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The Role of Dark Personalities in Intimate Partner Violence

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ABSTRACT

Intimate partner violence (IPV) is an international public health concern that poses significant mental and physical health risks for affected individuals. To improve prevention and intervention efforts, it is imperative that researchers and government bodies understand risk factors for IPV. This dissertation sought to evaluate individual differences in personality and childhood experiences as risk factors for various forms of IPV. The first two studies in this dissertation assessed whether the Dark Tetrad personality traits moderated the relationships between participants' and their partners' levels of IPV perpetration. In these studies, we assessed whether the Dark Tetrad traits operated differently in their associations with bidirectional IPV (i.e., both partners perpetrating violence against each other). The first sample comprised 109 men and 290 women (age range = 17-33, M_{age} = 18.74, SD_{age} = 1.84) recruited through the psychology participant pool at the University of Western Ontario. Results showed that the relationships between participants' and their partners' frequency of IPV varied depending on their levels of specific Dark Tetrad traits. Participants in Study 2 were 153 men and 207 women recruited from Amazon's Mechanical Turk (age range = 18-73, M_{age} = 34.39, SD_{age} = 10.96). Results showed that being female, higher levels of partner IPV perpetration severity, and Factor 2 psychopathy resulted in significantly higher odds of engaging in more severe IPV perpetration. Finally, the third study investigated whether the Dark Tetrad traits mediated the relationships between exposure to violence in childhood and subsequent IPV perpetration in adulthood. A total of 153 men and 246 women (age range = 18-73, M_{age} = 33.50, SD_{age} = 10.26) were recruited through Amazon's Mechanical Turk. Results showed no relationship between IPV perpetration and childhood IPV exposure. Therefore, mediation analyses were not possible. Follow-up exploratory analyses demonstrated that gender moderated the relationships between childhood

IPV exposure and levels of Factor 1 psychopathy and Machiavellianism. Results from this research have implications for future implementation of appropriate interventions in the context of IPV perpetration. It is also important to implement better education on individual differences as mechanisms underlying IPV perpetration for society as a whole.

Keywords: intimate partner violence; perpetration; Dark Tetrad; personality; psychopathy; sadism; narcissism; Machiavellianism; childhood violence exposure

SUMMARY FOR LAY AUDIENCE

Intimate partner violence (IPV) is an international public health concern that poses significant mental and physical health risks for affected individuals. To improve prevention and intervention efforts, it is important for researchers and government bodies to understand risk factors for IPV. The overarching purpose of this dissertation was to assess the ways in which a group of four 'dark' personality traits (i.e., the Dark Tetrad of personality), as well as exposure to violence in childhood predicted frequency and severity of IPV perpetration in adulthood. The first two studies in this dissertation evaluated whether the Dark Tetrad traits influenced the extent to which individuals engaged in bidirectional IPV (i.e., both partners perpetrating violence against each other). Results of Study 1 revealed that extent to which violence was bidirectional depended on participants' levels of specific Dark Tetrad traits. Results from Study 2 showed that women and those higher in the trait known as Factor 2 psychopathy had higher odds of engaging in more severe IPV perpetration. Finally, the third study investigated whether the Dark Tetrad traits explained the relationship between exposure to IPV in childhood and perpetration of IPV in adulthood. Results showed that there was no link between exposure to IPV in childhood and perpetration of IPV in adulthood in this sample. However, follow-up research showed that men who were exposed to violence in childhood were more likely to exhibit higher levels of dark traits than women. Results from these studies have implications for future implementation of appropriate IPV interventions. It is also important to implement better education on personality traits as predictors of IPV for society as a whole.

CO-AUTHORSHIP STATEMENT

The contents of Chapters 2 and 3 are presently in press as scientific journal articles. These studies were conducted in collaboration with co-authors. Across all articles, Rachel A. Plouffe was the primary investigator and took the lead role in all aspects of research and writing. References are provided below in the order in which they appear within the dissertation.

Plouffe, R. A., Wilson, C. A., & Saklofske, D. H. (in press). The role of dark personality traits in intimate partner violence: A multi-study investigation. *Current Psychology.*

Plouffe, R. A., Wilson, C. A., & Saklofske, D. H. (in press). Examining the relationships between childhood exposure to intimate partner violence, the Dark Tetrad of personality, and violence perpetration in adulthood. *Journal of Interpersonal Violence.*

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER 1: Introduction and Literature Review

1.1. Introduction

Intimate partner violence (IPV) is a major societal problem broadly defined by actual or threatened infliction of physical, psychological, and/or sexual harm to a partner or spouse (Heise & García-Moreno, 2002; World Health Organization, 2012). Until the mid-1970s feminist movement, IPV was considered a rare consequence of troublesome marriages, and was largely ignored across medical, legal, and social domains (McHugh & Frieze, 2006). Views have since evolved to recognize IPV as a pervasive violation of fundamental human rights, frequently resulting in serious physical and psychological harm for both women and men (Ansara & Hindin, 2011; McHugh & Frieze, 2006). Intimate partner violence is considered a priority public health issue (García-Moreno, Jansen, Ellsberg, Heise, & Watts, 2006), and as a result, risk factors associated with IPV perpetration have grown asymptotically as a focal point of empirical study. The overarching purpose of this research is to evaluate whether dark personality traits moderate the relationships between partners' and participants' IPV perpetration (i.e., bidirectional IPV). An additional purpose of this research is to investigate whether dark personality traits serve as mediators underlying the relationships between childhood exposure to IPV and subsequent IPV perpetration in adulthood. The following literature review will first provide a brief background on IPV, then outline the Dark Tetrad traits as they distinctly relate to IPV. Lastly, the current research program will be described.

1.2. Intimate Partner Violence: Prevalence, Risk Factors, and Outcomes

It is estimated that between 25% and 54% of women have reported experiencing physical, psychological, or sexual IPV at some point in their lifetime (e.g., Bensley, Macdonald, Van Eenwyk, Simmons, & Ruggles, 2000; Coker, Smith, McKeown, & King, 2000; Thompson

et al., 2006; Tjaden & Thoennes, 2000). Although these rates vary depending on the definitions of IPV, samples, and methodology employed, it is consistently estimated that in the United States, more than one in four women reported experiencing at least one instance of physical, psychological, or sexual IPV by an intimate partner (McHugh & Frieze, 2006; Smith et al., 2017). In Canada, police-reported data revealed that in 2011 alone, approximately 97,500 individuals (i.e., 341 per 100,000 in the population) disclosed that they had been victims of IPV (Sinha, 2013). Of these victims, 80% were women (Sinha, 2013). Another multi-country study representing 24,000 women across 10 countries found that 13-61% of women who had ever been in an intimate partner relationship reported experiencing physical violence by their partner, and 20-75% reported experiencing emotional abuse by their partner at some time in their life (García-Moreno et al., 2006). According to data from the 2014 Canadian General Social Survey on Victimization, men were also victimized at a rate of 2.9% in the population over the past five years, and 35% of male survivors reported experiencing intimate terrorism, a dangerous form of violence involving elements of coercive control (Lysova, Dim, & Dutton, 2019).

Early evaluations of IPV prevalence based solely on reports from currently-married couples often yield lower rates than more recent estimates that include individuals within nonmarital relationships (McHugh & Frieze, 2006). Over the past decade, research has shown that dating couples experience similar rates of IPV victimization to married or cohabiting couples. Several studies have reported that the most consistent rates of prevalence for dating violence range from 20% to 30% (e.g., Bell & Naugle, 2007; Fincham, Cui, Braithwaite, & Pasley, 2008; Shook, Gerrity, Jurich, & Segrist, 2000), and many victims tend to be adolescents, college-age, or young adults (Sinha, 2013; Smith, White, & Holland, 2003). In some cases, rates of IPV are even higher among dating couples than married couples. In Canada, the rate of

violence against dating partners was 1.6 times the rate of violence against married partners in 2011 (Sinha, 2013).

1.2.1. Risk factors and outcomes. The impact of IPV is profound in terms of its physical and psychological consequences for individuals, their families, communities, and societies (Sinha, 2013). Intimate partner violence has been associated with substantial negative health outcomes, including, for example, poor quality of life, direct physical effects of assault, development of chronic disease, sexually transmitted infections, and mortality (Campbell, 2002; Ansara & Hindin, 2011; Coker et al., 2002; Stöckl et al., 2013; Tollestrup et al., 1999). Survivors of IPV who sustain injury frequently experience chronic health problems such as pain, insomnia, choking sensations, and gastrointestinal symptoms (Campbell, 2002; Dutton, Haywood, & El-Bayoumi, 1997; Dutton et al., 2006; Diaz-Olavarrieta, Campbell, Garcia de la Cadena, Paz, & Villa, 1999; Jaffe, Wolfe, Wilson, & Zak, 1986). However, consequences of IPV extend far beyond adverse physical effects. Profound mental health burdens include higher prevalence and severity of depression, anxiety, post-traumatic stress disorder, and suicide ideation and attempts for victims of IPV than for those who have never been exposed to IPV (e.g., Dutton et al., 2006; Golding, 1999; Pico-Alfonso et al., 2006; Woods, 2000).

Given its extreme deleterious effects on both physical and mental health, it is imperative that we better understand the factors underlying perpetration of IPV. Understanding these risk factors is essential for researchers and organizations to foster and implement improved methods of IPV prevention and intervention.

Many sociological theories have been cited as explanations for IPV, such that perpetration of violence in relationships occurs as a function of social structures as opposed to individual differences (Lawson, 2012). The family violence paradigm, introduced by Gelles and

Straus (1979), contends that IPV is a ubiquitous phenomenon occurring in the context of the family structure, such that violence in romantic relationships occurs as a result of the everyday stressors that families experience. From this perspective, sociologists aim to evaluate why certain families initiate violence in response to stress whereas others do not. For example, some sociological researchers challenge the view that violence within the family is abnormal, and instead view it as a universal response to family conflict (Giles-Sims, 1983) in which the benefits of violence outweigh the consequences (Gelles, 1983). Those adopting a feminist perspective, on the other hand, maintain that IPV stems from the power differentials between men and women (e.g., Dobash & Dobash, 1979; Lloyd & Emery, 2000). This type of violence, according to the feminist perspective, occurs as a result of implicit and explicit patriarchal views that women are subordinate to men, and can be controlled using physical, psychological, sexual, and economic violence and force (McPhail, Busch, Kulkarni, & Rice, 2007). Feminist researchers do not view IPV as a gender-symmetrical phenomenon. Instead, they contend that IPV is mainly perpetrated by men against women, and that a majority of violence perpetrated by women is in self-defence. The gender symmetry of IPV is hotly debated, but as Johnson (2006) summarized, the distinct results across studies are most likely due to variation in sampling strategies (e.g., court, police, and shelter data vs. community sample data).

Environmental and demographic risk factors are also important in understanding the mechanisms underlying IPV perpetration, including victim history of parents' and perpetrator's problematic alcohol or drug use, age, residing in rural areas, exposure to violence in childhood, and financial stress, among several others (e.g., Okano, Langille, & Walsh, 2016; Roberts, Gilman, Fitzmaurice, Decker, & Koenen, 2010; Slep, Foran, Heyman, & Snarr, 2010, 2015; Swogger, Walsh, Kosson, Cashman-Brown, & Caine, 2012; Xu et al., 2005). However, it is also

important to consider individual difference variables (e.g., 'dark' personality traits) as risk factors of IPV, as described in the sections to follow.

1.3. The Dark Tetrad of Personality: Links with Intimate Partner Violence

The three most extensively studied dark traits described in recent research include psychopathy, Machiavellianism, and narcissism, collectively known as the Dark Triad of personality (Paulhus & Williams, 2002). Although the three traits are empirically distinct in terms of their conceptualization and correlates, they share overlapping core features such as interpersonal callousness, low agreeableness, and low honesty-humility (Jakobwitz & Egan, 2006; Jones & Figueredo, 2013; Lee & Ashton, 2005). Recent evidence has also supported the inclusion of a fourth trait, termed subclinical sadism, to form a 'Dark Tetrad' of personality (Buckels, Jones, & Paulhus, 2013; Chabrol, Van Leeuwen, Rodgers, & Séjourné, 2009; Plouffe, Saklofske, & Smith, 2017; Plouffe, Smith, & Saklofske, 2019). Although psychopathy, narcissism, and sadism were traditionally described by clinicians and researchers as clinical syndromes (Hare, 1996; Miller & Campbell, 2008; Mokros, Schilling, Weiss, Nitschke, & Eher, 2014), these constructs are now often studied as 'subclinical' personality traits manifested within the general population (Campbell & Baumeister, 2006; Millon & Davis, 1996).

Empirical research has reported positive relationships between the Dark Tetrad and various types of aggression in non-romantic relationships (e.g., Buckels et al., 2013; Jones & Neria, 2015; Goodboy & Martin, 2015; Burtăverde, Chraif, Aniţei, & Mihăilă, 2016). However, few studies have evaluated the relationships between the Dark Triad and IPV, and only one has investigated associations between the full Dark Tetrad and IPV. Of the studies investigating the contributions of the Dark Triad to IPV, psychopathy was reported as a unique predictor of verbal, sexual, economic, and general IPV, as well as stalking (Kiire, 2017). Primary and

secondary psychopathy have also shown utility in predicting levels of relationship control, including control over decision-making, autonomous behaviour, as well as surveillance and threat behaviours (Brewer et al., 2018). Machiavellianism predicted economic IPV significantly in women (Kiire, 2017). In the context of psychological IPV, psychopathy was a significant predictor of denigration, and both psychopathy and narcissism were predictors of restrictive engulfment, a subtype of emotional abuse involving efforts to monitor their partner's location or to prevent their partner from interacting with friends and family (Carton & Egan, 2017).

Tetreault, Bates, and Bolam (in press) evaluated the predictive effects of the Dark Tetrad traits on different types of IPV across Swedish and United Kingdom samples of men and women. Regardless of gender, results showed that psychopathy was the most robust predictor across verbal, explosive (i.e., displaced aggression; throwing or smashing something, but not at/on the other person), and physical IPV. For men, and Machiavellianism predicted lower levels of physical IPV. In women, sadism predicted higher levels of physical IPV. To date, this is the only study that has assessed the impact of the full Dark Tetrad on IPV. Despite the paucity of empirical research examining the simultaneous impact of the Dark Tetrad traits on IPV, several studies have evaluated the relationships between the traits and IPV separately (e.g., Beasley & Stoltenberg, 1992; Cunha, Braga, & Gonçalves, in press; Hammock & O'Hearn, 2002; Mager, Bresin, & Verona, 2014; Turner, 2013).

1.3.1. Psychopathy and intimate partner violence. Psychopathy is a personality pathology broadly characterized by a variety of callous interpersonal, affective, and behavioural features (Hare, 1996; Southard & Zeigler-Hill, 2016). Individuals high in psychopathy demonstrate minimal anxiety or empathy while asserting control over others and display a lack of remorse for their behaviours (Hare, 1996; Paulhus & Williams, 2002). Traditional clinical

descriptions of psychopathy frequently divide the construct into two general dimensions: Factor 1 psychopathy is characterized by affective-interpersonal components reflecting shallow affect, lack of empathy, superficial charm, and manipulativeness, whereas Factor 2 psychopathy reflects lifestyle-antisocial components including irresponsibility, impulsivity, and poor behavioural controls (Harpur, Hakstian, & Hare, 1988). Despite its long history within the clinical domain, psychopathy is now recognized in contemporary personality research as a subclinical personality trait (Lilienfeld & Andrews, 1996). That is, psychopathy is described as a personality trait that manifests within the general population on a continuous, non-clinical dimension ranging from mild to extreme.

Psychopathy is arguably the most nefarious of the Dark Triad traits, largely due to their willingness to violate social norms without regard for the welfare of others (Furnham, Richards, Rangel, & Jones, 2014; Rauthmann, 2012). It is no surprise, then, that psychopathy is consistently cited as a robust positive predictor of IPV, even once situational variables such as previous convictions are controlled for (e.g., Coyne, Nelson, Graham-Kevan, Keister, & Grant, 2010; Cunha et al., in press; Kiire, 2017; Mager et al., 2014; Okano et al., 2016; Swogger, Walsh, & Kosson, 2007; Theobald, Farrington, Coid, & Piquero, 2016). For example, Cunha et al. (in press) found that both total psychopathy scores and scores on the affective psychopathy facet uniquely predicted frequency of physical and psychological IPV perpetration among a sample of offenders. This indicates that individuals who exhibit violence toward their partners tend to be more callous, less empathic, and are deficient in affective experience.

1.3.2. Narcissism, aggression, and intimate partner violence. The study of narcissism as a subclinical personality trait rose in popularity with the introduction of the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979). Current definitions of narcissism as a

personality trait are largely consistent with earlier clinical descriptions of narcissistic personality disorder (American Psychiatric Association, 1980). Narcissism is characterized by entitlement, fantasies of unlimited success and power, need for admiration from others, lack of empathy, and a grandiose sense of superiority over others (Back et al., 2013; Campbell & Campbell, 2009; Emmons, 1987; Menon & Sharland, 2011; Morf & Rhodewalt, 2001).

Although narcissism is considered by some researchers to be the least socially-malevolent of the Dark Triad traits (Rauthmann & Kolar, 2012), several studies have found positive associations between narcissism and violence (e.g., Buckels et al., 2013; Bushman & Baumeister, 1998; Stucke & Sporer, 2002; Turner, 2013), as well as narcissism and reactive hostility (Jones & Neria, 2015; Jones & Paulhus, 2010). Despite the sense of superiority and entitlement exhibited by individuals high in narcissism, their grandiose sense of self is unstable and susceptible to negative feedback from others (Rhodewalt, Madrian, & Cheney, 1998; Ryan, Weikel, & Sprechini, 2008). Empirical research suggests that those high in narcissism are likely to aggress when faced with a situation that poses a threat to their self-esteem (e.g., Baumeister, Bushman, & Campbell, 2000; Buckels et al., 2013; Bushman & Baumeister, 1998; Stucke & Sporer, 2002; Turner, 2013). For example, in a study investigating aggression in psychopathy and narcissism using an essay evaluation paradigm, narcissism predicted reactive verbal aggression resulting from an ego-threatening event uniquely over psychopathy (Jones & Paulhus, 2010). Given their tendency to defensively self-enhance, these individuals feel justified in aggressing against others (Craig, 2003), and frequently interpret interpersonal interactions as transgressions against them (McCullough, Emmons, Kilpatrick, & Mooney, 2003).

Given the potential for partners in intimate relationships to experience conflict in the form of ego threat, similar relationships between narcissism and aggression can be expected

within an IPV context (Ryan et al., 2008). Unsurprisingly, those who recidivate following arrest for spousal abuse tend to be higher in clinical narcissism compared to individuals who do not recidivate (Hamberger & Hastings, 1990). Similarly, both men and women with a history of spousal abuse tend to be higher in narcissism than those without an abuse history, regardless of whether narcissism is measured at the clinical or subclinical level (Beasley & Stoltenberg, 1992; Craig, 2003; Simmons, Lehmann, Cobb, & Fowler, 2005).

1.3.3. Machiavellianism, aggression, and intimate partner violence. Machiavellianism is a personality construct reflecting deceit, manipulation, and a lack of concern for conventional morals (Christie & Geis, 1970). Individuals high in Machiavellianism are cynical about the world around them and are unlikely to express concern for others above themselves, resulting in cold social exchanges (Christie & Geis, 1970). Although Machiavellianism bears close resemblance to psychopathy (Paulhus & Williams, 2002), those high in Machiavellianism are more likely than those high in psychopathy to carefully and deliberately apply long-term strategies to get ahead in interpersonal situations (Fehr, Samson, & Paulhus, 1992; Jakobwitz & Egan, 2006).

When bivariate relationships are examined, Machiavellianism is significantly associated with general self-reported violence (Pailing, Boon, & Egan, 2014), relational aggression (Abell & Brewer, 2014), and bullying among adults and adolescents (Baughman, Dearing, Giammarco, & Vernon, 2012; Peeters, Cillessen, & Scholte, 2010). However, once psychopathy, narcissism, and sadism are controlled for, the relationships between Machiavellianism and physical aggression often do not hold. Although individuals high in Machiavellianism may threaten to harm others verbally, they are unlikely to physically aggress or retaliate against others in the

absence of large benefits due to their propensity to cautiously calculate their behaviour (Buckels et al., 2013; Furnham, Richards, & Paulhus, 2013; Jones & Paulhus, 2010).

Interestingly, in some instances, Machiavellianism does predict different forms of aggression over the Dark Triad traits. For example, Dinić and Wertag (2018) found that although psychopathy was the strongest predictor of reactive and proactive aggression, Machiavellianism was also a significant predictor of reactive aggression in men, and both reactive and proactive aggression in women. It is possible, then, that when faced with an ego-depleting situation, individuals high in Machiavellianism potentially aggress against others the same way that an individual high in psychopathy would (Dinić & Wertag, 2018; Furnham et al., 2013). In the context of IPV, Machiavellianism was significantly related to psychological violence and restrictive engulfment (Carton & Egan, 2017), which is no surprise given the Machiavellian's tendencies toward strategic control and emotional manipulation. However, when considered in conjunction with psychopathy and narcissism, Machiavellianism was no longer a significant predictor of psychological, physical, or sexual IPV (Carton & Egan, 2017; Kiire, 2017).

1.3.4. Sadism, aggression, and intimate partner violence. Subclinical sadism describes individuals who engage in or think about engaging in cruel, humiliating, and aggressive behaviours for enjoyment or subjugation (Myers, Burket, & Husted, 2006; O'Meara, Davies, & Hammond, 2011; Plouffe et al., 2017). Individuals high in sadism frequently exhibit intimidation, aggression, delinquency, sexual deviance, and antagonism (Chabrol et al., 2009; O'Meara, et al., 2011; Buckels et al., 2013). Prior to its introduction to the personality literature as a subclinical trait, the study of sadism was highly attuned to offender and psychiatric populations. Currently, however, subclinical sadism is recognized as a fourth member of the Dark Triad, calling for a Dark Tetrad of personality (Chabrol et al., 2009).

The main feature that distinguishes subclinical sadism from the Dark Triad traits involves a unique motivation to intimidate and torment victims for excitement and enjoyment (Buckels et al., 2013; Smoker & March, 2017). These individuals are willing to work hard to inflict pain on others, even if their opponent is innocent and there is risk of incurring personal cost (Buckels et al., 2013). In one study, for example, sadism provided unique variance in predicting unprovoked aggression over Factor 1 psychopathy in the context of administering shocks to an innocent confederate (Reidy, Zeichner, & Siebert, 2011). In a similar study implementing a computer game paradigm, both sadism and psychopathy emerged as significant predictors of aggression in the form of sending white noise blasts to an innocent opponent, whereas narcissism and Machiavellianism were not significant predictors (Buckels et al., 2013). However, only individuals high in sadism increased the intensity of the white noise blasts upon recognizing that their opponent would not retaliate. Additionally, only individuals high in sadism were willing to expend cognitive effort on a task in order to aggress against an innocent opponent (Buckels et al., 2013). Those scoring high on sadism also reported experiencing strong positive affect after viewing images of violent stimuli (Međedović, 2017) and after engaging in a violent 'bug-killing' task (Buckels et al., 2013), providing evidence for their pleasure-driven appetite for cruelty.

Sadism in its clinical form has been implicated as a major risk factor for IPV. Men who have been martially violent are more likely to display elevated scores on the aggressive-sadistic scale of the Millon Clinical Multiaxial Inventory (MCMI-II; Millon, 1987) than are happily married couples, as well as those in discordant nonviolent relationships (Beasley & Stoltenberg, 1992; Craig, 2003; Murphy, Meyer, & O'Leary, 1993). Specifically, men with higher scores on the aggressive-sadistic scale of the MCMI tend to engage in more proactive than reactive spousal

abuse, such that they implement physical and verbal violence as a means to control and intimidate their partners (Chase, O'Leary, & Heyman, 2001). Men high in aggressive-sadistic personality disorder also display low heart rates (i.e., below baseline levels) and high rates of verbal aggression during intimate partner conflicts (Gottman et al., 1995).

1.4. The Current Research

Understanding underlying risk factors associated with IPV perpetration is essential for researchers and organizations to implement improved methods of IPV prevention and intervention. The overarching goal of this of this dissertation is to assess the impact of individual differences on perpetration of physical and psychological forms of IPV. Although environmental, societal, and demographic variables are important in understanding the mechanisms underlying IPV perpetration, empirical evaluations of individual differences in levels of dark personality traits must also be explored as they relate to IPV. Additionally, the impact of environmental factors on perpetration may even be contingent upon personality trait variables.

This program of study investigated three specific research questions. The first research question is addressed by all three research studies within this dissertation: *When the Dark Tetrad traits are considered simultaneously, which traits provide unique variance in predicting levels of IPV perpetration?* This question provides the foundation for the remainder of this research program. It is important to consider the simultaneous effect, if any, of all of the Dark Tetrad traits on instances of IPV prior to establishing more fine-grained connections between dark traits and various types of violence (i.e., unidirectional vs. bidirectional). These effects were tested across three separate samples, including university students and two community samples.

The second research question was investigated in Studies 1 and 2: *Do the Dark Tetrad traits moderate the relationships between participant and partner levels of IPV perpetration?* In other words, we assessed whether the Dark Tetrad traits operated differently in predicting levels of bidirectional IPV, in which both partners engage in IPV against each other. We hypothesized that at varying levels of each trait, there would be distinct motivations for engaging in IPV based on trait-specific characteristics (e.g., reactions to provocation, impulsivity, or pleasure-seeking cruelty). First, in Study 1, we tested this research question using a sample of undergraduate university students and standard quantitative measures. In Study 2, we replicated and extended findings from Study 1 by testing the research question in a community adult sample using an open-ended IPV assessment method.

The final research question investigated whether environmental contributors to IPV were contingent upon levels of personality trait variables: *Do the Dark Tetrad traits mediate the relationships between exposure to violence in childhood and subsequent IPV perpetration in adulthood?* Not all children exposed to violence grow up to be violent themselves, but research has shown that there is a significant association between these events in childhood and perpetration of violence in adulthood (Choice, Lamke, & Pittman, 1995; Ehrensaft et al., 2003; Roberts et al., 2010). Although adverse childhood experiences are important in understanding mechanisms underlying IPV, the impact of these experiences may depend on the development of certain personality characteristics (e.g., Brennan, 2014; Weiler & Widom, 1996; White & Widom, 2003). In Study 3, we evaluated whether this relationship could be explained, or partially explained by the development of dark personality traits using a community sample of adults.

CHAPTER 2: Studies 1 and 2

2.1. Introduction

Intimate partner violence (IPV) is a major public health issue defined by the infliction of physical, psychological, and/or sexual harm to a partner or spouse (Heise & García-Moreno, 2002; World Health Organization, 2012). Ample research has demonstrated that IPV often involves the perpetrator's coercion and control, psychological aggression or intimidation, violence or threat of violence, and/or isolation (Ansara & Hindin, 2011; Tjaden & Thoennes, 2000). Intimate partner violence is associated with substantial negative outcomes for the victim, including direct physical effects of assault, depression, anxiety, sexually transmitted infections, and death (e.g., Ansara & Hindin, 2011; Campbell, 2002; Golding, 1999). Given these consequences, IPV has been widely recognized by governments and organizations as a serious societal concern. Thus, it is imperative that we better understand the factors underlying these behaviours. The purpose of this research is to identify the differential effects of dark personality traits (i.e., the Dark Tetrad of personality) on the relationships between participant and partner IPV perpetration.

2.1.1. Unidirectional vs. Bidirectional IPV

Initial research on IPV mainly focused on unidirectional violence, with men as perpetrators against women. Proponents of the unidirectional perspective frequently view IPV from a sociological standpoint and draw on social structures as explanations for IPV perpetration. For example, IPV is often viewed as 'asymmetrical,' such that men exercise their patriarchal power over women by engaging in aggression against their romantic partners (DeKeseredy & Dragiewicz, 2007; Lawson, 2012). Often described as intimate terrorism, male-perpetrated violence frequently involves use of coercive tactics, threats, force, and isolation to

assert control over one's partner (Johnson, 2007; Johnson, Leone, & Xu, 2014). Although intimate terrorism represents a smaller proportion of IPV perpetration overall, it is the most common type of violence that occurs within the context of the legal system and women's shelters (Johnson, 2011). This type of violence frequently stems from men's misogynistic views, and has largely been the focus of the battered women's movement (Johnson, 2011) due to its devastating consequences. Because intimate terrorism is less commonly reported among the general community, the focus of the present studies will reflect less severe types of violence (i.e., situational couple violence).

It is now recognized that IPV also frequently occurs bidirectionally, such that both partners in the relationship engage in reciprocal violence toward one another (e.g., Langhinrichsen-Rohling, Misra, Selwyn, & Rohling, 2012; Tetreault et al., in press; Whitaker, Haileyesus, Swahn, & Saltzman, 2007). Several studies have estimated that of all reported IPV, approximately 45-72% is bidirectional (e.g., Caetano, Ramisetty-Mikler, & Field, 2005; Langhinrichsen-Rohling et al., 2012; Whitaker et al., 2007). It should be noted, however, that the context, meaning, and motive in which the violence occurs must be considered (e.g., whether the events were defensive or offensive) when conducting IPV research (DeKeseredy & Dragiewicz, 2009). Bidirectional IPV is frequently cited as situational couple violence, in which specific arguments between couples escalate from verbal to physical aggression, but do not involve the element of coercive control that characterizes the often-unidirectional (i.e., male-perpetrated) intimate terrorism (Johnson et al., 2014; Kelly & Johnson, 2008). Although situational couple violence does not involve the same chronic, possibly life-threatening consequences as intimate terrorism, it is the most common type of violence reported across general community surveys (Johnson & Leone, 2005). For this reason, the focus of this research will mostly reflect instances

of situational couple violence. In some cases, bidirectional IPV has been associated with greater reported injury than unidirectional IPV, regardless of the perpetrator's gender (Graham, Bernards, Flynn, Tremblay, & Wells, 2012; Straus & Gozjolko, 2014; Whitaker et al., 2007). Significant predictors of bidirectional IPV include younger age, ethnicity, alcohol problems, number of drinks consumed per week for women, history of childhood abuse for women, and approval of violence to resolve conflict (Caetano et al., 2005). It is also possible, however, that individual differences in personality have an effect on the extent to which individuals engage in unidirectional or bidirectional violence.

2.1.2. The Dark Tetrad of Personality and Motivations for Intimate Partner Violence

The Dark Tetrad, comprising subclinical manifestations of psychopathy, Machiavellianism, narcissism, and sadism, are four extensively studied traits within the personality research domain (Buckels et al., 2013; Chabrol et al., 2009; Plouffe et al., 2017, 2019). Psychopathy is described as a trait reflecting callousness, shallow affect, and impulsivity (Paulhus & Williams, 2002). Traditional descriptions of psychopathy frequently divide the construct into two general dimensions: Factor 1 psychopathy is characterized by affective-interpersonal components reflecting shallow affect, lack of empathy, superficial charm, and manipulativeness, whereas Factor 2 psychopathy reflects lifestyle-antisocial components including irresponsibility, impulsivity, and poor behavioural controls (Harpur et al., 1988). Machiavellianism is a personality construct comprising features of deception, manipulation, and lack of morality (Christie & Geis, 1970). Narcissism reflects one's entitlement, need for success, power, admiration, and grandiosity (Paulhus & Williams, 2002). Finally, sadism represents a tendency to engage in cruel and aggressive behaviours for pleasure or subjugation (Plouffe et al., 2017, 2019). Few studies have assessed the relationships between the Dark Tetrad (or its

predecessor, the Dark Triad) and IPV simultaneously, but of those studies, psychopathy emerged as the most robust predictor of multiple different types of IPV, including verbal, psychological, sexual, and physical violence (Brewer et al., 2018; Carton & Egan, 2017; Kiire, 2017; Tetreault et al., in press).

Several studies have, however, investigated the associations between the Dark Tetrad traits and IPV separately (e.g., Beasley & Stoltenberg, 1992; Cunha et al., in press; Hammock & O'Hearn, 2002; Mager et al., 2014; Turner, 2013), and there may be distinct underlying motivations to engage in violence for individuals exhibiting high levels of various Dark Tetrad traits. For those high in psychopathy, engaging in violent or aggressive behaviours may not only provide them with a means to achieve an instrumental goal (e.g., hurting one's partner to assert control), but may also serve as a reaction to provocation (Blais, Solodukhin, & Forth, 2014; Dinić & Wertag, 2018; Jambroes et al., 2018; Reidy et al., 2011). In one study, psychopathy was implicated as a predictor of bidirectional partner violence such that in men, levels of bidirectional physical IPV were strengthened at higher levels of Factor 2 psychopathy (Mager et al., 2014). A plausible explanation is such that the impulsive and under-controlled nature of Factor 2 psychopathy better predicts levels of reactive violence, defined as an impulsive response based on anger or fear to a perceived provocation or threat (Blais et al., 2014). However, levels of IPV for those high in Factor 1 psychopathy were high regardless of whether their partner engaged in IPV toward them (Mager et al., 2014). Unlike those exhibiting high levels of Factor 2 psychopathy, those high in Factor 1 psychopathy may be more likely to engage in unprovoked, instrumental violence to achieve a particular goal or reward than to engage in reactive bidirectional aggression (Flight & Forth, 2007; Mager et al., 2014; Reidy et al., 2011). Overall, the results of this study suggested that Factor 2 psychopathy promotes a cyclical, reactive type of

bidirectional violence in men, whereas Factor 1 psychopathy may be more important in understanding instrumental types of aggression.

Several empirical studies have suggested that individuals high in narcissism are likely to engage in aggressive behaviours when encountering situations that pose a threat to their self-esteem (e.g., Baumeister et al., 2000; Buckels et al., 2013; Bushman & Baumeister, 1998; Stucke & Sporer, 2002; Turner, 2013). For example, when different dimensions of narcissism were examined in the context of IPV, men's covert narcissism, defined as an overt expression of low self-esteem with covert attitudes of grandiosity, was significantly related to physical assault toward dating partners (Ryan et al., 2008). The authors speculated that perhaps the covert narcissist's heightened sense of entitlement combined with their hypersensitivity to perceived ego threat allows for them to justify engagement in physical violence. Given the tendency for those high in narcissism to aggress reactively following ego threat or rejection, it would be reasonable to hypothesize that bidirectional IPV relationships would be strengthened at higher levels of narcissism.

Although bivariate relationships have shown significant associations between Machiavellianism and general aggressive and bullying behaviours (Baughman et al., 2012; Pailing et al., 2014; Peeters et al., 2010), once the remaining Dark Tetrad traits are controlled for, these relationships no longer hold. Despite the notion that manipulation of others is a psychological process, it is unlikely that the cynical, strategic, and cunning nature of those high in Machiavellianism is relevant to our understanding of direct forms of IPV (Carton & Egan, 2017). Instead, it is more likely that individuals high in Machiavellianism only aggress against others when the long-term benefits outweigh any negative short-term repercussions (Jones & Paulhus, 2009, 2010). Thus, despite high-Machiavellianism individuals' potential to retaliate

against aggressive others (Dinić & Wertag, 2018), it is unlikely that Machiavellianism would be a significant predictor of bidirectional IPV over the other Dark Tetrad traits.

Only one empirical study to date has examined the relationship between sadism as a subclinical personality trait and IPV (Tetreault et al., in press). The authors found that when the Dark Triad traits were controlled for, sadism predicted physical IPV in women. Sadism in its clinical form is a major risk factor for IPV (e.g., Beasley & Stoltenberg, 1992; Craig, 2003; Murphy et al., 1993), and has been reported as more prevalent among abusers compared to other personality disorders (e.g., borderline, dependent; Hart, Dutton, & Newlove, 1993). Additionally, in general, individuals high in sadism derive gratification from inflicting pain and suffering on others, even when there are significant costs associated with their violence (Buckels et al., 2013). Thus, it is likely that the high-sadism individual will perpetrate IPV regardless of their partner's levels of aggression to attain pleasure or to fulfill a need for control. The overarching purpose of the following research studies is to identify the distinct moderating effects of the Dark Tetrad traits on the relationships between participant and partner IPV perpetration. These will be the first studies to simultaneously evaluate impact of the Dark Tetrad traits and partner levels of IPV perpetration, as well as their interactions, on participant levels of IPV perpetration.

2.2. Study 1

2.2.1. Research Objectives and Hypotheses

The objective of this study is to determine whether the Dark Tetrad traits moderate relationships between participants' and their partners' frequency of physical IPV perpetration (i.e., bidirectional IPV). Based on the research outlined above, we hypothesized a significant bidirectional IPV relationship at higher levels of Factor 2 psychopathy. On the other hand, we predicted that those high in Factor 1 psychopathy would engage in IPV regardless of their

partner's levels of perpetration, indicative of a main effect. Additionally, because those high in narcissism aggress against others when their ego is threatened by a perpetrator, we anticipated a significant bidirectional IPV relationship at higher levels of narcissism. Due to their appetite for engaging in unprovoked aggression and pleasure-driven cruelty, we hypothesized that individuals high in sadism would engage in IPV regardless of their partner's levels of perpetration, indicative of a main effect. Because individuals high in Machiavellianism have a tendency to aggress against others only when long-term benefits outweigh short-term consequences (Jones & Paulhus, 2009, 2010), we did not hypothesize a significant effect of Machiavellianism on IPV.

2.3. Method

2.3.1. Participants

A total of 399 participants (109 men, 290 women) were recruited through the undergraduate psychology participant pool at the University of Western Ontario in Canada. Individuals were eligible to participate if they were age 17 or older (consenting age at university) and if they were involved in at least one romantic relationship lasting for a minimum of three months at some time in their life. To avoid recruiting inattentive participants, individuals were required to correctly respond to 2 of 3 attention checks on the survey-hosting platform, Qualtrics.

Participants ranged in age from 17 to 33 (M_{age} = 18.74, SD_{age} = 1.84). Demographic information, including race/ethnicity, relationship status, and year of study are presented in Table 1. The majority of participants were in a dating relationship at the time of study enrolment. Of those married, engaged, or in a relationship, the average length of relationship was 1.55 years (SD = 1.75 years).[1]

[1] There were two additional participants who reported length of relationship numerically without recording whether the length was in months or years; these participants' relationship lengths were not included.

There were 24 additional participants whose data were not used for the current study because they reported being non-heterosexual, and one participant's data were not used because they reported being nonbinary. These data were not used for this study because there were not large enough groups of non-heterosexual or nonbinary individuals to assess group differences on IPV. In addition, because partner gender was not requested, it would be impossible to accurately examine gender effects. Specifically, it would not have been possible to detect whether the bidirectional IPV relationships reported in this study were influenced by the partner's gender, which would add a confounding element to the study.

Table 1

Study 1 Participant Demographic Information

Variable	Frequency	Percentage (%)
Race/Ethnicity		
White	223	55.9
Black	2	0.5
Aboriginal	2	0.5
Asian	102	25.6
East Indian	23	5.8
Arab	15	3.8
Prefer not to say	3	0.8
Other	29	7.3
Relationship status		
Single	171	42.9
Engaged	3	0.8
Married	4	1.0
In a dating relationship	221	55.4
Year of study		
1	303	75.9
2	36	9.0
3	31	7.8
4	22	5.5
Other	6	1.5

2.3.2. Procedure

The study was approved by the Non-Medical Research Ethics Board at the University of Western Ontario prior to data collection. Eligible individuals signed up to participate through the online psychology participant pool and were redirected to complete a series of anonymous personality and relationship behaviour questionnaires via Qualtrics. The study took approximately 0.5 hours to complete. Participation was voluntary and all individuals received partial course credit for their time.

2.3.3. Measures

2.3.3.1. Self-Report Psychopathy Scale-IV. (SRP-IV; Paulhus, Neumann, & Hare, 2015). The SRP-IV contains 64 items designed to evaluate levels of psychopathy in the general population. The SRP is a self-report version of Hare (1991)'s Psychopathy Checklist - Revised. Participants responded to items on a 5-point scale (1 = *strongly disagree,* 5 = *strongly agree*). Mean scores were calculated to obtain levels of Factor 1 and 2 psychopathy. Past research has supported the validity and reliability of the SRP-IV (total score α = .89 - .92; Paulhus et al., 2015).

2.3.3.2. Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979). The NPI consists of 40 forced-choice items designed to measure levels of subclinical narcissism. Participants chose between options A and B on items such as "*I have a natural talent for influencing people*" and "*I am not good at influencing people*." Positive response endorsements were coded as 1, and the remaining were coded as 0. Scores were summed for each participant and range from 0-40, with higher scores representing higher levels of narcissism. Past research has supported the validity and reliability of the NPI (α = .87; Emmons, 1987).

2.3.3.3. MACH-IV (Christie & Geis, 1970). The 20-item MACH-IV was developed to assess levels of Machiavellianism. Participants responded to items on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*). Mean scores were obtained by averaging all Machiavellianism items, with higher scores indicating higher levels of Machiavellianism. The validity and reliability of the MACH-IV has been reported as strong (α = .83; Jones & Paulhus, 2014).

2.3.3.4. Assessment of Sadistic Personality (ASP; Plouffe et al., 2017). The ASP is a 9-item self-report measure of subclinical sadism. Participants endorsed items on a 5-point scale (1 = *strongly disagree,* 5 = *strongly agree*). Mean scores were derived for sadism, with higher scores indicating higher levels of subclinical sadism. Empirical research has supported the validity and reliability of the ASP (α = .83; Plouffe et al., 2017).

2.3.3.5. Revised Conflict Tactics Scale (CTS-2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). Participant and partner levels of IPV perpetration were evaluated using the 78-item self-report CTS-2. The CTS-2 comprises five subscales including Negotiation, Psychological Aggression, Physical Assault, Injury to Partner, and Sexual Coercion. However, for the purpose of the current study, only Physical Assault and Psychological Aggression were analyzed. Due to the nature of the sample (i.e., university students), scores on these subscales will largely reflect acts of situational couple violence rather than intimate terrorism.

Half of the items assessed the participants' own levels of IPV perpetration, and half of the items evaluated their partner's levels of IPV. Typically, the CTS-2 asks participants to report on their experiences within an intimate relationship over the past year. However, because the target population comprises undergraduate students, it may be the case that a larger window of time will be necessary to capture meaningful response variance. Thus, the current study requested that

participants report on their IPV experiences in romantic relationships over their lifetime. This has been employed successfully in past research (e.g., Turner, 2013). Response options ranged on a 7-point scale from 0 *(never)* to 6 *(more than 20 times)*. Scores were calculated as weighted frequencies by adding the midpoint for each response option selected.

Past studies have supported the validity and reliability of the CTS-2 (α = .79 - .95; Straus et al., 1996). Previous research has also shown moderate-to-high convergence between self-reports of partners' IPV and participants' reports of their own IPV (e.g., Chan et al., 2011; Salis, Salwen, & O'Leary, 2014). For example, Chan et al. (2011) reported Kappa coefficients ranging from .40 to .50 (interspousal agreement at 88-95%). Furthermore, Salis et al. (2014) reported that 80% of couples agreed about presence or absence of physical assault, and 72% of couples agreed about presence or absence of psychological aggression.

2.3.4. Data Analytic Strategy[2]

Descriptive statistics, reliability coefficients, Spearman's *rho* correlations, and Pearson correlations were calculated using SPSS Version 26 (IBM Corp., 2019). The outcome variables, frequency of participant physical assault and psychological aggression, were scored as count variables. Poisson regression models were not appropriate for use with this data due to overdispersion. Specifically, Poisson models restrict the variance of the data to be equal to the mean for predictor variables, and when this condition is not met, parameter estimate variances are not accurately estimated (Cameron & Trivedi, 1990). Therefore, we used the R Version 3.5.2 (R Development Core Team, 2019) MASS package (Venables & Ripley, 2002) to conduct 12 negative binomial regression models with the maximum likelihood estimator. Negative binomial models derive parameter estimates based on the log of the outcome variable, and results are

[2] Data and code available at https://osf.io/ptwj4/

interpreted using the incident rate ratio (*IRR*) value. The *IRR* value is calculated by exponentiating the regression coefficient. It represents the rate of change in incidents of the outcome variable for each unit change in the predictor variable, expressed in a percentage as (*IRR*–1)×100 (Hilbe, 2011).

We used listwise deletion for each model due to the low proportion of missing data (n = 2-5). The first model regressed participant psychological aggression frequency on the covariate gender, Factor 1 psychopathy, Factor 2 psychopathy, Machiavellianism, narcissism, sadism, and partner psychological aggression frequency. The next five models regressed participant psychological aggression frequency on the covariate gender, each Dark Tetrad trait (one per model), partner psychological aggression frequency, and the Dark Tetrad trait×partner psychological aggression interactions.

The next model regressed participant physical assault frequency on the covariate gender, Factor 1 psychopathy, Factor 2 psychopathy, Machiavellianism, narcissism, sadism, and partner physical assault frequency. The last five models regressed participant physical assault frequency on the covariate gender, each Dark Tetrad trait (one per model), partner physical assault frequency, and the Dark Tetrad trait×partner physical assault interactions. Predictor variables in all interaction models were grand-mean centered.

For any significant interactions, simple slopes were computed at one standard deviation below and one above the mean of the moderator variable following recommendations for continuous variables (Aiken & West, 1991). Specifically, the relationships between participant and partner IPV frequency were evaluated at high and low levels of Dark Tetrad traits for which significant interactions emerged.

2.4. Results

2.4.1. Descriptive Statistics and Background Analyses

Descriptive statistics, skewness, kurtosis, and Cronbach's alpha values are reported in Table 2. Internal consistencies for all Dark Tetrad variables and psychological aggression were high, and lower but acceptable for physical assault ($\alpha_{participant}$ = .62, $\alpha_{partner}$ = .65). Physical assault items ranged widely in terms of IPV severity. For example, some items include content pertaining to grabbing or pushing a partner, whereas other items reflect more severe forms of IPV such as kicking, choking, or using a knife or gun on a partner. Therefore, it is likely that some participants endorsing more minor forms of IPV would not also endorse the more severe forms, which would have resulted in smaller Cronbach's alpha values. Participants reported that their average frequency of engagement in psychological aggression was 14.29 times (*SD* = 19.49), and their partner's frequency of engagement in such behaviours was 15.16 times (*SD* = 21.34) throughout their lives. On the other hand, participants reported their average frequency of engagement in physical assault as 2.52 times (*SD* = 7.98), and their partner's frequency of engagement in such behaviours was 3.91 times (*SD* = 10.42). Thus, engagement in psychological aggression was higher than engagement in physical assault for participants and participant reports reflecting their partners' behaviours.

Skewness and kurtosis values for all Dark Tetrad variables fell within the acceptable range (Kline, 2011). However, physical assault was positively skewed and strongly leptokurtic. This is consistent with the notion that most individuals in the current study indicated low frequency of engagement in behaviours reflecting physical assault. These values were considered when conducting correlations and negative binomial regression analyses. Specifically, both

Pearson and Spearman's *rho* correlations are reported for physical assault due to their skewness and kurtosis values.

Table 2

Study 1 Descriptive Statistics

Variable	*M*	*SD*	α	Skewness	Kurtosis
Narcissism	15.93	6.67	.83	0.22	-0.55
Sadism	1.74	0.65	.84	0.84	0.09
Machiavellianism	2.71	0.41	.75	0.01	-0.23
Factor 1 Psychopathy	2.35	0.48	.88	0.21	-0.12
Factor 2 Psychopathy	2.04	0.42	.83	0.42	0.19
Participant Psychological Aggression Frequency	14.29	19.49	.72	2.33	6.37
Partner Psychological Aggression Frequency	15.16	21.34	.73	2.31	6.28
Participant Physical Assault Frequency	2.52	7.98	.62	6.81	64.84
Partner Physical Assault Frequency	3.91	10.42	.65	5.02	33.16

Correlations are reported in Table 3. As expected, the Dark Tetrad traits were correlated moderately-to-strongly with one another. Participant and partner psychological aggression and physical assault were also moderately-to-strongly correlated. Interestingly, all types of IPV were unrelated to narcissism, and only participant physical assault was significantly related to sadism. Although partner physical assault was significantly related to sadism when Spearman's correlations were used, the effect size was small. Machiavellianism showed a small significant correlation with partner psychological aggression. Factor 1 and 2 psychopathy were most strongly related to IPV, with small-to-medium correlations with both participant and partner psychological aggression and participant physical assault. However, the relationships between Factor 1 and 2 psychopathy and participant physical assault were non-significant when Spearman's correlations were examined. Age and year of study were unrelated to all study variables.

Table 3

Study 1 Bivariate Correlations

Variable	1	2	3	4	5	6	7	8	9	10
1. Narcissism										
2. Sadism	.30**									
3. Machiavellianism	.29**	.51**								
4. Factor 1 Psychopathy	.40**	.68**	.66**							
5. Factor 2 Psychopathy	.30**	.53**	.41**	.60**						
6. Participant psychological aggression	.05	.11	.13	.14*	.19**					
7. Partner psychological aggression	.02	.08	.14*	.21**	.25**	.78**				
8. Participant physical assault	.11 (.04)	.18** (.17**)	.05 (.08)	.15* (.10)	.15* (.08)	.29** (.42**)	.21** (.32**)			
9. Partner physical assault	.04 (.11)	.08 (.15*)	.09 (.08)	.10 (.12)	.11 (.15*)	.31** (.40**)	.46** (.45**)	.49** (.67**)		
10. Age	-.10	-.07	-.10	-.12	-.03	.12	.08	.02 (.003)	.06 (.03)	
11. Year of study	-.06	-.05	-.08	-.08	.01	.06	.09	.04 (.02)	.08 (.05)	.59**

Note. Bonferroni correction applied. $^{**}p < .001$, $^{*}p < .005$. Spearman's correlations in brackets. Remainder are Pearson's correlations.

As expected, men scored significantly higher than women on the Dark Tetrad variables (see Table 4). Notably, there were no significant gender differences in participant or partner psychological aggression and physical assault.

Table 4

Study 1 Gender Differences

Variable	*M(SD)* men	*M(SD)* women	*t*	Cohen's *d*
Narcissism	17.47(7.10)	15.36(6.42)	2.84*	.31
Sadism	2.17(0.69)	1.59(0.56)	7.79**	.92
Machiavellianism	2.84(0.42)	2.67(0.40)	3.67**	.42
Factor 1 Psychopathy	2.67(0.44)	2.23(0.44)	9.03**	1.00
Factor 2 Psychopathy	2.25(0.44)	1.97(0.39)	6.41**	.67
Participant psychological aggression	11.82(18.49)	15.23(19.80)	-1.56	.18
Partner psychological aggression	16.05(23.85)	14.83(20.34)	0.51	.06
Participant physical assault	2.94(11.41)	2.37(6.25)	0.64	.06
Partner physical assault	3.50(7.29)	4.07(11.39)	-0.49	.06

Note. $^{**}p<.001$, $^{*}p<.01$.

2.4.2. Negative Binomial Regression: Participant Psychological Aggression as Outcome

The first model regressed participant psychological aggression frequency on the covariate gender, the Dark Tetrad traits, and partner psychological aggression frequency (see Table 5). The coefficients for gender, partner psychological aggression, and narcissism were significant. This indicates that for every unit increase in partner psychological aggression and narcissism, there was a 5% and 2% increase, respectively, in the rate of participant psychological aggression. Although gender also had a significant effect on the rate of participant psychological aggression, this was likely due to the presence of a suppression effect (Kline, 2011), as gender on its own was not a significant predictor of participant psychological aggression (b = 0.25, SE = .13, p = .092, IRR = 1.28). Specifically, there were significant gender differences on the Dark Tetrad variables, so it is likely that including gender and dark traits together within the regression models resulted in the residual variance for gender accounting for a significant proportion of variance in psychological aggression. Thus, this gender finding should be interpreted with caution.

The next five models regressed participant psychological aggression frequency on the covariate gender, each Dark Tetrad trait (one per model), partner psychological aggression frequency, and the Dark Tetrad trait×partner psychological aggression interactions (see Table 5). Across all models, for every unit increase in partner psychological aggression, the rate of participant psychological aggression increased significantly. Narcissism and sadism were also significantly associated with psychological aggression, such that for every unit increase in narcissism and sadism, the rate of participant psychological aggression increased by 2% and 20%, respectively.

Table 5

Study 1 Negative Binomial Regression Models with Participant Psychological Aggression Frequency as Outcome

	Model Estimates			
Predictor	*b*	*SE*	*p*	*IRR*
Model 1				
Gender	**0.59**	**.13**	**<.001**	**1.80**
Partner psychological aggression	**0.05**	**.00**	**<.001**	**1.05**
Narcissism	**0.02**	**.01**	**.035**	**1.02**
Sadism	0.16	.11	.136	1.17
Machiavellianism	0.16	.16	.327	1.17
Factor 1 psychopathy	-0.29	.18	.104	0.75
Factor 2 psychopathy	0.20	.15	.194	1.22
Model 2				
Gender	**0.57**	**.11**	**<.001**	**1.77**
Partner psychological aggression	**0.05**	**.00**	**<.001**	**1.05**
Narcissism	**0.02**	**.01**	**.005**	**1.02**
Narcissism×Partner psychological aggression	0.00	.00	.242	1.00
Model 3				
Gender	**0.60**	**.12**	**<.001**	**1.82**
Partner psychological aggression	**0.05**	**.00**	**<.001**	**1.05**
Sadism	**0.18**	**.08**	**.025**	**1.20**
Sadism×Partner psychological aggression	0.00	.00	.103	1.00
Model 4				
Gender	**0.53**	**.11**	**<.001**	**1.70**
Partner psychological aggression	**0.05**	**.00**	**<.001**	**1.05**
Machiavellianism	0.17	.12	.154	1.19
Mach×Partner psychological aggression	**-0.02**	**.01**	**<.001**	**0.98**
Model 5				
Gender	**0.57**	**.12**	**<.001**	**1.77**
Partner psychological aggression	**0.05**	**.00**	**<.001**	**1.05**
Factor 1 psychopathy	0.18	.11	.115	1.20
F1×Partner psychological aggression	**-0.02**	**.00**	**<.001**	**0.98**
Model 6				
Gender	**0.57**	**.12**	**<.001**	**1.77**
Partner psychological aggression	**0.05**	**.00**	**<.001**	**1.05**
Factor 2 psychopathy	**0.34**	**.13**	**.006**	**1.40**
F2×Partner psychological aggression	**-0.02**	**.00**	**<.001**	**0.98**

Note. $N = 357$. *b* = unstandardized coefficient; *SE* = standard error for *b*; *IRR* = incident rate ratio. Significant coefficients bolded.

Significant interactions emerged for all models except for narcissism and sadism (see Figure 1). Examination of simple slopes revealed that at low levels of Factor 1 psychopathy, the relationship between partner psychological aggression and participant psychological aggression was slightly stronger ($b = 0.063$, $t = 14.41$, $p < .001$, $IRR = 1.07$) than at high levels of Factor 1 psychopathy ($b = 0.041$, $t = 15.08$, $p < .001$, $IRR = 1.04$). Similarly, at low levels of Factor 2 psychopathy, the relationship between partner psychological aggression and participant psychological aggression was slightly stronger ($b = 0.061$, $t = 15.15$, $p < .001$, $IRR = 1.06$) than at high levels of Factor 2 psychopathy ($b = 0.041$, $t = 14.71$, $p < .001$, $IRR = 1.04$). Finally, at low levels of Machiavellianism, the association between partner psychological aggression and participant psychological aggression was slightly stronger ($b = 0.061$, $t = 12.90$, $p < .001$, $IRR = 1.06$) than at high levels of Machiavellianism ($b = 0.042$, $t = 12.91$, $p < .001$, $IRR = 1.04$). Contrary to prediction, these results demonstrate that bidirectional psychological aggression tends to occur more strongly at lower levels of the Dark Tetrad traits[3].

[3] Separate negative binomial regressions for men and women are reported in Appendix B.

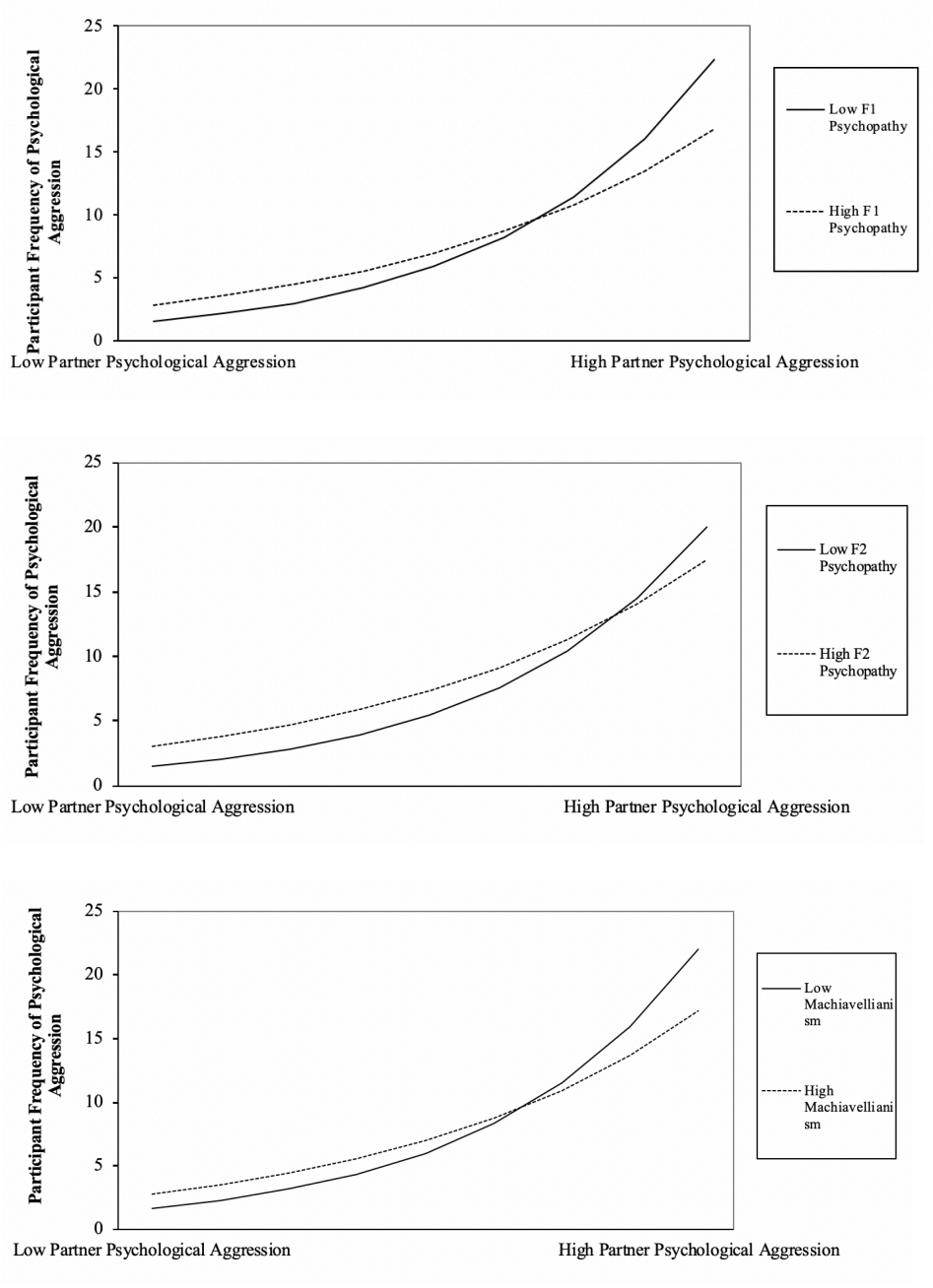

Figure 1. Study 1 participants' frequency of psychological aggression as a function of trait and partners' frequency of psychological aggression. Low partner psychological aggression = 1SD below mean; high partner psychological aggression = 1SD above mean. Predictor variables grand-mean centered.

2.4.3. Negative Binomial Regression: Participant Physical Assault as Outcome

The first model regressed participant physical assault frequency on the covariate gender, the Dark Tetrad traits, and partner physical assault frequency (see Table 6). The coefficients for gender, partner physical assault, and sadism were significant. Specifically, for every unit increase in partner physical assault and sadism, there was a 20% and 97% increase, respectively, in the rate of participant physical assault. The significant finding for gender, however, was likely due to a suppression effect (Kline, 2011), as gender on its own was not a significant predictor of participant physical assault (b = -0.22, SE = .34, p = .520, IRR = 0.80). Therefore, this effect should be interpreted with caution.

The next five models regressed participant physical assault frequency on the covariate gender, each Dark Tetrad trait (one per model), partner physical assault frequency, and the Dark Tetrad trait×partner physical assault interactions (see Table 6). Across all models, for every unit increase in partner physical assault, the rate of participant physical assault increased significantly. Sadism was also significantly associated with physical assault, such that for every unit increase in sadism, the rate of participant physical assault increased by 92%.

Table 6

Study 1 Negative Binomial Regression Models with Participant Physical Assault Frequency as Outcome

	Model Estimates			
Predictor	*b*	*SE*	*p*	*IRR*
Model 1				
Gender	**1.13**	**.32**	**<.001**	**3.10**
Partner physical assault	**0.18**	**.01**	**<.001**	**1.20**
Narcissism	-0.01	.02	.712	0.99
Sadism	**0.68**	**.26**	**.009**	**1.97**
Machiavellianism	-0.15	.40	.698	0.86
Factor 1 psychopathy	0.11	.44	.806	1.12
Factor 2 psychopathy	-0.02	.37	.958	0.98
Model 2				
Gender	**0.88**	**.29**	**.002**	**2.41**
Partner physical assault	**0.17**	**.01**	**<.001**	**1.19**
Narcissism	0.01	.02	.685	1.01
Narcissism×Partner physical assault	**0.01**	**.00**	**.001**	**1.01**
Model 3				
Gender	**1.14**	**.31**	**<.001**	**3.13**
Partner physical assault	**0.17**	**.01**	**<.001**	**1.19**
Sadism	**0.65**	**.20**	**.001**	**1.92**
Sadism×Partner physical assault	0.01	.01	.334	1.01
Model 4				
Gender	**-0.47**	**.07**	**<.001**	**0.63**
Partner physical assault	**0.04**	**.00**	**<.001**	**1.04**
Machiavellianism	**0.23**	**.09**	**.010**	**1.26**
Mach×Partner physical assault	**-0.02**	**.00**	**<.001**	**0.98**
Model 5				
Gender	**1.00**	**.31**	**.001**	**2.72**
Partner physical assault	**0.18**	**.01**	**<.001**	**1.20**
Factor 1 psychopathy	0.51	.28	.072	1.67
F1×Partner physical assault	0.00	.03	.913	1.00
Model 6				
Gender	**0.94**	**.30**	**.002**	**2.56**
Partner physical assault	**0.18**	**.01**	**<.001**	**1.20**
Factor 2 psychopathy	0.46	.31	.137	1.58
F2×Partner physical assault	0.01	.03	.620	1.01

Note. $N = 357$. *b* = unstandardized coefficient; *SE* = standard error for *b*; *IRR* = incident rate ratio. Significant coefficients bolded.

Significant interactions emerged for narcissism and Machiavellianism (see Figure 2). As expected, examination of simple slopes revealed that at low levels of narcissism, the relationship between partner physical assault and participant physical assault was weaker ($b = 0.131$, $t = 8.40$, $p < .001$, $IRR = 1.14$) than at high levels of narcissism ($b = 0.213$, $t = 14.32$, $p < .001$, $IRR = 1.24$). However, at low levels of Machiavellianism, the relationship between partner physical assault and participant physical assault was slightly stronger ($b = 0.053$, $t = 5.86$, $p < .001$, $IRR = 1.05$) than at high levels of Machiavellianism ($b = 0.036$, $t = 5.72$, $p < .001$, $IRR = 1.04$). Consistent with expectation, these results demonstrate that bidirectional physical assault tends to occur more strongly at higher levels of narcissism. Those high in Machiavellianism, however, appear to engage in more unidirectional physical assault than those low in Machiavellianism (see Figure 2).

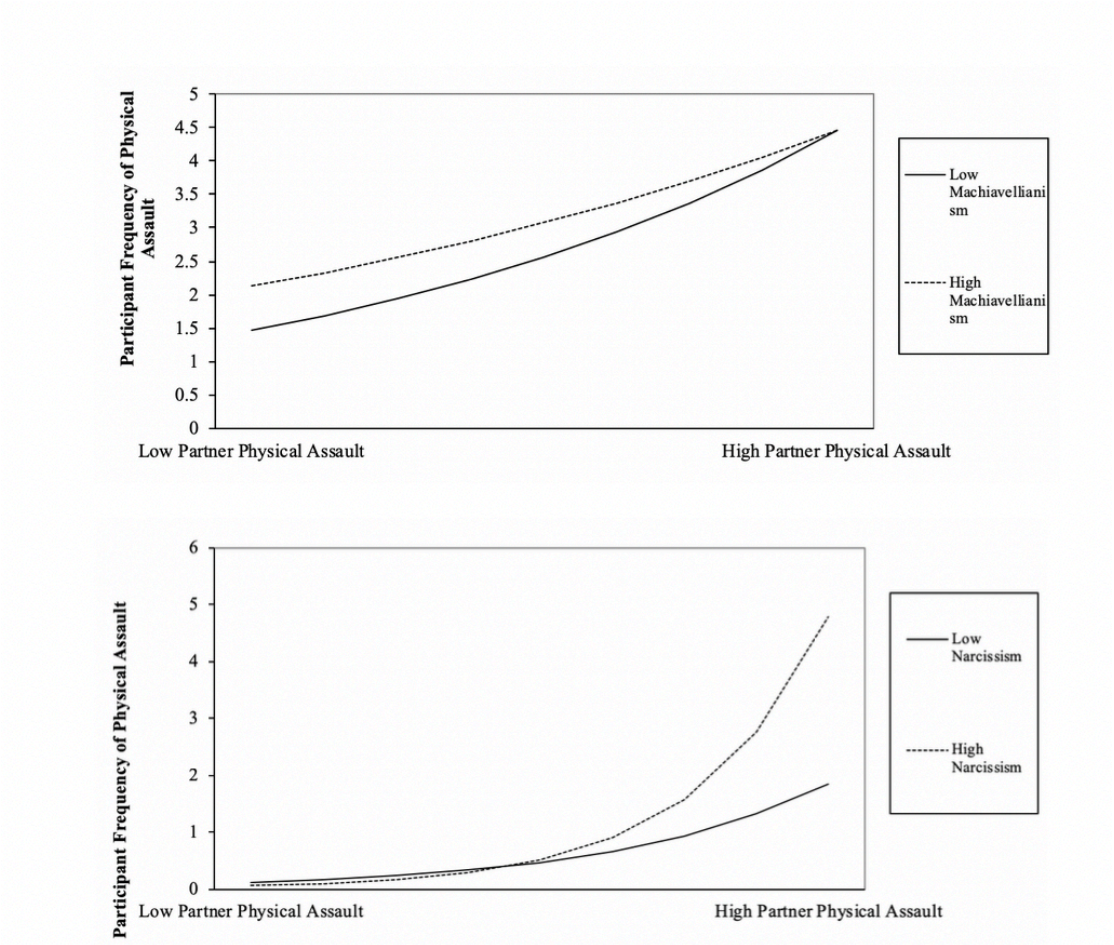

Figure 2. Study 1 participants' frequency of physical assault as a function of trait and partners' frequency of physical assault. Low partner physical assault = 1SD below mean; high partner physical assault = 1SD above mean. Predictor variables grand-mean centered.

2.5. Study 2

2.5.1. Research Objectives and Hypotheses

Despite widespread usage of the CTS-2 for evaluating self and partner levels of IPV, the scale only considers frequency and not severity of IPV, and as such, gender differences in IPV may be overlooked (e.g., Graham et al., 2012). Several studies have shown that women sustain more severe injuries as a result of men's perpetration of physical IPV, which can be attributed to their physical strength and size (Caldwell, Swan, & Woodbrown, 2012; Cascardi & Vivian, 1995; Vivian & Langhinrichsen-Rohling, 1994). On the other hand, samples of men and women typically report comparable rates of IPV when severity is not considered (Katz, Kuffel, & Coblentz, 2002). It is also important to evaluate whether the results of Study 1 generalize to wider demographic groups. Therefore, the purpose of Study 2 is to determine whether the Dark Tetrad traits moderate relationships between participants' and their partners' severity of physical IPV perpetration using an alternate method of IPV assessment.

Similar to Study 1, we hypothesized a stronger bidirectional IPV relationship at higher levels of Factor 2 psychopathy. We also predicted a stronger bidirectional IPV relationship at higher levels of narcissism. We anticipated that those high in Factor 1 psychopathy and sadism would engage in IPV regardless of their partner's levels of perpetration, indicative of a main effect. Finally, we did not expect that Machiavellianism would have an impact on IPV perpetration.

2.6. Method

2.6.1. Participants

A total of 360 participants (153 men, 207 women) were recruited through the crowdsourcing marketplace, Amazon Mechanical Turk (MTurk). Individuals were eligible to

participate if they were age 18 or older, resided in Canada or the United States, and if they were involved in at least one romantic relationship lasting for a minimum of three months at some time in their life. To avoid recruiting inattentive workers and bot workers from MTurk, participants were required to have completed between 100 and 500 MTurk human intelligence tasks (HITs) previously; have a HIT approval rate above 95%; complete a CAPTCHA image on the survey-hosting platform, Qualtrics; and correctly respond to 2 of 3 attention checks on Qualtrics. Open-ended responses were also screened by the researcher following data collection to ensure that participants understood the task. Although participant attentiveness has been recognized by researchers as an issue for self-report MTurk studies (Goodman, Cryder, & Cheema, 2013), recent research has indicated that MTurk participants are more attentive to instructions, assessed using an instructional manipulation check, than are college student samples (Hauser & Schwarz, 2016). MTurk worker samples also pass manipulation checks at rates similar to college student samples (Paolacci, Chandler, & Ipeirotis, 2010).

Participants ranged in age from 18 to 73 years (M_{age} = 34.39, SD_{age} = 10.96). The majority of participants lived in the United States (n = 339), and the remainder of participants lived in Canada (n = 21). Demographic information, including race/ethnicity, relationship status, highest level of education completed, current employment status, and income group are presented in Table 7. A majority of participants were married or in a dating relationship at the time of study enrolment. Of those married, engaged, or in a relationship, the average length of relationship was 7.75 years (SD = 8.16 years).[4]

[4] There were 18 additional participants who reported length of relationship numerically without recording whether the length was in months or years; these participants' relationship lengths were not included.

Table 7

Study 2 Participant Demographic Information

Variable	Frequency	Percentage (%)
Race/Ethnicity		
White	290	80.6
Black	27	7.5
Aboriginal	1	0.3
Asian	28	7.8
East Indian	1	0.3
Arab	1	0.3
Prefer not to say	1	0.3
Other	11	3.1
Relationship status		
Single	68	18.9
Engaged	20	5.6
Married	155	43.1
In a dating relationship	117	32.5
Highest level of education completed		
Less than high school diploma	6	1.7
High school degree or equivalent	35	9.7
Some college/university, no degree	84	23.3
Associate degree	45	12.5
Bachelor's degree	131	36.4
Master's degree	47	13.1
Professional degree	7	1.9
Doctorate	5	1.4
Employment status		
Full-time employed	194	53.9
Part-time employed	57	15.8
Unemployed	30	8.3
Self-employed	40	11.1
Student	25	6.9
Retired	14	3.9
Income group (per year)		
Less than $10,000	38	10.6
$10,001 - $20,000	33	9.2
$20,001 - $30,000	39	10.8
$30,001 - $40,000	53	14.7
$40,001 - $50,000	53	14.7
Over $50,000	144	40.0

There were 66 additional participants whose data were not used for the current study because they reported being non-heterosexual, and 5 participants' data were not used because they reported being nonbinary. These data were not used for this study because there were not large enough groups of non-heterosexual or nonbinary individuals to assess group differences on IPV. In addition, because partner gender was not requested, it would be impossible to accurately examine gender effects. Specifically, it would not have been possible to detect whether the bidirectional IPV relationships reported in this study were influenced by the partner's gender, which would add a confounding element to the study.

2.6.2. Procedure

The study was approved by the Non-Medical Research Ethics Board at the University of Western Ontario prior to data collection. Eligible individuals signed up to participate through MTurk and were redirected to complete a series of anonymous personality and relationship behaviour questionnaires via Qualtrics. The study took approximately 0.5 hours to complete. Participation was voluntary and all individuals received compensation of 1USD for their time. This compensation amount is consistent with typical reported median hourly wages of 1.38USD (Horton & Chilton, 2010).

2.6.3. Measures

2.6.3.1. Self-Report Psychopathy Scale-IV. (SRP-IV; Paulhus et al., 2015). The SRP-IV is a 64-item self-report questionnaire designed to evaluate subclinical levels of psychopathy. It is considered analogous to Hare (1991)'s Psychopathy Checklist - Revised. Participants respond to items on a 5-point scale (1 = *strongly disagree,* 5 = *strongly agree*). Mean scores were calculated for Factor 1 psychopathy and 2 psychopathy. The validity and reliability of the SRP-IV is well-established (total score α = .89 - .92; Paulhus et al., 2015).

2.6.3.2. Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979). The NPI is a 40-item forced-choice measure designed to measure levels of narcissism in the general population. Participants chose between options A and B on items such as "*I have a natural talent for influencing people*" and "*I am not good at influencing people*." Positive response endorsements were coded as 1, and the remaining were coded as 0. Dichotomized scores were summed for each participant, resulting in scores ranging from 0-40. Empirical research supports the validity and reliability of the NPI (α = .87; Emmons, 1987).

2.6.3.3. MACH-IV (Christie & Geis, 1970). The 20-item MACH-IV was developed to assess levels of Machiavellianism in the general population. Participants responded to items on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Mean scores were calculated to obtain overall levels of Machiavellianism, such that higher scores indicated higher levels of Machiavellianism. The MACH-IV has high validity and internal consistency (α = .83; Jones & Paulhus, 2014).

2.6.3.4. Assessment of Sadistic Personality (ASP; Plouffe et al., 2017). The ASP is a 9-item self-report measure of subclinical sadism. Items are endorsed on a 5-point Likert scale (1 = *strongly disagree,* 5 = *strongly agree*). Mean scores were obtained by averaging sadism items, with higher scores indicating higher levels of sadism. The validity and reliability of the ASP has been supported in past research (α = .83; Plouffe et al., 2017).

2.6.3.5. Participant and partner IPV perpetration. Participant IPV was evaluated using an adapted version of procedures outlined by Graham et al. (2012). Specifically, participants were asked the following pertaining to their physical aggression toward a partner over their lifetime: "*People can be physically aggressive in many ways, for example, pushing, punching, slapping, or physical aggression in some other way. What is the most physically*

aggressive thing that you have done over your lifetime to someone who is or was in a close romantic relationship with you such as a spouse/partner, lover, or someone you are or were dating or going out with for at least three months?" Exact responses were recorded, and aggressive behaviours were coded into categories reflecting increasing severity by two independent reviewers. When reviewers disagreed about categorization, they discussed choices until agreement was reached. The categories differed slightly from Graham et al. (2012) to accommodate responses that did not fit into original categories such as scratching, biting, sexual assault/rape, etc. The final categories included: 0 = *no violence,* 1 = *push/shove,* 2 = *grab/restrain,* 3 = *slap/smack/scratch/bite,* 4 = *hit,* 5 = *punch,* 6 = *kick,* 7 = *hit with a thrown object,* 8 = *choke/strangle/headlock,* 9 = *assault with a deadly weapon/sexual assault/rape.* If participants indicated that they acted in self-defence, their responses were coded as 0. If participants reported multiple aggressive incidents, the most severe incident was scored. Due to the nature of the sample (i.e., general community sample), scores on this measure will largely reflect acts of situational couple violence rather than intimate terrorism.

To assess levels of partner IPV, participants were asked the same question pertaining to their partner's IPV perpetration toward them over their lifetime (i.e., victimization severity). Similar to Graham et al. (2012), participants were asked whether the two incidents reported occurred within the same incident or with the same partner. This allowed for evaluation of whether the IPV was bidirectional or one-sided.

2.6.4. Data Analytic Strategy[5]

Descriptive statistics, reliability coefficients, Spearman's *rho* correlations, and Pearson correlations were calculated using SPSS Version 26 (IBM Corp., 2019). Due to the ordinal

[5] Data and code available at https://osf.io/ptwj4/

nature of the outcome variable, we used MPlus Version 8.3 (Muthén & Muthén, 1998–2017) to conduct six ordinal logistic regression models with the maximum likelihood estimator. All predictor variables in the interaction models were grand-mean centered. The first model included gender as a covariate and each Dark Tetrad trait, as well as IPV victimization severity as predictors of IPV perpetration severity. Five additional models were conducted with gender included as a covariate and each Dark Tetrad trait (one per model), IPV victimization severity, and the Dark Tetrad trait×victimization interaction as predictors of IPV perpetration severity. We used listwise deletion due to the low proportion of missing data (n = 3).

2.7. Results

2.7.1. Descriptive Statistics and Background Analyses

Descriptive statistics, skewness, kurtosis, and Cronbach's alpha values are reported in Table 8. Internal consistency for all variables was high, and skewness and kurtosis values for all study variables fell within the acceptable range (Kline, 2011). Spearman's *rho* and Pearson correlations are reported in Table 9. As expected, the Dark Tetrad traits were correlated moderately-to-strongly with one another. Intimate partner violence perpetration and partner IPV perpetration (i.e., victimization) were moderately correlated. Contrary to expectation, however, IPV perpetration was unrelated to any other variables, and IPV victimization had a small positive correlation with Factor 2 psychopathy and a small negative correlation with education level. Increasing age was associated with lower scores on narcissism and Factor 1 psychopathy, and higher education level was associated with lower scores on Factor 2 psychopathy and IPV victimization. Higher income was also related to higher levels of narcissism.

Table 8

Study 2 Descriptive Statistics

Variable	*M*	*SD*	α	Skewness	Kurtosis
Narcissism	12.63	7.90	.90	0.65	-0.23
Sadism	1.76	0.71	.87	1.16	1.11
Machiavellianism	2.71	0.47	.80	-0.08	0.50
Factor 1 Psychopathy	2.36	0.52	.89	0.06	-0.49
Factor 2 Psychopathy	2.17	0.52	.87	0.42	-0.18
IPV Perpetration	1.26	1.92	-	1.79	2.94
IPV Victimization	2.50	2.86	-	0.98	-0.25

Table 9

Study 2 Bivariate Correlations

Variable	1	2	3	4	5	6	7	8	9
1. Narcissism									
2. Sadism	.46**								
3. Machiavellianism	.22**	.46**							
4. Factor 1 Psychopathy	.45**	.64**	.66**						
5. Factor 2 Psychopathy	.39**	.58**	.40**	.65**					
6. IPV Perpetration	.001	-.05	-.01	.00	.11				
7. IPV Victimization	-.01	-.001	-.01	.03	.16*	.29**			
8. Age	-.19**	-.12	-.13	-.20**	-.04	.05	.09		
9. Education level	.08	-.01	.06	-.01	-.22**	-.09	-.18**	.07	
10. Income group	.16*	.08	-.02	.02	-.04	-.07	.01	.25**	.34**

Note. Bonferroni correction applied. $^{**}p < .001$, $^{*}p < .006$. Associations with IPV perpetration and IPV victimization are Spearman's *rho* correlations. Remaining are Pearson correlations.

As expected, men scored significantly higher than women on the Dark Tetrad variables (see Table 10). Notably, women scored significantly higher than men on IPV perpetration severity. There were no significant gender differences on IPV victimization severity. Figures 3 and 4 depict the percentage of men and women endorsing the different IPV perpetration and victimization behaviours.

Table 10

Study 2 Gender Differences

Variable	*M(SD)* men	*M(SD)* women	*t*	Cohen's *d*
Narcissism	13.90(8.06)	11.68(7.67)	2.66*	.28
Sadism	1.97(0.78)	1.60(0.61)	4.89**	.53
Machiavellianism	2.85(0.41)	2.61(0.48)	5.11**	.54
Factor 1 Psychopathy	2.60(0.47)	2.19(0.48)	7.95**	.86
Factor 2 Psychopathy	2.34(0.52)	2.04(0.48)	5.57**	.60
IPV Perpetration	0.86(1.74)	1.56(2.00)	-3.51**	.37
IPV Victimization	2.52(2.64)	2.49(3.03)	.10	.01

Note. **p<.001, *p<.01.

Overall, 197 individuals (54.70%) reported engaging in no IPV perpetration, and 139 (38.90%) reported that they were not victimized by IPV at any point. The most common types of IPV reported were pushing/shoving and slapping/smacking/scratching/biting. Of the total sample, 22 individuals (6.20%) reported being a victim of assault with a deadly weapon/sexual assault/rape. Of those who reported engaging in both IPV perpetration and experiencing IPV victimization, 71% reported that these events occurred within the same relationship, whereas 29% of participants reported that they occurred within different relationships.[6]

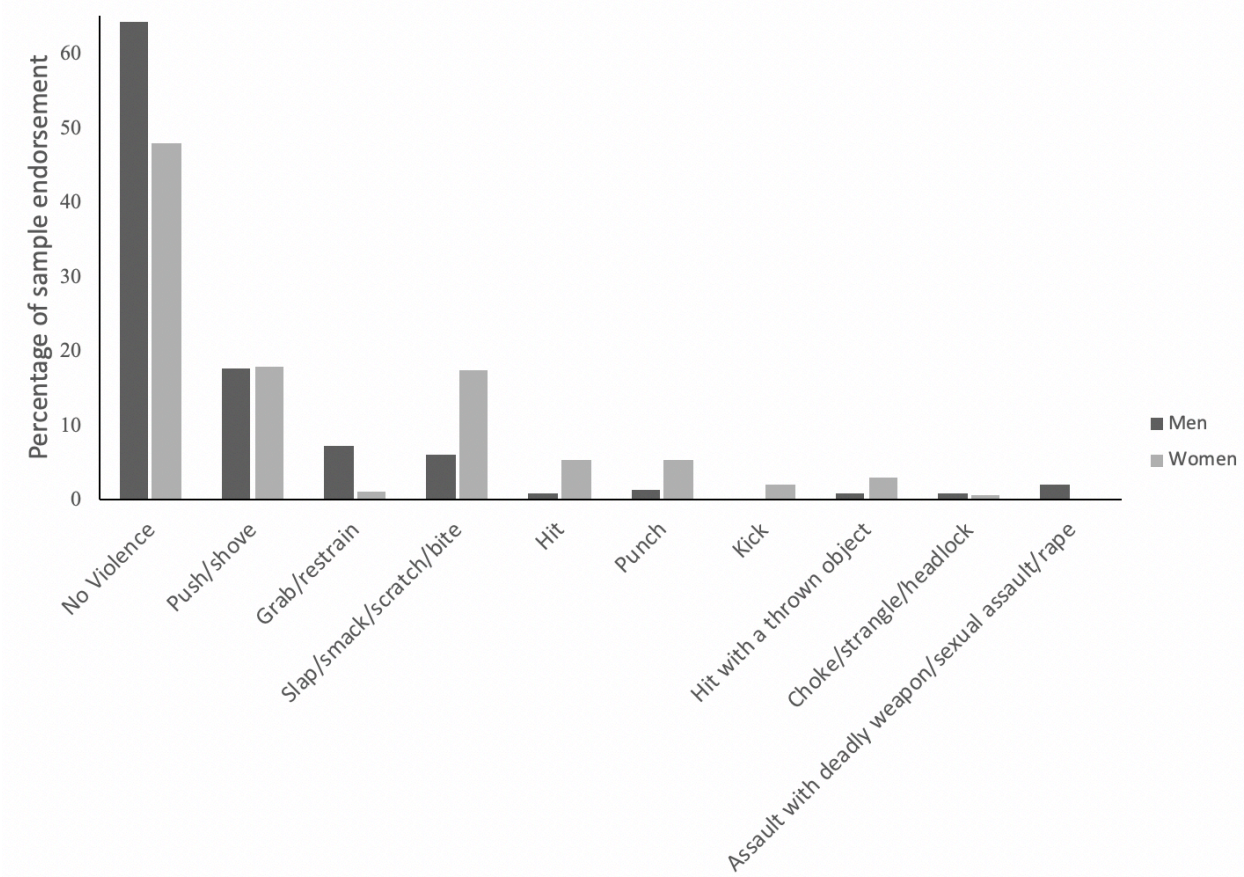

Figure 3. Study 2 percentage of men and women endorsing IPV perpetration response categories.

[6] There were only 45 valid results available for this item due to researcher error.

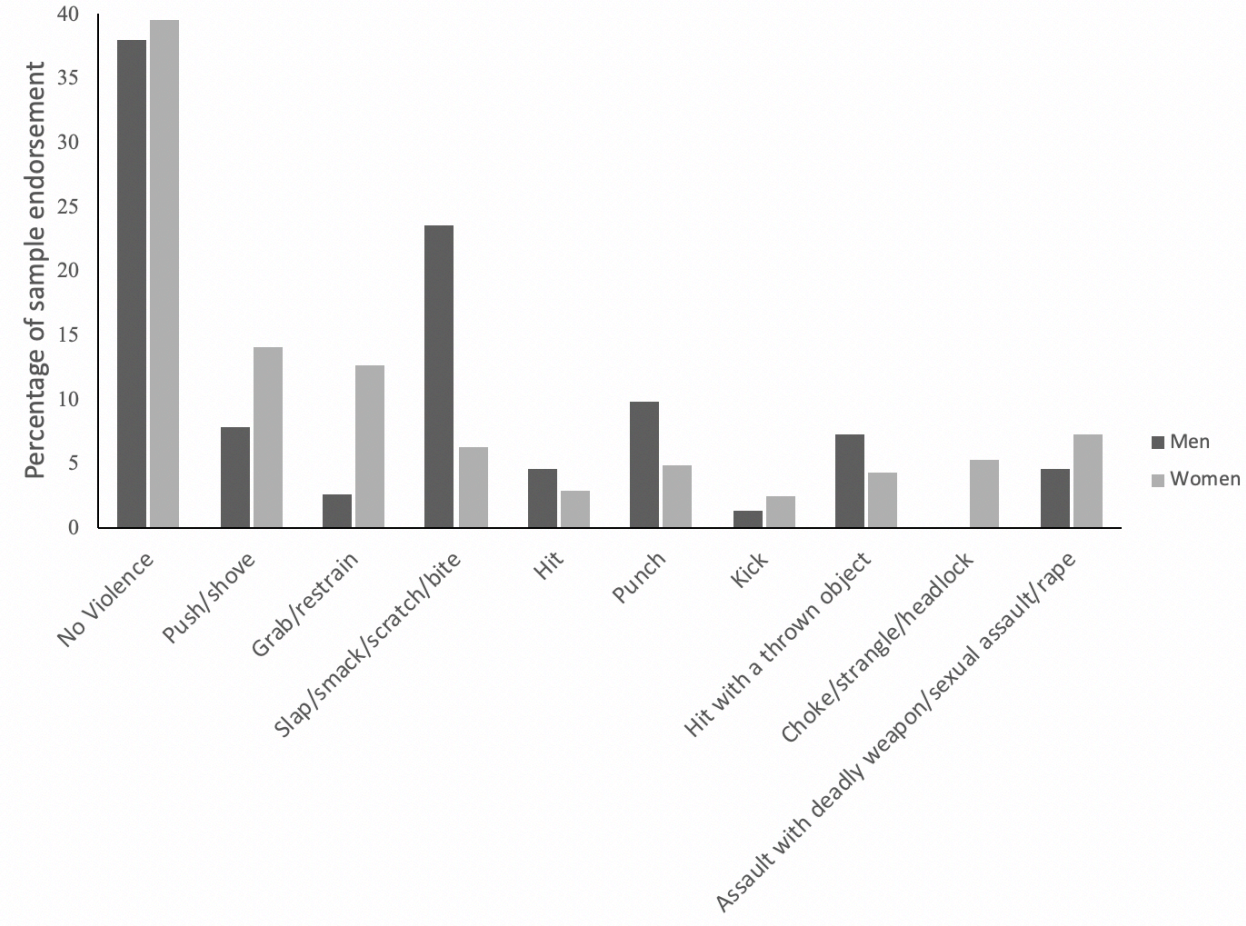

Figure 4. Study 2 percentage of men and women endorsing IPV victimization response categories.

2.7.2. Ordinal Logistic Regression

The first model regressed IPV perpetration severity on gender, each Dark Tetrad trait, and IPV victimization severity. When all variables were considered, being female, severity of IPV victimization, and higher levels of Factor 2 psychopathy were associated with increased odds of more severe IPV perpetration (see Table 11). Specifically, being female resulted in an expected 1.03 increase in log odds of moving from a given level of IPV perpetration severity to a higher level. Additionally, for every unit increase in IPV victimization, there was an expected

0.15 increase in log odds of moving from a given level of IPV perpetration to a higher level. Finally, for a unit increase in Factor 2 psychopathy, there was an expected 0.84 increase in log odds of moving from a given level of IPV perpetration to a higher level.

To evaluate whether narcissism moderated the relationship between IPV victimization severity and IPV perpetration severity, the second model regressed IPV perpetration severity on gender, narcissism, IPV victimization severity, and the narcissism×IPV victimization severity interaction. Contrary to expectation, being female and IPV victimization severity were the only two variables that significantly increased odds of more severe IPV perpetration (see Table 11). Specifically, being female resulted in an expected 0.84 increase in log odds of moving from a given level of IPV perpetration to a higher level, and for every unit increase in IPV victimization, there was an expected 0.16 increase in log odds of moving from a given level of IPV perpetration to a higher level.

To assess sadism as a moderator in the relationship between IPV victimization severity and IPV perpetration severity, a third model regressed IPV perpetration severity on gender, sadism, IPV victimization severity, and the sadism×IPV victimization severity interaction. Again, being female and IPV victimization severity were the only two variables that significantly increased odds of more severe IPV perpetration (see Table 11). Specifically, being female resulted in an expected 0.91 increase in log odds of moving from a given level of IPV perpetration to a higher level, and for every unit increase in IPV victimization, there was an expected 0.17 increase in log odds of moving from a given level of IPV perpetration to a higher level.

The next model included Machiavellianism as a moderator in the relationship between IPV victimization severity and IPV perpetration severity. The fourth model regressed IPV

perpetration severity on gender, Machiavellianism, IPV victimization severity, and the Machiavellianism×IPV victimization severity interaction. Results showed that being female and IPV victimization severity were the only two variables that significantly increased odds of more severe IPV perpetration (see Table 11). Specifically, being female resulted in an expected 0.93 increase in log odds of moving from a given level of IPV perpetration to a higher level, and for every unit increase in IPV victimization, there was an expected 0.17 increase in log odds of moving from a given level of IPV perpetration to a higher level.

In the fifth model, IPV perpetration severity was regressed on gender, Factor 1 psychopathy, IPV victimization severity, and the Factor 1 psychopathy×IPV victimization severity interaction. Again, contrary to expectations, being female and IPV victimization severity were the only two variables that significantly increased odds of more severe IPV perpetration (see Table 11). Specifically, being female resulted in an expected 0.98 increase in log odds of moving from a given level of IPV perpetration to a higher level, and for every unit increase in IPV victimization, there was an expected 0.17 increase in log odds of moving from a given level of IPV perpetration to a higher level.

Finally, IPV perpetration severity was regressed on gender, Factor 2 psychopathy, IPV victimization severity, and the Factor 2 psychopathy×IPV victimization severity interaction. In this model, being female, IPV victimization severity, and Factor 2 psychopathy significantly increased odds of more severe IPV perpetration (see Table 11). However, the interaction term was not significant. Specifically, being female resulted in an expected 1.03 increase in log odds of moving from a given level of IPV perpetration to a higher level. Additionally, for every unit increase in IPV victimization, there was an expected 0.16 increase in log odds of moving from a given level of IPV perpetration to a higher level. Finally, for a unit increase in Factor 2

psychopathy, there was an expected 0.65 increase in log odds of moving from a given level of IPV perpetration to a higher level[7].

[7] Separate ordinal logistic regressions for men and women are reported in Appendix C.

Table 11

Study 2 Ordinal Logistic Regression Models with IPV Perpetration Severity as Outcome

Predictor	Model Estimates			
	b	*SE*	*p*	*OR* (95% CI)
Model 1				
Gender	**1.03**	**.24**	**<.001**	**2.81 (1.76, 4.46)**
IPV victimization	**0.15**	**.04**	**<.001**	**1.16 (1.08, 1.25)**
Narcissism	-0.01	.02	.755	1.00 (0.97, 1.03)
Sadism	-0.21	.21	.308	0.81 (0.54, 1.22)
Machiavellianism	0.28	.31	.372	1.32 (0.72, 2.43)
Factor 1 psychopathy	-0.05	.36	.898	0.96 (0.47, 1.93)
Factor 2 psychopathy	**0.84**	**.28**	**.003**	**2.31 (1.33, 4.02)**
				R^2 = .14, p <.001
Model 2				
Gender	**0.84**	**.22**	**<.001**	**2.33 (1.51, 3.57)**
IPV victimization	**0.16**	**.04**	**<.001**	**1.17 (1.09, 1.25)**
Narcissism	0.01	.01	.497	1.01 (0.98, 1.04)
Narcissism×IPV victimization	0.002	.00	.552	1.00 (0.99, 1.01)
				R^2 = .10, p = .002
Model 3				
Gender	**0.91**	**.23**	**<.001**	**2.47 (1.59, 3.85)**
IPV victimization	**0.17**	**.04**	**<.001**	**1.19 (1.11, 1.28)**
Sadism	0.14	.16	.368	1.15 (0.85, 1.56)
Sadism×IPV victimization	0.09	.06	.116	1.09 (0.98, 1.22)
				R^2 = .11, p = .001
Model 4				
Gender	**0.93**	**.23**	**<.001**	**2.53 (1.63, 3.94)**
IPV victimization	**0.17**	**.04**	**<.001**	**1.19 (1.10, 1.28)**
Machiavellianism	0.39	.24	.107	1.48 (0.92, 2.37)
Mach×IPV victimization	0.07	.08	.357	1.07 (0.92, 1.25)
				R^2 = .11, p = .001
Model 5				
Gender	**0.98**	**.24**	**<.001**	**2.66 (1.68, 4.21)**
IPV victimization	**0.17**	**.04**	**<.001**	**1.18 (1.10, 1.27)**
Factor 1 psychopathy	0.37	.22	.094	1.45 (0.94, 2.23)
F1×IPV victimization	0.05	.06	.421	1.05 (0.93, 1.19)
				R^2 = .11, p = .001
Model 6				
Gender	**1.03**	**.23**	**<.001**	**2.81 (1.80, 4.40)**
IPV victimization	**0.16**	**.04**	**<.001**	**1.17 (1.09, 1.26)**
Factor 2 psychopathy	**0.65**	**.22**	**.003**	**1.91 (1.25, 2.92)**
F2×IPV victimization	0.11	.07	.112	1.11 (0.98, 1.27)
				R^2 = .14, p < .001

Note. N = 357. b = unstandardized coefficient; *SE* = standard error for b; *OR* = odds ratio; CI = confidence interval; R^2 = McKelvey & Zavoina's pseudo-R^2; IPV = intimate partner violence.
Significant coefficients bolded.

Across all models, an error occurred when running Brant Wald Tests of proportional odds for IPV perpetration. This indicated that the odds ratios for predictor variables were not stable across the 10 thresholds. However, this finding is not uncommon when the sample size is large (Allison, 1999) or there are continuous predictor variables in the model (Allison, 1999; O'Connell, 2006). When the models were tested using multiple linear regression, the same findings mostly emerged, indicating stability in the results (see Appendix D). However, there were some differences, such that sadism and Factor 2 psychopathy significantly moderated the relationship between IPV victimization and perpetration severity. In addition, when the Dark Tetrad traits were modelled separately, Machiavellianism and Factor 1 psychopathy were significantly associated with IPV perpetration severity. Despite these differing results, the use of ordinary least squares estimation is inappropriate given the ordinal nature of the outcome and violation of the assumption of homoscedastic residuals.

2.8. Discussion

The overarching purpose of this research was to identify the distinct moderating effects of the Dark Tetrad traits on the relationships between participants' and their partners' IPV perpetration (i.e., bidirectional IPV). These effects were evaluated across two studies: Study 1 implemented a survey-based measure of physical and psychological IPV frequency, whereas Study 2 used an open-ended measure of physical IPV severity.

Prior to assessing moderation effects in Study 1, bivariate correlations showed that the Dark Tetrad traits were moderately-to-strongly correlated with one another, which is consistent with past research (e.g., Plouffe et al., 2017, 2019; Smoker & March, 2017). Furthermore, participant and partner psychological aggression were strongly correlated, and participant and partner physical assault were strongly correlated. This is consistent with past research

demonstrating that bidirectional violence tends to be common in relationships across general population-based studies (Langhinrichsen-Rohling et al., 2012). In addition, small-to-medium significant correlations emerged between frequency of psychological aggression and physical assault. Interestingly, women and men did not differ significantly in frequency of participant or partner IPV perpetration. However, this is in line with findings that although women often sustain more severe injuries by their partners (Archer, 2000), women and men's frequencies of engagement in situational couple violence are comparable among community samples (Archer, 2000; Tetreault et al., in press).

When participant psychological aggression frequency was entered as a criterion across regression models, gender, frequency of partners' psychological aggression, narcissism, and sadism were significantly associated with this outcome. These findings pertaining to narcissism are consistent with past research, such that those with higher levels of narcissism reported higher levels of psychological abuse perpetration in relationships among college students and community members (Carton & Egan, 2017; Gormley & Lopez, 2010). Additionally, this is consistent with research findings that men high in clinical levels of aggressive-sadistic personality disorders demonstrated high rates of verbal aggression during in-lab verbal intimate partner conflicts (Gottman et al., 1995). However, the significant gender effect was likely due to the presence of a suppressor variable (Kline, 2011), as gender on its own was not a significant predictor of IPV perpetration, and there were no significant differences between men and women in IPV. As mentioned previously, it is likely that once variance from the Dark Tetrad traits was controlled for, this resulted in the residual variance for gender accounting for a significant proportion of variance in psychological aggression. Thus, this gender finding should be interpreted with caution.

An unexpected finding also emerged upon examination of moderation effects. Specifically, as partners' levels of psychological aggression increased, individuals low in Factor 1 and 2 psychopathy, as well as Machiavellianism engaged in psychological aggression at higher rates than those exhibiting higher levels of these traits. Use of the CTS-2 does not allow for examination of the context in which the violence occurred, so this finding is somewhat unsurprising for those low on the Dark Tetrad traits if they are engaging in IPV as a method of self-defence, emotion regulation, retaliation for past victimization, or previous abuse (Stuart, Moore, Hellmuth, Ramsey, & Kahler, 2006). In addition, Capezza and Arriaga (2008) found that college students perceived physical aggression to be less acceptable than psychological aggression, and thus, engagement in psychological aggression may be more pervasive among the general population, even among those exhibiting low levels of the Dark Tetrad traits. Mager et al. (2014) also found similar results to the current study, such that women low in Factor 1 psychopathy engaged in more frequent bidirectional IPV than women high in Factor 1 psychopathy. They speculated that for women high on Factor 1 psychopathy, their partner's violent behaviour may be less influential than their antagonism and lack of empathy in their own IPV perpetration (Mager et al., 2014). It is possible that this explanation extends to those high in Factor 2 psychopathy and Machiavellianism.

When frequency of physical assault was considered as a criterion across regression models, consistent with expectation, frequency of partners' physical assault and levels of sadism were significantly associated with this outcome. This is consistent with past findings in clinical samples that those higher scores on sadism, as measured using the Millon Clinical Multiaxial Inventory (MCMI-II; Millon, 1987), tend to engage in more proactive than reactive spousal abuse, such that they implement physical and verbal violence as a means to control and

intimidate their partners (Chase et al., 2001). Again, however, gender emerged as a significant predictor across models, which was likely due to the suppression effects described previously (Kline, 2011). As expected, narcissism emerged as a moderator in the relationship between participants' and partners' frequency of physical assault. Specifically, as partners' levels of physical assault increased, individuals high in narcissism engaged in physical assault at higher rates than those low in narcissism. This supports past empirical research suggesting that individuals high in narcissism are likely to aggress when faced with an ego-threatening situation (e.g., Baumeister et al., 2000; Buckels et al., 2013; Bushman & Baumeister, 1998; Stucke & Sporer, 2002; Turner, 2013). However, similar to our psychological aggression findings, individuals low in Machiavellianism engaged in more bidirectional physical assault than those high in Machiavellianism. Again, this finding can be explained by the lack of context provided by the CTS-2, and possible instances of self-defence.

In Study 2, the researchers used an open-ended format to assess whether the Dark Tetrad traits moderated relationships between partners' and participants' severity of physical IPV perpetration. This is because gender differences may be more accurately captured when severity of violence is considered, as opposed to solely frequency (Graham et al., 2012). First, bivariate correlational analyses were conducted to examine associations between study variables. Consistent with past research, the Dark Tetrad traits were significantly and positively correlated (e.g., Plouffe et al., 2017, 2019; Smoker & March, 2017). In addition, as scores on IPV victimization severity (i.e., partner IPV severity) increased, so too did IPV perpetration severity. This is in accordance with past research that has found significantly higher aggression severity ratings for bidirectional types of IPV than one-sided IPV (Graham et al., 2012; Temple, Weston, & Marshall, 2005; Whitaker et al., 2007). However, it is also possible that the high perpetration

severity scores reflect acts of self-defence. Unexpectedly, the relationships between IPV perpetration severity, victimization severity, and the Dark Tetrad traits were negligible in magnitude. This is in contrast to Study 1, as well as myriad studies finding significant positive relationships between the Dark Tetrad traits and IPV perpetration (Carton & Egan, 2017; Kiire, 2017; Tetreault et al., in press).

When the Dark Tetrad traits were examined together in conjunction with gender and IPV victimization severity, only being female, IPV victimization severity, and Factor 2 psychopathy resulted in significantly higher odds of engaging in more severe IPV perpetration. The significant gender finding was somewhat surprising, as past findings indicate that men more frequently engage in more severe types of violence, such as intimate terrorism, than women (Johnson, 2007; Johnson et al., 2014). However, research assessing physical abuse has found that women and men report comparable levels of behaviours consistent with situational couple violence (e.g., pushing, shoving, scratching) (Tanha, Beck, Figueredo, & Raghavan, 2010; Whitaker et al., 2007), and in our community sample, the majority of men and women reported engaging in these less severe types of violence. In addition, women have reported engaging in IPV as a method of self-defence, emotion regulation, retaliation for past victimization, and previous abuse (Stuart et al., 2006). Thus, to fully understand the link between gender and IPV, it is essential to consider the context in which women report perpetration of these behaviours. The tendency for those high in Factor 2 psychopathy to engage in more severe forms of IPV is consistent with their irresponsibility, impulsivity, and poor behavioural controls (Harpur et al., 1988). However, the remaining Dark Tetrad traits were not significant in this model. Possible explanations for this finding are outlined below.

When the moderation analyses were conducted, surprisingly, Factor 2 psychopathy was the only significant Dark Tetrad trait associated with IPV perpetration severity, and none of the interactions between the Dark Tetrad traits and IPV victimization were significant. This is in contrast to research that has shown that those high in Factor 2 psychopathy and narcissism engage in more reactive types of bidirectional violence as a result of provocation (Blais et al., 2014) or ego threat (Bushman & Baumeister, 1998; Turner, 2013). Also unexpectedly, Factor 1 psychopathy and sadism were not significantly associated with IPV perpetration in the regression model, which contradicts evidence for the high-sadism individual's pleasure-driven appetite for cruelty (Buckels et al., 2013), and the high-Factor 1 psychopathy individual's instrumental motivations to engage in violence (Blais et al., 2014). One possible explanation for this null effect concerns the nature of the IPV perpetration item. The item requests the participant to recall the most physically aggressive thing that they have done over their lifetime to someone who they were in a close romantic relationship with for at least three months. It is plausible that individuals entering relationships with those high in the Dark Tetrad traits would recognize their problematic behaviours within a three-month time period, especially if these included IPV-related behaviours. Therefore, it is possible that this data was not captured because these relationships had dissolved prior to the three-month mark. Another explanation concerns the nature of the sample. This was a community sample reporting on their physically violent behaviours. It is possible that if participants reported on their levels of psychological violence, as in Study 1, this would have resulted in a larger variance in responses and thus stronger relationships with the Dark Tetrad traits. Additionally, in Study 2, the researchers tried their best to code obvious instances of self-defence as a *0* on the physical IPV perpetration scale, but it was not possible to discern between all instances of self-defence and true acts of violence. Therefore,

some defensive actions may have been mistakenly reported as IPV perpetration, which would attenuate associations with the Dark Tetrad traits. Finally, although 71% of participants reported that the bidirectional violence occurred within the same relationship, this was not confirmed across the entire sample. Therefore, this may have reduced the associations between IPV victimization and perpetration at different levels of the Dark Tetrad traits.

Although the results from the two studies reported were not consistent, this emphasizes the importance of considering both frequency and severity of IPV perpetration. It is evident that different traits are associated with different levels of IPV perpetration depending on whether the frequency, severity, or type of violence is assessed. In addition, the two samples differed in terms of location, age distribution, and level of education, which may have impacted the results.

Findings from the current studies could have implications for future implementation of appropriate interventions in the context of IPV perpetration, especially if our findings generalize to clinical samples in future studies evaluating levels of intimate terrorism. Specifically, findings can be used to inform treatment programs of the impact of individual differences on IPV perpetration, and to tailor these interventions based on identification of traits or other factors contributing most to perpetration and recidivism. For example, individuals who engage in reactive or cyclical types of violence (e.g., high-narcissism individuals) may benefit from adopting alternate conflict resolution strategies (Mager et al., 2014). On the other hand, those engaging in proactive IPV (e.g., high-sadism individuals) may benefit more from structured cognitive-behavioural therapy (Crick & Dodge, 1996; Saunders, 1996).

Finally, results of the current studies may be important in terms of educating survivors of IPV on the role of personality variables in perpetration. Because individuals high in the Dark Tetrad traits are successful manipulators and often give off favourable first impressions (Back,

Schmukle, & Egloff, 2010; Jonason, Lyons, Baughman, & Vernon, 2014a), it may be difficult for survivors to leave these relationships. Individuals high in psychopathy, for example, frequently employ tactics such as deception, isolating the victim from family and friends, and progressing the relationship at a rapid pace in order to manipulate and control their victims (Kirkman, 2005). It is important for women and men to be informed of potential 'red flags' associated with maladaptive personality characteristics, and for family members, friends, and healthcare providers to support survivors in safely ending relationships with individuals exhibiting high levels of Dark Tetrad characteristics.

2.8.1. Limitations, Future Directions, and Concluding Remarks

Results from the current studies must be considered in light of their limitations. First, the present studies employed only self-reported instances of both participant and partner levels of IPV. Participants may engage in socially desirable responding, such that they do not fully disclose the frequency or severity of their IPV behaviours. Despite this, research has shown that individuals high in antagonistic traits (cf. narcissism) are unconcerned with socially desirable responding and maintaining favourable social impressions (Kowalski, Rogoza, Vernon, & Schermer, 2018). However, it is possible that those low in dark traits may underreport engagement in IPV to maintain a favourable self-image. Past research has also found that men are more likely to underreport IPV perpetration (DeKeseredy, 2009; Edleson & Brygger, 1986; Heckert & Gondolf, 2000; Hilton, Harris, & Rice, 2000), whereas women are more likely to overreport IPV perpetration (Hilton et al., 2000; Szinovacz & Egley, 1995). Future research should obtain both participant and partner reports of self and other Dark Tetrad traits and IPV perpetration for more objective indices of their trait levels and behaviours.

Next, the samples from both studies may not generalize to wider populations. Participants were recruited only from Canada and the United States, and most reported that they were either enrolled in university or had attained a Bachelor's degree. Rates of IPV differ across countries (García-Moreno, Jansen, Ellsberg, Heise, & Watts, 2006) and age groups (Mezey, Post, & Maxwell, 2002). Therefore, it is important in future research to assess levels of Dark Tetrad traits and IPV among more diverse samples. In addition, in order to further diversify the sample, it is important for future research studies to assess partner gender in order to effectively evaluate its effects on bidirectionally-violent relationships with non-heterosexual couples.

Finally, despite our efforts to implement an open-ended IPV assessment in Study 2, it was not possible to fully consider the context in which the violence occurred across both samples. Therefore, in many cases, we could not distinguish between IPV perpetrated as self-defence or proactively in the absence of this information. Future studies should ask a follow-up question pertaining to the circumstances under which the IPV occurred. It would also be beneficial for future research to assess the relative influence of individual difference variables and environmental variables, such as financial dependence on one's partner, family dynamics, socioeconomic status, or geographic location in predicting IPV behaviours.

To conclude, the present studies provide evidence for personality traits, namely the Dark Tetrad of personality, as important predictors of both unidirectional and bidirectional types of IPV. This is the first set of studies to assess the Dark Tetrad traits as moderators in the relationships between participant and partner IPV levels, which allows for us to draw some conclusions about their underlying motivations for aggressive behaviour. Overall, this work can be used to inform both treatment programs and society as a whole about the influence of personality on engagement in IPV behaviours.

CHAPTER 3: Study 3

3.1. Introduction

Intimate partner violence (IPV) continues to be a major international public health concern, posing significant mental and physical health risks for affected individuals. The United States Centers for Disease Control and Prevention has focused on efforts to reduce IPV, including, for example, promoting healthy relationships from an early age (i.e., primary prevention) and providing a range of services to those affected by IPV (i.e., secondary and tertiary prevention) (Breiding, Chen, & Black, 2014). To improve prevention efforts, it is also important for researchers to understand the extent to which violence is intergenerational, such that exposure to violence predisposes individuals to engage in violence toward intimate partners. The purpose of this research is to assess childhood exposure to violence as a risk factor for perpetration of IPV in adulthood, and to evaluate personality traits as potential mediators in this relationship.

3.1.2. Childhood Maltreatment and Adult Intimate Partner Violence Perpetration

Several studies have recognized various forms of childhood maltreatment as risk factors for adolescent and adult perpetration of IPV (e.g., Ehrensaft et al., 2003; Fang & Corso, 2007; Manchikanti Gómez, 2011; Heyman & Slep, 2002; Linder & Collins, 2005; Richards, Tillyer, & Wright, 2017; Swinford, DeMaris, Cernkovich, & Giordano, 2000; Whitfield, Anda, Dube, & Felitti, 2003). These risks partially arise because certain developmental processes become affected by childhood abuse and neglect, and result in expressions of anger, aggression, and social information processing biases in relationships with others (Dodge, Pettit, & Bates, 1994; Wolfe, Crooks, Chiodo, & Jaffe, 2009a). For example, Whitfield et al. (2003) found significant

increased risk of IPV perpetration in adulthood for men who reported experiencing physical abuse, sexual abuse, or witnessed domestic violence against their mother.

Among the many types of maltreatment, childhood exposure to violence in the home is frequently cited as a robust predictor of IPV perpetration in adolescence and adulthood (e.g., Aldarondo & Sugarman, 1996; Choice et al., 1995; Ehrensaft et al., 2003; Roberts et al., 2010). Childhood exposure to IPV is a complex phenomenon that includes a range of possible experiences. Holden (2003) contended that 'exposed' is a more favourable term than 'witnessed' because it is inclusive of many types of violent experiences that children may be exposed to. Holden (2003) subsequently created a comprehensive taxonomy of exposure based on reports from children and mothers. According to this taxonomy, exposure to IPV includes prenatal exposure, child victimization by parents, overhearing the violence, attempting to stop the violence by intervening, witnessing the initial effects on a parent, or hearing about the events later, among other possible experiences.

Children exposed to violence, particularly maternal abuse, may not only later accept violence as a response to conflict, but may also further shape distorted ideals of gender-role expectations in relationships (Wolfe et al., 2009a). Several studies have identified a link between childhood victimization in the family context and later perpetration through intergenerational transmission, such that children exposed to violence in childhood learn to be violent as a mechanism to resolve conflict in their adult intimate relationships (e.g., Ehrensaft et al., 2003; Richards et al., 2017; Widom, 1989). For example, in their prospective study examining demographic and environmental variables as risk factors, Ehrensaft et al. (2003) concluded that exposure to parental violence was the second-strongest predictor of IPV perpetration for both men and women behind conduct disorder. Using a retrospective design, Roberts et al. (2010)

found that after controlling for demographics and childhood circumstances, witnessing parental violence was related to increased risk of IPV perpetration in adulthood, and that childhood emotional support from the family did not mitigate this effect. Similar patterns also occured within adolescent dating relationships, such that children who experienced or witnessed violence and interparental conflict while growing up also reported greater use of threatening behaviours and physical abuse compared to those who did not experience violence (Kinsfogel & Grych, 2004; Wolfe, Scott, Wekerle, & Pittman, 2001).

3.1.3. Exposure to Violence in Childhood and Intimate Partner Violence Perpetration in Adulthood: Personality as a Mediator

Despite significant links reported between childhood exposure to family violence and IPV perpetration, not all children exposed to IPV grow up to be violent, and pathways from adverse childhood experiences to violence in adolescence and adulthood are often mediated by other processes. These include, for example, conflict resolution strategies, acceptance of dating violence, anger control, and marital distress (e.g., Choice et al., 1995; Clarey, Hokoda, & Ulloa, 2010; Kimonis, Ray, Branch, & Cauffman, 2011; Malik, Sorenson, & Aneshensel, 1997). Research has also suggested that personality disorders mediate associations between various childhood experiences of family violence (i.e., abuse, neglect) and later general violent behaviours (e.g., Baskin-Sommers & Baskin, 2016; Brennan, 2014; Weiler & Widom, 1996; White & Widom, 2003). Results of these studies emphasize the importance of considering circumstances by which children who are victimized subsequently become violent. For example, findings from Brennan (2014) showed that pathological narcissism partially mediated the relationship between childhood experiences of family violence and later general violence perpetrated by men and women.

Although few studies have evaluated personality disorders as mediators underlying these relationships, no studies have investigated personality traits at the subclinical level as mediators. One particular group of personality traits that provides incremental value in predicting relevant antisocial outcomes includes the Dark Tetrad of personality (Buckels et al., 2013; Chabrol et al., 2009). The Dark Tetrad comprises subclinical psychopathy, narcissism, Machiavellianism, and sadism. Individuals high on psychopathy exhibit callousness, shallow affect, and impulsivity (Paulhus & Williams, 2002). Psychopathy can be further divided into two dimensions: Factor 1 psychopathy, characterized by affective-interpersonal components, and Factor 2 psychopathy, characterized by lifestyle-antisocial components (Harpur et al., 1988). Those high in Machiavellianism possess a cynical worldview, are deceptive, and, manipulative (Christie & Geis, 1970). Individuals high in narcissism desire power and admiration, are entitled, and have a grandiose sense of self (Paulhus & Williams, 2002). Finally, subclinical sadism is characterized by a tendency to engage in aggressive and demeaning behaviours for pleasure or subjugation (Plouffe et al., 2017, 2019). Across studies, the Dark Tetrad (and its predecessor, the Dark Triad; Paulhus & Williams, 2002) has consistently been associated with aggression across several contexts and presents in many forms, including dispositional aggression (Jones & Neria, 2015), physical violence (Buckels et al., 2013), bullying (Baughman et al., 2012; Goodboy & Martin, 2015), driving aggression (Burtăverde et al., 2016), and IPV (Carton & Egan, 2017; Kiire, 2017).

Several studies have drawn associations between childhood and developmental experiences and subsequent development of dark personality traits (e.g., Barlett, 2016; Bernstein, Stein, & Handelsman, 1998; Brumbach, Figueredo, & Ellis, 2009; Jonason, Lyons, & Bethell, 2014b; Láng & Lénárd, 2015; Marshall & Cooke, 1999; Schraft, Kosson, & McBride, 2013). For example, findings by Jonason et al. (2014) suggested that low quality of maternal care predicted

higher levels of Machiavellianism, narcissism, and primary psychopathy, and that some of these processes were mediated by attachment style. Similarly, Schraft et al. (2013) found that childhood exposure to violence in the home predicted levels of psychopathy facet scores, and also predicted behavioural components of psychopathy over and above exposure to violence within the community. In terms of sadism, clinical levels of the sadistic personality have also been related to physical abuse and neglect in childhood (Bernstein et al., 1998). However, this relationship has yet to be examined at the subclinical level. Based on these results, as well as findings that the Dark Tetrad personality traits predict adolescent and adult levels of violence, it is plausible to hypothesize that the associations between childhood exposure to IPV and perpetration of IPV in adulthood may be partially contingent upon individual differences in the Dark Tetrad personality traits.

3.1.4. Research Objectives and Hypotheses

The aim of the present study is twofold. The first objective is to evaluate associations between retrospective accounts of childhood exposure to IPV, perpetration of physical IPV in adulthood, and the Dark Tetrad of personality. Based on past research (e.g., Carton & Egan, 2017; Choice et al., 1995; Ehrensaft et al., 2003; Kiire, 2017), we hypothesize that there will be a positive relationship between childhood exposure to IPV, perpetration of physical IPV in adulthood, and each of the Dark Tetrad traits. The second objective is to assess the Dark Tetrad traits both separately and simultaneously as mediators in the relationship between childhood exposure to IPV, perpetration of physical IPV in adulthood. Based on past research (Brennan, 2014; Weiler & Widom, 1996; White & Widom, 2003), we expect that subclinical psychopathy and narcissism will mediate these relationships. Although sadism and Machiavellianism have not been examined as mediators of these relationships in the past at the subclinical or clinical level,

based on their associations with various types of abusive behaviours in intimate partner contexts (e.g., Smoker & March, 2017; Tetreault et al., in press), we expect that they will emerge as significant mediators.

3.2. Method

3.2.1. Participants

A total of 399 participants (153 men, 246 women) were recruited through the crowdsourcing marketplace known as Amazon Mechanical Turk (MTurk). A priori sample size was calculated using the application entitled Monte Carlo Power Analysis for Indirect Effects (Schoemann, Boulton, & Short, 2017), run through R version 3.5.2 (R Development Core Team, 2019), based on effect sizes calculated by Brennan (2014). To achieve a power value of at least .80, 169 participants were required for the mediation analyses. Therefore, our sample size of 399 was adequate. Individuals were eligible to participate if they fulfilled inclusion criteria of having been in at least one romantic relationship lasting for a minimum of three months at some time in their life, if they were age 18 or older, and resided in the United States or Canada. To avoid recruiting inattentive or bot workers from MTurk, participants must have completed between 100 and 500 MTurk human intelligence tasks (HITs) previously; have demonstrated a HIT approval rate above 95%; completed a CAPTCHA image on the survey-hosting platform; and correctly responded to 2 of 3 attention checks on Qualtrics. Open-ended responses were screened by the researcher following data collection to ensure participant understanding of items.

Participants' ages ranged from 18 to 73 years (M_{age} = 33.50, SD_{age} = 10.26). Most participants resided in the United States (n = 384), and the remaining participants lived in Canada (n = 15). Demographic information, including race/ethnicity, relationship status, highest level of education completed, current employment status, and income group are presented in

Table 12. Most participants were married or in a dating relationship at the time of study enrolment. Of those married, engaged, or in a relationship, the average length of relationship was 6.87 years (*SD* = 7.39 years).[8]

There were five participants whose data were not used for the current study because they reported being nonbinary. These data were not used for this study because there was not a large enough group of nonbinary individuals to assess group differences on study variables.

[8] There were 63 participants who reported length of relationship numerically without recording whether the length was in months or years; these participants' relationship lengths were not included.

Table 12

Study 3 Participant Demographic Information

Variable	Frequency	Percentage (%)
Race/Ethnicity		
White	311	77.9
Black	40	10.0
Asian	21	5.3
East Indian	1	0.3
Arab	1	0.3
Prefer not to say	7	1.8
Other	18	4.5
Sexual orientation		
Heterosexual	333	83.5
Homosexual	13	3.3
Bisexual	45	11.3
Other	8	2.0
Relationship status		
Single	83	20.8
Engaged	20	5.0
Married	159	39.8
In a dating relationship	136	34.1
Highest level of education completed		
Less than high school diploma	2	0.5
High school degree or equivalent	37	9.3
Some college/university, no degree	94	23.6
Associate degree	47	11.8
Bachelor's degree	156	39.1
Master's degree	46	11.5
Professional degree	5	1.3
Doctorate	12	3.0
Employment status		
Full-time employed	206	51.6
Part-time employed	57	14.3
Unemployed	40	10.0
Self-employed	52	13.0
Student	35	8.8
Retired	9	2.3
Income group (per year)		
Less than $10,000	54	13.5
$10,001 - $20,000	38	9.5
$20,001 - $30,000	61	15.3
$30,001 - $40,000	53	13.3
$40,001 - $50,000	47	11.8
Over $50,000	146	36.6

3.2.2. Procedure

The study was approved by the Non-Medical Research Ethics Board at the University of Western Ontario. Eligible participants signed up to take part in the study via MTurk and were redirected to complete a series of anonymous personality, childhood event, and relationship questionnaires via the survey-hosting website, Qualtrics. The study took approximately 0.5 hours to complete. Participation was voluntary and all individuals received 1USD for their time.

3.2.3. Measures

3.2.3.1. Self-Report Psychopathy Scale-IV. (SRP-IV; Paulhus et al., 2015). This self-report scale comprises 64 items designed to evaluate levels of psychopathy. Participants respond to items on a 5-point scale (1 = *strongly disagree,* 5 = *strongly agree*). Mean scores were computed for Factor 1 and 2 psychopathy. Past research supports the validity and reliability of the SRP-IV (total score α = .89 - .92; Paulhus et al., 2015).

3.2.3.2. Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979). The NPI comprises 40 forced-choice items designed to measure levels of subclinical narcissism. Scores are summed and range from 0-40. Past research supports the validity and reliability of the NPI (α = .87; Emmons, 1987).

3.2.3.3. MACH-IV (Christie & Geis, 1970). The 20-item MACH-IV was developed to assess levels of Machiavellianism in the general population. Participants respond to items on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*). Scores were averaged to obtain the mean, with higher scores indicating higher levels of Machiavellianism. Past research supports the validity and reliability of the MACH-IV (α = .83; Jones & Paulhus, 2014).

3.2.3.4. Assessment of Sadistic Personality (ASP; Plouffe et al., 2017). The 9-item ASP is a self-report measure of subclinical sadism. Participants respond to items on a 5-point scale (1

= *strongly disagree,* 5 = *strongly agree*). Mean scores were calculated for subclinical sadism, with higher scores indicating higher levels of sadism. Past research supports the validity and reliability of the ASP (α = .83; Plouffe et al., 2017).

3.2.3.5. Physical IPV perpetration. Physical IPV perpetration severity was evaluated using an adapted version of the assessment procedure implemented by Graham et al. (2012). Participants were requested to respond to the following pertaining to their physical aggression toward a partner over their lifetime: "*People can be physically aggressive in many ways, for example, pushing, punching, slapping, or physical aggression in some other way. What is the most physically aggressive thing that you have done over your lifetime to someone who is or was in a close romantic relationship with you such as a spouse/partner, lover, or someone you are or were dating or going out with for at least three months?"* Physical IPV behaviours were subsequently coded into categories reflecting increasing severity by two independent reviewers. Reviewers discussed dissenting choices until agreement was reached. To accommodate responses that did not fit into original Graham et al. (2012) categories, including scratching, biting, sexual assault, and rape, these categories were added to the final list. Final categories included: 0 = *no violence,* 1 = *push/shove,* 2 = *grab/restrain,* 3 = *slap/smack/scratch/bite,* 4 = *hit,* 5 = *punch,* 6 = *kick,* 7 = *hit with a thrown object,* 8 = *choke/strangle/headlock,* 9 = *assault with a deadly weapon/sexual assault/rape.* Participants' responses indicating that they acted in self-defence were coded as 0, and participants' most severe incident was scored if multiple instances were reported. Due to the nature of the sample (i.e., general community sample), scores on this measure will largely reflect acts of situational couple violence rather than intimate terrorism.

3.2.3.6. Juvenile Victimization Questionnaire – 2nd Revision (JVQ-R2; Finkelhor, Hamby, Turner, & Ormrod, 2011). Retrospective accounts of childhood exposure to IPV were assessed using JVQ-R2. Although the self-report format of the JVQ is intended for children aged 12-17, instructions and items were modified to reflect the participant age group. The full JVQ-R2 evaluates the following areas of youth victimization: conventional crime, maltreatment, peer and sibling victimization, sexual victimization, and witnessing/other exposure to violence. Five items reflecting exposure to family violence and abuse were used for the current study. Item responses were coded on a dichotomous scale (1 = *yes,* 0 = *no*) and items were aggregated to create a total score. Empirical research supports the validity and reliability of the JVQ (exposure to IPV α = .86; Hamby, 2016).

3.2.4. Data Analytic Strategy[9]

Descriptive statistics, reliability coefficients, Spearman's *rho* correlations, Pearson correlations, and gender differences were calculated using SPSS Version 26 (IBM Corp., 2019). Mediation models will be tested in MPlus Version 8 (Muthén & Muthén, 1998-2017) using path analysis to test the hypothesis that the Dark Tetrad traits mediate the relationship between childhood exposure to IPV and IPV perpetration severity in adulthood. The first five path analyses will evaluate the Dark Tetrad traits separately as mediators underlying the link between childhood exposure to IPV and the outcome indicator variable, physical IPV perpetration severity. Gender will be entered as a covariate in the models. The last path analysis will evaluate all of the Dark Tetrad traits as mediators underlying these relationships within the same model.

[9] Data and code available at https://osf.io/fxnp8/

Direct, indirect, and total effects will be inspected to evaluate whether there is full or partial mediation in the models. If the indirect effects are significant and the direct effect is close to or at zero, we can conclude that the relationship between childhood exposure to IPV and IPV perpetration severity is mediated by one or more of the Dark Tetrad traits. All mediation models will be conducted using bias-correcting bootstrap confidence intervals. Bootstrapped confidence intervals have been cited as a more accurate alternative to Baron and Kenny's (1986) mediation approach (Preacher & Hayes, 2008). If the 95% confidence intervals for the indirect effects do not contain zeros, this will indicate that mediation is present (Preacher & Hayes, 2008). If the mediation effects are significant, effect sizes will be calculated using kappa-squared (k^2; Preacher & Kelley, 2011). This value provides the maximum proportion of the indirect effect occurring due to the variables tested in the model. k^2 is similar in interpretation to Cohen's (1988) guidelines, such that .01 represents a small effect, .09 represents a medium effect, and .25 represents a large effect (Preacher & Kelley, 2011).

3.3. Results

3.3.1. Descriptive Statistics and Background Analyses

Descriptive statistics, reliability coefficients, skewness, and kurtosis values are reported in Table 13. Reliability coefficients were high for all variables. Skewness and kurtosis values for all study variables fell within the acceptable range with cutoff values of 3.0 and 10.0 (Kline, 2011).

Table 13

Study 3 Descriptive Statistics

Variable	*M*	*SD*	α	Skewness	Kurtosis
Narcissism	12.68	7.55	.88	0.62	-0.13
Sadism	1.90	0.87	.90	0.93	-0.26
Machiavellianism	2.73	0.49	.80	0.05	0.20
Factor 1 Psychopathy	2.39	0.60	.91	0.44	-0.32
Factor 2 Psychopathy	2.21	0.58	.89	0.51	-0.48
Childhood IPV exposure	1.49	1.80	.86	0.84	-0.77
IPV perpetration	1.43	2.02	-	1.63	2.26

Correlations between study variables are reported in Table 14. As hypothesized, the Dark Tetrad traits were correlated moderately-to-strongly with one another. Childhood exposure to IPV also demonstrated small-to-moderate significant correlations with each Dark Tetrad trait, showing the strongest relationships with Factor 1 and Factor 2 psychopathy. Age was negatively related to sadism, Machiavellianism, Factor 1 psychopathy, and Factor 2 psychopathy. Education level was also negatively related to childhood IPV exposure, and income was negatively related to Factor 2 psychopathy. Unexpectedly, IPV perpetration was unrelated to any study variables. Therefore, it was not possible to test mediation hypotheses. Correlations were also computed separately for men and women (see Table 15) and were largely consistent across genders. Specifically, the Dark Tetrad traits were moderately-to-strongly correlated across men and women. Interestingly, the significant correlations between childhood exposure to IPV and the Dark Tetrad were driven by men. For women, the only Dark Tetrad trait significantly related to childhood IPV exposure was Factor 2 psychopathy. Again, across both genders, IPV perpetration was unrelated to all study variables. For women, age was negatively related to sadism and

Machiavellianism, and for men, age was negatively related to Factor 2 psychopathy and Machiavellianism. Income was also negatively related to Factor 2 psychopathy for men.

Table 14

Study 3 Bivariate Correlations

Variable	1	2	3	4	5	6	7	8	9
1. Narcissism									
2. Sadism	.52**								
3. Machiavellianism	.36**	.51**							
4. Factor 1 Psychopathy	.55**	.75**	.68**						
5. Factor 2 Psychopathy	.49**	.69**	.48**	.74**					
6. IPV Perpetration	-.08	-.001	-.04	-.03	.01				
7. Childhood IPV exposure	.14*	.19**	.14*	.25**	.30**	.05			
8. Age	-.13	-.19**	-.22**	-.18**	-.19**	.04	-.13		
9. Education level	.05	.04	.05	.03	-.11	-.03	-.15*	.16**	
10. Income group	-.08	-.08	-.08	-.10	-.14*	.05	-.12	.30**	.38**

Note. Bonferroni correction applied. **$p < .001$, *$p < .006$. Associations with IPV perpetration are Spearman's *rho* correlations. Remaining are Pearson correlations.

Table 15

Study 3 Bivariate Correlations for Men and Women

Variable	1	2	3	4	5	6	7	8	9	10
1. Narcissism		.52**	.36**	.58**	.50**	-.09	.20	-.16	-.04	-.19
2. Sadism	.43**		.49**	.76**	.74**	.18	.24*	-.17	.04	-.19
3. Machiavellianism	.28**	.44**		.62**	.43**	.10	.32**	-.26**	-.09	-.11
4. Factor 1 Psychopathy	.46**	.66**	.66**		.77**	.13	.38**	-.15	-.06	-.16
5. Factor 2 Psychopathy	.41**	.56**	.44**	.66**		.13	.37**	-.23*	-.16	-.28**
6. IPV Perpetration	-.01	.07	-.04	.02	.06		.17	-.04	.04	.01
7. Childhood IPV exposure	.09	.14	.01	.16	.25**	-.02		-.14	-.15	-.17
8. Age	-.09	-.19*	-.17*	-.17	-.14	.08	-.12		.24*	.34**
9. Education level	.08	-.03	.10	.03	-.13	-.06	-.17	.13		.54**
10. Income group	-.07	-.11	-.13	-.17*	-.14	.10	-.11	.30**	.28**	

Note. Bonferroni correction applied. **$p < .001$, *$p < .006$. Correlations for men reported above diagonal; women reported below diagonal. Associations with IPV perpetration are Spearman's *rho* correlations. Remaining are Pearson correlations.

As expected, men scored significantly higher than women on all Dark Tetrad traits (see Table 16). Interestingly, women scored significantly higher than men on IPV perpetration severity. There were no significant gender differences on childhood exposure to IPV.

Table 16

Study 3 Gender Differences

Variable	*M(SD)* men	*M(SD)* women	*t*	Cohen's *d*
Narcissism	15.00(8.04)	11.24(6.85)	4.81*	.50
Sadism	2.32(0.93)	1.63(0.73)	7.85*	.83
Machiavellianism	2.90(0.47)	2.62(0.48)	5.67*	.59
Factor 1 Psychopathy	2.69(0.58)	2.20(0.53)	8.47*	.88
Factor 2 Psychopathy	2.44(0.60)	2.07(0.52)	6.40*	.66
IPV Perpetration	0.91(1.54)	1.75(2.21)	-4.47*	.44
Childhood IPV exposure	1.60(1.88)	1.43(1.74)	.93	.09

Note. *p<.001.

Overall, 196 individuals (49.1%) reported engaging in no IPV perpetration. The most commonly reported IPV was pushing/shoving (18.8%) and slapping/smacking/scratching/biting (13.0%). The least commonly reported perpetration category was kicking (0.3%). Of the total sample, 4 participants (1.0%) reported perpetration consistent with assault with a deadly weapon, sexual assault, or rape. Figure 5 shows the percentage of men and women endorsing IPV severity categories separately.

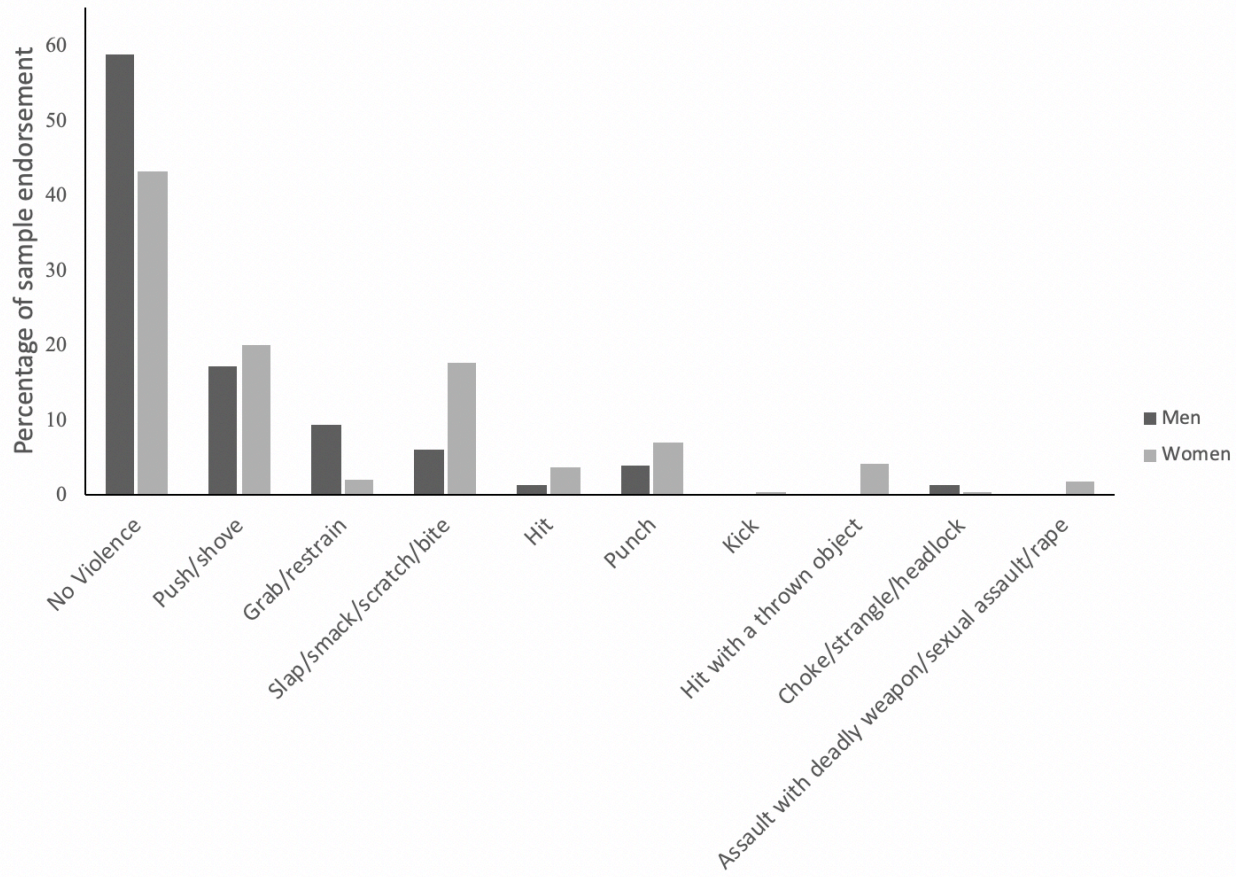

Figure 5. Study 3 percentage of men and women endorsing IPV perpetration response categories.

3.3.2. Exploratory Analyses: Regression of Dark Tetrad Traits on Childhood IPV Exposure

Levels of IPV perpetration were unrelated to all study variables in the present study. Therefore, it was not possible to conduct the proposed mediation analyses. Based on significant correlations in the current study, as an exploratory initiative, we examined whether childhood IPV exposure predicted levels of each Dark Tetrad trait using multivariate regression in SPSS

Version 26 (IBM Corp., 2019). Results showed that childhood IPV exposure significantly predicted levels of narcissism (R^2 = .02, F(1, 397)= 8.36, b = .60, t(397) = 2.89, p = .004); sadism (R^2 = .04, F(1, 397) = 15.02, b =.09, t(397) = 3.88, p < .001); Machiavellianism (R^2 = .02, F(1, 397)= 8.23, b = .04, t(397) = 2.87, p = .004); Factor 1 psychopathy (R^2 = .06, F(1, 397) = 26.19, b = .08, t(397) = 5.12, p < .001); and Factor 2 psychopathy (R^2 = .09, F(1, 397) = 39.74, b = .10, t(397) = 6.30, p < .001).

3.3.3. Exploratory Analyses: Gender as a Moderator in Relationship Between Childhood IPV Exposure and Adult Dark Tetrad Trait Levels

Based on past research findings using clinical data (e.g., Krischer & Sevecke, 2008; Watts, Donahue, Lilienfeld, & Latzman, 2017), we explored whether the relationships between childhood IPV exposure and the subclinical Dark Tetrad trait levels differed for men and women. Moderation analyses were tested separately for each Dark Tetrad trait in MPlus Version 8 (Muthén & Muthén, 1998-2017). There were no missing data points. Childhood IPV exposure was grand-mean centered. For any significant interactions, simple slopes were computed for men and women following recommendations by Aiken and West (1991).

Gender and childhood IPV exposure were significant predictors of each Dark Tetrad trait across models (see Table 17). The inclusion of the interaction term accounted for a significant amount of variance in both Factor 1 psychopathy and Machiavellianism (see Table 17). To better understand the significant gender×childhood exposure interactions, simple slopes were examined for the relationship between childhood IPV exposure and Factor 1 psychopathy, as well as the relationship between childhood exposure and Machiavellianism. As depicted in Figure 6, the relationship between childhood IPV exposure and Factor 1 psychopathy was significant for men (b = 0.12, t = 3.70, p < .001), but not for women (b = 0.05, t = 0.74, p = .458). A similar pattern

emerged for Machiavellianism (Figure 7), such that the relationship between childhood IPV exposure and Machiavellianism was significant for men ($b = 0.08$, $t = 3.95$, $p < .001$), but not for women ($b = 0.004$, $t = 0.09$, $p = .932$).

Table 17

Study 3 Exploratory Moderation Models with Dark Tetrad Traits as Outcomes

			Model Estimates	
Predictor	*b*	*SE*	*p*	95% CI
Model 1: F1 Psychopathy				
Gender	**-0.47**	**.06**	**<.001**	**-0.57, -0.36**
Childhood exposure	**0.12**	**.02**	**<.001**	**0.07, 0.16**
Gender×childhood exposure	**-0.07**	**.03**	**.020**	**-0.13, -0.01**
				$R^2 = .22$, $p < .001$
Model 2: F2 Psychopathy				
Gender	**-0.36**	**.05**	**<.001**	**-0.46, -0.25**
Childhood exposure	**0.12**	**.02**	**<.001**	**0.07, 0.16**
Gender×childhood exposure	-0.04	.03	.171	-0.10, 0.02
				$R^2 = .19$, $p < .001$
Model 3: Narcissism				
Gender	**-3.65**	**.75**	**<.001**	**-5.11, -2.19**
Childhood exposure	**0.86**	**.31**	**.006**	**0.25, 1.47**
Gender×childhood exposure	-0.52	.41	.203	-1.32, 0.28
				$R^2 = .08$, $p = .002$
Model 4: Machiavellianism				
Gender	**-0.27**	**.05**	**<.001**	**-0.36, -0.17**
Childhood exposure	**0.08**	**.02**	**<.001**	**0.04, 0.12**
Gender×childhood exposure	**-0.08**	**.03**	**.004**	**-0.13, -0.02**
				$R^2 = .11$, $p < .001$
Model 5: Sadism				
Gender	**-0.67**	**.08**	**<.001**	**-0.83, -0.51**
Childhood exposure	**0.12**	**.03**	**<.001**	**0.05, 0.19**
Gender×childhood exposure	-0.06	.05	.177	-0.15, 0.03
				$R^2 = .18$, $p < .001$

Note. $N = 399$. *b* = unstandardized coefficient; *SE* = standard error for *b*; CI = confidence interval; Childhood exposure = childhood exposure to IPV.
Significant coefficients bolded.

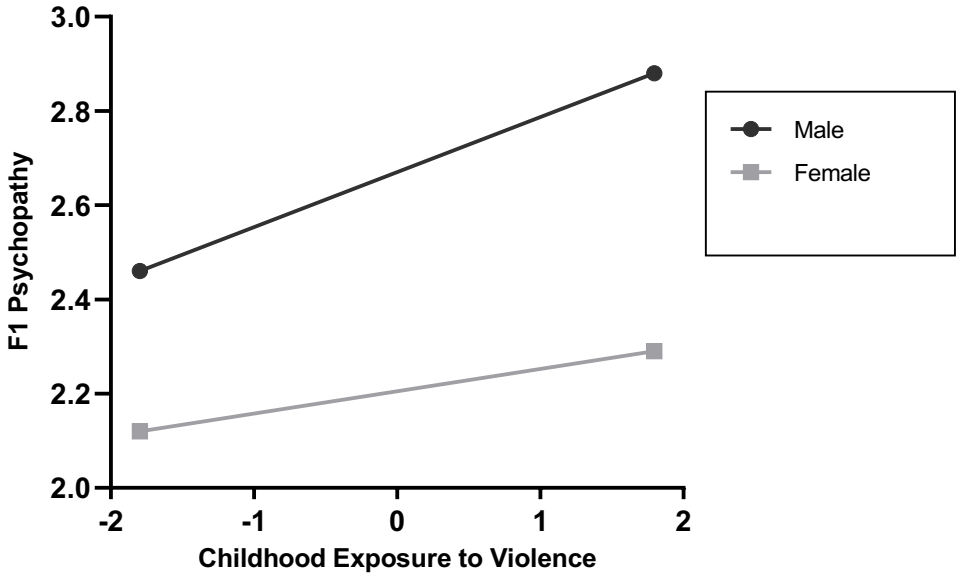

Figure 6. Study 3: Factor 1 psychopathy scores as a function of childhood IPV exposure for men and women. Childhood IPV exposure is grand-mean centered.

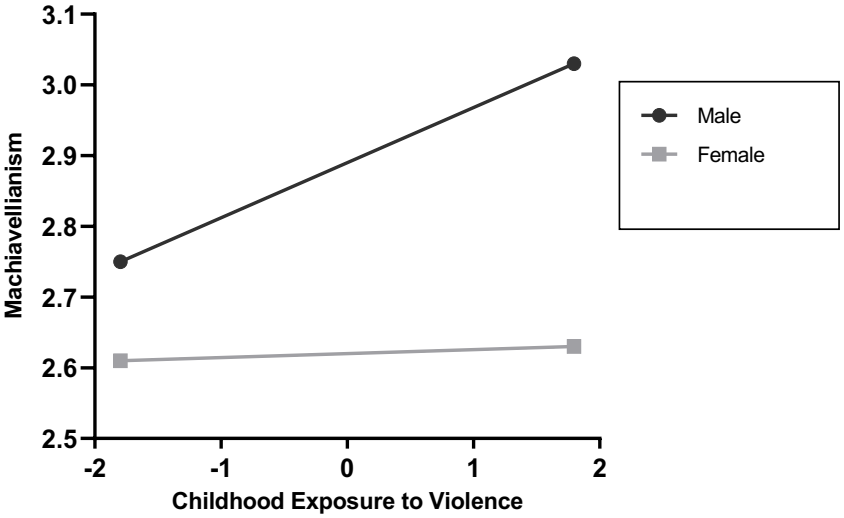

Figure 7. Study 3: Machiavellianism scores as a function of childhood IPV exposure for men and women. Childhood IPV exposure is grand-mean centered.

3.4. Discussion

The purpose of this study was to investigate whether the Dark Tetrad traits mediated the relationship between exposure to violence in childhood and subsequent IPV perpetration in adulthood. We hypothesized that each of the Dark Tetrad traits would mediate this association based on past research that has found significant relationships between adverse childhood experiences and subsequent development of dark personality traits (Barlett, 2016; Bernstein et al., 1998; Brumbach et al., 2009; Jonason et al. 2014; Láng & Lénárd, 2015; Marshall & Cooke, 1999; Schraft et al., 2013) and based on positive relationships between dark traits and various forms of aggression (Buckels et al., 2013; Carton & Egan, 2017; Jones & Neria, 2015; Kiire, 2017).

As expected, preliminary analyses revealed moderate-to-strong significant relationships between each of the Dark Tetrad traits. In addition, childhood exposure to IPV was significantly correlated with each of the Dark Tetrad traits with small-to-moderate effect sizes. The strongest correlation emerged between childhood IPV exposure and Factor 2 psychopathy with a medium effect size. These relationships are consistent with past research reporting tendencies for those who experienced adverse circumstances throughout development to later exhibit characteristics consistent with dark personality traits (e.g., Bernstein et al., 1998; Brumbach et al., 2009; Jonason et al., 2014b; Láng & Lénárd, 2015; Marshall & Cooke, 1999; Schraft et al., 2013). Interestingly, correlational analyses in the present study separated by gender revealed that these relationships were driven mainly by men, with the exception of Factor 2 psychopathy. Past studies have also demonstrated that the relationships between childhood maltreatment and subsequent development of psychopathic traits in youth and adults were more robust for men than women (Krischer & Sevecke, 2008; Watts et al., 2017), indicating that men may be more

susceptible to the development of callous-unemotional traits as a result of adverse experiences early in life.

Contrary to prediction, IPV perpetration was unrelated to all study variables, and this finding emerged across both men and women. Therefore, it was not possible to examine mediation hypotheses. This finding was in contrast to studies indicating positive relationships between IPV perpetration, dark personality traits, and childhood IPV exposure (e.g., Carton & Egan, 2017; Ehrensaft et al., 2003; Kiire, 2017; Tetreault et al., in press). However, there are several possible explanations for the non-significant finding in the current study. First, although the researchers attempted to code all instances of violence involving self-defence as *0*, reflecting no violence, it is probable that individuals who engaged in protective behaviours themselves did not always report these as defensive actions. Therefore, these may have been mistakenly reported as IPV perpetration behaviours, which would reduce correlations with relevant variables including dark personality traits. Second, more innocuous types of IPV, including pushing, shoving, scratching, smacking, etc., were more commonly reported in the current sample than were more dangerous types of IPV, such as punching, kicking, choking, etc. This range restriction would attenuate the magnitude of the relationships between IPV perpetration and other relevant study variables (e.g., Epstein, 1983). Given that this was a community sample of adults, it is possible that assessing levels of psychological IPV would result in stronger correlations because it is more prevalent in the general population than is physical violence (e.g., Cohen & Maclean, 2004; Romans, Forte, Cohen, Du Mont, & Hyman, 2007). Finally, it is possible that retrospective accounts of childhood IPV exposure, and even retrospective accounts of IPV perpetration in adulthood, are susceptible to memory distortions or omission of forgotten

experiences (Sudman & Bradburn, 1973). Such memory distortions would hinder the accuracy of the participant's responses to the IPV perpetration item.

Although no relationships were found between IPV perpetration and study variables, childhood IPV exposure significantly predicted levels of each Dark Tetrad trait. This was unsurprising given past empirical findings linking childhood maltreatment to the development of personality disorders and dark personality traits (e.g., Bernstein et al., 1998; Jonason et al., 2014b; Kircaburun et al., in press). As an additional exploratory initiative, the researchers explored whether gender moderated the relationships between childhood IPV exposure and subclinical Dark Tetrad trait levels. This was based on the premise that among clinical samples of youth and adults, men and boys who were exposed to physical or emotional maltreatment as children were more likely to develop certain psychopathic characteristics than were women and girls (Krischer & Sevecke, 2008; Watts et al., 2017). We found results consistent with this premise, such that greater childhood exposure to IPV resulted in higher levels of Factor 1 psychopathy and Machiavellianism for men, but not for women. Although psychopathy demonstrates a moderate-to-large heritable component (Vernon, Villani, Vickers, & Harris, 2008), the current study supports the notion that environmental influences, such as experiences in childhood, also play a critical role in the development of psychopathic characteristics, particularly for men. Similarly, men exposed to IPV in childhood exhibited higher levels of Machiavellianism, including manipulative tendencies, deception, and a cynical worldview than those who were not exposed. This is consistent with findings that levels of Machiavellianism are largely influenced by environmental, rather than genetic factors (Vernon et al., 2008).

Interestingly, however, women were not more likely to exhibit higher levels of Factor 1 psychopathy, nor Machiavellianism, following childhood IPV exposure. Although both boys and

girls experience a range of adverse psychological and behavioural outcomes following exposure to IPV in childhood (e.g., Jaffe et al., 1986), these outcomes may be expressed differently for boys/men and girls/women. For instance, in their meta-analytic review of 60 studies evaluating the associations between childhood IPV exposure and subsequent behavioural symptoms, Evans, Davies, and DiLillo (2008) revealed that boys were more likely to exhibit externalizing symptoms and behaviour problems, such as delinquency and conduct problems, than girls. These behaviours are consistent with outcomes exhibited by individuals high in traits such as psychopathy and Machiavellianism. On the other hand, exposure to violence or abuse in childhood has also been linked to increased subsequent internalizing behaviours in girls, including depression and anxiety (Stagg, Wills, & Howell, 1989; Yates, Dodds, Sroufe, & Egeland, 2003).

Another explanation for significant moderation findings concerns the notion of modeling same-sex parents. Modeling theory contends that the same-sex parent serves as a stronger model of behaviour than the opposite-sex parent (Mischel, 1970). Therefore, observing the same-sex parent engage in IPV behaviours against the opposite-sex parent may indicate to the child that these behaviours are acceptable in their own relationships (Jankowski, Leitenberg, Henning, & Coffey, 1999). In their study of the effects of witnessing parental violence on perpetrating dating aggression, Jankowski et al. (1999) concluded that those who witnessed a same-sex parent perpetrate IPV were at higher risk of perpetrating dating aggression than those who witnessed the opposite-sex parent perpetrate IPV. Although we did not request gender of the parent engaging in IPV, it is possible that individuals were more frequently exposed to their fathers engaging in IPV than their mothers. Therefore, men modeling their fathers would be at greater risk for

engaging in callous or aggressive behaviours commonly seen in those high in psychopathy and Machiavellianism.

Overall, findings from the present study have implications for prevention and intervention for children exposed to IPV. Given the substantial negative impact of exposure to violence in childhood on future outcomes, including development of maladaptive personality traits, early intervention is of paramount importance for children who have been affected by IPV. It is, therefore, imperative that healthcare providers are equipped with the knowledge and information necessary to mitigate negative outcomes on children exposed to violence within the family.

3.4.1. Limitations, Future Directions, and Concluding Remarks

This study is not without its limitations. First, the data collected in our study were self-report in nature and included retrospective accounts of IPV exposure in childhood and adult IPV perpetration. Retrospective accounts of past events and self-report measures are susceptible to memory distortions (Sudman & Bradburn, 1973) and validity concerns (e.g., Kolar, Funder, & Colvin, 1996). However, other research suggests that the impact of response distortions on the criterion and construct validity of self-report measures remains low, even when motivation for faking is high (Smith & Ellingson, 2002). Future research should aim to longitudinally evaluate effects of adverse childhood events on later outcomes.

Second, our open-ended measure of IPV perpetration did not consider the context in which the violent behaviours occurred (e.g., self-defence versus IPV initiation), which may have hindered the accuracy of the relationships between IPV perpetration and relevant study variables. Future research should assess not only the severity of violent behaviours, but also the context behind the action for more accurate coding.

Third, it is possible that survivors of child abuse or neglect would be more likely to go on to engage in IPV behaviours upon reaching adulthood than would children who witnessed or were exposed to IPV between parental figures. Future research should examine the magnitude of the associations between child abuse/neglect and future IPV perpetration, and whether the strength of these relationships differs from those between childhood exposure to IPV and IPV perpetration in adulthood.

Finally, we recruited a community sample of adults for participation in this study. Most participants were affluent individuals residing in the United States. As such, the variance of study variables, particularly IPV perpetration, was low, and results may not generalize to more diverse groups of individuals or clinical samples. Future research should conduct similar research and compare findings with clinical samples, as well as more diverse community samples.

Despite these limitations, this study outlines important findings linking adverse experiences in childhood, particularly exposure to violence, with the development of maladaptive traits at the subclinical level. Furthermore, this study is the first to highlight gender differences in pathways between exposure to IPV and subsequent development of the Dark Tetrad traits. Overall, this work has implications for providing researchers and clinicians with a greater understanding of environmental events preceding maladaptive trait development, which will be imperative in introducing paradigms designed to reduce behavioural outcomes associated with the Dark Tetrad traits.

CHAPTER 4: General Discussion

4.1. Discussion

For decades, IPV has persisted as an urgent public health issue resulting in long-term negative health outcomes for those affected. Survivors of IPV report profound short- and long-term physical and psychological effects. Psychological effects include general psychological distress, somatisation, suicide ideation, post-traumatic stress disorder, depression, and anxiety (Dutton et al., 2006; Golding, 1999; Lagdon, Armour, & Stringer, 2014; Mechanic, Weaver, & Resick, 2008; Pico-Alfonso et al., 2006; Warsaw, Brashler, & Gil, 2009; Woods, 2000). Indeed, the psychological trauma associated with prolonged exertion of coercive control over a partner is often greater than the trauma resulting from a single act of violence perpetrated by a stranger (Herman, 1992). Physical consequences for IPV victims are equally, if not more detrimental to the health and well-being of those affected. These outcomes include, but are not limited to chronic pain, direct injury, sleep disorders, choking sensations, gastrointestinal disorders, and mortality (Campbell, 2002; Coker et al., 2002; Dutton et al., 1997, 2006; Díaz-Olavarrieta et al., 1999; Jaffe et al., 1986; Plitchta, 2004). Given these negative health outcomes, and the unwavering high prevalence of physical, psychological, and sexual IPV across the world (Bott, Guedes, Ruiz-Celis, & Mendoza, 2019; Lysova et al., 2019), identifying salient risk factors is important for the development of successful IPV prevention and intervention initiatives. Although demographic, environmental, and societal variables are important in understanding motivations for engaging in IPV, it is also important to study individual difference characteristics (i.e., dark personality traits) as factors contributing to these violent behaviours.

This dissertation sought to address three pertinent research questions. The first research question was addressed across all three research studies: *When the Dark Tetrad traits are*

considered simultaneously, which traits provide unique variance in predicting levels of IPV perpetration? Given their common features, including disagreeableness and callous manipulation (Jakobwitz & Egan, 2006; Jones & Figueredo, 2013), the Dark Tetrad traits are often evaluated in tandem to predict relevant behaviours. Therefore, it was important to consider both the unique and common effects of the Dark Tetrad traits on IPV. When the Dark Tetrad traits were entered together in models predicting IPV perpetration, results differed depending on the sample and IPV assessment used. In Study 1, when all variables were considered together, narcissism was the only trait significantly associated with a change in the rate of psychological aggression frequency. Individuals high in narcissism will go to great lengths to maintain their feelings of superiority and grandiosity, including engaging in hostility (Bushman & Baumeister, 1998) and derogation toward partners (Campbell, Rudich, & Sedikides, 2002). Thus, it is unsurprising that narcissism is associated with various types of psychological abuse perpetration (Carton & Egan, 2017; Gormley & Lopez, 2010), including restrictive engulfment (Carton & Egan, 2017). Although Factor 1 and 2 psychopathy were not significantly associated with psychological aggression in the model with all Dark Tetrad traits included, there were positive bivariate relationships between Factor 1 and 2 psychopathy and frequency of psychological aggression. These variables were likely non-significant in the predictive model because they did not exhibit enough unique variance in their associations with IPV behaviours over the remaining Dark Tetrad traits. In Study 1, when the traits were considered together, sadism was the only significant variable related to rate of change in physical assault frequency. This is consistent with past findings among clinical samples that those higher scores on sadism engage in more proactive than reactive spousal abuse (Chase et al., 2001), and with studies indicating that sadism

demonstrated incremental variance in predicting various forms of unprovoked aggression (Buckels et al., 2013; Reidy et al., 2011).

Interestingly, in Study 2, the only variable that was significantly associated with physical IPV perpetration severity was Factor 2 psychopathy, and in Study 3, none of the Dark Tetrad were significantly related to physical IPV severity. The tendency for those high in Factor 2 psychopathy to engage in more severe forms of IPV is consistent with their impulsivity and lack of behavioural controls (Harpur et al., 1988). However, it is surprising that Factor 1 psychopathy and sadism were not significantly related to physical IPV severity across either study. Specifically, our findings were in contrast to defining features of sadism including engagement in aggression for pleasure or subjugation (Plouffe et al., 2017, 2019), as well as features of Factor 1 psychopathy, including shallow affect, superficial charm, callous manipulation, and aggression (Harpur et al., 1988). However, as described previously, it is plausible that the null effect for physical IPV severity across Studies 2 and 3 occurred due to the lack of context provided using this assessment method. Specifically, the open-ended item used to assess IPV severity did not request that participants differentiate between acts of self-defence and acts of true violence, resulting in possible conflation between violent resistance and acts of intimate terrorism or situational couple violence. Additionally, given that the study sample comprised general community members, their responses were consistently on the low end of the physical IPV severity spectrum. This range restriction likely affected the magnitude of the relationships between physical IPV severity and the Dark Tetrad traits, reducing them to non-significance.

Notably, across all studies, Machiavellianism was unrelated to perpetration of psychological and physical forms of IPV. Although Machiavellianism on its own has been cited as a significant predictor of self-reported violence and bullying (Abell & Brewer, 2014;

Baughman et al., 2012; Carton & Egan, 2017; Pailing et al., 2014), individuals high in Machiavellianism are unlikely to aggress against others when the benefits do not outweigh the negative consequences (Buckels et al., 2013; Furnham et al., 2013; Jones & Paulhus, 2010). Instead, they are only likely to act impulsively and react aggressively toward others once they encounter ego depletion (Dinić & Wertag, 2018; Furnham et al., 2013).

Overall, although the relationships between IPV perpetration and the Dark Tetrad traits varied across samples and assessment methods, narcissism, sadism, and Factor 2 psychopathy emerged as the most salient predictors across studies. Specifically, narcissism demonstrated the most utility in predicting rates of psychological aggression frequency, whereas sadism and Factor 2 psychopathy were related to physical assault frequency and severity, respectively. These findings emphasize the importance of conducting multiple studies across samples and settings in order to draw meaningful conclusions pertaining to predictive utility and relationships between variables.

The second research question was investigated in Studies 1 and 2: *Do the Dark Tetrad traits moderate the relationships between participant and partner levels of IPV perpetration?* Historically, IPV has been recognized as a phenomenon involving the male's perpetration of violence toward a female partner within the context of shelters, hospitals, and law enforcement agencies (e.g., Archer, 2000; Dobash & Dobash, 1979; Johnson, 1995; Lloyd & Emery, 2000). Feminist scholars contend that IPV is a result of the patriarchal system in which women can be controlled physically, sexually, psychologically, and economically using force (Dobash & Dobash, 1979; McPhail et al., 2007). Women also frequently sustain greater injuries than men as a result of IPV, further justifying the focus on male-perpetrated IPV with women as victims (Archer, 2000; Tjaden & Thoennes, 2000; Vivian & Langhinrichsen-Rohling, 1994). However,

recent findings have challenged the notion that violence is solely male-perpetrated (e.g., Langhinrichsen-Rohling et al., 2012; Tetreault et al., in press; Whitaker et al., 2007). Instead, they contend that IPV often occurs bidirectionally, especially among community samples in which the legal system is not involved (Langhinrichsen-Rohling et al., 2012). Thus, our research sought to determine whether individual differences in the Dark Tetrad of personality had an effect on whether individuals engage in bidirectional violence.

As expected, Study 1 findings revealed that there was a significant change in the rate of participant psychological aggression and physical assault when sadism was entered as a predictor, indicating that those high in sadism engaged in IPV regardless of their partner's levels of violence. This is in keeping with their tendencies to work hard to inflict violence on innocent others for enjoyment (Buckels et al., 2013). Also consistent with expectations, in Study 1, there was a stronger tendency for those high in narcissism to engage in bidirectional physical assault than for those low in narcissism. This supports past research findings suggesting that individuals high in narcissism perpetrate aggression against others when they perceive another's action as a threat to their self-esteem (Baumeister et al., 2000; Buckels et al., 2013; Bushman & Baumeister, 1998; Stucke & Sporer, 2002; Ryan et al., 2008; Turner, 2013). Unexpectedly, narcissism was also significantly related to psychological aggression regardless of partners' levels of IPV in Study 1. However, this finding was consistent with tendencies of those high in narcissism to engage in hostility and derogation to maintain a sense of grandiosity and superiority over others (Bushman & Baumeister, 1998; Campbell et al., 2002).

Contrary to hypotheses, in Study 1, we found that as partners' levels of psychological aggression increased, those low in Factor 1 psychopathy, Factor 2 psychopathy, and Machiavellianism engaged in psychological aggression at higher rates than those exhibiting

higher levels of these traits. The same finding emerged for the relationship between partners' frequency of physical assault and Machiavellianism. This indicates that at low levels of these Dark Tetrad traits, there were stronger bidirectional IPV relationships than at higher levels. However, it is probable that individuals scoring low on Dark Tetrad traits were engaging in what would appear to be bidirectional IPV, but was actually a method of self-defence.

As mentioned previously, in Study 2, the only significant trait related to physical IPV perpetration severity was Factor 2 psychopathy. Those high in Factor 2 psychopathy had higher odds of engaging in more severe IPV regardless of their partner's levels of perpetration. This was inconsistent with our hypotheses based on the notion that individuals high in Factor 2 psychopathy engage in more impulsive and reactive forms of violence following provocation (Blais et al., 2014) as opposed to proactive, unidirectional types of violence. In addition, none of the interaction terms were significant. Although these results were unexpected, as mentioned previously, it was not always possible to accurately differentiate between acts of self-defence and acts of true violence using the open-ended IPV assessment method. Additionally, it is also likely that because this was a community sample of adults and the severity of violence was positively skewed, the restriction of range in responses would have attenuated relationships between Dark Tetrad traits and physical IPV severity. Finally, although 71% of participants reported that instances of participant and partner IPV occurred within the same relationship, this was not confirmed across all participants in Study 2. If these instances of violence did not occur within the same relationship with the same individual, this would likely reduce the associations between participant and partner physical IPV severity at different levels of the Dark Tetrad traits.

Finally, it is important to discuss the significant predictive findings for gender across Studies 1 and 2. Across all models, gender emerged as a significant predictor of IPV

perpetration, such that being a woman resulted in greater frequency and severity of physical and psychological IPV perpetration. However, in Study 1, there were no significant gender differences in participants' or partners' frequency of physical assault or psychological aggression. In addition, when gender was considered on its own as a predictor of participant physical assault and psychological aggression, the gender effect was non-significant. This indicates the presence of a suppression effect (Kline, 2011), such that the residual variance in gender was only significant once the Dark Tetrad traits were controlled for. In Study 2 (and Study 3), however, there were significant gender differences, such that women reported engaging in more severe forms of physical IPV. This was somewhat surprising, as several studies have reported that women are less likely to engage in more severe forms of IPV perpetration than men, such as intimate terrorism involving elements of coercive control (Graham-Kevan & Archer, 2003; Johnson, 2006, 2007, 2008, 2011; Tjaden & Thoennes, 2000). However, consistent with our findings, many studies conducted across countries and samples have found gender symmetry in IPV, such that men and women perpetrated comparable rates of IPV, and in some cases, women reported higher levels of engagement in severe IPV behaviours (see Chan, 2011 for a review of studies). However, the reasoning behind this gender symmetry (and findings that women perpetrate more severe violence than men) remains elusive without contextual information. Although men often report engaging in higher levels of intimate terrorism, especially among clinical samples, less severe types of violence (i.e., situational couple violence) involving behaviours such as pushing, shoving, and scratching, are perpetrated by both women and men relatively equally among general community samples (Johnson et al., 2014; Tanha et al., 2010). In our community and university student samples, the majority of men and women reported engaging in these less severe types of violence, and our sample sizes were too small at

the more severe ends to accurately calculate gender differences. It is also possible that the women in our samples were utilizing IPV behaviours as a way to protect themselves. Therefore, although we can conclude that in our samples that women engaged in IPV at roughly the same rate as men, as well as in more 'severe' forms, we cannot confirm whether these are true gender differences without contextual background information.

The final research question pertained to Study 3: *Do the Dark Tetrad traits mediate the relationships between exposure to violence in childhood and subsequent IPV perpetration in adulthood?* Intergenerational transmission of violence is one of the most prominent approaches used to explain how individuals become predisposed to perpetrate IPV. This perspective has roots in social learning theory (Bandura, 1978), such that children exposed to IPV accept violence as an appropriate method of conflict resolution and are thus more likely to initiate violence toward others throughout their lives (e.g., Ehrensaft et al., 2003; Richards et al., 2017; Straus, Gelles, & Steinmetz, 1980; Widom, 1989). However, not all children exposed to violence grow up to engage in these behaviours, and several mediating pathways have been proposed to explain the relationships between childhood IPV exposure and perpetration of violence in adulthood (e.g., Choice et al., 1995; Clarey et al., 2010; Kimonis et al., 2011; Malik et al., 1997). Based on past findings (Brennan, 2014; Weiler & Widom, 1996; White & Widom, 2003), we hypothesized that the Dark Tetrad traits would significantly mediate these relationships.

As expected, we found that exposure to IPV in childhood significantly predicted levels of each of the Dark Tetrad traits. However, similar to Study 2 with the exception of Factor 2 psychopathy, physical IPV perpetration severity was unrelated to all study variables, even when tests were performed separately by gender. This finding was unexpected given past significant relationships between IPV perpetration, dark personality traits, and childhood IPV exposure

(e.g., Carton & Egan, 2017; Ehrensaft et al., 2003; Kiire, 2017; Tetreault et al., in press). Therefore, it was not possible to test mediation hypotheses. Despite these non-significant findings, several plausible explanations were proposed, including those outlined above for Study 2. Specifically, participants were not asked to distinguish between protective self-defence behaviours and proactive violent behaviours in their open-ended responses. Therefore, acts of self-defence may have been recorded as proactive acts of violence, which would have reduced correlations with childhood exposure to IPV and Dark Tetrad traits. Second, IPV perpetration behaviours were positively skewed, such that participants reported more pushing, shoving, scratching, smacking, etc., than more dangerous behaviours, such as punching, kicking, choking, etc. This range restriction likely attenuated the strength of relationships between IPV perpetration, the Dark Tetrad, and childhood IPV exposure.

It is important to note that like Study 2, there were significant gender differences in IPV perpetration, such that women reported engaging in more severe acts of IPV. Again, however, most of the violence reported was relatively minor (i.e., pushing/shoving, grabbing/restraining, scratching, etc.), and it is also possible that the women were engaging in self-defensive actions. Without assessing the context behind the violence, we cannot confirm the reason for this gender difference.

Although we did not find support for our mediation hypotheses, the significant relationships between childhood IPV exposure and the Dark Tetrad traits prompted the exploratory initiative to investigate whether gender moderated these relationships. This was also in part motivated by past research assessing these relationships among clinical samples of youth and adults. For example, in one study assessing gender differences in the relationships between childhood abuse and psychopathy, Krischer and Sevecke (2008) found that for delinquent boys,

higher levels of physical and emotional abuse resulted in higher total psychopathy scores, as well as Antisocial and Affective psychopathy facets. For girls, however, there was a significant relationship found only between emotional neglect and antisocial behaviour. Instead, number of foster homes was a stronger predictor of psychopathy in girls, highlighting the negative effects of the breakdown of the family system (Krischer & Sevecke, 2008). Similarly, in a sample of Hungarian adults, emotional parentification (i.e., a form of neglect in which there is a violation of family boundaries) was significantly related to adult levels of Machiavellianism in men, but not in women (Láng, 2016). Our results showed that higher levels of childhood exposure to IPV resulted in higher levels of Factor 1 psychopathy and Machiavellianism for men, but not for women.

We outlined potential reasons for these findings, including differences in externalizing and internalizing behaviours for men and women following instances of childhood IPV exposure. Specifically, meta-analytic findings showed that boys are more likely than girls to experience externalizing symptoms, including delinquent behaviours, following exposure to IPV in childhood (Evans et al., 2008). Women, however, are more likely to experience internalizing symptoms, including depression and anxiety, following these negative childhood experiences (Stagg et al., 1989; Yates et al., 2003). Additionally, as mentioned previously, events such as moving to a greater number of foster homes leading to a breakdown of the family unit may have a stronger influence on shaping women's adult levels of psychopathy (Krischer & Sevecke, 2008). Finally, it is possible that men in our sample were more likely to model their same-sex parent (i.e., their father figure) engaging in IPV against the opposite-sex parent (i.e., their mother figure), conveying to them that engagement in callous, manipulative, and aggressive behaviours is acceptable (Jankowski et al., 1999). Although we did not anticipate the absence of a mediation

effect, our exploratory results highlighted important gender considerations in the relationships between childhood adverse events and the development of socially aversive personality traits.

4.2. Implications

A goal of the present research was to broaden researchers' understanding of dark personality traits as risk factors for IPV in the general community. In terms of empirical implications, these studies helped to clarify the relationships between the Dark Tetrad of personality and specific types of IPV, including bidirectional and unidirectional violence, as well as physical and psychological violence. The Dark Tetrad traits demonstrated moderate overlap, such that there was between 0.05% and 56% shared variance across studies. The most shared variance emerged in Study 3 between sadism and Factor 1 psychopathy. However, the three studies also provided empirical evidence for the uniqueness of the Dark Tetrad traits, such that each of the traits demonstrated distinct relationships with various types of IPV. The most salient personality trait predictors of IPV were sadism, narcissism, and Factor 2 psychopathy. High-sadism individuals reported engaging in more frequent unidirectional physical and psychological IPV, whereas those high in narcissism reported engaging in more frequent unidirectional psychological IPV and bidirectional physical IPV. On the other hand, individuals high in Factor 2 psychopathy were more likely to perpetrate more severe instances of physical IPV. Overall, findings across the three studies support past research contending that although the traits show overlapping features, they are ultimately unique constructs that should be assessed as separate entities (Dowgwillo & Pincus, 2017; Furnham et al., 2013, 2014; Jones & Figueredo, 2013; Paulhus & Williams, 2002; Rauthmann & Kolar, 2013).

Findings from the three studies also have clinical implications for all levels of IPV prevention and intervention, ranging from primary to tertiary. Primary prevention initiatives are

designed as a means to reduce the number of new instances of IPV before any violence takes place (Harvey, García-Moreno, & Butchart, 2007). An important step in any primary prevention framework involves identification of risk factors for IPV (Harvey et al., 2007). Across our study, subclinical narcissism, sadism, and Factor 2 psychopathy emerged as significant risk factors for physical and psychological IPV perpetration. Those scoring high on the Dark Tetrad traits are often successful manipulators and give off favourable first impressions (Back et al., 2010; Jonason et al., 2014a), making it difficult for those affected by IPV to identify 'red flags' associated with their behaviours. For example, those high in psychopathy may damage or prevent relationships between the victim and their loved ones, tell intricate lies, control their finances, invade their privacy, and progress the relationship at a rapid pace in order to control them (Kirkman, 2005). It is, therefore, important for researchers and healthcare practitioners to be made aware of these risks and to promote educational initiatives designed to deliver information about individual differences as mechanisms underlying IPV perpetration. It is also important to raise awareness through the media to highlight these features as potential markers of socially aversive personality characteristics.

Study 3 revealed negative outcomes (i.e., development of dark personality traits) as a result of exposure to IPV in childhood. Therefore, primary prevention frameworks should focus on reinforcing positive parenting styles and healthy child-rearing environments (Harvey et al., 2007; Wolfe & Jaffe, 1999). For example, public health and nursing professionals can support young children by performing home visits in order to improve parenting and ensure healthy development of the child (Olds et al., 1999; Wolfe & Jaffe, 1999). For example, Olds et al. (1999) concluded that high-risk new mothers visited regularly by nurses were less likely to engage in child maltreatment (i.e., abuse and neglect) at long-term follow-up. At age 15, the

same children showed positive outcomes, such as fewer arrests, drinking less, and having fewer sexual partners than a control group with no nurse visits (Olds et al., 1999). Similarly, Wolfe et al. (2009b) introduced a promising school-based prevention method targeting dating violence, in which adolescents learned healthy nonviolent relationship skills. Additional primary prevention efforts are aimed at parent training programs, social development programs, and education for children emphasizing cognitive-behavioural skills (Harvey et al., 2007).

Secondary and tertiary prevention involve immediate and long-term intervention, respectively, to mitigate both short- and long-term negative outcomes associated with IPV (Breiding et al., 2014). Immediate secondary prevention may involve ensuring that survivors receive adequate and timely healthcare, housing, safety, and referrals to legal services (Breiding et al., 2014; Kirk, Terry, Lokuge, & Watterson, 2017). Secondary prevention also involves efforts to screen for IPV in workplace and healthcare settings to identify signs of violence (Coker, 2004). In terms of tertiary prevention, findings from the current studies can be used to tailor future interventions for perpetrators of IPV based on identification of traits contributing most to perpetration and recidivism. For example, individuals who engage in reactive or cyclical types of violence (e.g., high-narcissism individuals) may benefit from adopting alternate conflict resolution strategies (Mager et al., 2014). On the other hand, those engaging in proactive IPV (e.g., high-psychopathy individuals) may benefit more from structured cognitive-behavioural therapy (CBT) (Crick & Dodge, 1996; Saunders, 1996), as they tend to be resistant to treatment (e.g., Rice, Harris, & Cormier, 1992). For example, there is evidence to suggest that CBT treatments may be effective for those high in psychopathy (e.g., Mulloy, Smiley, Dawda, & Hart, 1996; Salekin, 2002). In one study, although only 68% of individuals scoring high on psychopathy completed a CBT intervention for battering compared to 96% of non-psychopaths,

the high-psychopathy individuals who completed the program were no more likely to reoffend than non-psychopaths (Mulloy et al., 1996). Thus, promoting completion of a CBT program for individuals high in Dark Tetrad traits may be an effective means to reduce recidivism in the context of future instances of IPV perpetration.

Protecting and enhancing the lives of children is a major priority in ensuring healthy development. Based on findings from Study 3, it is important that children who have been exposed to IPV at home receive the appropriate intervention designed to prevent negative outcomes, including the development of maladaptive personality traits. For example, at the level of secondary prevention, children exposed to violence should receive early intervention comprising home visits, crisis support, and counselling services (Wolfe & Jaffe, 1999). Tertiary prevention involves, for example, incorporating specialized treatment services for children demonstrating emotional and behavioural problems associated with the violence (e.g., Graham-Bermann, Lynch, Banyard, DeVoe, & Halabu, 2007; Jouriles et al., 2001; Wolfe & Jaffe, 1999). For example, a 10-week intervention program developed by Graham-Bermann et al. (2007) focused on increasing children's knowledge and modifying their beliefs about family violence, managing their emotions, and resolving conflict. Of the children who received the intervention along with their mothers, there was a 77% reduction of children in the clinical range from post-treatment to follow-up in internalizing behaviours and a 79% reduction of children in the clinical range for externalizing behaviours (Graham-Bermann et al., 2007). These findings highlight the efficacy of programs designed to decrease maladaptive behaviours and adjustment problems commonly exhibited by those high in the Dark Tetrad of personality following exposure to IPV.

Overall, to effectively reduce prevalence of IPV in adults, prevention and intervention methods must consider the impact of both personality and other environmental risk factors on

perpetration of violent relationship behaviours. Findings from the current studies further indicate that a one-size-fits-all approach to prevention and intervention is not appropriate, and that individual differences in personality must be considered to effectively curtail IPV behaviours in the population.

4.3. Limitations and Future Directions

There are several limitations to address in the present studies. First, the samples comprised mostly affluent individuals residing in Canada and the United States. The majority of participants were enrolled in enrolled in university or had attained a Bachelor's degree at the time of study enrolment. Rates of IPV vary across countries, (García-Moreno et al., 2006), age groups (Mezey et al., 2002), and sample types (e.g., clinical vs. nonclinical; Langhinrichsen-Rohling, 2010). Moreover, although MTurk samples tend to be more diverse than undergraduate student samples (Sheehan, 2018), the use of MTurk samples is often criticized for their lack of adequate representation of the overall population (Arditte, Çek, Shaw, & Timpano, 2016). Future research should evaluate whether results from the current studies generalize to more diverse samples, including across countries, age groups, education levels, and clinical samples.

Each of the studies also employed self-report assessments of antagonistic traits and relationship behaviours. Therefore, the results may have been susceptible to socially desirable responding, such that individuals attempted to respond favourably so as not to offset a positive self-image. Both participant and partner levels of IPV were also only assessed using participant self-reports. This may have hindered the accuracy of the reports, as men are more likely to underreport their own IPV perpetration (DeKeseredy, 2009; Edleson & Brygger, 1986; Heckert & Gondolf, 2000; Hilton et al., 2000) and women are more likely to overreport IPV perpetration (Hilton et al., 2000; Szinovacz & Egley, 1995). Retrospective accounts of childhood exposure to

IPV are also susceptible to memory distortions. In addition to issues with memory, it is possible that men overreport instances of childhood exposure to IPV in order to justify their own perpetration of violence, or that social stigma associated with violence may have reduced their reporting (Murrell, Christoff, & Henning, 2007). Use of partner reports and longitudinal accounts of exposure to IPV from childhood would be useful in future research to mitigate potential for inaccurate responding.

As mentioned previously, across each of the studies, the measures of participant and partner IPV perpetration did not request that participants indicate the context in which the violent behaviours occurred. Therefore, it is possible that actions intended to be defensive would have been coded as violent. In addition, although 71% of participant surveyed in Study 2 reported that the bidirectional violence occurred in the same relationship with the same individual, this was not confirmed across all participants and studies. Future research should follow up with an item asking participants to record the context in which the IPV took place to distinguish between proactive and defensive types of violence, as well as an item across studies clarifying that bidirectional IPV occurred with the same individual.

In Study 3, participants reported whether they had been exposed to a parent (or someone who cared for them in childhood) getting hurt, pushed, kicked, etc. by another parent. Although the non-significant relationship between childhood exposure to IPV and perpetration of IPV in adulthood could have been due to the lack of context provided in the IPV perpetration item, it is also possible that there would have been significant associations between other forms of childhood maltreatment and adult IPV perpetration. For example, the proportion of our sample who also encountered direct child abuse or neglect is unclear, and including abuse and neglect in childhood as predictors in the models may have resulted in significant positive relationships with

IPV perpetration outcomes in adulthood. Future research should include additional childhood experiences as predictors of violent behaviours perpetrated in adulthood, including abuse and neglect.

Despite its limitations, the studies presented provide the foundation for future research directions. For example, findings from this research established evidence for the associations between individual differences in personality and IPV. However, past research shows associations between several environmental and societal predictors and IPV, including neighbourhood poverty (Cunradi, Caetano, Clark, & Schafer, 2000), residing in rural areas (Brieding, Ziembroski, & Black, 2009), school context (Foshee et al., 2011), and family conflict (Simons, Lin, & Gordon, 1998), among others. Other individual difference variables recognized as significant predictors of IPV include, for example, alcohol use (Slep et al., 2015), hostile attributions and beliefs (Fite et al., 2008), conduct disorder (Ehrensaft et al., 2003), and antisocial behaviour (Kim & Capaldi, 2004). Despite the importance of each of these variables in predicting IPV behaviours, it is crucial that future studies evaluate the incremental utility of personality traits over environmental, societal, and other individual difference variables in the prediction of IPV.

The current research also did not consider variables that may serve as protective factors against the development of dark personality traits and IPV perpetration in adulthood. For example, it is unknown whether adaptive variables such as resiliency moderate the relationships between exposure to IPV in childhood and development of dark personality traits. It is plausible that personal resiliency, defined as the ability to thrive in the face of adverse circumstances (Masten, 2001, 2014), may serve as a protective buffer when children are exposed to violence,

such that their susceptibility to developing antisocial personality traits or engaging in violent acts in adulthood is reduced.

Finally, a consideration that permeated throughout the studies in this dissertation was the importance of evaluating the context in which the violence occurred to obtain valid results. A particular way to achieve this goal in future studies is to qualitatively assess the experiences of both perpetrators and survivors of IPV in an effort to more accurately evaluate risk factors for perpetration and protective factors from negative outcomes. Engaging in qualitative research with regard for the conditions under which the violence was initiated will allow for researchers to disentangle the various risk and protective factors for different types of violence, including instances of violent resistance (i.e., self-defensive actions), bidirectional violence, and unidirectional violence.

4.4. Concluding Remarks

This line of research revealed novel findings pertaining to the impact of individual differences in personality on IPV perpetration, as well as the impact of childhood experiences on the development of maladaptive personality traits. These studies were the first to investigate the Dark Tetrad traits simultaneously in terms of their relationships with not only unidirectional IPV, but also bidirectional IPV. These results allude to the distinct motivations for those high in Dark Tetrad traits to engage in IPV, such that their violence may reflect reactions to provocation, impulsivity, or pleasure-seeking cruelty. This research was also the first to evaluate the impact of childhood exposure to IPV on dark personality traits at the subclinical level. Our findings further highlighted the important distinctions between men and women in terms of developmental precursors to dark personality traits. Overall, we emphasize the critical need to tailor prevention and intervention approaches based on adverse childhood experiences and identification of traits

contributing most to IPV perpetration not only among incarcerated offender samples, but within the general community.

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APPENDICES

APPENDIX A

Research Ethics Approval Forms

Western Research

Date: 18 December 2018

To: Dr. Donald Saklofske

Project ID: 113046

Study Title: The role of personality in relationship behaviours

Application Type: NMREB Initial Application

Review Type: Delegated

Full Board Reporting Date: January 11 2019

Date Approval Issued: 18/Dec/2018

REB Approval Expiry Date: 18/Dec/2019

Dear Dr. Donald Saklofske

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the WREM application form for the above mentioned study, as of the date noted above. NMREB approval for this study remains valid until the expiry date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

This research study is to be conducted by the investigator noted above. All other required institutional approvals must also be obtained prior to the conduct of the study.

Documents Approved:

Document Name	Document Type	Document Date	Document Version
V1 Study 1 debriefing form	Debriefing document	08/Nov/2018	1
V1 Study 1 Measures	Online Survey	08/Nov/2018	1
V1 Study 2 debriefing form	Debriefing document	08/Nov/2018	1
V1 Study 2 Measures	Online Survey	08/Nov/2018	1
V1 Study 3 debriefing form	Debriefing document	08/Nov/2018	1
V1 Study 3 Measures	Online Survey	08/Nov/2018	1
V2 MTurk Recruitment Study 2	Recruitment Materials	14/Dec/2018	2
V2 MTurk Recruitment Study 3	Recruitment Materials	14/Dec/2018	2
V2 SONA Recruitment Study 1	Recruitment Materials	14/Dec/2018	2
V2 Study 1 LOI Dissertation	Implied Consent/Assent	14/Dec/2018	2
V2 Study 2 LOI Dissertation	Implied Consent/Assent	14/Dec/2018	2
V2 Study 3 LOI Dissertation	Implied Consent/Assent	14/Dec/2018	2

No deviations from, or changes to the protocol should be initiated without prior written approval from the NMREB, except when necessary to eliminate immediate hazard(s) to study participants or when the change(s) involves only administrative or logistical aspects of the trial.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario. Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Please do not hesitate to contact us if you have any questions.

Sincerely,

Kelly Patterson, Research Ethics Officer on behalf of Dr. Randal Graham, NMREB Chair

Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).

Western Research

Date: 19 November 2019

To: Dr. Donald Saklofske

Project ID: 113046

Study Title: The role of personality in relationship behaviours

Application Type: Continuing Ethics Review (CER) Form

Review Type: Delegated

Meeting Date: 06/Dec/2019

Date Approval Issued: 19/Nov/2019

REB Approval Expiry Date: 18/Dec/2020

Dear Dr. Donald Saklofske,

The Western University Non-Medical Research Ethics Board has reviewed this application. This study, including all currently approved documents, has been re-approved until the expiry date noted above.

REB members involved in the research project do not participate in the review, discussion or decision.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario. Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Please do not hesitate to contact us if you have any questions.

Sincerely,

Daniel Wyzynski, Research Ethics Coordinator, on behalf of Prof. Randal Graham, NMREB Chair

Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).

APPENDIX B

Study 1 Negative Binomial Regression Models by Gender

Table B.1

Negative Binomial Regression Models with Participant Psychological Aggression Frequency as Outcome by Gender

Predictor	Model Estimates			
	b	*SE*	*p*	*IRR*
Model 1				
Partner psychological aggression	**0.05 (0.05)**	**.00 (.00)**	**<.001 (<.001)**	**1.05 (1.05)**
Narcissism	0.02 (0.02)	.01 (.01)	.268 (.095)	1.02 (1.02)
Sadism	-0.12 **(0.37)**	.17 **(.14)**	.476 **(.006)**	0.88 **(1.45)**
Machiavellianism	0.16 (0.12)	.30 (.19)	.581 (.533)	1.17 (1.13)
Factor 1 psychopathy	-0.06 **(-0.44)**	.35 **(.21)**	.858 **(.035)**	0.94 **(0.65)**
Factor 2 psychopathy	0.05 (0.25)	.28 (.18)	.870 (.159)	1.05 (1.28)
Model 2				
Partner psychological aggression	**0.05 (0.05)**	**.00 (.00)**	**<.001 (<.001)**	**1.05 (1.05)**
Narcissism	0.02 **(0.02)**	.01 **(.01)**	.200 **(.022)**	1.02 **(1.02)**
Narcissism×Partner psychological aggression	0.00 **(0.00)**	.00 **(.00)**	.117 **(.020)**	1.00 **(1.00)**
Model 3				
Partner psychological aggression	**0.06 (0.05)**	**.00 (.00)**	**<.001 (<.001)**	**1.06 (1.05)**
Sadism	-0.03 **(0.32)**	.14 **(.10)**	.823 **(.001)**	0.98 **(1.38)**
Sadism×Partner psychological aggression	**-0.01** (0.00)	**.01** (.01)	**.018** (.873)	**0.99** (1.00)
Model 4				
Partner psychological aggression	**0.06 (0.05)**	**.00 (.00)**	**<.001 (<.001)**	**1.06 (1.05)**
Machiavellianism	0.13 (0.18)	.23 (.15)	.568 (.224)	1.14 (1.20)
Mach×Partner psychological aggression	**-0.03 (-0.03)**	**.01 (.01)**	**.014 (.003)**	**0.97 (0.97)**
Model 5				
Partner psychological aggression	**0.05 (0.06)**	**.00 (.00)**	**<.001 (<.001)**	**1.05 (1.06)**
Factor 1 psychopathy	0.15 (0.14)	.23 (.13)	.508 (.281)	1.16 (1.15)
F1×Partner psychological aggression	**-0.02 (-0.04)**	**.01 (.01)**	**.027 (<.001)**	**0.98 (0.96)**
Model 6				
Partner psychological aggression	**0.06 (0.05)**	**.00 (.00)**	**<.001 (<.001)**	**1.06 (1.05)**
Factor 2 psychopathy	0.13 **(0.43)**	.23 **(.15)**	.556 **(.004)**	1.14 **(1.54)**
F2×Partner psychological aggression	**-0.03 (-0.03)**	**.01 (.01)**	**<.001 (<.001)**	**0.97 (0.97)**

Note. Coefficients for women in brackets; remainder are men. *b* = unstandardized coefficient; *SE* = standard error for *b*; *IRR* = incident rate ratio. Significant coefficients bolded. Results for men should be interpreted with caution due to small sample size (n = 109).

Table B.2

Negative Binomial Regression Models with Participant Physical Assault Frequency as Outcome by Gender

Predictor	Model Estimates			
	b	*SE*	*p*	*IRR*
Model 1				
Partner physical assault	**0.14 (0.13)**	**.01 (.01)**	**<.001 (<.001)**	**1.15 (1.14)**
Narcissism	**0.06** (-0.03)	**.01** (.02)	**<.001** (.231)	**1.06** (0.97)
Sadism	0.10 **(0.88)**	.16 **(.30)**	.534 **(.004)**	1.11 **(2.41)**
Machiavellianism	**-1.53** (-0.13)	**.20** (.43)	**<.001** (.760)	**0.22** (0.88)
Factor 1 psychopathy	0.32 (0.06)	.38 (.48)	.402 (.905)	1.38 (1.06)
Factor 2 psychopathy	0.51 (-0.20)	.28 (.41)	.067 (.617)	1.67 (0.82)
Model 2				
Partner physical assault	**0.26 (0.14)**	**.03 (.01)**	**<.001 (<.001)**	**1.30 (1.15)**
Narcissism	**0.09** (-0.01)	**.04** (.02)	**.039** (.649)	**1.09** (0.99)
Narcissism×Partner physical assault	0.00 **(.00)**	.00 **(.00)**	.405 **(.024)**	1.00 **(1.00)**
Model 3				
Partner physical assault	**0.17 (0.13)**	**.01 (.01)**	**<.001 (<.001)**	**1.19 (1.14)**
Sadism	**0.63 (0.69)**	**.17 (.23)**	**<.001 (.003)**	**1.88 (1.99)**
Sadism×Partner physical assault	**-0.04** (0.01)	**.01** (.02)	**<.001** (.775)	**0.96** (1.01)
Model 4				
Partner physical assault	**0.16 (0.15)**	**.01 (.01)**	**<.001 (<.001)**	**1.17 (1.16)**
Machiavellianism	0.35 (0.35)	.28 (.33)	.220 (.295)	1.42 (1.42)
Mach×Partner physical assault	**-0.07 (-0.10)**	**.01 (.03)**	**<.001 (<.001)**	**0.93 (0.90)**
Model 5				
Partner physical assault	**0.17 (0.14)**	**.01 (.01)**	**<.001 (<.001)**	**1.19 (1.15)**
Factor 1 psychopathy	**1.07** (0.47)	**.32** (.30)	**.001** (.126)	**2.92** (1.60)
F1×Partner physical assault	**-0.07** (-0.04)	**.02** (.04)	**<.001** (.230)	**0.93** (0.96)
Model 6				
Partner physical assault	**0.17 (0.14)**	**.01 (.01)**	**<.001 (<.001)**	**1.19 (1.15)**
Factor 2 psychopathy	**1.24** (0.36)	**.26** (.34)	**<.001** (.293)	**3.46** (1.43)
F2×Partner physical assault	**-0.07** (-0.01)	**.01** (.03)	**<.001** (.836)	**0.93** (0.99)

Note. Coefficients for women in brackets; remainder are men. *b* = unstandardized coefficient; *SE* = standard error for *b*; *IRR* = incident rate ratio. Significant coefficients bolded. Results for men should be interpreted with caution due to small sample size (*n* = 109).

APPENDIX C

Study 2 Ordinal Logistic Regression Models by Gender

Table C.1

Ordinal Logistic Regression Models with IPV Perpetration Severity as Outcome by Gender

	Model Estimates			
Predictor	*b*	*SE*	*p*	*OR*
Model 1				
IPV victimization	**0.26 (0.10)**	**.07 (.04)**	**<.001 (.023)**	**1.30 (1.11)**
Narcissism	-0.02 (0.00)	.03 (.02)	.337 (.957)	0.98 (1.00)
Sadism	0.15 (-0.46)	.34 (.28)	.655 (.101)	1.16 (0.63)
Machiavellianism	0.43 (0.24)	.54 (.39)	.427 (.536)	1.54 (1.27)
Factor 1 psychopathy	-0.55 (0.10)	.60 (.47)	.356 (.825)	0.58 (1.11)
Factor 2 psychopathy	0.79 **(0.92)**	.42 **(.39)**	.060 **(.017)**	2.21 **(2.51)**
			R^2 = .17, *p* = .010 (R^2 = .09, *p* = .030)	
Model 2				
IPV victimization	**0.29 (0.13)**	**.07 (.04)**	**<.001 (.003)**	**1.34 (1.14)**
Narcissism	0.01 (0.01)	.02 (.02)	.759 (.440)	1.01 (1.01)
Narcissism×IPV victimization	-0.01 (0.01)	.01 (.01)	.106 (.211)	0.99 (1.01)
			R^2 = .15, *p* = .018 (R^2 = .04, *p* = .123)	
Model 3				
IPV victimization	**0.25 (0.11)**	**.07 (.05)**	**<.001 (.012)**	**1.29 (1.12)**
Sadism	0.16 (0.03)	.22 (.22)	.486 (.909)	1.17 (1.03)
Sadism×IPV victimization	0.08 (0.01)	.09 (.08)	.340 (.899)	1.09 (1.01)
			R^2 = .14, *p* = .020 (R^2 = .03, *p* = .178)	
Model 4				
IPV victimization	**0.27 (0.12)**	**.07 (.04)**	**<.001 (.009)**	**1.31 (1.21)**
Machiavellianism	0.27 (0.40)	.42 (.29)	.523 (.168)	1.31 (1.50)
Mach×IPV victimization	0.29 (-0.05)	.17 (.09)	.084 (.616)	1.34 (0.96)
			R^2 = .16, *p* = .012 (R^2 = .04, *p* = .127)	
Model 5				
IPV victimization	**0.26 (0.12)**	**.07 (.04)**	**<.001 (.006)**	**1.29 (1.13)**
Factor 1 psychopathy	0.09 (0.53)	.36 (.28)	.800 (.060)	1.10 (1.69)
F1×IPV victimization	0.09 (-0.03)	.15 (.08)	.572 (.730)	1.09 (0.97)
			R^2 = .13, *p* = .026 (R^2 = .05, *p* = .095)	
Model 6				
IPV victimization	**0.24 (0.11)**	**.07 (.04)**	**<.001 (.009)**	**1.27 (1.12)**
Factor 2 psychopathy	0.49 **(0.74)**	.34 **(.29)**	.144 **(.009)**	1.63 **(2.10)**
F2×IPV victimization	0.15 (0.03)	.12 (.09)	.202 (.713)	1.16 (1.03)
			R^2 = .15, *p* = .010 (R^2 = .07, *p* = .047)	

Note. Coefficients for women reported in brackets; remainder are for men. *b* = unstandardized coefficient; *SE* = standard error for *b*; *OR* = odds ratio; R^2 = McKelvey & Zavoina's pseudo-R^2; IPV = intimate partner violence. Significant coefficients bolded.

APPENDIX D

Study 2 Linear Regression Models

Table D.1

Linear Multiple Regression Models with IPV Perpetration Severity as Outcome

Predictor	Model Coefficients *b*	*SE*	*p*
Model 1			
Gender	**0.94**	**.21**	**<.001**
IPV victimization	**0.13**	**.03**	**<.001**
Narcissism	-0.01	.01	.362
Sadism	-0.01	.19	.961
Machiavellianism	0.32	.28	.252
Factor 1 psychopathy	-0.20	.33	.555
Factor 2 psychopathy	**0.93**	**.26**	**<.001**
			$R^2 = .13$, $F(7, 349) = 7.58$, $p < .001$
Model 2			
Gender	**0.76**	**.20**	**<.001**
IPV victimization	**0.15**	**.03**	**<.001**
Narcissism	0.01	.01	.632
Narcissism×IPV victimization	0.01	.00	.242
			$R^2 = .08$, $F(4, 352) = 8.04$, $p < .001$
Model 3			
Gender	**0.90**	**.20**	**<.001**
IPV victimization	**0.16**	**.03**	**<.001**
Sadism	**0.31**	**.14**	**.031**
Sadism×IPV victimization	**0.15**	**.05**	**.002**
			$R^2 = .11$, $F(4, 352) = 11.33$, $p < .001$
Model 4			
Gender	**0.85**	**.20**	**<.001**
IPV victimization	**0.16**	**.03**	**<.001**
Machiavellianism	**0.49**	**.22**	**.026**
Mach×IPV victimization	0.12	.07	.091
			$R^2 = .10$, $F(4, 352) = 9.86$, $p < .001$
Model 5			
Gender	**0.91**	**.21**	**<.001**
IPV victimization	**0.15**	**.03**	**<.001**
Factor 1 psychopathy	**0.45**	**.21**	**.030**
F1×IPV victimization	0.11	.06	.085
			$R^2 = .10$, $F(4, 352) = 9.91$, $p < .001$
Model 6			
Gender	**0.96**	**.20**	**<.001**
IPV victimization	**0.14**	**.03**	**<.001**
Factor 2 psychopathy	**0.77**	**.19**	**<.001**
F2×IPV victimization	**0.19**	**.06**	**.002**
			$R^2 = .15$, $F(4, 352) = 15.40$, $p < .001$

Note. $N = 357$. *b* = unstandardized coefficient; *SE* = standard error for *b*; *OR* = odds ratio; CI = confidence interval; IPV = intimate partner violence.
Significant coefficients bolded.

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