9),

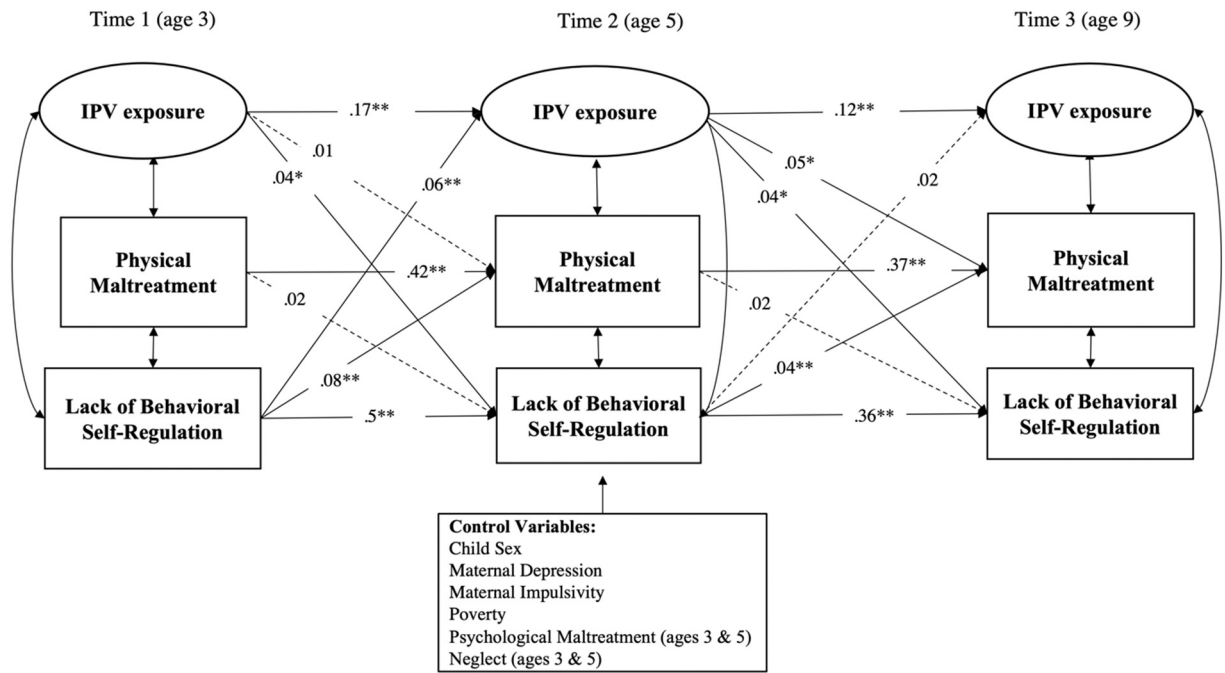
5.2.3. Behavioral self-regulation

The Child Behavior Checklist (CBCL; Achenbach, 2011) was used to measure children’s behavioral self-regulation based on mothers’ reports. The CBCL included items from the impulsivity, aggression, and attention span subscales (Dawes et al., 1997) and the subset of items used to measure lack of behavioral regulation was validated in previous studies (see the full list of items published in Boutwell & Beaver, 2010a, 2010b). These items were designed to capture children’s capacity to manage their behaviors in social settings by purposefully applying different forms of attentional and cognitive adaptability and inhibitory control (McClelland & Tominey, 2014). The assessment of behavioral self-regulation in this study involved a list of 27 items collected at age 3. For ages 5 and 9, the items in the CBCL were more reflective of older children’s behavioral problems and included rule-breaking problem behaviors that are indicative of self-control deficits (e.g., cheating, destroying property, and fighting). This study followed the same approach used by previous research (Jackson et al., 2018), and included 25 items to measure children’s behavioral self-regulation at ages 5 and 9. To ensure the validity and comparability of the measurement across different waves, a series of confirmatory factor analyses were conducted. The results of these analyses, along with the supporting item selection and measurement invariance information, can be found in the supplemental material.

Mothers were asked to rate the frequency of their child’s behaviors using a three-point Likert-type scale ranging from 0 = “not true,” 1 = “somewhat or sometimes true,” and 2 = “very true or often true.” The composite score was formed by summing the scores, with higher scores indicating lower levels of self-regulation. Thus, the term of “lack of behavioral regulation” was used accordingly. The Cronbach’s alpha values for the behavioral self-regulation scales were .91 (age 3), .86 (age 5), and .89 (age 9), indicating high reliability.

5.3. Control variables

To account for potential confounding factors that may influence children’s levels of behavioral self-regulation, we included four covariates in our analyses: child’s sex at birth, maternal depression, maternal impulsivity, and poverty ratio. Child’s sex at birth was included as a dichotomous control variable (0 = girls and 1 = boys; Matthews et al., 2009). Maternal depression was assessed using the Composite International Diagnostic Interview — Short Form (CIDI-SF; Kessler et al., 1998) and was characterized as a probable diagnosis of major depression. Mothers completed the CIDI-SF at the first-year follow-up data collection; based on their responses to questions assessing depressive symptoms, they were classified as either 1 = probable cases of depression or 0 = unlikely cases of depression. Maternal impulsivity was measured when children were at the age of 3. Six items from the Dickman scale (1990) were aggregated into a composite variable, with higher scores representing higher levels of impulsivity. Poverty ratio was assessed using the



Model fit:  $\chi^2 = 94.58, df = 30, p < .01; CFI = .99; TLI = .96, RMSEA = .02$

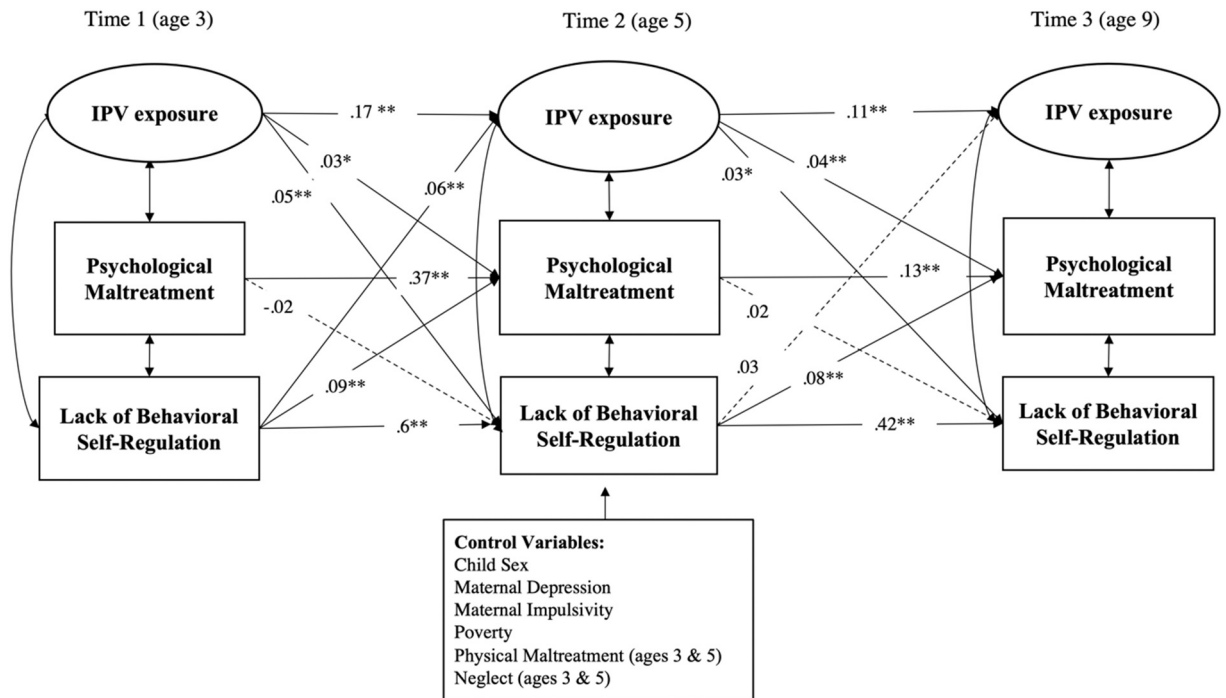
Fig. 1. Conceptual model-reciprocal cross-lagged model among IPV exposure, physical maltreatment, and behavioral self-regulation (N = 4402). Note: Solid lines indicate significant paths, while dashed lines represent non-significant paths. The reported coefficients refer to standardized estimates. Statistical significance levels are denoted as follows: \* $p < .05$ , \*\* $p < .01$ .

annual household income reported by mothers at age 1. Respondents were asked to provide an exact dollar amount or a range of income. Income was then transformed into a poverty ratio based on family size and then compared to the poverty threshold (U.S. Census Bureau, n.d.). Four categories were created with a score of 0 = 0 %–99 %, 1 = 100 %–199 %, 2 = 200 %–299 %, and 3 = equal to or above 300 % of the poverty threshold.

5.4. Analytic Plan

To examine the longitudinal reciprocal relationships among various types of maltreatment, IPV exposure, and behavioral self-regulation, we conducted three-wave cross-lagged path analyses using Amos 27. Full information maximum likelihood estimation was used to handle missing data (Enders, 2013). The cross-lagged analysis allowed us to assess the relationships among all three study variables over time, while accounting for the stability of these relationships. To control for potential confounding variables, we covaried child sex, maternal depression, maternal impulsivity, and poverty ratio at the first wave. We ran separate analyses for each of the three types of maltreatment (physical, psychological, and neglect), as illustrated in Figs. 1–3. To obtain the effect of specific forms of maltreatment on the outcome, we also included other maltreatment variables as covariables in the model when it is not examined in the central role in the cross-lagged model. For example, in the model when physical maltreatment is in the cross-lagged model, we included psychological maltreatment and neglect (with allowing ages 3 psychological maltreatment and neglect to predict IPV exposure and behavioral self-regulation at age 5 and age 5 psychological maltreatment and neglect to predict PV exposure and behavioral self-regulation at age 9). To evaluate the fit of our models, we utilized fit indexes of comparative fit index (CFI; Bentler, 1990), Tucker-Lewis Index (TLI; Hu & Bentler, 1999) and the root mean square error of approximation (RMSEA; Browne & Cudeck, 1992). Acceptable model fit was determined by the CFI and TLI values  $\geq .90$  and an RMSEA value of  $\leq .08$  (Hu & Bentler, 1999). Our models included correlations among concurrent constructs at all time points, autoregressive paths for each construct across time, and all cross-lagged paths.

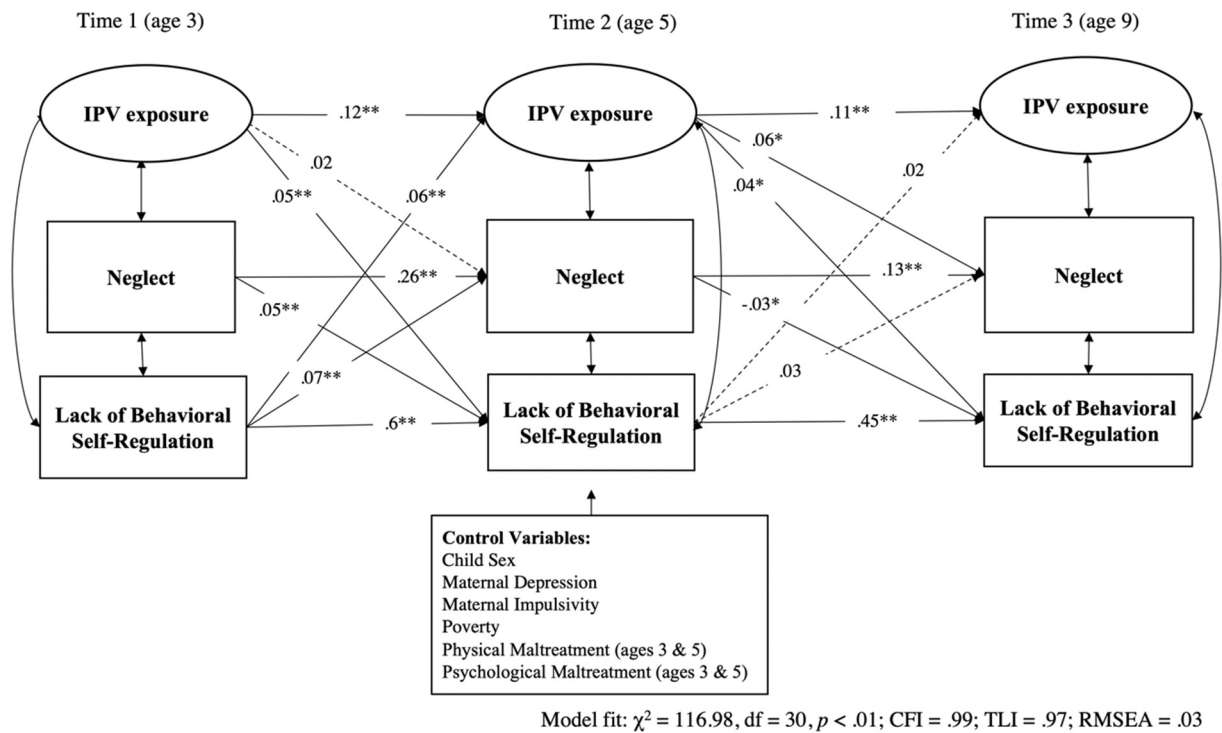
The percentage of missing data for the variables was first examined in this study. For measures of IPV, the missing data was 11.5 % at age 3, 22.6 % at age 5, and 43.8 % at age 9. This highest percentage of missing data at age 9 was primarily due to a significant number of mothers had ended their intimate partner relationship with the children’s biological fathers and skipped the questions on IPV. Regarding measures of maltreatment, the missing data percentages were 29.1 % at age 3, 35.4 % at age 5, and 28.2 % at age 9. As for measures of behavioral self-regulation, the missing data percentages were 41.3 % at age 3, 37.6 % at age 5, and 32.2 % at age 9. These missing values were attributed to retention challenges and dropout at each wave. It is important to note that the missing pattern



Model fit:  $\chi^2 = 71.34$ ,  $df = 30$ ,  $p < .01$ ; CFI = .99; TLI = .99; RMSEA = .02

Fig. 2. Conceptual model-reciprocal cross-lagged model among IPV exposure, psychological maltreatment, and behavioral self-regulation (N = 4402).

Note: Solid lines indicate significant paths, while dashed lines represent non-significant paths. The reported coefficients refer to standardized estimates. Statistical significance levels are denoted as follows: \* $p < .05$ , \*\* $p < .01$ .



**Fig. 3.** Conceptual model-reciprocal cross-lagged model among IPV exposure, neglect, and behavioral self-regulation (N = 4402). Note: Solid lines indicate significant paths, while dashed lines represent non-significant paths. The reported coefficients refer to standardized estimates. Statistical significance levels are denoted as follows: \* $p < .05$ , \*\* $p < .01$ .

was also influenced by the use of composite scores, where individuals who missed part of the scale were considered missing for that particular measure. The results of Little’s missing completely at random test showed that the missing in this sample was not completely at random ( $\chi^2 (df = 4821) = 5807.01, p < .001$ ), which is consistent with other studies using the FFCWS data and suggested that families with disadvantaged demographics and socioeconomic status were more likely to be lost to attrition (Huang et al., 2020; Juan et al., 2017). To maximize the sample size and retain as many participants as possible throughout the study, FFCWS implemented strategies to minimize attrition and maintain engagement. These efforts involved actively staying in contact with all baseline participants at every wave of data collection. In this particular study, to ensure a sufficient analytical sample, families who completed data for at least one wave were included. By including these families, the study could capture valuable information and maintain a larger sample size for analysis. To address the missing data and potential non-normality issues in the sample, we conducted multiple imputation and Bollen-Stine Bootstrap when estimating standard errors and constructing confidence intervals (Enders, 2002; Kim & Millsap, 2014; Zhang, 2022). In our study, we employed the multiple imputation method in AMOS (Arbuckle, 2005) to handle missing data. The process began by fitting the model using maximum likelihood estimation to estimate the model parameters. Afterward, a linear regression approach was utilized to predict the missing values for each case, based on a linear combination of the observed values within that same case. These predicted values were then substituted for the missing values in subsequent analyses.

## 6. Results

### 6.1. Preliminary analyses

Table 2 displays the descriptive statistics and correlation matrix for all the variables observed in the study. The correlation analysis indicates that exposure to IPV and various forms of maltreatment are positively correlated with a lack of behavioral self-regulation at all three age points. We also observed concurrent correlation of IPV and maltreatment at all three time points. However, the presence of IPV at age 9 was not significantly correlated with physical maltreatment at age 9. Additionally, psychological maltreatment and neglect at age 5 were found to be significantly associated with IPV at age 9.

### 6.2. Cross-lagged path models

#### 6.2.1. Physical maltreatment, IPV, and behavioral self-regulation

As shown in Fig. 1, the proposed reciprocal model had a good model fit with CFI = .99, TLI = .96, and RMSEA = .02.  $\chi^2 = 94.58, df = 30, p < .01$ . The standardized path coefficient from the model (as seen in Fig. 1) showed that IPV exposure at age 3 was significantly

**Table 2**  
Bivariate correlations among key variables in the model (N = 4402).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1 IPV exposure (age 3)	1																			
2 IPV exposure (age 5)	.18**	1																		
3 IPV exposure (age 9)	.09**	.13**	1																	
4 Maltreatment—physical (age 3)	.06**	.04**	.02	1																
5 Maltreatment—psychological (age 3)	.1**	.08**	.04**	.65**	1															
6 Maltreatment—neglect (age 3)	.09**	.08**	.06**	.10**	.11**	1														
7 Maltreatment—physical (age 5)	.06**	.04**	.02	.52**	.40**	.13**	1													
8 Maltreatment—psychological (age 5)	.1**	.05**	.04**	.39**	.53**	.10**	.61**	1												
9 Maltreatment—neglect (age 5)	.06**	.06**	.02	.05*	.05*	.21**	.10**	.10**	1											
10 Maltreatment—physical (age 9)	.06**	.07**	.02	.43**	.30**	.07**	.53**	.37**	.05	1										
11 Maltreatment—psychological (age 9)	.08**	.09**	.07**	.34**	.42**	.08**	.39**	.48**	.04	.64**	1									
12 Maltreatment—neglect (age 9)	.05*	.07**	.04*	.07**	.07**	.11**	.09**	.09**	.18**	.21**	.23**	1								
13 Lack of behavioral self-regulation (age 3)	.14**	.1**	.06**	.32**	.38**	.15**	.25**	.30**	.09**	.18**	.21**	.08**	1							
14 Lack of behavioral self-regulation (age 5)	.12**	.09**	.09*	.19**	.23**	.14**	.34**	.41**	.14**	.24**	.27**	.09**	.54**	1						
15 Lack of behavioral self-regulation (age 9)	.1**	.09**	.09**	.17**	.20**	.06**	.21**	.24**	.06**	.35**	.40**	.18**	.38**	.48**	1					
16 Child sex at birth	0	-.01	-.01	.10**	.07**	.01	.07**	.07**	-.01	.08**	.07**	0	.08**	.08**	.11**	1				
17 Maternal impulsivity	-.15**	-.1**	-.07**	-.11**	-.15**	-.12**	-.11**	-.14**	-.11**	-.08**	-.12**	-.11**	-.27**	-.18**	-.16**	-.03*	1			
18 Maternal depression	.12**	.09**	.06**	.03	.06**	.05**	0	.05*	.06**	.06**	.06**	.08**	.13**	.12**	.11**	0	-.11**	1		
19 Poverty ratio	-.02**	-.05**	.02	0	-.02	-.10**	-.05**	-.03	-.07**	-.04	.02	-.04*	-.16**	-.13**	-.10**	.01	.15**	-.06**	1	
Range	[-.21, 1.9]	[-.11, 2.32]	[-.07, 2.41]	[0, 16.8]	[0, 20]	[0, 6]	[0, 5.2]	[0, 20]	[0, 2.8]	[0, 5.4]	[0, 20]	[0, 5]	[0, 1.84]	[0, 1.6]	[0, 2]	[1, 4]	[0, 4]	[0, 1]	[0, 3]	
Mean/%	0	0	0	2.87	4.28	.07	1.1	4.87	.06	.75	3.31	.13	.59	.35	.52	2.97	2.97	12.1 %	1.29	
SD	.34	.22	.14	3.12	3.28	.27	.97	3.39	.23	.88	3.14	.36	.33	.25	.5	.61	.61	N/A	1.16	

\*\*  $p < .01$ .

\*  $p < .05$  (two-tailed).

associated with lack of behavioral self-regulation at age 5 ( $\beta = .04, p = .01$ ) and IPV exposure at age 5 was significantly associated with lack of behavioral self-regulation at age 9 ( $\beta = .04, p = .02$ ). However, significant links between physical maltreatment and lack of behavioral self-regulation were not observed. Lack of behavioral self-regulation predicted both IPV and physical maltreatment in the follow-up waves, except for IPV at age 9 as indicated by the standardized path coefficients in Fig. 1. IPV exposure at age 5 predicted physical maltreatment at age 9. Cross-lagged analyses further revealed that the effects of IPV exposure on lack of behavioral self-regulation in early childhood persisted until age 9, even after controlling for the effects of psychological maltreatment and neglect.

### 6.2.2. Psychological maltreatment, IPV, and behavioral self-regulation

The proposed reciprocal model showed good model fit, as indicated by CFI = .99, TLI = .99, and RMSEA = .02.  $\chi^2 = 71.34, df = 30, p < .01$  (see Fig. 2). The standardized path coefficient from this model showed that IPV exposure at age 3 was significantly associated with lack of behavioral self-regulation at age 5 ( $\beta = .05, p < .01$ ) and IPV exposure at age 5 was significantly associated with lack of behavioral self-regulation at age 9 ( $\beta = .03, p = .03$ ). Interestingly, no significant links were observed between psychological maltreatment and lack of behavioral self-regulation. Lack of behavioral self-regulation at age 3 predicted psychological maltreatment at both ages 5 and 9 and IPV at age 5 only, as indicated by the standardized path coefficients in Fig. 2. IPV exposure was found to be associated with psychological maltreatment in the following waves.

### 6.2.3. Neglect, IPV, and behavioral self-regulation

As shown in Fig. 3, the proposed reciprocal model had a good model fit with CFI = .99; TLI = .97; RMSEA = .03.  $\chi^2 = 116.98, df = 30, p < .01$ . The standardized path coefficient from this model (as seen in Fig. 3) showed that IPV exposure at age 3 was significantly associated with lack of behavioral self-regulation at age 5 ( $\beta = .05, p < .01$ ) and at age 9 ( $\beta = .04, p = .02$ ). Significant links between neglect and lack of behavioral self-regulation were observed between ages 3 and 5 ( $\beta = .05, p < .01$ ) and between ages 5 and 9 ( $\beta = -.03, p = .04$ ). Lack of behavioral self-regulation at age 3 was found to predict both IPV and neglect at age 5 but not at age 9, as indicated by the standardized path coefficients in Fig. 3. IPV exposure at age 5 predicted neglect at age 9.

## 7. Discussion

Child maltreatment and exposure to family violence are known to have a significant impact on children's ability to regulate their behaviors (Kim-Spoon et al., 2013). However, it is not well understood how these factors interact with each other over time. This study aims to investigate the bidirectional relationship between children's experience of IPV exposure, different types of maltreatment, and their behavioral regulation over time.

Our study found that IPV exposure was consistently linked to lower levels of self-regulation in children, both within and across the three timepoints when children were aged 3, 5, and 9. These longitudinal associations were found with the consideration of the impact of the various forms of child maltreatment (i.e., physical abuse, psychological abuse, and neglect). These findings add to the growing body of research on the negative impact of early IPV exposure on children's development of self-regulation in childhood. Importantly, they highlight that this impact extends beyond the direct effects of violence or neglect toward children.

Contrary to our initial hypothesis, our data and cross-lagged path model did not support consistent significant associations between physical and psychological abuse and children's levels of behavioral self-regulation when considering the effects of exposure IPV against mothers. However, we did find support for the hypothesis that experiencing neglect in toddlerhood predicts lower levels of behavioral self-regulation at ages 5 and 9. This finding is consistent with previous research demonstrating that young children who experience low levels of parent emotional expressivity might be at increased risk for difficulties with self-regulation in early childhood (Haskett et al., 2012). It is important to highlight that our study incorporated multiple types of maltreatment into the model, enabling us to capture the distinct impacts of each form of maltreatment on behavioral self-regulation. However, it is crucial to note that our approach does not mirror the examination of the influence of simultaneous co-occurrence of multiple maltreatment types on children's behavioral self-regulation. Existing research has highlighted that the cumulative and synergistic effects arising from experiencing multiple forms of maltreatment (such as the combination of physical and psychological maltreatment) could potentially influence the emergence of problem behaviors in children (Warmingham et al., 2018). While this study's scope does not encompass such an examination, future research endeavors may find it valuable to explore the implications of multiple maltreatment occurrences on children's self-regulation, especially with IPV exposure being also considered.

The significant effect of neglect in this study highlights the potential severe consequences of this form of maltreatment, particularly for younger children. Examining neglect as a separate factor from other types of maltreatment showed that neglect may be particularly prevalent in the aftermath of maternal IPV victimization, and our findings suggest that it should not be overlooked as a risk factor for poor self-regulation. By addressing the risky factors of neglect, such as maternal IPV victimization, and providing support for families experiencing these challenges, it may be possible to mitigate the harmful effects of maltreatment on children's self-regulation and overall development. Our results showed that experiencing IPV predicted psychological abuse at both later ages and physical abuse and neglect at age 9, with this relationship being observed when maternal depression was considered in the cross-lagged model. In other words, the experience of IPV was associated with increased likelihoods of psychological abuse, physical abuse, and neglect occurring at later ages. These findings align with previous research suggested that mothers experiencing IPV may exhibit more negative parenting behaviors, such as harshness and psychological aggression (Easterbrooks et al., 2018; Harding et al., 2013; Katz et al., 2007; Rigerink et al., 2010). In our cross-lagged model, an unexpected and notable finding emerged: a significant negative path coefficient between neglect at age 5 and the lack of behavioral self-regulation at age 9. This suggests that children who experienced neglect at age 5 exhibited higher levels of behavioral self-regulation at age 9. Given the positive bivariate relationship between neglect

and poor behavioral self-regulation, as well as the high correlation between these two variables across the two time points, this negative pathway is likely attributed to a suppression effect (e.g., MacKinnon et al., 2000). This intriguing observation underscores the importance of understanding self-regulation as a “contextually-contingent process” and its asset-based nature, as well as its sensitivity to environmental variations (Miller-Cotto et al., 2021, p. 3). Despite initial variations in self-regulation being linked to experiences of maltreatment and the exposure to IPV, some children at age 9 may still exhibit comparable levels of behavioral self-regulation. This resilience implies the presence of protective mechanisms at play, such as potential support from teachers and peers once they enter school after turning age 5. These external factors may contribute to the “bouncing back” in terms of the levels of self-regulation observed among these children.

To examine child effects, our results suggested consistent evidence of stability for child levels of behavioral self-regulation. In line with the past literature looking at children’s behavioral problems and maltreatment, the evidence from this study presents statistically significant cross-lagged effects between child’s lack of behavioral self-regulation, IPV exposure, and maltreatment between age 3 and age 5. The child effect on violence exposure was depicted in the McCoy (2013) theory of early violence exposure and self-regulatory development. Allostatic load in violence-exposed children is thought to relate directly to the ways that they react to and process environmental stimuli (Bellis et al., 2001). Children who have been exposed to violence are known to be more alert to threat cues than those who have not (Taylor et al., 2006). While this increased vigilance can be beneficial in the short term, allowing children to identify potentially dangerous situations and plan accordingly, it can also have negative consequences for their long-term emotional regulation and behaviors. For example, these children may exhibit inappropriate levels of aggression or defensiveness in everyday interactions due to a heightened tendency to misinterpret neutral situations as threatening or become emotionally overwhelmed and unable to manage negative emotions (Dodge et al., 1995; Katz & Gottman, 1996). Parents may misinterpret these behaviors as intentional and may react with negative parenting, which could lead to more conflicts between caregivers and further negative outcomes for the child. Mothers who experienced IPV may have even less bandwidth to engage in co-regulatory parenting practices with their children when the child presents challenging behaviors. The combined stresses of IPV victimization and parenting aggravation may result in less optimal parenting practices and even maltreatment.

### 7.1. Strengths, limitations, and future directions

The present study extends previous work on bidirectional effects of, IPV exposure, child maltreatment, and self-regulation between mothers and children in a large, underrepresented sample. We provide novel insight into whether different types of maltreatment and child’s behavioral self-regulation influence one another reciprocally. Furthermore, we expand on previous research by using the cross-lagged path model to examine children’s experiences of IPV throughout their early childhood.

Nevertheless, our study has several limitations that should be considered when interpreting the results. Firstly, all constructs were assessed using maternal self-report measures, which may be prone to social desirability bias. Mothers may have been particularly hesitant to report maltreatment behaviors that could portray them negatively or result in investigation by Child Protective Services, which potentially led to an underestimation of the levels and effects of different types of maltreatment on behavioral self-regulation (Kim & Maguire-Jack, 2015). Additionally, because our focus was on examining the impact of IPV victimization on maternal parenting behaviors, only maltreatment measures that were directed from mothers to children were included; the effects of maltreatment from father figures were not considered. This may partially explain the relatively small path coefficient observed between IPV exposure and children’s levels of self-regulation, as children’s self-regulation may be affected by their dual experience of IPV and maltreatment from the father figure. It is also important to note that the data collection procedure used by FFCWS only allowed for three timepoints to be included, spanning six years in childhood between age 3 and 9. This limits the examination of real-time consequences of experiencing IPV and maltreatment in early childhood. Future research could be improved by including more frequent waves of data collection (e.g., once every year) to better examine how changes, duration, and cumulative adversity may impact children’s development of self-regulation. Despite these limitations, this study also has notable strengths that help to unravel the bidirectional relationships between family violence and self-regulation. The finding that bidirectional relationships between IPV exposure, maltreatment, and child behavior may be particularly significant in families living in poverty highlights the potential impact of socioeconomic factors on child development. Poverty can create a range of stressors for families, including financial hardship, inadequate housing, and limited access to healthcare and educational resources. These stressors may not only add risks to both IPV incidences and various types of maltreatment, but also exacerbate the effects of IPV and maltreatment (neglect in particular) on children, potentially leading to more severe and persistent poor behavioral regulation in children.

Another limitation of the study was that behavioral self-regulation was measured solely through mother reported questionnaires. The inclusion of other methods measuring self-regulation could be helpful to capture the holistic picture of behavioral self-regulation. For example, children’s self-reporting of their emotional experiences and regulation approaches are meaningful in understanding their emotional responses and behavioral manifestations toward interparental conflict from children’s perspectives (Crandall et al., 2018). Currently, direct assessments on children’s self-regulation are considered more objective when measuring aspects of self-regulation and were found to be mostly associated with behavioral outcomes (Crandall et al., 2018). Plus, direct assessments would more accurately capture children’s objective changes over time in terms of the “absolute” change of aspects of self-regulation over years. However, direct assessments of children’s self-regulation were difficult to find and use consistently over time for children, such as ages 3 to 9 in this study. Future studies using the FFCWS could consider validating existing tasks (especially for studies only requiring single time points of measuring attentional aspect of self-regulation) based on the design in the NIH Toolbox — Cognition Battery (Zelazo et al., 2013). By including these methods, it would not only adjust for measurement errors but also provide a more comprehensive picture of children’s self-regulatory abilities.

It is important to note that this study focused on examining the specific effects of co-occurring IPV and each type of child maltreatment. By analyzing each form of maltreatment separately, we gained a more nuanced understanding of their individual impact and the specific mechanisms involved. It is worth noting that some overlapping variance among the maltreatment types and outcomes is possible, as demonstrated in previous research (e.g., Cecil et al., 2017). The co-occurrence of IPV and other forms of abuse has been associated with a “dual exposure effect”, wherein the cumulative consequences on children are more severe and persistent (Herrenkohl et al., 2008). Although past studies have often explored the combined effects of IPV and child maltreatment as adverse childhood experiences (Renner, 2021; Skafida et al., 2022) using variable centered approach, there is a need to identify subgroups of children who may experience dual exposure to various types of violence (e.g., physical violence vs. psychological abuse) and types of maltreatment (physical abuse vs. neglect) using a person-centered approach in future studies. This could provide valuable insights into the specific patterns and interactions between different forms of adversity and the development and self-regulation, therefore enhance our understanding of the complex dynamics involved and help identify specific intervention strategies tailored to the unique needs of these subgroups.

Consequently, future research should strive to disentangle the distinct impacts of different types of maltreatment within the context of IPV and their respective effects on children’s levels of self-regulation. This approach would provide a more comprehensive understanding of the complex dynamics and interactions between IPV and various aspects of child maltreatment in shaping children’s self-regulatory abilities.

## 7.2. Implications

Our findings offer important implications for providers preventing and intervening with underrepresented families at a risk of experiencing violence. The finding from the bidirectional model of IPV exposure in early childhood and children’s behavioral self-regulation influence each other reciprocally may provide a potential theoretical framework for early interventions. In delineating early childhood as a vulnerable period to IPV exposure, mother’s IPV experience increased children’s externalizing behaviors, particularly in the lack of sufficient maternal care (Manning et al., 2014). Our results emphasize the need for early preventions in supporting parents to understand of the impact of IPV on their children. For example, providing resources, curricula, and trainings to couples prior to the birth of a child would increase their awareness of IPV. Additionally, conducting universal prenatal IPV screening with the medical providers for pregnant women would increase their awareness of negative consequences of IPV and address their concerns (Estefan et al., 2019). The postnatal period is also a crucial one for prevention, as partners face parenting stress and declining relationship satisfaction (Charles & Perreira, 2007). Those participating in skill-based IPV prevention programs delivered to couples with their new-born in the community reported better relationship satisfaction and communication, which are protective factors for IPV (Heyman et al., 2019). The promotion and education of healthy relationship skills and conflict resolution techniques in the family may reduce the risks for children’s exposure to IPV.

Experiencing IPV diminishes a mother’s parenting skills, which in turn may amplify the negative effects of IPV exposure (e.g., neglect) on children’s behavioral outcomes. The results from our bidirectional model of IPV exposure and children’s behavioral regulation suggests that early IPV interventions may lower negative consequences for mothers and their children. Early screening of IPV and interventions to encourage women survivors to seek help by providing them access to protective shelters, education regarding parenting skills, and trauma healing from counseling have been recommended (Kita et al., 2016). Interventions that focus on both mother and child have been found to be more effective in reducing children’s behavioral problems (Anderson & Van Ee, 2018).

The findings from this study underscore the importance of targeting self-regulation in interventions aimed at helping children exposed to IPV and/or maltreatment to reach their full developmental potential. It is noteworthy that children who score lowest in self-regulation assessments tend to benefit the most from intervention programs, as shown in studies by Robson et al., 2020, Tominey & McClelland, 2011, and Wass et al., 2012. Fortunately, there are existing intervention programs designed for children exposed to IPV that focus on enhancing self-regulation skills. For instance, the Camp HOPE America summer camp program, based on Snyder’s Theory of Hope, targets school-aged children exposed to IPV and is effective in increasing children’s sense of self-control and emotional intelligence (Hellman & Gwinn, 2017; Snyder, 2000). Since children exposed to IPV usually have little control over their home environment, teaching them effective coping strategies that emphasize regulating their emotions and behaviors, such as self-soothing, can be helpful in promoting self-regulation (Rigterink et al., 2010; see Pandey et al., 2018 for systematic review of intervention programs on self-regulation).

## 8. Conclusion

This study provides important insights into the intricate relationships between child maltreatment, IPV exposure, and behavioral self-regulation. We found that exposure to IPV at ages 3 and 5 has a significant impact on children’s behavioral self-regulation at ages 5 and 9, even after controlling different types of maltreatment. The spillover effect of IPV on maltreatment was also observed. Moreover, we found evidence of child effects, with lower levels of behavioral self-regulation at age 3 being linked to more maltreatment and IPV exposure at age 5. Understanding the complex interplay between these factors is crucial for developing effective interventions to support children’s self-regulation and long-term success. Our findings suggest that early intervention to address IPV exposure may be particularly important in promoting optimal self-regulation development in children.

## Declaration of competing interest

We have no known conflict of interest to disclose.

## Data availability

The data is available through an application from Princeton University's data archive: <https://ffcws.princeton.edu/>

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.chiabu.2023.106507>.

## References

- Achenbach, T. M. (2011). Child behavior checklist. In J. S. Kreutzer, J. DeLuca, & B. Caplan (Eds.), *Encyclopedia of clinical neuropsychology* (pp. 546–552). New York: Springer. [https://doi.org/10.1007/978-0-387-79948-3\\_1529](https://doi.org/10.1007/978-0-387-79948-3_1529)
- Anderson, K., & Van Ee, E. (2018). Mothers and children exposed to intimate partner violence: A review of treatment interventions. *International Journal of Environmental Research and Public Health*, 15(9), 1955. <https://doi.org/10.3390/ijerph15091955>
- Arbuckle, J. (2005). *Amos 6.0 user's guide*. Marketing Department, SPSS Inc.
- Assink, M., Spruit, A., Schuts, M., Lindauer, R., van der Put, C. E., & Stams, G. J. M. (2018). The intergenerational transmission of child maltreatment: A three-level meta-analysis. *Child Abuse & Neglect*, 84, 131–145. <https://doi.org/10.1016/j.chiabu.2018.07.037>
- Awada, S. R., Corning, E. R., & Shelleby, E. C. (2020). Maternal experiences of intimate partner violence and adolescent delinquency: Pathways through parenting stress and harsh parenting behaviors. *Journal of Family Trauma, Child Custody & Child Development*, 17(3), 268–292. <https://doi.org/10.1080/26904586.2020.1806771>
- Banyard, V. L., Williams, L. M., & Siegel, J. A. (2003). The impact of complex trauma and depression on parenting: An exploration of mediating risk and protective factors. *Child Maltreatment*, 8(4), 334–349. <https://doi.org/10.1177/1077559503257106>
- Bellis, M. D. d., Broussard, E. R., Herring, D. J., Wexler, S., Moritz, G., & Benitez, J. G. (2001). Psychiatric co-morbidity in caregivers and children involved in maltreatment: A pilot research study with policy implications. 25, 923–944.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107(2), 238–246. <https://doi.org/10.1037/0033-2909.107.2.238>
- Blair, C., & Ku, S. (2022). A hierarchical integrated model of self-regulation. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.725828>
- Boutwell, B. B., & Beaver, K. M. (2010a). The role of broken homes in the development of self-control: A propensity score matching approach. *Journal of Criminal Justice*, 38(4), 489–495. <https://doi.org/10.1016/j.jcrimjus.2010.04.018>
- Boutwell, B. B., & Beaver, K. M. (2010b). The intergenerational transmission of low self-control. *Journal of Research in Crime and Delinquency*, 47(2), 174–209. <https://doi.org/10.1177/0022427809357715>
- Breiding, M., Basile, K., Smith, S., Black, M., & Mahendra, R. R. (2015). *Intimate partner violence surveillance: uniform definitions and recommended data elements, Version 2.0*. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. <https://doi.org/10.1002/oms.1210161107>
- Brown, J. (1999). Bowen family systems theory and practice: Illustration and critique. *Australian and New Zealand Journal of Family Therapy*, 20(2), 94–103. <https://doi.org/10.1002/j.1467-8438.1999.tb00363.x>
- Brown, S. M., Rhoades, G. K., Marti, C. N., & Lewis, T. (2021). The co-occurrence of child maltreatment and intimate partner violence in families: Effects on children's externalizing behavior problems. *Child Maltreatment*, 26(4), 363–375. <https://doi.org/10.1177/1077559520985934>
- Browne, M., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods & Research*, 21(2), 230–258. <https://doi.org/10.1177/0049124192021002005>
- Carpenter, G. L., & Stacks, A. M. (2009). Developmental effects of exposure to Intimate Partner Violence in early childhood: A review of the literature. *Children and Youth Services Review*. <https://doi.org/10.1016/j.childyouth.2009.03.005>
- Casanueva, C., Martin, S. L., & Runyan, D. K. (2009). Repeated reports for child maltreatment among intimate partner violence victims: Findings from the National Survey of Child and Adolescent Well-Being. *Child Abuse & Neglect*, 33(2), 84–93. <https://doi.org/10.1016/j.chiabu.2007.04.017>
- Cecil, C. A. M., Viding, E., Fearon, P., Glaser, D., & McCrory, E. J. (2017). Disentangling the mental health impact of childhood abuse and neglect. *Child Abuse & Neglect*, 63, 106–119. <https://doi.org/10.1016/j.chiabu.2016.11.024>
- Chan, K. L. (2011). Children exposed to child maltreatment and intimate partner violence: A study of co-occurrence among Hong Kong Chinese families. *Child Abuse & Neglect*, 35(7), 532–542. <https://doi.org/10.1016/j.chiabu.2011.03.008>
- Charles, P., & Perreira, K. M. (2007). Intimate partner violence during pregnancy and 1-year post-partum. *Journal of Family Violence*, 22(7), 609–619. <https://doi.org/10.1007/s10896-007-9112-0>
- Cicchetti, D., & Rizley, R. (2005). Developmental perspectives on the etiology, intergenerational transmission, and sequelae of child maltreatment. *New Directions for Child and Adolescent Development*, 198(11), 31–55. <https://doi.org/10.1002/cd.23219811104>
- Cicchetti, D., & Toth, S. L. (2005). Child maltreatment. *Annual Review of Clinical Psychology*, 1, 409–438.
- Crandall, A. A., Magnusson, B. M., & Novilla, M. L. B. (2018). Growth in adolescent self-regulation and impact on sexual risk-taking: A curve-of-factors analysis. *Journal of Youth and Adolescence*, 47(4), 793–806. <https://doi.org/10.1007/s10964-017-0706-4>
- Cummings, E., El-Sheikh, M., Kouros, C. D., & Buckhalt, J. A. (2009). Children and violence: The role of children's regulation in the marital aggression-child adjustment link. *Clinical Child and Family Psychology Review*, 12(1), 3–15. <https://doi.org/10.1007/s10567-009-0042-7>
- Dawes, M. A., Tarter, R. E., & Kirisci, L. (1997). Behavioral self-regulation: Correlates and 2 year follow-ups for boys at risk for substance abuse. *Drug and Alcohol Dependence*, 45(3), 165–176. [https://doi.org/10.1016/s0376-8716\(97\)01359-8](https://doi.org/10.1016/s0376-8716(97)01359-8)
- Dodge, K. A., Pettit, G. S., Bates, J. E., & Valente, E. (1995). Social information-processing patterns partially mediate the effect of early physical abuse on later conduct problems. *Journal of Abnormal Psychology*, 104(4), 632–643. <https://doi.org/10.1037/0021-843X.104.4.632>
- Easterbrooks, M. A., Katz, R. C., Kotake, C., Stelmach, N. P., & Chaudhuri, J. H. (2018). Intimate partner violence in the first 2 years of life: Implications for toddlers' behavior regulation. *Journal of Interpersonal Violence*, 33(7), 1192–1214. <https://doi.org/10.1177/0886260515614562>
- Egeland, B., Yates, T., Appleyard, K., & van Dulmen, M. (2002). The long-term consequences of maltreatment in the early years: A developmental pathway model to antisocial behavior. *Children's Services: Social Policy, Research, and Practice*, 5(4), 249–260. [https://doi.org/10.1207/S15326918CS0504\\_2](https://doi.org/10.1207/S15326918CS0504_2)
- Eisenberg, N., Taylor, Z. E., Widaman, K. F., & Spinrad, T. L. (2015). Externalizing symptoms, effortful control, and intrusive parenting: A test of bidirectional longitudinal relations during early childhood. *Development and Psychopathology*, 27, 953–968. <https://doi.org/10.1017/S0954579415000620>
- Enders, C. K. (2002). Applying the Bollen-Stine bootstrap for goodness-of-fit measures to structural equation models with missing data. *Multivariate Behavioral Research*, 37(3), 359–377. [https://doi.org/10.1207/S15327906MBR3703\\_3](https://doi.org/10.1207/S15327906MBR3703_3)

- Enders, C. K. (2013). Dealing with missing data in developmental research. *Child Development Perspectives*, 7(1), 27–31. <https://doi.org/10.1111/cdep.12008>
- Estefan, L. F., Armstead, T. L., Rivera, M. S., Kearns, M. C., Carter, D., Crowell, J., ... Daniels, B. (2019). Enhancing the national dialogue on the prevention of intimate partner violence. *American Journal of Community Psychology*, 63, 153–167. <https://doi.org/10.1002/ajcp.12318>
- Finkelhor, D., Turner, H., Ormrod, R., & Hamby, S. L. (2009). Violence, abuse, and crime exposure in a national sample of children and youth. *Pediatrics*, 124(5), 1411–1423. <https://doi.org/10.1542/peds.2009-0467>
- Grodner, B. (1977). A family systems approach to child abuse: Etiology and intervention. *Journal of Clinical Child Psychology*, 6(1), 32–35. <https://doi.org/10.1080/15374417709532740>
- Gustafsson, H. C., Coffman, J. L., & Cox, M. J. (2015). Intimate partner violence, maternal sensitive parenting behaviors, and children's executive functioning. *Psychology of Violence*, 5(3), 266–274. <https://doi.org/10.1037/a0037971>
- Harding, H. G., Morelen, D., Thomassin, K., Bradbury, L., & Shaffer, A. (2013). Exposure to maternal- and paternal-perpetrated intimate partner violence, emotion regulation, and child outcomes. *Journal of Family Violence*, 28(1), 63–72. <https://doi.org/10.1007/s10896-012-9487-4>
- Haskett, M. E., Stelter, R., Proffit, K., & Nice, R. (2012). Parent emotional expressiveness and children's self-regulation: Associations with abused children's school functioning. *Child Abuse & Neglect*, 36(4), 296–307. <https://doi.org/10.1016/j.chiabu.2011.11.008>
- Hellman, C. M., & Gwinn, C. (2017). Camp HOPE as an intervention for children exposed to domestic violence: A program evaluation of hope, and strength of character. *Child and Adolescent Social Work Journal*, 34(3), 269–276. <https://doi.org/10.1007/s10560-016-0460-6>
- Herbell, K., Li, Y., Bloom, T., Sharps, P., & Bullock, L. F. C. (2020). Keeping it together for the kids: New mothers' descriptions of the impact of intimate partner violence on parenting. *Child Abuse & Neglect*, 99. <https://doi.org/10.1016/j.chiabu.2019.104268>
- Herrenkohl, T. I., Sousa, C., Tajima, E. A., Herrenkohl, R. C., & Moylan, C. A. (2008). Intersection of child abuse and children's exposure to domestic violence. *Trauma, Violence, & Abuse*, 9(2), 84–99. <https://doi.org/10.1177/1524838008314797>
- Heyman, R. E., Smith Slep, A. M., Lorber, M. F., Mitnick, D. M., Xu, S., Baucom, K. J. W., ... Niolon, P. H. (2019). A randomized, controlled trial of the impact of the couple CARE for parents of newborns program on the prevention of intimate partner violence and relationship problems. *Prevention Science*, 20, 620–631. <https://doi.org/10.1007/s11121-018-0961-y>
- Holmes, M. R. (2013). Aggressive behavior of children exposed to intimate partner violence: An examination of maternal mental health, maternal warmth and child maltreatment. *Child Abuse & Neglect*, 37, 520–530. <https://doi.org/10.1016/j.chiabu.2012.12.006>
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Huang, C. C., Chen, Y., & Cheung, S. (2020). Early childhood exposure to intimate partner violence and teen depression symptoms in the U.S. *Health and Social Care in the Community*, June, 1–9. <https://doi.org/10.1111/hsc.13240>
- Jackson, D. B., Newsome, J., Vaughn, M. G., & Johnson, K. R. (2018). Considering the role of food insecurity in low self-control and early delinquency. *Journal of Criminal Justice*, 56(May, 2017), 127–139. <https://doi.org/10.1016/j.jcrimjus.2017.07.002>
- Juan, S. C., Washington, H. M., & Kurlychek, M. C. (2017). Breaking the intergenerational cycle: Partner violence, child–parent attachment, and children's aggressive behaviors. *Journal of Interpersonal Violence*. <https://doi.org/10.1177/0886260517692996>
- Katz, L. F., & Gottman, J. M. (1996). Spillover effects of marital conflict: In search of parenting and coparenting mechanisms. *New Directions for Child Development*, 74, 57–76. <https://doi.org/10.1002/cd.23219967406>
- Katz, L. F., Hessler, D. M., & Annet, A. (2007). Domestic violence, emotional competence, and child adjustment. *Social Development*, 16(3), 513–538. <https://doi.org/10.1111/j.1467-9507.2007.00401.x>
- Kessler, R. C., Andrews, G., Mroczek, D., Ustun, B., & Wittchen, H.-U. (1998). The World Health Organization composite international diagnostic interview short-form (CIDI-SF). *International Journal of Methods in Psychiatric Research*, 7(4), 171–185. <https://doi.org/10.1002/mp.47>
- Kim, B., & Maguire-Jack, K. (2015). Community interaction and child maltreatment. *Child Abuse & Neglect*, 41, 146–157. <https://doi.org/10.1016/j.chiabu.2013.07.020>
- Kim, H., & Millsap, R. (2014). Using the Bollen-Stine bootstrapping method for evaluating approximate fit indices. *Multivariate Behavioral Research*, 49(6), 581–596. <https://doi.org/10.1080/00273171.2014.947352>
- Kim-Spoon, J., Cicchetti, D., & Rogosch, F. A. (2013). A longitudinal study of emotion regulation, emotion lability-negativity, and internalizing symptomatology in maltreated and nonmaltreated children. *Child Development*, 84(2), 512–527. <https://doi.org/10.1111/j.1467-8624.2012.01857.x>
- Kita, S., Haruna, M., Matsuzaki, M., & Kamibeppu, K. (2016). Associations between intimate partner violence (IPV) during pregnancy, mother-to-infant bonding failure, and postnatal depressive symptoms. *Archives of Women's Mental Health*, 19, 623–634. <https://doi.org/10.1007/s00737-016-0603-y>
- Kopp, C. B. (1982). Antecedents of self-regulation: A developmental perspective. *Developmental Psychology*, 18(2), 199–214. <https://doi.org/10.1037/0012-1649.18.2.199>
- Levendosky, A. A., & Graham-Bermann, S. A. (2001). Parenting in battered women: The effects of domestic violence on women and their children. *Journal of Family Violence*, 16(2), 171–192. <https://doi.org/10.1023/A:1011111003373>
- MacKinnon, D. P., Krull, J. L., & Lockwood, C. M. (2000). Equivalence of the mediation, confounding and suppression effect. *Prevention Science*, 1, 173–181. <https://doi.org/10.1023/A:1026595011371>
- Maneta, E. K., White, M., & Mezzaocappa, E. (2017). Parent-child aggression, adult-partner violence, and child outcomes: A prospective, population-based study. *Child Abuse and Neglect*, 68, 1–10. <https://doi.org/10.1016/j.chiabu.2017.03.017>
- Manning, L. G., Davies, P. T., & Cicchetti, D. (2014). Interpersonal violence and childhood adjustment: How and why maternal sensitivity is a protective factor. *Child Development*, 85(6), 2263–2278. <https://doi.org/10.1111/cdev.12279>
- Martin, S. E., & Clements, M. L. (2002). Young children's responding to interparental conflict: Associations with marital aggression and child adjustment. *Journal of Child and Family Studies*, 11, 231–244. <https://doi.org/10.1023/A:1015133827129>
- Matthews, J. S., Ponitz, C. C., & Morrison, F. J. (2009). Early gender differences in self-regulation and academic achievement. *Journal of Educational Psychology*, 101(3), 689–704. <https://doi.org/10.1037/a0014240>
- McClelland, M. M., & Cameron, C. E. (2012). Self-Regulation in early childhood: Improving conceptual clarity and developing ecologically valid measures. *Child Development Perspectives*, 6(2), 136–142. <https://doi.org/10.1111/j.1750-8606.2011.00191.x>
- McClelland, M. M., & Tominey, S. L. (2014). The development of self-regulation and executive function in young children. *Zero to Three Journal*, 35(2), 2–8.
- McCoy, D. C. (2013). Early violence exposure and self-regulatory development: A bioecological systems perspective. *Human Development*, 56(4), 254–273. <https://doi.org/10.1159/000353217>
- Miller-Cotto, D., Smith, L. V., Wang, A. H., & Ribner, A. D. (2021). Changing the conversation: A culturally responsive perspective on executive functions, minoritized children and their families. *Infant and Child Development*. <https://doi.org/10.1002/icd.2286>
- Morrison, F. J., Ponitz, C. C., & McClelland, M. M. (2010). Self-regulation and academic achievement in the transition to school. In *Child development at the intersection of emotion and cognition* (pp. 203–224). American Psychological Association. <https://doi.org/10.1037/12059-011>
- Murray, C. E. (2006). Controversy, constraints, and context: Understanding family violence through family systems theory. *The Family Journal*, 14(3), 234–239. <https://doi.org/10.1177/1066480706287277>
- Zhang, Q. (2022). Comparing methods for assessing a difference in correlations with dependent groups, measurement error, nonnormality, and incomplete data. *Psychological Methods*. <https://doi.org/10.1037/met0000522>
- Zhang, Y., Cannata, S., Razza, R., & Liu, Q. (2023). Intimate partner violence exposure and self-regulation in children and adolescents: A systematic review. *Journal of Family Violence*, 1–17. <https://doi.org/10.1007/s10896-023-00636-1>
- National Survey of Child and Adolescent Well-Being (NSCAW): Fourth Wave Report to Congress. (2010). Administration for Children and Families, U.S. Department of Health and Human Services. Retrieved from [https://www.acf.hhs.gov/sites/default/files/documents/opre/nis4\\_report\\_congress\\_full\\_pdf\\_jan2010.pdf](https://www.acf.hhs.gov/sites/default/files/documents/opre/nis4_report_congress_full_pdf_jan2010.pdf).

- Pandey, A., Hale, D., Das, S., Goddings, A. L., Blakemore, S. J., & Viner, R. M. (2018). Effectiveness of universal self-regulation-based interventions in children and adolescents a systematic review and meta-analysis. In , Vol. 172. *JAMA pediatrics* (pp. 566–575). American Medical Association. <https://doi.org/10.1001/jamapediatrics.2018.0232>. Issue 6.
- Paschall, K. W., & Mastergeorge, A. M. (2016). A review of 25 years of research in bidirectionality in parent-child relationships. *International Journal of Behavioral Development*, 40(5), 442–451. <https://doi.org/10.1177/0165025415607379>
- Reichman, N. E., Teitler, J., Garfinkel, I., & McLanahan, S. S. (2001). Fragile families: Sample and design. *Children and Youth & Services Review*, 23(4–5), 303–326.
- Renner, L. M. (2021). The co-occurrence of child maltreatment and intimate partner violence: A commentary on the special issue. *Child Maltreatment*, 26(4), 464–469. <https://doi.org/10.1177/10775595211034430>
- Rigterink, T., Katz, L. F., & Hessler, D. M. (2010). Domestic violence and longitudinal associations with children's physiological regulation abilities. *Journal of Interpersonal Violence*, 25(9), 1669–1683. <https://doi.org/10.1177/0886260509354589>
- Robson, D. A., Allen, M. S., & Howard, S. J. (2020). Self-regulation in childhood as a predictor of future outcomes: A meta-analytic review. *Psychological Bulletin*, 146(4), 324–354. <https://doi.org/10.1037/bul0000227>
- Sameroff, A. (1975). Transactional models in early social relations. *Human Development*, 18(1–2), 65–79. <https://doi.org/10.1159/000271476>
- Schatz, J. N., Smith, L. E., Borkowski, J. G., Whitman, T. L., & Keogh, D. A. (2008). Maltreatment risk, self-regulation, and maladjustment in at-risk children. *Child Abuse & Neglect*, 32(10), 972–982. <https://doi.org/10.1016/j.chiabu.2008.09.001>
- Sektman, M., McClelland, M. M., Acocck, A., & Morrison, F. J. (2010). Relations between early family risk, children's behavioral regulation, and academic achievement. *Early Childhood Research Quarterly*, 25(4), 464–479. <https://doi.org/10.1016/j.ecresq.2010.02.005>
- Shaffer, A., Lindhiem, O., Kolko, D. J., & Trentacosta, C. J. (2013). Bidirectional relations between parenting practices and child externalizing behavior: A cross-lagged panel analysis in the context of a psychosocial treatment and 3-year follow-up. *Journal of Abnormal Child Psychology*, 41(2), 199–210. <https://doi.org/10.1007/s10802-012-9670-3>
- Shields, A., & Cicchetti, D. (1998). Reactive aggression among maltreated children: The contributions of attention and emotion dysregulation. *Journal of Clinical Child Psychology*, 27(4), 381–395. [https://doi.org/10.1207/s15374424jccp2704\\_2](https://doi.org/10.1207/s15374424jccp2704_2)
- Shipman, K., Edwards, A., Brown, A., Swisher, L., & Jennings, E. (2005). Managing emotion in a maltreating context: A pilot study examining child neglect. *Child Abuse & Neglect*, 29(9), 1015–1029. <https://doi.org/10.1016/j.chiabu.2005.01.006>
- Sijtsema, J. J., Stolz, E. A., & Bogaerts, S. (2020). Unique risk factors of the co-occurrence between child maltreatment and intimate partner violence perpetration. *European Psychologist*, 25(2), 122–133. <https://doi.org/10.1027/1016-9040/a000396>
- Skafta, V., Morrison, F., & Devaney, J. (2022). Intimate partner violence and child maltreatment in Scotland — Insights from nationally representative longitudinal survey data. *Child Abuse and Neglect*, 132. <https://doi.org/10.1016/j.chiabu.2022.105784>
- Slep, S., & O'leary, S. G. (2001). Examining partner and child abuse: Are we ready for a more integrated approach to family violence? *Clinical Child and Family Psychology Review*, 4, 87–107. <https://doi.org/10.1023/A:1011319213874>
- Snyder, C. R. (2000). The past and possible futures of hope. *Journal of Social and Clinical Psychology*, 19(1), 11–28. <https://doi.org/10.1521/jscp.2000.19.1.11>
- Stith, S. M., Liu, T., Davies, L. C., Boykin, E. L., Alder, M. C., Harris, J. M., ... Dees, J. E. M. E. G. (2009). Risk factors in child maltreatment: A meta-analytic review of the literature. In , Vol. 14. *Aggression and violent behavior* (pp. 13–29). <https://doi.org/10.1016/j.avb.2006.03.006>. Issue 1.
- Straus, M. A., & Douglas, E. M. (2004). A short form of the revised conflict tactics scales, and typologies for severity and mutuality. *Violence and Victims*, 19(5), 507–520. <https://doi.org/10.1891/vivi.19.5.507.63686>
- Straus, M. A., Hamby, S. L., Finkelhor, D., Moore, D. W., & Runyan, D. (1998). Identification of child maltreatment with the parent-child Conflict Tactics Scales: Development and psychometric data for a national sample of American parents. *Child Abuse & Neglect*, 22(4), 249–270. [https://doi.org/10.1016/S0145-2134\(97\)00174-9](https://doi.org/10.1016/S0145-2134(97)00174-9)
- Taylor, S. E., Eisenberger, N. I., Saxbe, D., Lehman, B. J., & Lieberman, M. D. (2006). Neural responses to emotional stimuli are associated with childhood family stress. *Biological Psychiatry*, 60(3), 296–301. <https://doi.org/10.1016/j.biopsych.2005.09.027>
- Tiberio, S. S., Capaldi, D. M., Kerr, D. C., Bertrand, M., Pears, K. C., & Owen, L. (2016). Parenting and the development of effortful control from early childhood to early adolescence: A transactional developmental model. *Development and Psychopathology*, 28(3), 837–853. <https://doi.org/10.1017/S0954579416000341>
- Tominey, S. L., & McClelland, M. M. (2011). Red light, purple light: Findings from a randomized trial using circle time games to improve behavioral self-regulation in preschool. *Early Education and Development*, 22(3), 489–519. <https://doi.org/10.1080/10409289.2011.574258>
- U.S. Census Bureau. (n.d.). Poverty measures. Retrieved March 28, 2023, from <https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html>.
- Valentino, K., Speidel, R., Fondren, K., Behrens, B., Edler, K., Cote, K., & Cummings, E. M. (2022). Longitudinal effects of reminiscing and emotion training on child maladjustment in the context of maltreatment and maternal depressive symptoms. *Research on Child and Adolescent Psychopathology*, 50(1), 13–25. <https://doi.org/10.1007/s10802-021-00794-0>
- Warmingham, J. M., Handley, E. D., Rogosch, F. A., Manly, J. T., & Cicchetti, D. (2018). Identifying maltreatment subgroups with patterns of maltreatment subtype and chronicity: A latent class analysis approach. *Child Abuse & Neglect*, 1–12. <https://doi.org/10.1016/j.chiabu.2018.08.013>. August.
- Wass, S. V., Scerif, G., & Johnson, M. H. (2012). Training attentional control and working memory — Is younger, better?. In , 32. *Developmental review* (pp. 360–387). Academic Press. <https://doi.org/10.1016/j.dr.2012.07.001>. Issue 4.
- World Health Organization. (2016). Child maltreatment. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/child-maltreatment>.
- Zelazo, P. D., Anderson, J. E., Richler, J., Wallner-Allen, K., Beaumont, J. L., & Weintraub, S. (2013). NIH toolbox cognition battery (CB): Measuring executive function and attention. *Monographs of the Society for Research in Child Development*, 78(4), 16–33. <https://doi.org/10.1111/mono.12032>