

**A prospective longitudinal investigation of the intergenerational transmission of intimate partner violence stemming from childhood exposure to inter-parental violence.**

by

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## **Abstract**

**Background:** Intimate partner violence (IPV) is the most common form of violence against women. One hypothesized risk factor for victimization in women is their childhood exposure to IPV, suggesting the intergenerational transmission of IPV behaviour and its acceptance.

**Objectives:** (1) To determine how womens' childhood exposure to IPV varied, in terms of timing, duration and form, and (2) To assess if womens' childhood exposure to IPV was associated with IPV victimization in young adulthood.

**Methods:** Using data from the Avon Longitudinal Study of Parents and Children (ALSPAC), female childrens' exposure to physical and psychological IPV was reported by mothers at nine time points from birth until age 18, and then the children reported on their IPV victimization between ages 19-21. Regression analyses, adjusted for confounders, were used to evaluate intergenerational transmission of any IPV victimization and the severity of victimization.

**Results:** Exposure to psychological IPV was much more common than exposure to physical IPV. Childhood (0-8) appears to be a sensitive period for intergenerational transmission, where exposure to any IPV was associated with a 33% higher prevalence of young adult victimization.

**Conclusions:** Preliminary evidence of intergenerational transmission of IPV was found, but future studies are required to validate findings due to study power limitations. Findings from this study could inform future researchers and policy makers of optimal periods to implement intervention strategies, such as education and health promotion programs that work on providing information on conflict resolution strategies to families in hopes of breaking the cycle of IPV intergenerational transmission.

## List of Abbreviations Used

|        |   |
|--------|---|
| IPV    | Intimate Partner Violence                       |
| SLT    | Social Learning Theory                          |
| ALSPAC | Avon Longitudinal Study of Parents and Children |
| CTS    | Conflict Tactics Scale                          |
| R-CTS  | Revised Conflict Tactics Scale                  |
| PTSD   | Post-Traumatic Stress Disorder                  |
| CI     | Confidence Interval                             |
| CCA    | Complete Case Analysis                          |

## **Chapter 1: Introduction**

### ***1.1 The Global Burden of Violence Against Women***

Violence against women is highly prevalent worldwide, and can be seen in all social, economic, religious, and/or cultural groups (Krug et al., 2002). The most common form of violence against women is intimate partner violence (IPV), which is defined as the actual or threatened physical, psychological, or sexual abuse perpetrated by a past or current intimate partner (Chibber & Krishnan, 2011). It is estimated that approximately one in three women (~30%) have been the victim of physical or sexual violence by an intimate partner at one point in their lifetime (Sardinha et al., 2022). Some examples of violent behaviors between intimate partners include slapping, beating, humiliation, forced intercourse and controlling behaviours such as restricting access to information or finances (Chibber & Krishnan, 2011; Krug et al., 2002).

The negative impacts of IPV extend past the acts of violence and have the potential to permanently alter a woman's mental and physical health by placing them at higher risk for physical disabilities, chronic pain, and mental illnesses compared to those who have not experienced IPV victimization (Chibber & Krishnan, 2011; Garcia-Moreno, Jansen, et al., 2005; World Health Organization, 2014). In a multi-country study on women's health conducted by the World Health Organization (WHO), victims of IPV were more likely to report poor health and increased pain, as well as problems with carrying out daily activities, memory loss and dizziness within the preceding four weeks of abuse compared to women who had never been victims of IPV (Garcia-Moreno, Jansen, et al., 2005). Further, victims of IPV were more likely to suffer from emotional distress and to have contemplated or attempted suicide (Garcia-Moreno, Jansen, et al.,

2005). Reproductive health problems such as unwanted or unplanned pregnancies, miscarriages, sexually transmitted diseases, low birth weight, malnutrition, and neonatal and infant mortality are all more likely to occur in women experiencing IPV (Chibber & Krishnan, 2011).

Even when compared to other chronic diseases such as high blood pressure, obesity, and smoking, an Australian study found that the consequences of IPV victimization resulted in more ill health and premature death among women than any other risk factor (VicHealth & Department of Human Services, 2004). The most severe physical outcome, death stemming from intimate partners or a family member, was found to account for 56% of female homicides globally in 2021 (UNODC, 2022).

On top of mental and physical health disruptions, IPV carries a financial burden too, where significantly higher health care costs are seen among women who experienced IPV for as long as five years after the abuse concluded (Bonomi et al., 2009). In the United States, a study estimated that the annual health care costs were 42% and 33% higher among women experiencing physical and nonphysical abuse, respectively, compared to non-abused women (Bonomi et al., 2009). The financial burden extends to the economy as well, where the cost of intimate partner rape, physical assault and stalking was estimated to exceed \$5.8 billion each year in the United States, with over \$4 billion being directed to medical and mental health care services (National Center for Injury Prevention and Control, 2003).

In 2002, the WHO declared IPV an epidemic due to its increasing prevalence in all social, economic, religious and cultural groups (Chibber & Krishnan, 2011; Krug et al., 2002). In the past few decades, IPV has gained increased academic attention, with

the development of several distinct theoretical frameworks directed at understanding the causes of IPV, and the relevant prevention and intervention approaches (Yakubovich et al., 2018). Much of the IPV literature has suggested that victims of IPV are more likely to have been exposed to violence in their family of origin, making the theory of intergenerational transmission a popular theory among IPV researchers when investigating the etiology of IPV (Cochran et al., 2011).

### ***1.2 The Intergenerational Transmission of Violence Theory***

The intergenerational transmission of violence hypothesis suggests that abusive behaviour patterns are communicated and passed down from parent to child by exposure to violence during childhood, which is then reinforced due to perceived favorable outcomes from the use of aggression (Cochran et al., 2011; Wareham et al., 2009). Exposure to violence in the family of origin can be direct by experiencing child abuse, or indirect by witnessing inter-parental violence (Haselschwerdt et al., 2019). The intergenerational transmission of violence hypothesis states that exposure to either form of childhood violence would increase the likelihood of experiencing IPV in adulthood, as children exposed to violence early in life learn that violence is normal, inescapable, and inevitable (Woollett & Thomson, 2016).

The intergenerational transmission of violence hypothesis was originally developed to examine how childhood exposure to violence influences the likelihood of perpetrating violence rather than experiencing it, as victimization is more of a status than a learned behaviour (Cochran et al., 2011; Foshee et al., 1999; Kimber et al., 2018; Roberts et al., 2010). However, theorists such as Cochran suggest the theory can also predict victimization as individuals who witness or experience familial violence may

become so accustomed to it that they become targets suitable for their own victimization later in life (Cochran et al., 2011). Children exposed to inter-parental violence may be more likely to accept violence as normal and internalize their families' norms surrounding violence use in conflict resolution (Cochran et al., 2011). Research suggests individuals exposed to IPV may be more likely to stay in abusive relationships when the perceived costs, such as fear of violence spreading to other family members (i.e., children), appear to outweigh the benefits of leaving the abuser (Cochran et al., 2011). These individuals may consider maintaining the relationship, having a place to live, and the financial support for one's self and children as rewards for tolerating IPV victimization, causing them to be more inclined to stay in the relationship and become accustomed to victimization (Cochran et al., 2011). In fact, early cross-sectional studies on the intergenerational transmission of violence found that adults exposed to physical violence through childhood were more likely to be both victims and perpetrators of violence later in life, suggesting intergenerational transmission of partner violence occurs for victims and perpetrators (Kalmuss, 1984).

Among recent studies focusing on victimization outcomes, a majority have focused on direct experiences of violence such as child abuse and re-victimization patterns in adulthood (Gomez, 2011; Widom et al., 2008). However, evidence suggests imitation is a sufficient and adequate mechanism by which behaviours can transmit from adult to child (Bandura, 1962; Bandura et al., 1963; Bandura & Houston, 1961; Freud, 1936). To understand how the indirect exposure to inter-parental violence can lead to generational transmission, key concepts from Akers' social learning theory (SLT) must be explored.

### *1.2.1 The influence of social learning theory (SLT) on the intergenerational transmission of violence theoretical framework*

The theoretical framework for the intergenerational transmission of violence hypothesis remains informally developed, but other theories that rely on social learning processes such as Ronald Akers' social learning theory (SLT) provide a framework to evaluate the mechanism by which behaviours and attitudes can be translated from parent to child indirectly (Cochran et al., 2011). The SLT is comprised of four key elements: imitation, definitions, differential associations and differential reinforcement (Akers, 1985). The first concept, imitation, refers to the extent to which an individual emulates a behaviour witnessed between role models, such as parents (Akers, 1985). Imitation is dependent on the context in which we are exposed to violence, and relies on the characteristics of role models, the behaviour observed and the perceived outcomes of the behaviour (Bandura, 1973). The SLT suggests the concept of imitation is especially important for the adoption rather than maintenance of a behaviour, and individuals are more likely to imitate a behaviour observed from an admired person, such as parental models, that resulted in a desired outcome (Fox, 2017). In the context of IPV, children exposed to inter-parental violence may be more likely to perceive aggression as a successful form of conflict resolution, rather than employing skills of safe and effective conflict resolution such as negotiation, verbal reasoning, and active listening to reach resolution (Foshee et al., 1999).

The second component of the SLT is definitions, which refers to the attitudes and meanings individuals assign to behaviours based on morality and perceived wrongfulness (Akers, 1985). When applied to IPV, the SLT would suggest victimization to be more common among individuals who accept violence as normal or weakly

oppose the use of violence in conflict resolution (Cochran et al., 2011). A possible mechanism for the adoption of these behaviours in conflict resolution utilizes concepts from the Intimate Partner Violence Stigmatization model, which demonstrate how stigma can influence our definitions (Overstreet & Quinn, 2013). In these models, IPV stigma, which refers to the social shame one may associate with experiencing IPV, can influence our individual definitions in two ways: stigma internalization and anticipated stigma (Overstreet & Quinn, 2013).

Stigma internalization focuses on the extent to which individuals internalize negative cultural beliefs of IPV, such as that victims of IPV are “weak and helpless” or that IPV is “shameful” (Overstreet & Quinn, 2013). The internalized stigma they experience may cause them to have feelings of self-blame, guilt and/or shame, resulting in low self-esteem, which causes them not to seek IPV help services, potentially resulting in an increased vulnerability to IPV victimization and re-victimization (Beaulaurier et al., 2005; Petersen et al., 2004). Anticipated stigma refers to the degree of fear and stigmatization an individual expects when disclosing experiences of IPV with others (Overstreet & Quinn, 2013). It is possible that the fear associated with disclosing IPV experiences outweighs the cultural perceived wrongfulness of violence use in conflict resolution, creating another stigma-related barrier in seeking help, which could eventually lead to repeat victimization (Overstreet & Quinn, 2013). One study even found that women did not disclose experiences of IPV to employers and co-workers due to the fear of losing their job (Swanberg & Logan, 2005). In conclusion, mothers who experience IPV may be more likely to attach IPV stigma (i.e., social shame) to the acts of violence they endure compared to those who did not experience IPV through child

development. The stigma, which could be passed down from mother to child, leads individuals to not seek IPV help services, which increases vulnerability to IPV victimization and re-victimization. Therefore, it is possible that there is intergenerational transmission of IPV stigma and help seeking behaviours and tendencies. When coupled with other concepts from the SLT such as imitation, the intergenerational transmission of tolerance to violence behaviours due to IPV stigma may provide the mechanism by which victimization is transmitted from mothers to child.

The third concept from Aker's SLT is differential associations, which focuses on the influence that significant others' definitions and behaviours have on our own definitions and behaviours (Akers, 1985). When applied to IPV, the SLT suggests that IPV victimization is more likely to occur among individuals whose close associates (i.e., friends, family) endorse or engage in the behaviour themselves (Cochran et al., 2011). More specifically, Sutherland's theory of differential association suggests that the attitudes and behaviours in which individuals are exposed to (1) more frequently, (2) for a longer duration, (3) earlier in one's life, and (4) in more intimate relationships are weighed heavier than attitudes and behaviours in other contexts (Sutherland, 1939).

Much of the literature on childhood development is in agreement that early childhood, particularly the first five years of life, play a crucial role in the long-term social, cognitive, emotional and physical development of a child (Anderson et al., 2003; Karoly et al., 2006). Attachment theory, originally developed by John Bowlby and adapted by Mary Ainsworth, posits that early exposure to inter-parental violence causes children to develop a flawed internal working model for relationships, which can cause them to be more vulnerable to victimization or perpetration of violence later in life (Park,

2016). A review on violence across the life-course had similar conclusions, suggesting that exposure to violence in childhood (in the form of abuse or neglect) elevated the risk for violence in subsequent developmental periods such as adolescence, early and middle adulthood (Herrenkohl et al., 2022).

The final concept from Akers SLT is differential reinforcement, which refers to the perceived cost and benefit associated with a given behaviour (Akers, 1985). The principles behind Bandura's operant conditioning, which built the framework for Akers concept of differential reinforcement, suggest that learning through an experience is largely governed by the rewarding and punishing consequences that follow an action, where successful behaviours are eventually selected for and ineffective ones are discarded (Bandura, 1973). When applied to IPV, the SLT suggests that individuals are more likely to experience repeated IPV victimization in situations where the reward for tolerance of IPV victimization outweighs the costly alternatives such as injury, shame and embarrassment, or financial challenges upon leaving the relationship (Cochran et al., 2011).

On its own, the intergenerational transmission of violence theory remains informally developed, due to the absence of a consistent and logical description of the specific mechanisms by which normalizing violence can be learned and passed down from parent to child (Cochran et al., 2011). When combined with Sutherland's theory of differential association and the Intimate Partner Violence Stigmatization model, the SLT combats this limitation and provides a theoretical framework for the intergenerational transmission of IPV that emphasizes internalization of negative IPV stigma that leads to tolerance of violent behaviour stemming from social learning processes (i.e., imitation)

as the main mechanism by which IPV victimization can be transmitted from parent to child.

### ***1.3 Empirical Findings of the Intergenerational Transmission of IPV***

IPV research has been increasing steadily since the first World Report on Violence and Health in 2002, with 80% of IPV publications between 2000-2019 being published in the later 10 years (2010-2019) (Goldfarb et al., 2023). Systematic reviews on risk factors for IPV in adulthood have all documented childhood experiences with violence, either directly through child abuse or indirectly through witnessing inter-parental violence, as risk factors for future violence, but the strength of their conclusions is hindered by some key methodological limitations in the IPV literature (Capaldi et al., 2012; Jennings et al., 2017; Stith et al., 2000; Yakubovich et al., 2018). One meta-analysis concluded growing up in a violent home to be significantly correlated to IPV victimization, but the pooled effect estimates (weighed by the sample size of their study) were weak for both child abuse (mean  $r = 0.19$ ,  $p < 0.001$ ) and witnessing inter-parental violence (mean  $r = 0.14$ ,  $p < 0.001$ ) (Stith et al., 2000). The most recent systematic review to evaluate the intergenerational transmission of IPV also found evidence of a weak association between witnessing inter-parental violence through childhood and experiencing IPV in adulthood, but the outcome measure focused on perpetration of violence and not victimization (Kimber et al., 2018). Further, the studies included were found to be of low methodological quality, largely due to inconsistencies between studies in the operationalization of exposure and outcome variables and the utilization of retrospective data collection on childhood measures (Kimber et al., 2018).

Much of the current IPV literature that has focused on the popular hypothesis that violence is transmitted across generations has focused on child abuse and revictimization patterns that occur in adulthood; however, there is a paucity of research on the intergenerational effects of witnessing inter-parental violence (Butler et al., 2020; Finkelhor et al., 2007; Widom et al., 2008). One meta-analysis that identified risk and protective factors for IPV against women using only prospective-longitudinal studies found evidence of a statistically non-significant positive relationship between experiencing child abuse and subsequent IPV, but conclusions could not be drawn on the effects of exposure to inter-parental violence due to little available evidence (Yakubovich et al., 2018). Prospective studies on the intergenerational transmission of violence are rare due to the length of time required for such an approach. One prospective study found exposure to inter-parental violence to be the highest risk factor for IPV victimization compared to other measures of childhood violence, with those exposed to inter-parental violence experiencing a 2.68 (95%CI: 1.49-4.82) times increase in the odds of experiencing any form of violence from a partner in adulthood compared to those who were not exposed (Ehrensaft et al., 2003).

Studies utilizing cross-sectional data collection, which rely on retrospective recall of childhood experiences while simultaneously reporting the outcome measure, are the most prevalent study design in the IPV literature (Capaldi et al., 2012; Kimber et al., 2018; Stith et al., 2000; Yakubovich et al., 2018). Many of these studies have suggested any experience of childhood violence (child abuse or exposure to inter-parental violence) to be associated with a higher likelihood of experiencing IPV victimization in adulthood (Abajobir et al., 2017; Haselschwerdt et al., 2019; Krug et al., 2002; Lang et

al., 2004; Renner & Slack, 2006; Shields et al., 2020). In fact, one study found that women appear to have a dose-response relationship between the severity and frequency of childhood experiences of violence and IPV experiences in adulthood, where the more severe and frequent the childhood exposure to violence, the more likely women were to report IPV in adulthood (Shields et al., 2020). However, as mentioned, a common limitation affecting the accuracy of conclusions is the overreliance on retrospective recall of childhood experiences, which could limit the accuracy of the effect estimates by introducing recall bias.

### *1.3.1 Methodological limitations of retrospective recall of childhood events*

Many of the studies included in systematic reviews on risk factors for IPV utilize retrospective reporting of childhood experiences, with most studies requiring participants to report on childhood experiences and IPV experiences in young adulthood simultaneously (Capaldi et al., 2012; Kimber et al., 2018; Stith et al., 2000). Although useful information can be gathered using retrospective assessment of childhood events, this form of measurement is prone to recall bias, which can lead to misclassification of individuals and influence the validity of effect estimates (Celentano & Szklo, 2018; Haselschwerdt et al., 2019).

Recall bias occurs when individuals may be more or less likely to identify exposures depending on their outcome status (Celentano & Szklo, 2018). When attempting to recall events from the past, individuals may not only have trouble recalling whether the event occurred, but whether their recall of the event is accurate. Studies have found that the accuracy of recall among individuals with childhood trauma is dependent on current experiences with trauma, with one study concluding that

individuals who reported more symptoms of PTSD to be more likely to recall their childhood trauma accurately (Goldfarb et al., 2023). These same principles can be applied to the intergenerational transmission of IPV, in that individuals currently experiencing IPV victimization may be more likely to accurately recall their childhood exposure to inter-parental violence than individuals who are not currently experiencing IPV victimization. In this case, recall bias introduced from retrospective assessment of childhood experiences would misclassify individuals exposed to inter-parental violence but not currently experiencing IPV victimization as unexposed, causing an overestimation of the effect estimate.

### *1.3.2 Methodological limitations of focusing solely on the presence of physical violence.*

Another common methodological limitation in the current IPV literature is the tendency for researchers to focus on physical IPV for measures of childhood exposure to inter-parental violence and measures of IPV victimization in adulthood. Systematic and methodological reviews on the intergenerational transmission of violence have found that most studies focus primarily on physical IPV outcomes, with little focus on non-physical forms of IPV such as psychological (verbal), sexual or emotional abuse (Haselschwerdt et al., 2019; Kimber et al., 2018; Stith et al., 2000; Yakubovich et al., 2018). Psychological abuse has been demonstrated to have just as great, if not greater, of a negative impact on victims than physical violence (O’Leary et al., 1994). Yet, a recent systematic review conducted in 2018 on the intergenerational transmission of violence found 68% of studies focused solely on physical violence, and only 5% evaluated physical, verbal, emotional and sexual IPV outcomes (Kimber et al., 2018).

Although efforts have been made in the adult IPV literature to focus on other forms of IPV, especially sexual and psychological violence, the youth exposure to IPV literature has lagged behind and still remains predominantly focused on acts of physical violence (Haselschwerdt et al., 2019). On top of focusing solely on childhood exposure to physical violence, most studies reduce childhood exposure to violence down to a single dichotomized variable (Linder & Collins, 2005). By using a dichotomized variable to evaluate exposure to childhood violence, conclusions cannot be made on how differences in timing, duration or severity of the exposure to inter-parental violence influence the likelihood of experiencing IPV victimization in young adulthood (Linder & Collins, 2005).

Other forms of bias have contributed to the dominant focus on physical violence in the IPV literature. Selection bias occurs when the form of sampling individuals for analysis distorts the measure of an association due to its inability to reflect the target population (Celentano & Szklo, 2018). In IPV literature, statistical differences in effect estimates have been shown based on whether they are sampled from community or clinical samples, where stronger associations have been reported when clinical samples were used compared to community samples (Stith et al., 2000). The use of clinical samples could be yielding stronger associations due to the likelihood that the cases identified in clinical samples are severe cases of physical IPV, as individuals often only seek medical attention when serious injuries persist (Garcia-Moreno, Heise, et al., 2005). By only selecting for individuals with severe cases of physical IPV, individuals suffering from less severe forms of physical IPV or other forms of IPV (i.e., sexual or psychological) are being excluded from analysis in IPV research.

Social desirability bias, which is described as the tendency for individuals to report desirable attitudes and behaviours rather than their own, may also influence the number of individuals reporting IPV experiences (Celentano & Szklo, 2018). For both help-seeking and self-reporting studies, most cases of IPV are unreported by women, whether it be for personal reasons such as embarrassment or financial dependency, or societal reasons such as imbalanced power of men and women in society (Gracia, 2004). Although in IPV literature social desirability has affected reporting of perpetration more than victimization, a negative association was found between social desirability and verbal IPV victimization, but not for physical victimization (Gracia, 2004). This means that a higher social desirability was associated with decreased reporting of verbal IPV victimization, an association that could be contributing to the paucity of research on forms of victimization that are not physical (Gracia, 2004). In conclusion, many factors appear to be contributing to the dominant focus on physical violence in IPV research, introducing a gap surrounding the assessment of other forms of violence and their influence across generations. The current IPV literature has captured the tip of the iceberg of IPV experiences by investigating cases of physical IPV, but in order to fully understand whether IPV can be transmitted across generations, the rest of the spectrum of IPV experiences require further investigation for both childhood exposure and adulthood victimization measures.

### *1.3.3 Limitations in the measurement of acts of violence in IPV literature*

Overall, the IPV literature pertaining to the intergenerational transmission of violence remains focused on the outcome of IPV perpetration, with few studies focusing on IPV victimization in young adulthood as the outcome measure (Aldarondo &

Sugarman, 1996; Kimber et al., 2018; Roberts et al., 2010). One possible explanation for the focus on IPV perpetration could be the limited ability of the most commonly used measures of IPV, the Conflict Tactics Scale (CTS) and the Revised Conflict Tactics Scale (R-CTS), to understand the context of violence (Capaldi et al., 2012; Haselschwerdt et al., 2019; Kimber et al., 2018; Yakubovich et al., 2018). To explain the two scales briefly, the original CTS consisted of 19 items grouped into three scales: reasoning (3 items), verbal aggression (6 items) and physical assault (9 items) and one item for crying (Jones et al., 2017). Response options for each act of violence denoted the frequency: never, once, twice, 3-5 times, 6-10 times, 11-20 times and over 20 times or “don’t know” (Jones et al., 2017) . Although originally developed as an interview, it was reformatted into a self-administered measurement tool (Jones et al., 2017). The R-CTS was developed to address some of the limitations from the CTS highlighted by other researchers and provided a greater difference between minor and severe conflict tactics, increased the number of acts measured, and added a scale for injury and sexual coercion (Jones et al., 2017).

While concise, widely used, and easy to administer, the validity of these measures continues to be questioned (Ackerman et al., 2018). Some critics have argued that the CTS and R-CTS decontextualize assessment of IPV by limiting its measurement to discrete acts of violence (Grych & Hamby, 2014; Jones et al., 2017; Lehrner et al., 2014; O’Leary et al., 1994). The CTS does not measure the attitudes, emotions, and intent behind violent behaviors, so perpetrators of violence are regarded similarly to individuals employing violence in self-defence or retaliation (Yakubovich et al., 2019). As a result, high rates of self-reported IPV perpetration by women are seen

when studies use the CTS or R-CTS measures for IPV assessment (Lehrner et al., 2014). Although both sexes perpetrate violence, the high rates of IPV perpetration seen by women in the IPV literature are inconsistent with data from other sources, such as criminal justice and social service data (Jones et al., 2017; Lehrner et al., 2014). Due to the inability of the CTS and R-CTS to measure intent behind violent behaviours, it seems plausible that women who are victims of IPV but use some form of violence (i.e., physical force) in self-defence are wrongfully regarded as perpetrators of violence when using the CTS or R-CTS measures, rather than victims. Therefore, the use of the CTS and R-CTS may not be the most accurate tool for measuring IPV victimization, as it could be overestimating the number of women perpetrating violence while simultaneously underestimating the number of women experiencing IPV victimization.

Overall, the empirical evidence concludes a weak-to-moderate association between childhood violence measures (child abuse and witnessing inter-parental violence) and IPV experiences in adulthood, whether it be perpetration or victimization (Capaldi et al., 2012; Kimber et al., 2018; Stith et al., 2000; Yakubovich et al., 2018). Although both sexes are perpetrators and victims of IPV, studies have suggested that women are more likely to adopt the victim role and men are more likely to adopt the perpetrator role in adulthood when exposed to familial violence in childhood (Cappell & Heiner, 1990; Smith-Marek et al., 2015; Stith et al., 2000). Overall, exposure to violence in childhood has been shown to increase the likelihood of experiencing IPV in adulthood, but the high correlation between direct (child abuse) and indirect (witnessing inter-parental violence) childhood exposure to violence has made it challenging to determine their individual influence on IPV victimization in adulthood (Stith et al., 2000).

### *1.3.4 The dual exposure of child abuse and witnessing inter-parental violence*

Child abuse and witnessing inter-parental violence are often referred to as a dual exposure, and when measured together or independently, have been associated with an increased risk of IPV involvement in adulthood (Hamby et al., 2010; Shields et al., 2020; Smith-Marek et al., 2015; Stith et al., 2000). One study that evaluated young adults in Canada found that various forms of childhood violence (witnessing inter-parental violence, physical & sexual CA) have the potential to act synergistically but independently remain statistically significant in their association with IPV in adulthood (Shields et al., 2020). In contrast, a meta-analysis found that although both child abuse and witnessing inter-parental violence were significantly correlated to IPV victimization in young adulthood, their influence was not independent due to the large number of individuals reporting exposure to both forms of childhood violence (Stith et al., 2000). As demonstrated by previous research, it is impossible to evaluate one form of childhood exposure to violence without consideration of the other. In order to make the most accurate conclusions on the intergenerational transmission of IPV stemming from witnessing inter-parental violence, child abuse must be accounted for.

### **1.4 Study Rationale**

The empirical evidence only weakly supports the intergenerational transmission of IPV stemming from exposure to inter-parental violence; but methodological concerns, such as the overreliance on retrospective reporting, paucity of research on the various forms of IPV, and limitations in common measures of IPV, could be influencing the strength of the association reported and the validity of results. This study seeks to

address these methodological limitations to provide a more in-depth understanding of the intergenerational transmission of IPV.

This prospective analysis addresses three clear gaps in the IPV literature. First, rather than relying on retrospective assessment of childhood exposure to inter-parental violence, this study uses repeated, prospective maternal reports on physical and psychological inter-parental violence through childhood and adolescence. By using repeated prospective measures, this study is able to more accurately assess whether exposure to inter-parental violence occurred and assess variations in exposure patterns by evaluating the form, timing, and duration of exposure. To my knowledge, this is the first prospective study to assess variations in childhood exposure to inter-parental psychological and physical IPV, and their respective influence on IPV victimization in young adulthood.

Second, this study looks at different types of childhood exposure to inter-parental violence as well as different forms of IPV victimization in young adulthood. As mentioned previously, childhood exposure to parental IPV literature remains heavily focused on physical violence, so this study will broaden the current evidence and understanding of the intergenerational transmission of IPV. The study evaluates childhood exposure to psychological and physical inter-parental violence and their combined association to experiences of *any* IPV victimization, as well as the severity of victimization experienced, in young adulthood (18-21). Instead of focusing solely on physical violence, outcome measures included assessment of physical, psychological, and sexual IPV, with participants also reporting the severity of IPV victimization for each measure. Third, this study uses a scale that provided context to the violence, a notable

limitation of the CTS and R-CTS, which are the most used measurement tools in the IPV literature (Barter et al., 2009).

## **Chapter 2: Objectives**

Among female offspring from pregnant mothers who entered the Avon Longitudinal Study of Parents and Children (ALSPAC), the study objectives are:

### ***2.1 Objective one***

To determine how study participants' exposure to inter-parental violence varies through development, in terms of the form of IPV (i.e., physical, or psychological), its timing and its duration.

### ***2.2 Objective two***

To assess whether the observed variation (i.e., form, duration, and timing) in childhood exposure to inter-parental violence influences the likelihood of experiencing IPV victimization, and the severity of the victimization, in young adulthood, defined in this study as 18—21 years of age.

## **Chapter 3: Methods**

### **3.1 ALSPAC and Participants**

This thesis is a prospective cohort study that used data from the Avon Longitudinal Study of Parents and Children (ALSPAC). ALSPAC is a large prospective birth cohort study with over 30 years of data assessing phenotypic, genetic, and environmental factors that affect a person's health and development. The study website has details on all the available data through a searchable data dictionary and variable search tool available at <http://www.bristol.ac.uk/alspac/researchers/our-data/>. Data were sourced from in-person clinical assessments and self-reported questionnaires (sent by post and later virtually) at multiple time points throughout the years. Study data were collected and managed using REDCap electronic data capture tools at the University of Bristol (Northstone et al., 2019).

The study began with the recruitment of pregnant women in the United Kingdom with estimated delivery dates between April 1991 and December 1992. Based out of the University of Bristol, the pregnant women resided in the City of Bristol and surrounding urban and rural areas (Boyd et al., 2013). Of 20, 248 eligible pregnancies, 72% of mothers (n=14, 541) provided baseline data on themselves and their babies, who were enrolled at birth in the Children of the Nineties cohort (Fraser et al., 2013).

Complications in pregnancies such as miscarriages, stillbirths and no known birth outcome were excluded from the ALSPAC sample (n=674) (Fraser et al., 2013). With additional funding, a second and third recruitment phase was conducted at seven and eight years follow up, where the aim was to expand recruitment to mothers and their children who were eligible but not enrolled at pregnancy, excluding those who had

previously refused enrolment. This resulted in the additional recruitment of 452 and 254 (n=706) mothers and children in Phase II and Phase III, respectively (Boyd et al., 2013). This increased the total sample size to 15,247 eligible pregnancies for continuous follow up. Mothers completed questionnaires about their lives over the duration of the study and completed questionnaires about their children until the child reached the age of 18. Children began self-reporting on questionnaires at 5 years of age.

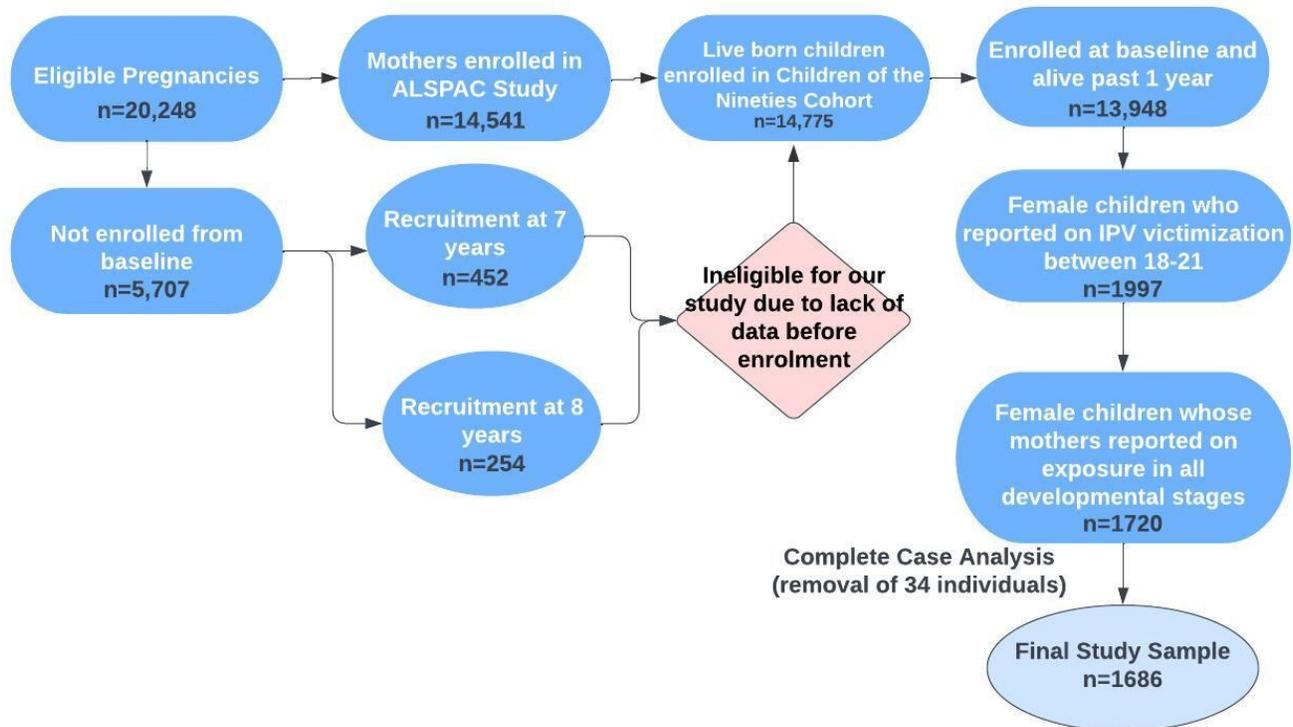
The “Children of the Nineties” cohort was made up of the children of participating pregnant women and consisted of 14,775 live-birth children (Boyd et al., 2013). If participants completed a baseline assessment, participants remained in the study regardless of whether they moved away from the study area as questionnaires were administered worldwide (Boyd et al., 2013). If participants withdrew from the study, they remained eligible to re-enroll at any time. Data were not available on reasons for non-contact or non-response. It is important to note that the ALSPAC study population had slightly higher socioeconomic status and less ethnic diversity than the national population of the United Kingdom (Boyd et al., 2013; Fraser et al., 2013).

### **3.2 Study Sample**

A flow chart illustrating study respondents going from the original ALSPAC sample to the final analytic sample can be found in Figure 1.

**Figure 1**

*Flow diagram demonstrating how my study reached its final sample from the original ALSPAC study population.*



The starting sample consisted of any child enrolled in the “Children of the Nineties” cohort that (1) responded to questions pertaining to IPV victimization between 18-21 on the age-21 wave, (2) whose mothers were enrolled at baseline and reported baseline characteristics of the child, and (3) whose mothers self-reported on their exposure to IPV at least once in each developmental stage (early childhood, late childhood and adolescence). Those recruited during the second (age 7) and third (age 8) recruitment phase were excluded due to lack of data before enrolment, such as in utero, infancy and early childhood. I restricted the sample to females because while both sexes engage in IPV perpetration and victimization, women are more likely to learn the victimization from their family of origin (Cappell & Heiner, 1990). Of the eligible

6,749 female children enrolled in baseline, 1,997 females responded to at least one IPV victimization measure on the age-21 wave. After excluding females whose mothers did not report on exposure to inter-parental violence in all developmental stages a total of 1,720 females met the study inclusion criteria. After a complete case analysis approach was used to handle missing data, the final analytic sample for the study was 1686.

Loss to follow up is inevitable in most cohort studies such as ALSPAC and can introduce bias and lower the study's statistical power (Kristman et al., 2003). Attrition bias, a form of selection bias, occurs when there are systematic differences between those included in a study and those lost to follow up (Kristman et al., 2003). To determine whether attrition bias is a concern in this study, I compared baseline sociodemographic characteristics of my study sample with that of female participants enrolled in the 'Children of the Nineties' cohort who were lost to follow up (Table 3). Within this study, 4626 females who were enrolled in baseline did not complete the age-21 wave which assessed the outcome variable of IPV victimization. To ensure comparability to my study sample, I applied some of the exclusion criteria to the lost to follow up group that (1) required children to be enrolled at baseline and (2) for mothers to have reported on exposure to inter-parental violence at least once, bringing the final sample size of females lost to follow up to 3,847.

### **3.3 Ethics**

Original ethical approval for ALSPAC was obtained from the Bristol and Weston Health Authority (E1808 Children of the Nineties: Avon Longitudinal Study of Pregnancy and Childhood, 28<sup>th</sup> November 1989), Southmead Health Authority, and Frenchay Health Authority. Ethical approval for the study was obtained from the ALSPAC Ethics and Law

Committee and the Local Research Ethics Committees. On top of this, ethics approval was submitted to the Dalhousie University Research Ethics Board (REB) in October 2022 and approval was obtained in December 2022.

### **3.4 Exposure Variables**

The primary exposure variable was childhood exposure to inter-parental violence. Mothers self-reported on whether a partner was physically and/or psychologically abusive during the child's development at ten time points from gestational age until the child reached 18 years old. For this study, I only analyzed the nine time points that came after the birth of the child, starting at 8 months until the child reached 18 years. Due to the large number of missing data at each individual time point, exposure to inter-parental violence was categorized into three developmental stages: early childhood (0-3), late childhood (4-8) and adolescence (9-18). A child was considered exposed if mother's reported experiencing IPV on any of the survey waves corresponding to each developmental period, as described in Table 1. This allowed my study to minimize missing data while maintaining a larger sample size and a higher statistical power.

**Table 1**

*Details on type of childhood exposure to IPV, survey question and coding, study developmental periods and time points of exposure measurement.*

| Child Exposure Variable               | Survey Question and Coding                                     | Developmental Period        | Time points of IPV assessment   |
|---------------------------------------|--|-----------------------------|---|
| Inter-Parental Physical Violence      | “Your partner hurt you physically.”<br>Yes = 1<br>No = 0       | Early Childhood (0-3 years) | 8 months<br>1.75 years (21 months)<br>2.75 years (33 months)                              |
|                                       |  | Late Childhood (4-8 years)  | 4 years (47 months)<br>5 years (61 months)<br>6 years (73 months)<br>9 years (110 months) |
|                                       |  | Adolescence (9-18 yr)       | 11 years (134 months)<br>18 years   |
| Inter-Parental Psychological Violence | “Your partner was emotionally cruel to you”<br>Yes=1<br>No = 0 | Early Childhood (0-3 years) | 8 months<br>1.75 years (21 months)<br>2.75 years (33 months)                              |
|                                       |  | Late Childhood (4-8 years)  | 4 years (47 months)<br>5 years (61 months)<br>6 years (73 months)<br>9 years (110 months) |
|                                       |  | Adolescence (9-18 yr)       | 11 years (134 months)<br>18 years   |

*Note.* Each time point is referencing exposure since last assessment, except between adolescence measures at 11 years and 18 years, where there is a period of unobserved time following assessment at 11 years until one year prior to assessment at 18 years (17 years).

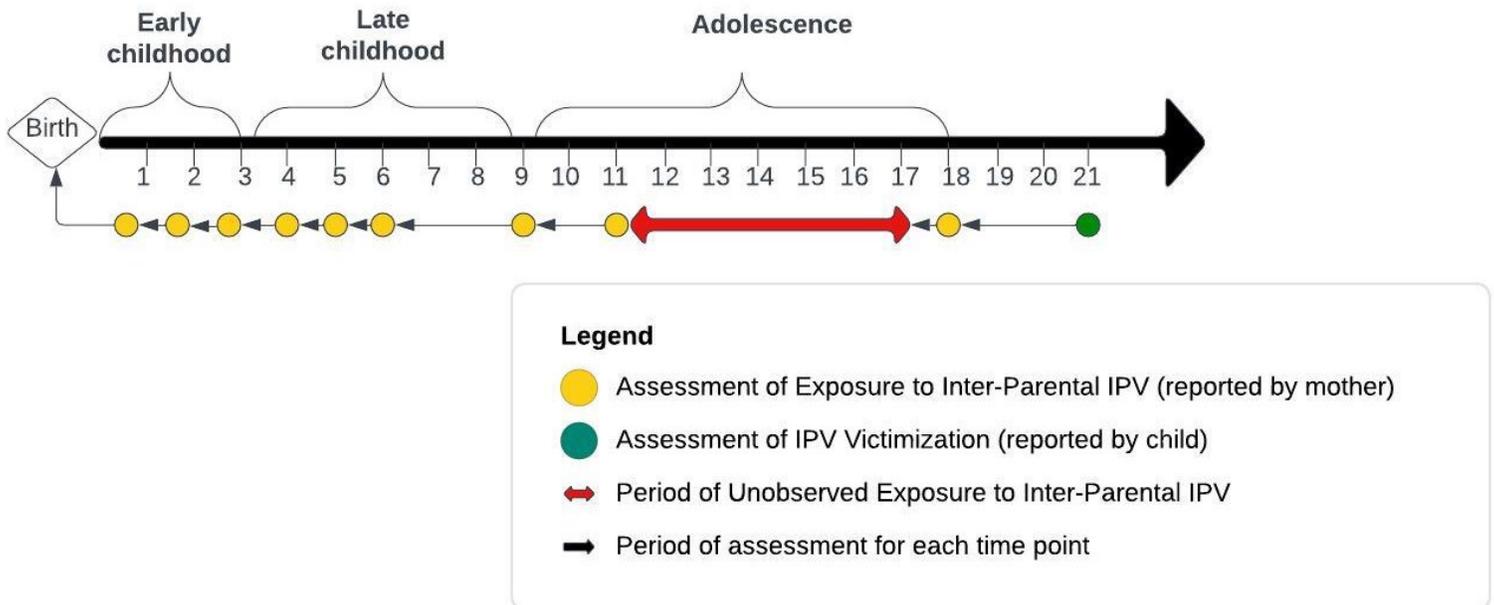
To measure duration of exposure to inter-parental violence, interaction terms were created to determine the prevalence of those exposed at one, two or three developmental stages. Duration patterns were operationalized as isolated, intermittent, or continuous depending on if exposure was reported in one, two or three developmental stages, respectively. Two-way interaction terms were used to evaluate the prevalence of various patterns of intermittent exposure (i.e., early/late childhood exposure compared to late childhood/adolescent exposure), and a three-way interaction

term was used to evaluate the prevalence of continuous exposure to inter-parental violence through development.

A diagram depicting the study timeline, including the developmental stages, and timing of exposure and outcome assessment, can be found in Figure 2. Each time point assesses exposure to inter-parental violence since the last time point, making a continuous period of observation from birth to 18 years, with one exception. Following assessment at 134 months (11 years), mothers did not self-report on inter-parental violence until the child was 18 years old. At 18 years, the survey asked mothers about exposure to inter-parental violence within the last year, creating a period of unobserved time for child's exposure to inter-parental violence between the ages of 11-17 (Figure 2). Exposure assessment at 33 months (~ 3 years) and 110 months (~ 9 years) encompass the period since last assessment and was included in the early childhood and late childhood categories, respectively.

## Figure 2

*Timeline of female study participant from birth to 21, including the developmental stages defined in the study and time points of exposure and outcome assessment.*



### 3.5 Outcome variable

The primary outcome variable for the study was female offspring IPV victimization in young adulthood (18-21), which was measured using a 9-item scale that featured different forms of IPV victimization (Table 2). The validated 9-item scale, based off the National Society for the Prevention of Cruelty to Children (NSPCC) questionnaire, was modified by a team of IPV researchers (with input from a young people advisory group and a ALSPAC advisory panel) who conducted interviews and surveys on a clinical sample of young people in Bristol (Barter et al., 2009). To address the validity and reliability of the scale, one study evaluated the psychometric properties of the scale and concluded strong internal consistency between all IPV scale items, with an alpha coefficient of 0.95 (Yakubovich et al., 2019). The exploratory factor analysis

suggested the most valid and appropriate assessment of the scale would be to operationalize the outcome variable as a single dimension with factor-based scores, as all scale items loaded heavily onto a single factor (Yakubovich et al., 2019). The validated scale also provided an additional benefit by limiting the number of items on the scale to nine, as longer lists risk response burden in repeat measurement surveys (Yakubovich et al., 2019).

The scale included eight items that measured physical, psychological and sexual IPV victimization and one item that measured the impact of violence (Table 2). The questionnaire asked participants “How often altogether have any of your partners ever done any of the following to you and how old were you” with response options of Never (0), Once, (1), A few times (2), and Often (3) (Table 2). Individuals who did not report on a single scale item were excluded from analysis. Individuals who did not respond to a specific scale item were coded as 0 for the respective measure to maintain a larger sample to preserve study power.

Participants reported the age of IPV victimization occurrence by indicating whether the abuse occurred before or after the age of 18. This study only analyzed IPV victimization between the ages of 18-21 in order to use a measure of period prevalence, which is generally accepted to be more reliable than lifetime or past prevalence measures due to the shorter, more recent period of recall (Althubaiti, 2016). Further, by limiting analysis to those that experienced IPV after 18, it was ensured that exposure (exposure to inter-parental violence from birth to the age of 18) preceded the outcome (IPV victimization between 18-21), which satisfies the condition of temporality for determining causality. To maximize study power, on each scale item those who

reported IPV victimization before 18 but not during the period of 18-21 (my outcome time point of interest) were coded as unexposed for that scale item.

**Table 2**

*IPV Victimization measures from the validated 9-item scale and their rank, form of IPV and questionnaire statement*

| Order                       | Questionnaire Statement   | Type of IPV          |
|-----------------------------|---|----------------------|
| 1                           | Told you who you could see and where you could go and/or regularly checked what you were doing and where you were (by phone or text)? | Psychological        |
| 2                           | Made fun of you, called your hurtful names, shouted at you?   | Psychological        |
| 3                           | Used physical force such as pushing, slapping, hitting or holding you down?   | Physical             |
| 4                           | Used more severe physical force such as punching, strangling, beating you up, hitting you with an object?                             | Physical             |
| 5                           | Pressured you into kissing/touching/something else?   | Sexual/Psychological |
| 6                           | Physically forced you into touching/kissing/something else?   | Sexual/Physical      |
| 7                           | Pressured you into having sexual intercourse?   | Sexual/Psychological |
| 8                           | Physically forced you into having sexual intercourse?   | Sexual/Physical      |
| <b>Victimization Impact</b> | Did any of the above make you feel scared or frightened, or did any partner make you feel frightened in any other way?                | Negative Impact      |

*Note.* For each item on the scale, participants indicated the frequency of victimization (0 = Never, 1= Once, 2= A few times and 3 = Often). Although participants indicate whether IPV victimization occurred before or after 18, only IPV victimization reported between the ages of 18-21 will be analyzed. Those indicating victimization prior to the age of 18 will be classified as unexposed.

IPV victimization was operationalized in two different ways. First, a dichotomous variable was used to determine the prevalence of *any* IPV victimization in young adulthood. This was measured by grouping all individuals who self-reported an experience of IPV victimization on the first eight items on the scale into one group, irrespective of which item or the reported frequency. Individuals who responded never

to all IPV victimization items on the scale were placed into the unexposed group. This form of operationalization allowed us to make general conclusions regarding different exposure patterns and their association with *any* experience of IPV victimization in young adulthood. Second, to account for the severity of victimization, I created an average score derived from the frequency in which female study participants reported on the first 8 items on the scale (0=None, 1=Once, 2=A Few Times, 3=Often), ranging from 0-3. I then multiplied the average value by 8 to create a continuous outcome variable ranging from 0-24 that accounts for the severity and frequency of IPV experienced in young adulthood. The final item on the scale, which does not pertain to an act of violence, asks respondents if any of the above statements made them feel frightened or scared, which was used in the sensitivity analyses to incorporate the impact of violence.

### **3.6 Covariate assessment**

The selection of potential confounders was based on a review of the literature and variable availability within the original ALSPAC study (Afifi et al., 2014; Brownridge et al., 2016; Bunting et al., 2018; Capaldi et al., 2012; Dumas et al., 1994; Drake & Pandey, 1996; Jennings et al., 2017; Krug et al., 2002; Lefebvre et al., 2017; Schumacher et al., 2001; Straus et al., 1980; Straus & Gelles, 1986). Although co-variables were collected at multiple time points, I used measures from baseline (gestation) to ensure their measurement preceded that of the exposure of interest and are therefore not on the causal pathway between the exposure and outcome of interest. The confounders I adjusted for in this study were marital status at gestation, family

socioeconomic status (SES) at gestation, parental educational attainment at gestation, and child's racialization.

Marital status was coded as a dichotomous variable, comparing those who were married with those who were divorced, widowed, separated or had never been married. Family SES was coded as a categorical variable based on parent's occupation and ranked according to the standard occupational classification: I – Professional, II – Managerial & Technical, III – Manually & Non-Manually Skilled, IV – Partly skilled and V- Unskilled (Office of Population Censuses and Surveys, 1990). Although collected for both parents, only the highest standard occupational classification of the two parents was used. As IPV disproportionately affects minority groups, I created a dichotomous variable for racialization that was derived from maternal reports on both parent's race at gestation. Children were coded as a visible minority if one or both parents identified as Black, Indian, Pakistani, Bangladeshi, Chinese, or any other race described. If both parents were White, children were coded as White. Educational attainment for mothers and their partners was self-reported by mothers at baseline and coded as a dichotomous variable comparing individuals who completed their GCSE or O-level with those who did not. To maintain a larger sample size for analysis, repeated measurements of confounders from the wave closest to baseline were used to input covariable measures that were missing at gestation.

Child abuse (CA) has been heavily documented as a co-occurrence with witnessing inter-parental violence (Haselschwerdt et al., 2019). Although child abuse was measured at 9 time points from birth to age 18, it was coded as a dichotomous variable in this study. Mothers who reported their child had experienced child abuse at

any one time point were compared against those who had never reported any experiences of CA.

### **3.7 Statistical Analysis Plan**

Statistical analyses were completed using STATA version SE17. Although the ALSPAC study is ongoing, the follow up period for the study was 21 years, as this was the age when participant's self-reported on the outcome measure of IPV victimization. As I evaluated exposure patterns over the three developmental stages, only those that reported exposure status in all three developmental stages were included for statistical analyses (n=1686).

#### **3.7.1 Analysis Plan for Objective One**

The aim of the first research objective was to descriptively analyze the variability in childhood exposure to inter-parental violence, considering the timing and duration of the exposure through development. Among females exposed to inter-parental violence, I determined the number of time points in which a positive exposure was reported. Individuals who were missing exposure assessment at a time point were coded as unexposed to ensure their inclusion. I then reported the prevalence of exposure and percentage of sample exposed to *any* inter-parental violence, psychological IPV and physical IPV for each time point of exposure assessment as well as each developmental stage. To evaluate duration, I created a categorical variable that illustrated the various patterns of exposure that could occur over the three developmental stages. These exposure patterns included exposure in early childhood only, late childhood only, adolescence only, early and late childhood, early childhood and adolescence, late childhood and adolescence and exposure at all three-

developmental stages. The prevalence and percentage of the sample that indicated each exposure pattern was reported for any inter-parental violence, as well as physical and psychological inter-parental violence independently.

### *3.7.2 Analysis Plan for Objective Two*

The aim of the second objective was to determine whether the variation in childhood exposure to inter-parental violence (observed in the first objective) influenced women's susceptibility to experiencing IPV victimization in young adulthood. Due to limited study power, exposure assessment was not able to be separated into physical and psychological inter-parental violence for statistical analyses. Therefore, only exposure to *any* inter-parental violence, which encompassed physical and psychological exposure, in each developmental stage was included in statistical models. For both operationalizations of IPV victimization, the first models reported the effect for any exposure to inter-parental violence on IPV victimization in young adulthood. The second models separated exposure to inter-parental violence into the three developmental stages: early childhood, late childhood, and adolescence to determine the main effects for each stage on IPV victimization in young adulthood. The regression of IPV victimization was conducted separately for exposure in each developmental stage, rather than using one categorical variable for all exposure patterns. The third model simplified childhood exposure into one variable, encompassing the period of early and late childhood to determine the robustness of conclusions from Model 2. Unadjusted regression models reported effect estimates to show the strength of the association between various patterns of exposure to inter-parental violence and IPV victimization in young adulthood without the influence of confounders. Adjusted models provided effect

estimates that were adjusted for confounders (i.e., marital status, parental educational attainment, SES and child rationalization) and potential effect modifiers such as CA.

First, log binomial regression analyses were used to examine the association between exposure to inter-parental violence with the binary outcome of *any* IPV victimization, where any IPV victimization was regressed on childhood patterns of exposure to inter-parental violence (Models 1-3). Effect estimates were reported as prevalence ratios (PR). Second, negative binomial regression models will be used to evaluate the association between different exposure patterns and the severity of IPV victimization in young adulthood to account for the overdispersion due to the number of individuals who did not experience IPV victimization. Although estimates are usually reported as incidence rate ratios, the outcome variable was an ordinal dependent variable that will be modeled as a count variable, therefore effect estimates were reported as relative scores. Although unconventional, previous studies have successfully applied this approach to similar data sets (Byers et al., 2003).

Missing data was of greatest concern for repeated exposure assessment and confounder assessment at baseline. To attenuate the impact of missing data in the repeated exposure assessment, I created developmental stages composed of multiple time points to ensure a fuller sample size and allow individuals with some missing time points to be included in the study. Individual time points were not used for statistical analyses of Objective 2, and only individuals who reported exposure in all three developmental stages were included. As mentioned previously, repeated measurements of covariates from the wave closest to baseline were used to input covariable measures that were missing at baseline. For marital status and SES

measures, repeated measurement at 8 months were used to input missing data, whereas parental educational attainment and child ethnicity utilized measures at 97 months and 140 months, respectively. After missing data mechanisms, less than 5% of data was missing and a complete cases analysis (CCA) was conducted where all individuals who still had missing data on confounders were excluded (n=34), bringing the final sample size to 1686 (Jakobsen et al., 2017).

### **3.8 Sensitivity analyses**

In the sensitivity analyses, I used the final item on the validated 9-item scale which asked respondents if any act of victimization made them feel scared or frightened to determine the context of the violence. First, I determined how correlated any experience of IPV victimization in young adulthood was with feeling scared or frightened from a partner. I then re-ran regression models to only include cases of IPV victimization where females reported being negatively impacted by the violence to determine if effect estimates changed. Individuals who reported IPV victimization but did not report being scared or frightened of their partner were not included as cases and were classified as unexposed for this analysis. For simplicity, I evaluated the impact of violence measure as a dichotomous variable, where individuals were coded as being impacted if they responded Once, A few times or Often to the scale item compared to those who responded never and were coded as unimpacted. Unadjusted and adjusted effect estimates were reported.

## Chapter 4: Results

A comparison of exposure and sociodemographic characteristics between those included in the final study sample (N=1686) and those lost to follow up (N=3847) can be found in Table 3.

Although the lost to follow up sample included more than 3847 females, the exclusion criteria applied to the study sample was applied to the lost to follow up group to ensure comparability between the samples with two exceptions: the lost to follow up group did not undergo a CCA and reporting on exposure status in all three developmental stages was not mandatory.

The prevalence of exposure to inter-parental violence was similar for the study sample and those lost to follow up, with just under one third of female children being exposed to inter-parental violence at least once through development in both samples and the 95%CI overlapping (Table 3). The study sample had a higher proportion of females who were exposed to child abuse compared to those lost to follow up, but the percentages were within 5%, indicating a small difference. Compared to those lost to follow up, individuals included in the study sample were more likely to be White, married, from a higher SES and have at least one parent who completed their O-level of education.

**Table 3**

*Comparison of baseline sociodemographic characteristics between those included in the study sample and those lost to follow up.*

| Baseline Sociodemographic Characteristics                | Percentage of Females in Study Sample (95%CI) | Percentage of Females Lost to Follow Up (95%CI) |
|--|---|---|
| <b>Sample Size</b>                                       | <b>1686</b>                                   | <b>3847</b>                                     |
| <b>Any Exposure to Inter-parental violence</b>           |   |   |
| Yes  | <b>28.0</b> (25.9 - 30.2)                     | <b>29.9</b> (28.5 - 31.4)                       |
| No   | <b>72.0</b> (69.8 - 74.1)                     | <b>70.1</b> (68.6 - 71.5)                       |
| Missing  | <b>0</b>                                      | <b>0</b>  |
| <b>Any Child Abuse</b>                                   |   |   |
| Yes  | <b>15.4</b> (13.7 - 17.2)                     | <b>11.8</b> (10.8 - 12.9)                       |
| No   | <b>84.6</b> (82.8 - 86.3)                     | <b>81.1</b> (79.8 - 82.3)                       |
| Missing  | <b>0</b>                                      | <b>7.1</b>                                      |
| <b>Racialization</b>                                     |   |   |
| White  | <b>96.3</b> (95.3 - 97.2)                     | <b>89.8</b> (88.8 - 90.8)                       |
| Visible Minority Group                                   | <b>3.7</b> (2.8 - 4.7)                        | <b>4.5</b> (3.9 - 5.2)                          |
| Missing  | <b>0</b>                                      | <b>5.7</b>                                      |
| <b>Family SES (based on occupation)</b>                  |   |   |
| I - Professional   | <b>14.2</b> (12.5 - 16.8)                     | <b>6.7</b> (5.9 - 7.5)                          |
| II - Managerial and Technical                            | <b>47.6</b> (45.2 - 50.0)                     | <b>34.5</b> (33.0 - 36.1)                       |
| IIINM/M - Non-Manual / Manual Skilled                    | <b>35.0</b> (32.8 - 37.3)                     | <b>43.6</b> (42.0 - 45.2)                       |
| IV - Partly Skilled                                      | <b>2.6</b> (1.9 - 3.5)                        | <b>4.8</b> (4.2 - 5.6)                          |
| V - Unskilled  | <b>0.6</b> (0.3 - 1.2)                        | <b>1.6</b> (1.2 - 2.0)                          |
| Missing  | <b>0</b>                                      | <b>8.8</b>                                      |
| <b>At least one parent higher than O-level education</b> |   |   |
| Yes  | <b>91.3</b> (89.8 - 92.6)                     | <b>72.4</b> (70.9 - 73.8)                       |
| No   | <b>8.7</b> (7.4 - 10.2)                       | <b>22.3</b> (21.0 - 23.7)                       |
| Missing  | <b>0</b>                                      |   |
| <b>Marital Status</b>                                    |   |   |
| Married  | <b>84.8</b> (83.0 - 86.4)                     | <b>71.6</b> (70.2 - 73.0)                       |
| Other  | <b>15.2</b> (13.6 - 17.0)                     | <b>26.8</b> (25.4 - 28.2)                       |
| Missing  | <b>0</b>                                      | <b>1.6</b>                                      |

*Note:* Those included in the study sample had the exclusion criteria that required exposure in all three developmental stages and the removal of individuals with missing confounders. \* Other: Divorced, Separated, Widowed or Never Married

In evaluating the dual exposure to childhood violence in the sample, a chi-square test revealed a statistically significant relationship between any exposure to inter-

parental violence and any experience of child abuse in the study sample (Table 4). In the study sample, almost all individuals who were unexposed to inter-parental violence were also unexposed to child abuse. Among those exposed to inter-parental violence, just over 40% reported experiencing child abuse at least once through development (Table 4).

**Table 4**  
*Percentage of sample exposed to inter-parental violence by occurrence of child abuse through development.*

|                        | <b>ANY Exposure to Inter-parental violence (%)</b> | <b>No Exposure to Inter-parental violence (%)</b> | <b>Total</b>        |
|------------------------|--|---|---------------------|
| <b>Any Child Abuse</b> | <b>193 (40.1%)</b>                                 | <b>67 (5.6%)</b>                                  | <b>260 (15.4%)</b>  |
| <b>No Child Abuse</b>  | <b>279 (59.9%)</b>                                 | <b>1147 (94.4%)</b>                               | <b>1426 (84.6%)</b> |
| <b>Total</b>           | <b>472 (100%)</b>                                  | <b>1214 (100%)</b>                                | <b>1686 (100%)</b>  |

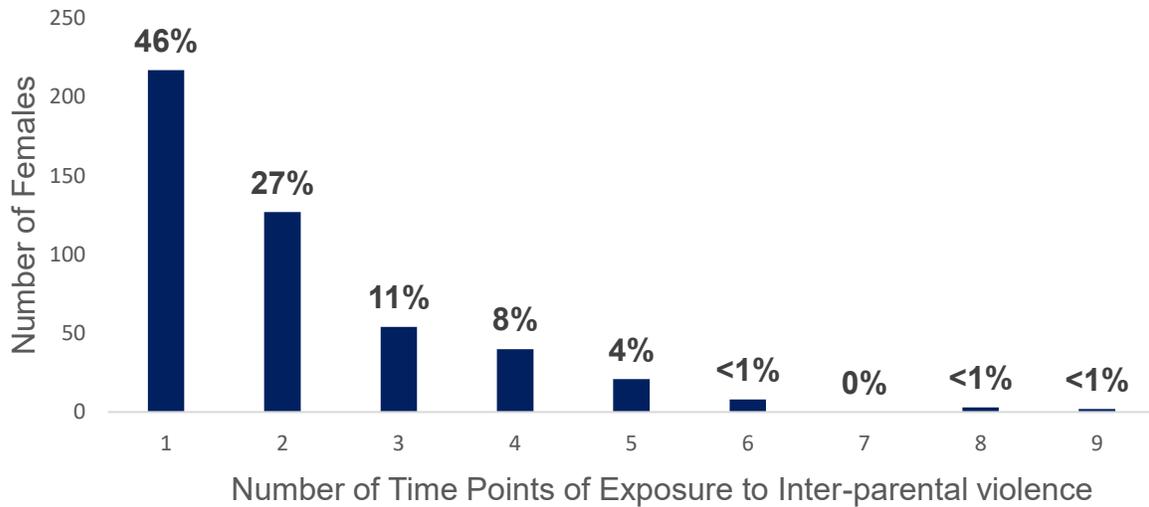
*Note:* Exposure to inter-parental violence and child abuse were reported by mothers from the time the child was born until the age of 18. Column percentages reported.

#### **4.1 Objective One Results**

The first objective was to determine how childhood exposure to inter-parental violence varied in terms of timing, duration, and form, among female study participants. In my sample, 472 female study participants (28%) were exposed to inter-parental violence at least once through development, and the number of time points in which positive exposure was reported followed a right-skewed distribution (Figure 3). Around half of those who reported exposure to inter-parental violence experienced it at one time point only (46%), while 27% reported exposure at two time points, and 27% reported exposure at three or more time points (Figure 3).

### Figure 3

Frequency of exposure to inter-parental violence among participants exposed to inter-parental violence between birth and age 18 (n=472).



*Note:* Exposure to inter-parental violence reported by mothers. Individuals who were missing exposure assessment at a time point were coded as unexposed to ensure their inclusion in analysis. Those unexposed to inter-parental violence were not included in the graph (n=1214).

Table 5 illustrates how the timing of exposure to inter-parental violence varied across development time points for study participants, whereas Table 6 descriptively analyzed various exposure patterns in terms of the duration of exposure to inter-parental violence. The proportion of the sample exposed to inter-parental violence (physical and psychological) at each individual time point was much lower than the proportion of the sample exposed within each developmental stage (approximately 50% less on average), which is to be expected as almost half the sample was exposed at only one time point (Table 5).

**Table 5**

*Prevalence of exposure to inter-parental violence among study participants at each time point and developmental stage. (n and percentage)*

| <b>Time Point (Child Age)</b>  | <b>Exposure to Any Inter-parental violence</b> | <b>Exposure to Physical Only</b> | <b>Exposure to Psychological Only</b> |
|--------------------------------|--|----------------------------------|---------------------------------------|
| 1 (8 mo)                       | 114 (24.2%)                                    | 16 (3.4%)                        | 110 (23.3%)                           |
| 2 (21 mo)                      | 105 (22.2%)                                    | 13 (2.8%)                        | 103 (21.8%)                           |
| 3 (33 mo)                      | 145 (30.7%)                                    | 26 (5.5%)                        | 139 (29.4%)                           |
| <b>Early Childhood (0-3yr)</b> | <b>257 (54.4%)</b>                             | <b>45 (9.5%)</b>                 | <b>248 (52.5%)</b>                    |
| 4 (47 mo)                      | 110 (23.3%)                                    | 29 (6.1%)                        | 97 (20.6%)                            |
| 5 (61 mo)                      | 109 (23.1%)                                    | 21 (4.4%)                        | 105 (22.2%)                           |
| 6 (73 mo)                      | 107 (22.7%)                                    | 21 (4.4%)                        | 100 (21.2%)                           |
| 7 (110 mo)                     | 102 (21.6%)                                    | 28 (5.9%)                        | 94 (19.9%)                            |
| <b>Late Childhood (4-8 yr)</b> | <b>281 (59.6%)</b>                             | <b>77 (16.3%)</b>                | <b>262 (55.5%)</b>                    |
| 8 (134 mo)                     | 104 (22.0%)                                    | 28 (5.9%)                        | 98 (20.8%)                            |
| 9 (18 yr)                      | 92 (19.5%)                                     | 15 (3.2%)                        | 92 (19.5%)                            |
| <b>Adolescence (9-18 yr)</b>   | <b>175 (37.1%)</b>                             | <b>39 (8.3%)</b>                 | <b>169 (35.8%)</b>                    |
| <b>Any Exposure (0-18 yr)</b>  | <b>472 (100.0%)</b>                            | <b>129 (27.3%)</b>               | <b>456 (96.7%)</b>                    |

*Note:* Cases reported by mothers, and reported percentages represent the percentage of total sample exposed (n=472). mo=months, yr=years

At all-time points, exposure to psychological inter-parental violence was much higher than that of physical inter-parental violence, and almost all those exposed to physical inter-parental violence were exposed to psychological inter-parental violence in tandem (Table 5). Among those exposed to inter-parental violence in early childhood, 83% (n=212) were exposed to psychological IPV only, 14% (n=36) were exposed to physical and psychological IPV, and 3% (n=9) were exposed to physical IPV only. In late childhood, 73% (n=204) those exposed to psychological inter-parental violence only, while 20% (n=58) were exposed to both physical and psychological IPV, and 7% (n=19) were exposed to physical violence only. For adolescence, 78% (n=136) those exposed to inter-parental violence were exposed to psychological violence only, 19%

(n=33) were exposed to both forms of IPV, and 3% (n=6) were exposed to physical IPV only.

**Table 6**

*Patterns of exposure to inter-parental violence among ALSPAC female participants through development (0-18 years), utilizing self-reported data from mothers on their experiences with IPV (N and percentages provided)*

| Exposure Patterns Through Development | Exposure to Any Inter-parental violence | Exposure to Physical IPV Only | Exposure to Psychological IPV Only |
|---------------------------------------|---|-------------------------------|------------------------------------|
| <b>No exposure</b>                    | <b>1214</b> (73.3%)                     | <b>1557</b> (92.3%)           | <b>1230</b> (73.0%)                |
| <b>Any exposure</b>                   | <b>472</b> (26.7%)                      | <b>129</b> (7.6%)             | <b>456</b> (27.0%)                 |
| <b>Early Childhood Only</b>           | <b>97</b> (4.6%)                        | <b>25</b> (1.5%)              | <b>100</b> (5.9%)                  |
| <b>Late Childhood Only</b>            | <b>102</b> (7.0%)                       | <b>51</b> (3.0%)              | <b>96</b> (5.7%)                   |
| <b>Adolescence Only</b>               | <b>72</b> (4.6%)                        | <b>24</b> (1.4%)              | <b>72</b> (4.3%)                   |
| <b>Early + Late Childhood</b>         | <b>98</b> (4.9%)                        | <b>14</b> (<1%)               | <b>91</b> (5.4%)                   |
| <b>Late Childhood + Adolescence</b>   | <b>41</b> (1.1%)                        | <b>9</b> (<1%)                | <b>40</b> (2.4%)                   |
| <b>Early Childhood + Adolescence</b>  | <b>22</b> (<1%)                         | <b>3</b> (<1%)                | <b>22</b> (1.3%)                   |
| <b>Continuous Exposure</b>            | <b>40</b> (2.1%)                        | <b>3</b> (<1%)                | <b>35</b> (2.1%)                   |
| <b>Total</b>                          | <b>1686</b> (100%)                      | <b>1686</b> (100%)            | <b>1686</b> (100%)                 |

*Note:* Reported percentages are based off the full sample (N=1686)

The exposure patterns illustrated in Table 6 provide evidence of heterogeneity among participants in the duration of exposure to inter-parental violence through development. Among individuals exposed to *any* inter-parental violence, 57% were exposed in one developmental stage, 34% were exposed in two stages and 9% were exposed in all three stages. For exposure to any form of inter-parental violence, late childhood was the most prevalent isolated exposure pattern, and exposure in early and late childhood was the most prevalent intermittent exposure pattern. The isolated exposure to psychological inter-parental violence was highest in early childhood,

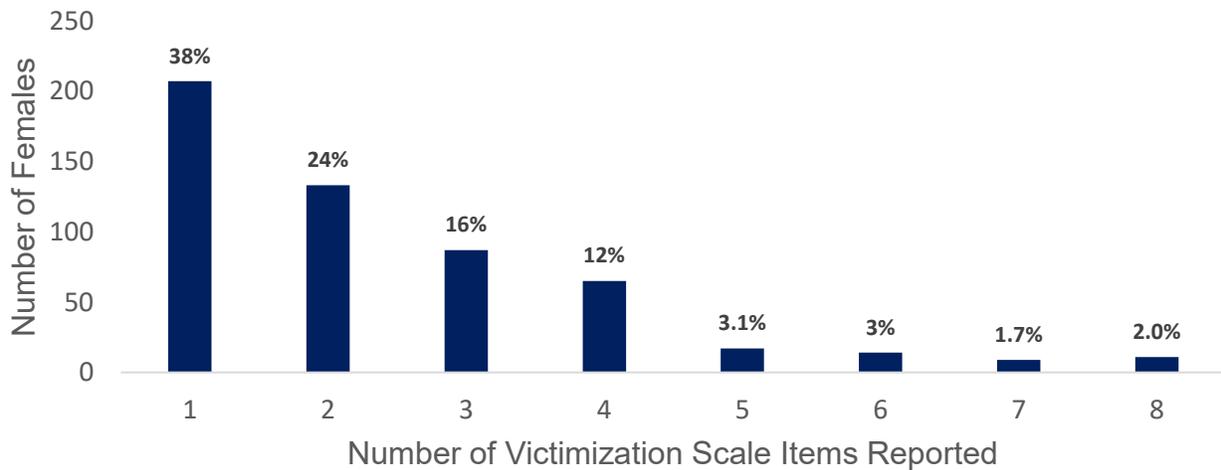
whereas late childhood had the highest prevalence of exposure to physical inter-parental violence.

#### 4.2 Objective Two Results

The second objective was to assess whether the observed heterogeneity in exposure to inter-parental violence among female study participants influenced the likelihood of experiencing IPV victimization, and the severity, in young adulthood. In the study sample, 543 females reported exposure to at least one IPV victimization scale item. Just over one third of females experienced only one victimization scale item, and just under 10% were exposed to more than half of IPV victimization scale items (>5/8 scale items).

**Figure 4**

*The sum of IPV victimization items reported by each female among those exposed (n=543)*



##### 4.2.1 Regression analyses evaluating intergenerational transmission of violence with the binary outcome of any IPV Victimization

In log binomial models, findings from Model 1 provide preliminary evidence of intergenerational transmission of IPV victimization: individuals exposed to *any* inter-

parental violence had a 37% increase in the risk of IPV victimization in young adulthood compared to those unexposed to inter-parental violence when adjusted for covariates (PR: 1.37, 95%CI: 1.06-1.76) (Table 7). When exposure was divided into developmental stages, the main effects were all non-significant, but the effect estimates for early (PR:1.19, 95%CI: 0.87-1.64) and late childhood (PR:1.19, 95%CI: 0.87-1.62) suggest a weak positive association with any IPV victimization in young adulthood. These findings were used to justify the third model, where exposure status was simplified to two categories: childhood (encompassing early and late childhood from Model 2) and adolescence.

**Table 7**

*Unadjusted and adjusted log binomial regression of ANY IPV Victimization between the ages of 18-21 on exposure patterns to inter-parental violence.*

| Exposure To Inter-parental violence Pattern                                  | Female Experiences of IPV Victimization (N=543) |                           |
|--|---|---------------------------|
|  | Unadjusted PR (95%CI)                           | Adjusted PR (95%CI)       |
| <b><u>Model 1 - Any Exposure (Vs Non-Exposure)</u></b>                       |   |                           |
| Any Exposure   | <b>1.46</b> (1.17 - 1.83)                       | <b>1.37</b> (1.06 - 1.76) |
| <b><u>Model 2 - Exposure by Developmental Stage (Vs Unexposed)</u></b>       |   |                           |
| Exposed in Early Childhood   | <b>1.25</b> (0.92 - 1.69)                       | <b>1.19</b> (0.87 - 1.64) |
| Exposed in Late Childhood  | <b>1.26</b> (0.93 - 1.71)                       | <b>1.19</b> (0.87 - 1.62) |
| Exposed in Adolescence   | <b>1.03</b> (0.73 - 1.46)                       | <b>0.98</b> (0.69 - 1.41) |
| <b><u>Model 3 - Exposure in Childhood and Adolescence (vs Unexposed)</u></b> |   |                           |
| Exposed in Childhood   | <b>1.44</b> (1.13 - 1.84)                       | <b>1.33</b> (1.03 - 1.73) |
| Exposed in Adolescence   | <b>1.02</b> (0.72 - 1.43)                       | <b>0.96</b> (0.68 - 1.38) |

*Note:* Adjusted effect estimates controlled for family SES, ethnicity, marital status, parental educational attainment and child abuse.

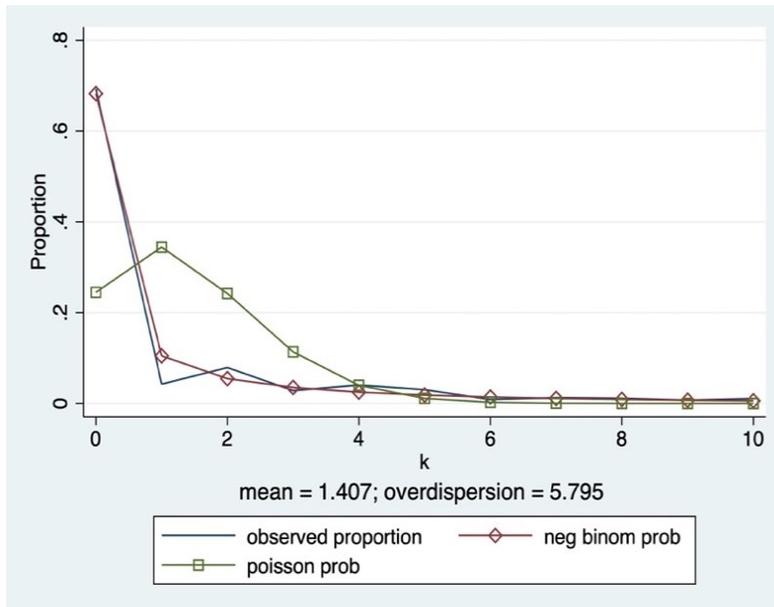
Results from Model 3 provide evidence that the timing of exposure to inter-parental violence does impact the risk of experiencing IPV victimization, as females exposed in childhood had a 33% increase in the risk of experiencing IPV victimization in young adulthood compared to those unexposed when adjusted for covariates, and the finding was statistically significant. In contrast, exposure to inter-parental violence in adolescence had no effect as the effect estimate hovered around 1 and the 95%CI crossed the threshold value of 1.

#### *4.2.2 Regression analyses evaluating intergenerational transmission with the count outcome modeling the severity of IPV victimization*

The second operationalization of IPV victimization was a count variable used to illustrate how various patterns of exposure to any inter-parental violence influence the severity of IPV victimization in young adulthood, with the effect estimate reported as relative scores ranging from 0-24. Severity scores for those who experienced IPV victimization followed a right skewed distribution, with 84% (N=456) recording a score between 1-7, 15% (N=79) recording a score between 8-15, and 1% (N=9) recording a score between 16-24. Overdispersion was observed in the outcome variable due to the large number of individuals who were unexposed to IPV victimization between 18-21. Therefore, as hypothesized, the form of regression analyses best fit for the count data on IPV victimization was a negative binomial regression rather than a Poisson regression model (Figure 5).

**Figure 5**

*The observed proportions along with the Poisson and negative binomial probabilities for the severity of IPV victimization in young adulthood among female study participants*



Unadjusted and adjusted effect estimates modeling the association between patterns of exposure to inter-parental violence and the severity of IPV victimization experienced in young adulthood can be found in Table 8. When adjusted for covariates, females exposed to any inter-parental violence had a 30% higher IPV victimization severity score than those unexposed to inter-parental violence through development. Although the effect estimate suggests a positive association, the 95%CI just barely crosses the threshold of 1, deeming the finding practically meaningful but statistically non-significant (Table 8).

When the severity of IPV victimization in young adulthood is considered, the main effects of exposure to inter-parental violence in late childhood is the only developmental stage to provide evidence of a positive association. Females exposed to inter-parental violence in late childhood appear to have a 40% higher IPV victimization score in young adulthood compared to those unexposed at this time point, and the

finding is statistically significant (1.40, 95%CI:1.00-1.95). The effect estimates for early childhood (0.96, 95%CI: 0.68-1.36) and adolescence (0.84, 95%CI: 0.56–1.28) suggest no association between their timing of exposure and the severity of IPV victimization experienced in young adulthood.

**Table 8**

*Unadjusted and adjusted negative binomial regressions of the severity of IPV victimization between the ages of 18-21 on exposure patterns to inter-parental violence.*

| Exposure To Inter-parental violence Pattern                                  | Severity of IPV Victimization (N=543) |                           |
|--|---------------------------------------|---------------------------|
|  | Unadjusted Scores (95%CI)             | Adjusted Scores (95%CI)   |
| <b><u>Model 1 - Main Effects of Any Exposure (Vs Non-Exposure)</u></b>       |                                       |                           |
| Any Exposure   | <b>1.40</b> (1.08 - 1.81)             | <b>1.30</b> (0.98 - 1.73) |
| <b><u>Model 2 - Exposure by Developmental Stage (Vs Unexposed)</u></b>       |                                       |                           |
| Exposed in Early Childhood   | <b>1.05</b> (0.75 - 1.47)             | <b>0.96</b> (0.68 - 1.36) |
| Exposed in Late Childhood  | <b>1.46</b> (1.05 - 2.03)             | <b>1.40</b> (1.00 - 1.95) |
| Exposed in Adolescence   | <b>0.90</b> (0.61 - 1.34)             | <b>0.84</b> (0.56 - 1.28) |
| <b><u>Model 3 - Exposure in Childhood and Adolescence (vs Unexposed)</u></b> |                                       |                           |
| Exposed in Childhood   | <b>1.51</b> (1.14 - 2.00)             | <b>1.40</b> (1.04 - 1.87) |
| Exposed in Adolescence   | <b>0.88</b> (0.59 - 1.31)             | <b>0.84</b> (0.55 - 1.27) |

*Note:* Adjusted effect estimates controlled for family SES, ethnicity, marital status, parental educational attainment, and child abuse.

Similar to findings with the binary operationalization of IPV victimization, when exposure was simplified to childhood and adolescence in Model 3, there was evidence of an association between childhood exposure to inter-parental violence and the severity of IPV victimization in young adulthood, but not adolescence (Table 8). When adjusted for covariates, female study participants who were exposed to inter-parental

violence through childhood had IPV victimization scores that were 40% higher than those who were not exposed to inter-parental violence in childhood (1.40, 95%CI: 1.04-1.87). Conclusions on the significance of adolescent exposure remained consistent in Model 3, where no association was found with the severity of IPV victimization experienced in young adulthood.

### 4.3 Sensitivity Analyses Results

In the sensitivity analyses, I addressed the limitation of the CTS and R-CTS by ensuring I provided context when assessing acts of IPV (Table 9). The final measure on the IPV victimization scale asked female respondents if their partners had ever made them feel scared or frightened (Table 2). Among females who reported IPV victimization to at least one scale item, just under half (46%, n=249) reported being scared or frightened of their partner, meanwhile less than 1% (0.8%, n=9) of females who did not experience IPV victimization reported being scared or frightened of their partner (Table 9).

**Table 9**

*Cross tabulation of females who self-reported experiences of IPV victimization in young adulthood and being impacted by the acts of violence experienced (N and percentages presented)*

| Impact of Violence | IPV Victimization | No IPV Victimization | Total              |
|--------------------|-------------------|----------------------|--------------------|
| Scared/Frightened  | 249 (45.9%)       | 9 (<1%)              | 258 (15.3%)        |
| Unimpacted         | 289 (53.2%)       | 1113 (97.4%)         | 1402 (83.2%)       |
| Missing            | 5 (<1%)           | 21 (1.8%)            | 26 (1.5%)          |
| <b>Total</b>       | <b>543 (100%)</b> | <b>1143 (100%)</b>   | <b>1686 (100%)</b> |

The operationalization of IPV victimization was adapted to only include those who reported being negatively impacted by IPV victimization as cases (n=249),

compared to the previous operationalization that included all individuals who reported victimization (n=543). For this sensitivity analyses and to ensure context is provided to victimization measure, those who reported IPV victimization but did not report being scared or frightened of their partner were treated as unexposed (n=289). When adjusted for covariates, females exposed to any inter-parental violence had a 34% higher risk of experiencing IPV victimization in young adulthood and being negatively impacted by it than females who were unexposed (Table 10). Although the magnitude of the effect estimate for any exposure to inter-parental violence on the risk of IPV victimization in young adulthood is similar in the primary and sensitivity analyses, the findings from the sensitivity analyses were based on a much smaller sample of those exposed (n=259 vs 472), which could explain why the finding just barely missed statistical significance. In conclusion, in this sample, adding context to IPV assessment did not change the strength of the association between exposure to inter-parental violence and IPV victimization in young adulthood.

**Table 10**

*Unadjusted and adjusted log binomial regression of females who were negatively impacted by IPV victimization between the ages of 18-21 on exposure patterns to inter-parental violence through development.*

| Exposure To Inter-parental violence Pattern                                  | Female Experiences of IPV Victimization Involving Fear (N=249) |                           |
|--|--|---------------------------|
|  | Unadjusted PR (95%CI)  | Adjusted PR (95%CI)       |
| <b><u>Model 1 - Any Exposure (Vs Non-Exposure)</u></b>                       |  |                           |
| Any Exposure   | <b>1.47</b> (1.10 - 1.95)                                      | <b>1.34</b> (0.97 - 1.86) |
| <b><u>Model 2 - Exposure by Developmental Stage (Vs Unexposed)</u></b>       |  |                           |
| Exposed in Early Childhood   | <b>1.15</b> (0.77 - 1.70)                                      | <b>1.08</b> (0.72 - 1.63) |
| Exposed in Late Childhood  | <b>1.55</b> (1.06 - 2.26)                                      | <b>1.44</b> (0.97 - 2.13) |
| Exposed in Adolescence   | <b>0.83</b> (0.53 - 1.32)                                      | <b>0.77</b> (0.48 - 1.24) |
| <b><u>Model 3 - Exposure in Childhood and Adolescence (vs Unexposed)</u></b> |  |                           |
| Exposed in Childhood   | <b>1.69</b> (1.24 - 2.30)                                      | <b>1.57</b> (1.13 - 2.19) |
| Exposed in Adolescence   | <b>0.81</b> (0.51 - 1.29)                                      | <b>0.75</b> (0.47 - 1.21) |

*Note:* Adjusted effect estimates controlled for family SES, ethnicity, marital status, parental educational attainment and child abuse.

Congruent with findings from the primary analyses, all main effects for exposure to inter-parental violence in Model 2 crossed the threshold of 1 deeming them statistically non-significant, but late childhood exposure just barely crossed the threshold and had the highest effect estimate compared to the other developmental stages. When exposure to inter-parental violence in childhood was deduced to a single variable in Model 3, the effect reached statistical significance and showed a larger effect estimate, suggesting a stronger association (1.57, 99%CI: 1.14-2.08). Results show that females exposed to inter-parental violence in childhood, when adjusted for covariates,

had a 57% higher risk of experiencing IPV victimization that negatively affected them compared to females who were unexposed. Exposure in adolescence, when adjusted for covariates, continued to show no evidence of an association with the risk of experiencing IPV victimization in young adulthood and being negatively affected by it, even when context was added.

## Chapter 5: Discussion

Violence against women has become highly prevalent around the world, with an estimated one in three women globally experiencing some form of victimization in their lifetime (Garcia-Moreno, Heise, et al., 2005; Sardinha et al., 2022). On top of mental, physical, and reproductive health complications that arise from IPV victimization, one Australian study found that female victims of IPV were more likely to report ill health or experience premature death than women experiencing other chronic diseases such as high blood pressure, obesity and smoking (VicHealth & Department of Human Services, 2004). The negative impacts of IPV are damaging to not only victims, but their family unit and society as well, which coupled with the increasing prevalence, have led to a heightened academic interest in understanding the etiology of IPV (Garcia-Moreno, Heise, et al., 2005; National Center for Injury Prevention and Control, 2003).

A commonly hypothesized risk factors for IPV is childhood experiences of violence, suggesting the intergenerational transmission of violence as a plausible mechanism for behavior adoption (Cochran et al., 2011). Previous IPV literature has focused on intergenerational transmission of perpetration, while neglecting how IPV victimization can be transmitted across generations due to social learning processes such as observational learning and tolerance of violent behaviours due to internalized IPV stigma (Akers, 1998; Beaulaurier et al., 2005, 2005; Petersen et al., 2004; Wilkins et al., 2014). As women are more likely to adopt the victimization role in childhood, this has led to a paucity of research on the intergenerational transmission of IPV among women (Cappell & Heiner, 1990; Smith-Marek et al., 2015; Stith et al., 2000).

To my knowledge, this study was the first to descriptively analyze female children's exposure to inter-parental violence over time and examine how the observed variability influenced their susceptibility to experiencing IPV victimization in young adulthood. In the IPV literature, empirical evidence on the intergenerational transmission of IPV was hindered by methodological limitations such as an overreliance on retrospective dichotomized assessment of childhood experiences with violence, limiting the scope of IPV measurement to physical acts of violence and focusing on generational transmission of perpetration, without considering how victimization can be transmitted across generations. This study addressed many of these limitations by using repeated, prospective maternal reports for child's exposure to inter-parental violence and utilizing a scale for IPV victimization that evaluated psychological, sexual, and physical IPV victimization in young adulthood.

### ***5.1 The observed heterogeneity in a child's exposure to inter-parental violence through development***

In contrast to the many IPV studies that utilized a single dichotomous variable for childhood exposure to violence, this study used repeated, prospective measurement of maternal experiences of partner violence, which allowed the present study to broaden our understanding of childhood exposure to inter-parental violence. In this study, just over one quarter of participants (28%) were exposed to inter-parental violence throughout their childhood development. Another study within the IPV literature that previously evaluated the prevalence of exposure to physical and psychological inter-parental violence through childhood but relied on retrospective assessment of childhood events found the prevalence to be around 13%, which is just under half what was observed in the present study (Madruga et al., 2017).

Retrospective assessment of childhood events in adulthood is more prone to recall bias, which could lead to misclassification of individuals and bias effect estimates (Celentano & Szklo, 2018; Haselschwerdt et al., 2019). The use of repeated, prospective reports of mother's experiences of IPV decreased the period of recall and captured events more closely to the time in which they occurred. Theoretically, this should improve accuracy and confidence on prevalence estimates for exposure to inter-parental violence in the present study compared to previous studies such as Madruga et al (2017), which relied on retrospective, dichotomized measurement of childhood exposure to physical and psychological inter-parental violence (Rothman & Greenland, 1998).

Although this study was the first to prospectively analyze the variability in a child's exposure to inter-parental violence using repeated assessment, a few methodological limitations on exposure assessment must be considered when interpreting the results. First, the questions used to evaluate exposure were developed more than thirty years ago and could be considered out-dated. The measure could be interpreted as subjective and vague, as it asked if partners were physically or emotionally cruel to mothers without specifying any acts of IPV. A recent methodological review of the intergenerational transmission of violence literature noted that studies that have not accounted for the possible variation in family violence exposure have hindered the field's ability to fully understand the impact the exposure has on later outcomes like IPV in adulthood (Haselschwerdt et al., 2019) . On top of not specifying acts of violence, the severity of inter-parental violence exposure was not considered, which Sutherland

suggests would influence the adoption of behaviour, and therefore the possibility of intergenerational transmission (Haselschwerdt et al., 2019; Sutherland, 1939).

Second, exposure status was based off repeated maternal reporting of experiences with IPV, which were used in this study as a proxy for childhood exposure to inter-parental violence. It is possible that children were not aware of the inter-parental violence that maternal reports reflect, which could underestimate the effect by misclassifying children who were truly unexposed into the exposed group. However, maternal reports are not only essential for exposure status in the first few years before children are able to fill out surveys on their own but are more reliable as children are less likely to comprehend the complexities of IPV and may struggle to accurately recall and communicate their exposure to inter-parental violence (Zeanah & Zeanah, 1989). Further, mothers are more likely to be aware of the frequency, severity and duration of IPV events and the impact inter-parental violence may have on a child compared to the child themselves (Levendosky & Graham-Bermann, 2001).

#### *5.1.1 The variability in the form of inter-parental violence exposure*

In this study, exposure to psychological inter-parental violence was more common than physical inter-parental violence exposure at all time points and within each developmental stage. At all-time points, the number of those reporting exposure to psychological inter-parental violence was on average 3-6 times greater than the number of those reporting physical inter-parental violence exposure. Exposure to physical inter-parental violence only was rare at all time points. However, the IPV literature pertaining to youth exposure to IPV remains predominately focused on acts of physical violence. A recent systematic review evaluating intergenerational transmission found 68% of

studies focused solely on physical violence and only 26% included other forms of IPV (Haselschwerdt et al., 2019; Kimber et al., 2018). The high prevalence of exposure to psychological inter-parental violence observed in the present study highlights the importance of considering multiple forms of violence when investigating the prevalence of IPV to ensure findings have greater external validity and more accurately reflect the full picture of family violence exposure.

#### *5.1.2 The variability in the duration of inter-parental violence exposure*

The duration of exposure to inter-parental violence was evaluated based on the number of time points mothers reported exposure to inter-parental violence and ranged from 0 (no exposure) to 9 (exposed at all time points). Among those exposed, almost half were exposed at one time point only. This contrasts with previous research within the IPV literature on the duration of exposure, where studies that focused on childhood maltreatment found that children who were exposed to one incident of violence victimization were more likely to be chronically exposed, either to the same form of violence repeatedly (re-victimization) or to multiple different types of victimization (polyvictimization) (Moffitt & The Klaus-Grawe 2012 Think Tank, 2013)

When looking at the duration of exposure to inter-parental violence across developmental stages, more than half of females exposed to inter-parental violence were only exposed in one developmental stage, whereas continuous exposure in all three developmental stages was rare. Research has suggested that the negative long-term impacts of exposure to inter-parental violence (i.e., psychological and behaviour problems) are more likely among children with chronic exposure to IPV (Kernic et al., 2003; Riedl et al., 2019; Wolfe et al., 2003). To minimize the amount of missing data on

the repeated prospective measurement of exposure status and maintain a higher study power to detect statistically significant effects, female children who were exposed at one time point within a developmental stage were coded as being exposed for the entire developmental stage. This may have hindered our ability to evaluate the duration of female exposure to inter-parental violence accurately, as it is likely that those exposed continuously at all time points within a developmental stage were more negatively impacted by the exposure to inter-parental violence than an individual who was exposed at only one time point. This limitation to our study may bias effect estimate towards the null by failing to account for the variation within each developmental stage, limiting the validity of conclusions.

### *5.1.3 The variability in the timing of inter-parental violence exposure*

The developmental stage with the highest prevalence of exposure to inter-parental violence was late childhood (n=281), where the largest number of cases were recorded for both physical (n=77) and psychological (n=262) inter-parental violence. Of those exposed in two developmental stages, the most common intermittent pattern of exposure was early and late childhood exposure to inter-parental violence (n=98), with very few individuals experiencing combined exposure with the adolescent developmental stage. This finding is congruent with the current evidence in the IPV literature that suggests children are most likely to be exposed to inter-parental violence during their early to late childhood years, typically between the ages of 6 to 12 (Fantuzzo & Mohr, 1999; McDonald et al., 2006). However, the adolescent developmental stage had a period of unobserved exposure assessment from the time the child was 11-17, where the ALSPAC study did not ask mothers to report on IPV

experiences. This was likely the reason for the low number of individuals exposed in this developmental stage, and the fact that adolescent exposure to inter-parental violence was not associated with IPV victimization in any models. Future prospective studies evaluating exposure to inter-parental violence over time should ensure continuous exposure assessment with no periods of unobserved assessment.

## ***5.2 Evaluating the Intergenerational Transmission of IPV Victimization***

### ***5.2.1 The influence of exposure variability on experiencing IPV victimization***

The findings from this study provide preliminary support for the intergenerational transmission of IPV victimization, as individuals who were exposed to any inter-parental violence through development had a 37% higher risk of experiencing IPV victimization in young adulthood compared to those unexposed. This finding is congruent with the current IPV literature, with one longitudinal study concluding individuals who experienced childhood maltreatment, including exposure to inter-parental violence, to be at a heightened risk of becoming victims or perpetrators of IPV in adulthood (Widom et al., 2008).

When evaluating the influence that the timing of exposure had on an individual's susceptibility to IPV victimization in young adulthood, this study suggested childhood (0-8) to be a sensitive period for intergenerational transmission of IPV as females had a 33% higher risk of experiencing IPV victimization in young adulthood compared to those unexposed in childhood. In all models, adolescent exposure did not appear to be associated with IPV victimization. When childhood was separate into early (0-3) and late (4-8) childhood, both developmental stages individually suggested a 19% increase in the risk of IPV victimization, but the finding was not statistically significant. This is likely

because exposure in early and late childhood was correlated, and when included in the same model their effects were adjusted for one another. This explains why the effect estimate not only became insignificant when both early and late childhood were included in statistical models, but why the strength of the effect decreased compared to when childhood was evaluated as one single exposure time point. Further, study power limitations may have also impacted conclusions on the influence of early and late childhood exposure independently. When grouping early and late childhood together, childhood likely reached statistical significance because of the larger sample of those exposed when grouping the two developmental stages together.

Although this study found evidence of intergenerational transmission, the results of this study may be biased by residual confounding, as the time-varying nature of some of the covariates could not be evaluated in this thesis. All covariates were measured at baseline, however, covariates such as family SES, experiences of child abuse, parental educational and marital status all have time-varying abilities that could not be accounted for in this study. For example, in our study, 85% of the study sample was married at baseline, and the IPV literature suggests being married is protective against IPV. However, marital status can vary over 21 years, and marital conflict is one of the most consistent markers for engagement in partner abuse (Black et al., 2010; Capaldi et al., 1998; Krug et al., 2002) By measuring covariates at baseline, this study did not have the capacity to examine how the change in parental marriage status influenced intergenerational transmission of IPV. The inability of this study to account for time-varying confounders biased effect estimates away from the null by allowing residual confounding, a limitation to the study.

Further, even though this study found evidence of an association between inter-parental violence exposure and future susceptibility to IPV victimization among women in young adulthood, the causal mechanism behind why intergenerational transmission of IPV occurred cannot be addressed in this study. This study proposed IPV victimization was transmitted across generations from childhood exposure to inter-parental violence through social learning mechanisms, such as observational learning, which caused female children to internalize IPV stigma and become more tolerant to violent behaviour in conflict resolution (Akers, 1998; Beaulaurier et al., 2005, 2005; Petersen et al., 2004; Wilkins et al., 2014). However, many sociodemographic factors such as SES, child alcohol and substance use, adverse childhood experiences (ACEs), and mental health conditions among offspring have all been associated with IPV victimization in the literature and could potentially mediate the association between exposure to inter-parental violence and IPV victimization in young adulthood partially or completely (Galvani, 2006; Gilchrist et al., 2019; Lang et al., 2004; Wilson et al., 2017). One study found that depressive symptoms, either in isolation or when coupled with early alcohol and cocaine consumption, mediated the association between witnessing inter-parental violence and involvement in IPV in adult life (Madruga et al., 2017). Mediation analyses was out of the scope of this thesis, and the mediating effect of these variables could not be assessed, limiting the present study's ability to conclude that the observed association was fully attributable to a child's exposure to inter-parental violence through development. To truly determine the influence of childhood exposure to inter-parental violence on IPV victimization later in life, future studies should

investigate the mediating effects of key risk factors and their effect on intergenerational transmission of IPV stemming from childhood exposure to inter-parental violence.

Another possible reasoning for weak effect estimates comes from a recent meta-analysis that found evidence for a “sleeper effect” when evaluating the long-term influence of exposure to inter-parental IPV, which could explain why effect estimates were weaker than originally hypothesized (Vu et al., 2016). A “sleeper-effect” is an effect that is weak early on but strengthens over time and becomes clear at a later time point (Vu et al., 2016). In this study, there was a three-year gap between the final exposure assessment (reported by mothers) and outcome assessment (reported by the child). It is possible that intergenerational transmission of IPV victimization follows a “sleeper effect” trend, where the negative long-term impacts of exposure (i.e., IPV victimization) could not properly be assessed in the study because the time lag between exposure and outcome assessment was too short. Future studies should look to evaluate whether increasing the time between exposure and outcome assessment changes the strength of effect estimates for the intergenerational transmission of IPV.

Nonetheless, the significance of childhood in this study aligns with what I would have expected based on the current IPV literature, which suggests that during preschool years children have the strongest attachment to their parents and have no means to escape violence compared to individuals exposed in adolescence (Kim, 2015). This, in turn, may lead them to be more susceptible to externalizing and internalizing behaviour problems later in life that they were exposed to as a child. A review on violence across the life-course is in agreement with the IPV literature, as childhood exposure to violence was shown to elevate the risk for violence in subsequent

developmental periods such as adulthood, which study results support (Herrenkohl et al., 2022).

This study intended to observe how the variation in the form, timing, and duration of exposure to inter-parental violence influenced future susceptibility to IPV victimization in young adulthood, but only the timing was able to be considered in statistical models. The influence of psychological and physical inter-parental violence exposure could not be separated due to the small number of females reporting exposure to physical inter-parental violence only. Although our study was hindered by study power limitations and it is possible that studies with a larger sample size would be able to stratify by form of exposure to inter-parental violence, the present study findings suggest that psychological and physical violence exposure may be, to a certain degree, inseparable conceptually. This aligns with findings from a study that evaluated the psychometric properties of the IPV scale used for the outcome in this study, where an exploratory factor analysis found strong evidence for linking all forms of physical, psychological and sexual IPV into one singular construct with factor-based scores rather than measuring them independently (Yakubovich et al., 2019). Although there was evidence for a two-dimensional approach, it was weaker, and separated sexual IPV from physical and psychological IPV, supporting the finding from this study that physical and psychological IPV may be inseparable in research due to their high correlation (Yakubovich et al., 2019). As this study was the first to prospectively analyze exposure to both physical and psychological inter-parental violence, future studies are required to determine if this is a limitation of the study sample, or an observation on the true presentation of IPV with implications for analytic decisions. On top of not being able to evaluate how the form of

the exposure influenced a female's risk of experiencing IPV victimization, this study did not have sufficient power to evaluate the influence the duration of exposure had on intergenerational transmission of IPV. This is due to the high prevalence of isolated exposure and small number of individuals chronically exposed in all three developmental stages.

### *5.2.2 The influence of exposure variability on the severity of IPV victimization*

When the severity of IPV victimization was considered, conclusions were consistent, with a few notable exceptions. Although indicative of a positive effect, any exposure to inter-parental violence was marginally nonsignificant in its association with the severity of IPV victimization experienced in young adulthood. Surprisingly, when exposure was stratified by developmental stage, exposure to inter-parental violence in late childhood increased IPV severity scores by 40% compared to those unexposed in late childhood, whereas exposure in the other developmental stages (early childhood and adolescence) had no effect on the severity of IPV victimization experienced in young adulthood. In other words, those exposed to inter-parental violence between the ages of 4-8 years may be more susceptible to more severe forms of IPV later in life compared to those exposed before or after late childhood. The significance of late childhood aligns with previous study findings on the importance of childhood exposure to inter-parental violence for intergenerational transmission of IPV. These findings would best be supported by a sensitive period model, which proposes there is a specific period during the life course where an individual is particularly susceptible to the effects of an exposure (Kuh et al., 2003). In contrast to critical period models, sensitive periods may be more flexible, which explain why childhood exposure was significant in all models,

but late childhood was only significant in association with the severity of victimization (Kuh et al., 2003).

Although the importance of late childhood on IPV victimization in young adulthood was not hypothesized based off Sutherland's theory of differential association and Mary Ainsworth's attachment theory, Jean Piaget's cognitive development theory might help to explain why exposure to inter-parental violence in late childhood, versus early childhood, may be more critical for the learning and adoption of violent behaviours. Although not usually applied within the context of IPV, Piaget's theory of cognitive development states that between the ages of 7-11 (Stage 3 of his model, the concrete operational stage), children understand the concept of rules, which are often determined by parental authority (Huitt & Hummel, 2003). During this time, it is possible that exposure to inter-parental violence is more likely to result in externalization of the behaviour due to the internalization of aggressive behaviours as part of the rules by which children live and observe (Emery, 2006; Huitt & Hummel, 2003). Drawing on Piaget's framework, individuals that are exposed to inter-parental violence in early childhood may be too young to understand the concept of violence in conflict resolution, and therefore do not internalize the 'rules' observed by parental models and therefore, are no more likely to become victims of IPV later in life than those who were not exposed to inter-parental violence. Individuals exposed in late childhood, however, may be more likely to understand that violence was used to resolve a conflict between parental models and may be more susceptible to internalizing the behaviour and replicating it later in life.

When forming conclusions on the significance of certain developmental stages, it is important to note that early childhood, late childhood, and adolescence had three, four and two time points of exposure assessment within the developmental stage, respectively. In this study, the strongest effect estimates observed were in late childhood, which had the most time points of exposure assessment (4), whereas the weakest effect estimates were in adolescence, which had the fewest time points of exposure assessment (2). As our study struggled with obtaining sufficient study power to detect effects, it is possible that the significance of the association was not attributed to the time period, but rather the developmental stage that had the most study power to detect an effect. This is a limitation to our study and lowers the confidence on result findings. Future studies should look to ensure equal dispersion of time points within each category of exposure assessment.

IPV victimization was only assessed between the ages of 18-21 to use a measure of period prevalence, which is generally accepted to be more reliable than lifetime or past prevalence measures due to a shorter period of recall. This was also to ensure exposure preceded the outcome to satisfy temporality and to ensure covariates acted as confounders and not mediators. In the present study, results were parameterized with those exposed to IPV victimization before 18 in two ways: by excluding them from analysis and coding them as unexposed. Across both parameterizations effect estimates and interpretations remained consistent, showing some robustness to my study findings. In an effort to increase sample size to preserve study power to detect significant effects, those exposed prior to the age of 18 were ultimately coded as unexposed in the present study.

An important limitation to consider in longitudinal prospective studies is loss to follow up and attrition bias, as they have the potential to not only bias effect estimates, but also the generalizability of conclusions. There were large differences between those included in the present study and those lost to follow up on the prevalence of key factors shown in the IPV literature to disproportionately effect rates of IPV, which indicate this study had attrition bias. Within the IPV literature, higher rates of IPV are seen among women who are visible minorities, not married, have parents with education below O-level and who come from a lower SES (Black et al., 2010; Cunradi et al., 2002; Ehrensaft et al., 2003; Krug et al., 2002; Yakubovich et al., 2018). Compared to those lost to follow up, females selected for the present study were more likely to be “better-off” victims, as they were more likely to be White, be from a higher SES, and have parents with a higher educational attainment who were married. Coupled with the observed high prevalence of isolated exposure and low prevalence of chronic exposure to inter-parental violence in this study, the study findings are limited in their external validity, and cannot be generalized to be reflective of the general population of children exposed to inter-parental violence, a limitation to the present study interpretations

### ***5.3 Conclusions and Potential Implications***

This study was the first to prospectively analyze the variability in childhood exposure to inter-parental violence in terms of the form, timing, and duration, and how the observed variability in exposure influenced the likelihood of experiencing IPV victimization and the severity in young adulthood (18-21). Female children were more likely to be exposed to psychological inter-parental violence than physical at all time points, and the most prevalent time period for exposure was in late childhood between

the ages of 4-8 years. More than half of females were exposed in only one developmental stage, and few females had chronic exposure to inter-parental violence throughout childhood. Although I was only able to evaluate the influence of the timing of inter-parental violence on future susceptibility to IPV victimization in young adulthood, the study findings suggest childhood to be a sensitive period for IPV transmission. Within childhood, exposure to inter-parental violence between the ages of 4 to 8 (late childhood) was most likely to influence the severity of violence experienced in young adulthood.

This study addressed many of the critiques of the current IPV literature, such as relying on retrospective, dichotomized assessment of childhood violence and focusing on physical violence transmission and neglecting other forms of violence (i.e., psychological, and sexual). However, in addressing these limitations, the present study still found the effect estimates for the intergenerational transmission of IPV to be weak, suggesting that perhaps childhood exposure to inter-parental violence is not as strong of a risk factor as IPV researchers originally hypothesized. Using life course epidemiology, one plausible explanation for the weak effect estimates could be that susceptibility to IPV victimization in adulthood was more likely to follow an accumulation of risk model rather than a sensitive or critical period causal model. In accumulation of risk models used in life course epidemiology, factors that influence risk of an outcome occurring accumulate gradually over the life course (Kuh et al., 2003). Some periods, such as childhood, may lead to greater impacts on the effect than other periods, but as the intensity, number, and/or duration of exposures increase, there is increasing cumulative burden associated (Kuh et al., 2003). The intergenerational transmission of

IPV victimization would most likely follow a chain of risk additive model, where each exposure (one of which being exposure to inter-parental violence) increases the risk of the other exposures (such as SES, educational attainment, child abuse, etc.), but also have independent effects on the outcome themselves. The current IPV literature has identified many different risk factors for IPV victimization, many of which overlap and influence each other (Kuh et al., 2003). For example, child abuse and exposure to inter-parental IPV are commonly referenced to as a dual exposure, and when measured together or independently, are associated with an increased risk of IPV involvement in adulthood (Hamby et al., 2010; Shields et al., 2020; Smith-Marek et al., 2015; Stith et al., 2000). Future studies should look to evaluate the accumulative risk of factors previously identified in IPV literature on IPV victimization both directly and indirectly through other factors.

Although preliminary, study findings identified childhood, particularly late childhood, as the period in which children may be most susceptible to intergenerational transmission of IPV, leading to future IPV victimization in young adulthood. The weak effect estimates suggest the mechanism may not be as clear as originally hypothesized, and further prospective research is required to determine whether other risk factors for IPV act synergistically or mitigate the effect of childhood exposure to violence on future IPV victimization. Regardless of whether exposure to violence in childhood led to intergenerational transmission, a significant portion of children in this community-based sample were exposed to violence in childhood, which warrants resources and support. Exposure to inter-parental violence can permanently affect a child's health, as research suggests that children exposed to inter-parental IPV exhibit many of the same

behavioural and psychological disturbances as children who are themselves abused (Edleson, 1999; Jaffe et al., 1990). The findings from this study could inform future researchers and policy makers of optimal periods to implement intervention strategies, such as education and health promotion programs targeted at providing healthy conflict resolution skills to families in hopes of decreasing the number of children exposed to violence through development.

On top of implementing new intervention strategies targeted at conflict resolution among families, this study identified a time in which implementing new intervention strategies could attempt to navigate the challenging closeted nature of IPV by screening for inter-parental IPV exposure in children. Most reported cases of IPV against women are of the most severe form (serious injury or homicide), while most cases go unreported or undetected due to the damaging impact on the family unit and social systems (Black et al., 2010; Gracia, 2004). This is evident by the fact that maternal health services such as antenatal care are less likely to be used by women experiencing IPV due to social and emotional barriers (Tura & Licoze, 2019). Screening children, specifically at points in development that have been identified as sensitive periods for intergenerational transmission of violence, could help combat the issue of underreporting and underutilization of resources among women suffering from IPV and could ultimately lead to a break in the cycle of intergenerational transmission of IPV.

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