NON-SUICIDAL SELF-INJURY IN UNIDIRECTIONAL AND BIDIRECTIONAL INTIMATE PARTNER VIOLENCE

by

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Abstract

Non-suicidal self-injury (NSSI) and intimate partner violence (IPV) are prevalent among college students. Prior studies have identified associations between NSSI and IPV, but have focused mainly on victims, and have not considered directionality of IPV (unidirectional vs. bidirectional). The present research is the first to examine directionality of violence in the association between NSSI and IPV. This study also examined the functions of NSSI, which have not been examined before in this context, and further examined the potential mediating role of emotion dysregulation, as it has been suggested that this factor may underlie both NSSI and IPV perpetration. Data on IPV, NSSI, and emotion dysregulation were collected for 1018 participants, who were then classified into four groups: unidirectional perpetrators, unidirectional victims, bidirectional IPV, and non-violent. Findings indicated that being in a violent relationship increased the likelihood of NSSI, especially in the case of unidirectional perpetrators and individuals that engaged in bidirectional IPV. Intrapersonal NSSI functions were equivalent across groups, whereas the interpersonal functions of revenge and peer-bonding were more highly endorsed by individuals who engaged in bidirectional IPV. The study findings suggest that the association between IPV and NSSI may be understood in terms of generally violent relationships rather than as a distinct consequence of victimization. Findings indicate that NSSI serves primarily to alter or regulate emotional states, and may serve also as a form of communication among mutually violent couples. Individuals with NSSI in all the groups exhibited higher levels of emotion dysregulation than their counterparts without NSSI, except for unidirectional perpetrators. Emotion dysregulation accounted for a significant amount of the relationship between NSSI and bidirectional IPV, providing further support for the importance of this construct in understanding both NSSI
and IPV. Implications are discussed from theoretical, methodological, and clinical perspectives.
Preface

The University of British Columbia’s Behavioural Research Ethics Board granted ethics approval for this research. The ethics approval certificate number for the current research is H10-02387. To date, the data included in this thesis has not been published.
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Dedication

This work is especially dedicated to my partner Nadir; you are the one who kept me going, I would not be here without you. I also want to dedicate this work to my family for always believing in me.

Thank you all for always being there for me.
CHAPTER 1 Introduction

Non-suicidal self-injury (NSSI) is a major public health concern with a high prevalence reported among college students (12-38%; Gratz, 2001; Gratz, Conrad, & Roemer, 2002; Heath, Toste, Nevedecheca, & Charlebois, 2008; Whitlock, Eckenrode, & Silverman, 2006). NSSI is a dangerous behaviour that can result in physical injuries that require medical attention or even lead to death (Klonsky, 2007b). Intimate partner violence (IPV) is also a prevalent problem among college students, with over 30% of this population experiencing perpetration, victimization, or both (e.g., Hines & Saudino, 2003; Prospero, 2008; Straus & Ramirez, 2007). Several studies have found an association between NSSI and IPV perpetration and victimization (e.g., Murray Wester, & Paladino, 2008; Sansone, Chu, and Weiderman, 2007). However, the nature of this potentially important relationship is still not well understood due to the scarcity of research about this topic, and the limitations inherent to prior assessments that have not addressed the heterogeneous nature of IPV and functions of NSSI.

The studies assessing the relationship between NSSI and IPV have focused on either perpetrators (Murray et al., 2008; Swahn et al., 2010) or, more commonly, victims (e.g., Jaquier, Hellmuth, & Sullivan, 2013; Levesque, Lafontaine, Bureau, Cloutier, & Dandurand, 2010; Murray et al., 2008; Sansone et al., 2007; Swahn et al., 2010), and have completely overlooked the directionality of IPV; that is, these studies have not assessed whether IPV perpetration and victimization were unidirectional (i.e., one member of the couple is exclusively the perpetrator or the victim of IPV) or bidirectional (i.e., both members of the couple are perpetrators and victims of IPV). Also, extant research has focused primarily on examining straightforward associations between NSSI and IPV whereas the prevalence,
methods, and functions of NSSI have received less attention; specifically, the functions of NSSI have never been assessed in the context of IPV. The present research was designed to address the limitations of prior studies by examining the prevalence and functions of NSSI in IPV victims and perpetrators taking into account directionality of IPV (unidirectional and bidirectional). This study was the first to consider the importance of directionality of violence for understanding the association between IPV and NSSI and is based on the theoretical proposition that overlooking the distinction between unidirectional and bidirectional IPV may obscure the true nature of this relationship. The distinct contribution of this examination is accentuated by the novel examination of NSSI functions in the context of IPV, which has the potential to further elucidate the factors that underlie differences in the nature of NSSI across IPV subgroups. This study also examined the potential mediating role of emotion dysregulation, as it has been associated with NSSI (e.g., Cadwood & Huprich, 2011), and IPV perpetration (e.g., Gratz, Paulson, Jakupack, & Tull, 2009). This study was the first to test the explanatory power of emotion dysregulation in the context of co-occurring IPV and NSSI.

1.1. NSSI

1.1.1 General characteristics

NSSI is defined as the “intentional destruction of body tissue without suicidal intent and for purposes not socially sanctioned” (Klonsky, 2007a, p. 1039). Several aspects of this definition warrant further explanation. This definition excludes those behaviours in which the tissue damage is accidental, unintentional, or the result of side effects, as in eating and substance disorders (Klonsky, 2007a). Socially sanctioned behaviours that result in tissue damage, such as piercing and tattooing body parts, also are typically excluded from this
definition given that these behaviours are considered symbolically and culturally meaningful forms of expression (Klonsky, 2007a; Miller & Brock, 2010). Critical to this definition is that the intention to die is absent when individuals engage in self-injury; this is an important characteristic that differentiates NSSI from other forms of self-harm, such as suicidal behaviour. Although NSSI and suicidal behaviour can both be included under the broader definition of deliberate self-injury (Nock, 2010), they differ not only in terms of intent, but also in prevalence, chronicity, methods, functions, and lethality (Klonsky & Muehlenkamp, 2007; Hamza, Stewart, & Willoughby, 2012; Muehlenkamp, 2005; Muehlenkamp, & Kerr, 2010). Therefore, it is important to differentiate between suicidal and non-suicidal behaviours when assessing self-injury. In this thesis, the terms self-injury and self-harm are used to refer to NSSI, not to suicidal behaviours.

NSSI can be expressed in various forms, such as skin cutting, burning, severe scratching, banging or hitting self, interfering with wound healing, or sticking needles into one’s body (Klonsky, 2007a; Muehlenkamp, 2005; Nock and Favazza, 2009). Usually individuals who engage in NSSI use multiple methods to self-injure (Gratz, 2001; Kakhnovets, Young, Purnell, Hueber, & Bishop, 2010; Whitlock et al., 2006, 2011). The most frequently reported methods in college populations are skin cutting, banging or hitting self, and severe scratching (Cadwood & Huprich, 2011; Heath et al, 2008; Whitlock et al 2006, 2011). The age of onset for NSSI generally occurs during adolescence, but there is evidence of the onset of this behaviour during college years (Heath et al., 2008; Kakhnovets et al., 2010; Whitlock et al., 2011). Although, significant gender differences in NSSI prevalence have not been found in the majority of studies (Cawood & Huprich, 2011; Gratz,
2001; Gratz et al., 2002; Heath et al., 2008; Whitlock et al., 2006, 2011), some studies have reported higher NSSI prevalence in females (e.g., Wilcox et al., 2012).

The psychological characteristics that characterize individuals who engage in NSSI include negative emotionality, emotion skills deficits, negative self-concept and low-self esteem, a tendency to self-derogation, and interpersonal skill deficits (e.g., Cawood & Huprich, 2011; Claes, Houben, Vandereycken, Bijttebier, & Muehlenkamp, 2010; Klonsky & Muehlenkamp, 2007; Nock & Mendes, 2008). Negative emotionality might be considered the most relevant characteristic among these features given that it is frequently present in the everyday lives of self-injurers (Klonsky & Muehlenkamp, 2007). In this regard, it has been found that self-injurers exhibit higher levels of negative temperament (e.g., hostility) and negative affect (e.g., anxiety, depression) compared to individuals who do not engage in this behaviour (Andover, Pepper, Ryabchenko, Orrico, & Gibb, 2005; Gollust, Eisenberg, & Golberstein, 2008; Jacobson & Gould, 2007; Laye-Gindhu & Schonert-Reichl, 2005; Wilcox et al., 2012). Self-injurers tend to experience emotion regulatory difficulties (Gratz & Roemer, 2004, 2008; Heath et al., 2008; Klonsky & Muehlenkamp, 2007) involving the experience, identification, understanding, or expression of their emotions compared to non-self-injurers (Gratz & Roemer, 2004, 2008; Klonsky & Muehlenkamp, 2007). They also tend to use more maladaptive coping strategies when faced with emotional distress compared to individuals who do not engage in NSSI (Cawood & Huprich, 2011; Hamza, Willoughby, & Good, 2013). Individuals who engage in NSSI tend to have low self-esteem and a negative view of the self with regard to intellectual, emotional, physical, and social aspects compared to individuals without NSSI (Cawood & Huprich, 2011; Claes et al., 2010; Duggan, Toste, & Heath, 2013; Ross & Heath, 2003; Ross, Heath, & Toste, 2009). Self-injurers are also likely

NSSI also has been associated with a wide range of psychiatric diagnoses such as borderline personality disorder, anxiety disorders, depression disorders, substance disorders, and eating disorders (e.g., Cawood & Huprich, 2011; Claes, Klonsky, Muehlenkamp, Kuppens, & Vandereycken, 2010; Gollust et al., 2008; Kakhnovet et al., 2010; Whitlock et al., 2006). Suicidal ideation and attempts also have been found in a substantial portion of non-clinical populations of self-injurers (Klonsky, May, & Glenn, 2013; Whitlock & Knox, 2007; Wilcox et al., 2012). Also, NSSI has been associated with childhood sexual abuse (Etkind, 2010; Gladstone et al., 2004; Noll, Horowitz, Bonanno, Trickett, & Putnam, 2003).

Although the study of psychological characteristics and correlates of NSSI help to identify which people may be at greater risk of engaging in NSSI, they do not provide an explanation of why people engage in this behaviour (Nock & Cha, 2009). To this end, the assessment of NSSI functions is essential; it would provide a better understanding of the motivations that may trigger and maintain this behaviour, and it would also aid the improvement of treatment programs and the design of preventive interventions (Klonsky, 2009; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; Nock & Cha, 2009).

1.1.2 Functions

NSSI can be classified as serving either intra or interpersonal functions (Klonsky & Glenn, 2009). Intrapersonal functions, also called automatic functions, are focused on and reinforced by the self (Klonsky & Glenn, 2009; Klonsky & Weinberg, 2009; Nock & Prinstein, 2004, 2005), and their main purpose is to alter the emotional state of the individual (e.g., alleviate
overwhelming emotions). When NSSI serves intrapersonal functions this behaviour is usually performed in private (Klonsky & Muehlenkamp, 2007). Interpersonal functions, also called social functions, are focused on and reinforced by others (Klonsky & Glenn, 2009; Klonsky & Weinberg, 2009; Nock & Prinstein, 2004, 2005), and they are typically driven to elicit a response from others (e.g., seeking care from others) or establish a differentiation from others (e.g., creating boundaries between oneself and others), (Klonsky & Weinberg, 2009). When NSSI is driven to serve interpersonal functions it is more likely that this behaviour would be performed around others (Klonsky & Muehlenkamp, 2007). In general, individuals engage in NSSI more often to serve intrapersonal functions than interpersonal functions (Nock, 2008; Nock & Prinstein 2004; Klonsky 2007b).

Different models have been proposed to explain why individuals self-injure based on the functions they serve and how NSSI is reinforced. Four models have been described with regard to intrapersonal functions: affect-regulation, self-punishment, anti-suicide, and anti-dissociation or feeling generation. The affect regulation model is generally the most prominent model, and conceptualizes NSSI as a strategy to alleviate overwhelming emotions or heightened arousal (Klonsky, 2007b). NSSI is usually preceded or accompanied by negative or painful feelings such as anger (both towards others and towards the self), sadness, stress, frustration, hopelessness, emptiness, distress, shame, and feelings of being out of control (Kakhnovets et al., 2010; Klonsky and Weiner, 2009; Whitlock et al., 2011; Wilcox et al., 2012; Wong et al, 2011); in this scenario, NSSI would be use as a strategy to release this emotional pressure (Klonsky & Muehlenkamp, 2007; Suyemoto, 1998). Numerous studies have documented feelings of calm and relief after performing NSSI for
emotional regulation purposes (Favazza & Conterio, 1989; Gratz, 2003; Kakhnovets et al., 2010).

The self-punishment model views NSSI as a way to express anger towards oneself or as a way to punish oneself when experiencing emotional distress (Klonsky & Muehlenkamp, 2007). As previously mentioned, non-suicidal self-injurers are characterized by low self-esteem and self-derogation; in this context, NSSI would function as a means of physically expressing and alleviating those negative feelings they have towards themselves.

The anti-suicide model considers that NSSI provides a way to escape from suicidal impulses by shooting the negative feelings that led to feel suicidal (Klonsky, 2007b; Klonsky & Muehlenkamp, 2007). NSSI in this case would act as a replacement of the suicidal attempt (Klonsky, 2007b; Suyemoto, 1998).

The anti-dissociation or feeling generation model holds that NSSI is performed in order to end dissociative states where the individual feels unreal or lacks any feelings; in this context, NSSI would be a strategy to regain the ability to feel again (Klonsky, 2007b; Klonsky & Muehlenkamp, 2007; Suyemoto, 1998).

With regard to interpersonal functions, three models have been described: interpersonal influence, interpersonal boundaries, and sensation seeking. The interpersonal influence model considers that individuals use NSSI to influence or manipulate people in their environment (e.g., family, friends, authority figures) by eliciting a response from them; NSSI may be used to seek attention or care from others, or to avoid abandonment (Klonsky, 2007b; Klonsky & Muehlenkamp, 2007). In this context, it has been hypothesized that individuals may turn to NSSI when less intense communication strategies have been unsuccessful (e.g., speaking, yelling, crying) (Nock, 2008). This model also considers that
NSSI may be used to communicate or to create social connections (e.g., bonding with peers), (Klonsky, 2007b; Klonsky & Muehlenkamp, 2007). Sometimes individuals may engage in NSSI without being interpersonal influence the primary motivation of this behaviour, but it may elicit a response from others anyways, which will end up reinforcing NSSI (Gratz, 2003). Therefore, in this context, individuals may not be aware that their behaviour is being reinforced by others’ reactions (Klonsky, 2007b).

The interpersonal boundaries model views NSSI as a way to affirm the boundaries of the self when the sense of identity may be lost or blurred. Also, NSSI could be used to establish a distinction between the self and others, or to assert that one is self-sufficient and does not need other people to rely on (Klonsky, 2007b; Klonsky & Muehlenkamp, 2007; Suyemoto, 1998).

The sensation-seeking model considers that individuals engage in NSSI to generate excitement or entertainment by pushing the limits of the self; NSSI would be considered as a way to generate feelings similar to those generated by extreme sports (Klonsky, 2007b; Klonsky & Muehlenkamp, 2007). When NSSI serves this function, usually it is performed when other people are around (Klonsky & Muehlenkamp, 2007).

A review of the literature regarding NSSI functions provided support for these models; affect regulation and self-punishment were the functions more strongly supported, whereas the rest of the functions received moderate support (Klonsky, 2007b). This study found that the most prevalent function of NSSI was affect regulation, followed by self-punishment and anti-dissociation/feeling generation (Klonsky, 2007b).

Finally, in relation to NSSI functions it is important to mention that interpersonal stressors involving people in the environment of the self-injurer usually precede the
engagement in NSSI (Pristein, Guerry, Browne, & Rancourt, 2009); some of these stressors could be the experience of loneliness, rejection or loss, or a fight or conflict with a family member, romantic partner, friend, or other important people in the self-injurer’s life (Klonsky & Weinberg, 2009; Prinstein et al., 2009).

1.2 IPV

1.2.1 Types of IPV

Traditionally IPV has been conceptualized as primarily perpetrated by men and suffered by women. However, a large body of research has challenged this traditional view with findings that women are as likely or more likely than men to be the perpetrators of violence against intimate partners (e.g., Hines & Saudino, 2003; Prospero, 2008; Straus & Ramirez, 2007). Further, the conceptualization of IPV as a unidirectional phenomenon, where one member of the couple is either the perpetrator or the victim, has been challenged with evidence of bidirectional or mutual violence in nearly half of the couples that engage in IPV (e.g., Hines & Saudino, 2003; Prospero, 2008; Straus & Ramirez, 2007). These findings have been the center of considerable debate in the field of IPV in the past two decades. To address this, several researchers have suggested that the key to understand this controversial evidence is to recognize that IPV is a heterogeneous phenomenon, and that different types of IPV may occur in different and non-overlapping populations (Archer, 2000; Langhinrichsen-Rohling, 2010; Straus, 2011). On the one hand, findings from research conducted with samples from law enforcement agencies, shelters for battered women, treatment programs, and crime surveys, point to IPV as a unidirectional phenomenon predominantly perpetrated by men and suffered by women. In these studies, victims experience high levels of violence (Archer, 2000; Jonhson, 2010; Langhinrichsen-Rohling, 2010; Straus, 2011). On the other hand,
findings from research conducted with general population samples, mainly with large samples of college and high school students, point to IPV as a generally bidirectional or mutual phenomenon, where men and women exhibit similar rates of perpetration against intimate partners and where violence is not as severe as in agency and crime survey samples (Archer, 2000; Jonhson, 2010; Langhinrichsen-Rohling, 2010; Straus, 2011). The explanation of the dual population has received support from different reviews of the literature (Archer, 2000; Jonhson, 1995, 2006, 2010; Langhinrichsen-Rohling, 2010; Straus, 2011). Empirically validated IPV typologies have provided support for different types of IPV. Johnson (1995, 2006) proposed an IPV typology based on the configuration of violence and controlling behaviour in relationships, which accounted for unidirectional and bidirectional violence and also provided specific predictions regarding gender. It seems that the type of IPV that characterizes agency and crime survey samples is what Johnson (1995, 2006) described as intimate terrorism, which is predominantly perpetrated by men who exhibit a general pattern of coercive control over their non-controlling and non-violent partners; this type of violence is what traditionally has been referred as domestic/spousal violence (Johnson & Leone, 2005). The type of IPV found in general population samples is what Johnson (1995, 2006) described as situational couple violence, which is gender symmetric in terms of perpetration and refers to when both members of the couple are violent but noncontrolling. Johnson (1995, 2006) argued that in situational couple violence violent incidents arise from specific arguments that escalate to violence, but there is no attempt to exert general control over one’s partner. Overall, these findings provide support for the existence of different types of IPV in different populations, which has allowed the
field of IPV to reconcile contradicting data regarding gender and directionality of violence (Johnson, 2010; Langhinrichsen-Rohling, 2010).

1.2.2 IPV in young/college populations

An extensive body of research has established that bidirectional IPV is the most prevalent type of IPV in young populations (in comparison to unidirectional perpetration and unidirectional victimization), with over half of the violent couples reporting engaging in mutual violence (Hines & Saudino, 2003; Orcutt, Garcia, & Pickett, 2005; Prospero, 2008; Straus & Ramirez, 2007; Straus, 2008; Testa, Hoffman & Leonard, 2011; Whitaker, Haileyesus, Swahn, & Saltzman, 2007). With regard to unidirectional perpetration, the majority of studies have found that females are as likely or more likely than males to be the perpetrators of violence when only one member of the couple is violent (Hines & Saudino, 2003; Orcutt, Garcia, & Pickett, 2005; Prospero, 2008; Straus & Ramirez, 2007; Straus, 2008; Testa et al., 2011; Whitaker et al., 2007). Although there is evidence of relative gender symmetry with regard to the perpetration of violence, the effects or consequences of violence has been found to be asymmetrical with regard to victimization, with female victims suffering greater detrimental effects, such as more fear and more physical and psychological injury than males, both in bidirectional and unidirectional IPV (Langhinrichsen-Rohling, 2010; Straus 2011; Straus & Ramirez, 2007; Whitaker et al., 2007); and this has been found in both general population samples and agency and crime survey samples (Archer, 2000; Johnson, 2010; Langhinrichsen-Rohling, 2010; Straus, 2011). Therefore, it is important to keep in mind that the existence of bidirectional violence does not necessarily indicate that the frequency, the severity, and the consequences of violence are equal or similar between
partners; it just indicates that both partners are violent towards each other (Whitaker et al., 2007; Langhinrichsen-Rohling, 2010)

Bidirectional violence is more prevalent in both minor and severe violent incidents (Orcutt et al., 2005; Straus, 2011; Straus & Ramirez, 2007), and across different forms of IPV (i.e., physical, psychological, and sexual) when compared to unidirectional IPV (Orcutt, et al., 2005; Renner & Whitney, 2012; Testa et al., 2011). Also, it has been found that bidirectional IPV is associated with greater frequency of violence and more inflicted injury than unidirectional IPV (Orcutt et al., 2005; Testa et al., 2011) regardless of gender (Whitaker et al., 2007), and that violence is more likely to escalate and to be maintained over the time in bidirectional IPV (Testa et al., 2012). Some studies have found that bidirectional and unidirectional IPV also differ with regard to associated risk factors (Melander, Noel, & Tyler, 2010), and that there are more risk factors associated with bidirectional than unidirectional IPV for both males and females (Renner & Whitney, 2012).

As for the motives that underlie IPV perpetration, several studies have found that the perpetration of violence seems to be driven by similar motives in both men and women in college populations. Commonly reported motives by both genders are anger, retaliation for being emotionally hurt, to get partner’s attention, jealousy, and self-defence (Follingstad, Wright, Lloyd, & Sebastian, 1991; Hettrich & O'Leary, 2007; Leisring, 2013; Makepeace, 1986; Shorey, Meltzer & Cornelius, 2010). With regard to bidirectional IPV, it has been the common belief that when women engage in violence against their intimate partners it is for self-defence motives (Straus, 2011). However, the above findings indicate that self-defence is not the predominant motive that drives women to engage in IPV perpetration. Further, some studies have found no gender differences in self-defence motives in individuals who
engage in bidirectional IPV (Harned, 2001), and another study has found that self-defence was barely reported by females who engage in bidirectional IPV (Leisring, 2013). Therefore, these findings point to similar motivations for the perpetration of violence against intimate partners for both unidirectional and bidirectional IPV, regardless of gender.

In summary, all these findings highlights the importance of distinguishing between unidirectional and bidirectional IPV given the differences in prevalence, characteristics, and correlates found for both types of IPV, particularly in young populations.

1.3 NSSI and IPV

The link between IPV and other forms of deliberate self-injury (i.e., suicidal attempts) has been well documented (e.g., Chan et al., 2008; Chan, Tiwari, Leung, Ho, & Cerulli, 2007; Espinoza-Gómez et al., 2010). However, the literature providing a more fine grained analysis of the relationship between NSSI and IPV is sparse. To date, seven studies have been conducted to assess the relationship between NSSI and IPV: one with high school students (Swahn et al., 2010), two with college students (Levesque et al., 2010; Murray et al., 2008), two with community samples (Etzel, 2005; Jaquier et al., 2013; Nada-Raja & Skegg, 2011), one with an agency sample, and one with psychiatric inpatients (Sansone et al., 2007). The majority of these studies have focused on the association between NSSI and IPV, or the prediction of NSSI by IPV victimization or perpetration; the prevalence has been examined only in three studies (Etzel, 2005; Jaquier et al., 2013; Sansone et al., 2007), and none of these studies have assessed the functions of NSSI. Also, none of these studies have examined bidirectional IPV.
1.3.1 NSSI and IPV victimization

The study of NSSI in the context of IPV has focused mainly on victims. In general, the studies assessing the relationship between NSSI and IPV victimization have found a positive association between the two, and have identified IPV victimization as a significant predictor of NSSI (Levesque et al., 2010; Nada-Raja & Skegg, 2013; Murray et al., 2008; Sansone et al., 2007; Swahn et al., 2010).

With regard to college populations, a positive association has been found between recent NSSI and past year IPV victimization (physical and psychological in Murray et al., 2008; physical, psychological, and sexual in Levesque et al., 2010) in males and females undergraduate students. Murray and colleagues (2008) found that IPV victimization significantly predicted NSSI after controlling for demographic variables and attitudes towards violence, and Levesque and colleagues (2010) found that IPV victimization significantly predicted NSSI behaviours, regardless of gender. In explaining the association between NSSI and IPV victimization both studies suggested that NSSI might be the result of maladaptive coping strategies and difficulties to regulate emotions (Levesque et al., 2010; Murray et al., 2008); if victims have difficulties regulating their emotions appropriately, they may engage in violence towards themselves as a way to control or alleviate these emotions (Levesque et al., 2010). It was also suggested that NSSI might be used as a way to manipulate intimate partners (Murray et al., 2008). Childhood abuse was proposed as a potential factor that might connect NSSI and IPV victimization due to its association with both adult re-victimization and NSSI (Murray et al., 2008).

Consistent with these findings are those of a study conducted with high school students, which showed a positive association between past year NSSI and past year dating
violence victimization (physical and sexual) for males and females (Swahn et al., 2010). This study also found that both NSSI and dating violence victimization were related to emotional difficulties, peer and date violence perpetration, risk behaviours (just for boys), and child maltreatment (Swahn et al., 2010).

Nada-Raja & Skegg (2013) conducted a longitudinal study with community men and women to analyze the relationship between physical and sexual assault victimization at age 21 and NSSI at age 26, and found that women who reported sexual assault whose assailant was an intimate partner were more likely to engage in subsequent NSSI than women who did not report these characteristics; this pattern of relationship was not found for men. The authors of the study suggested that women might engage in NSSI as a way to deal with the impact of being assaulted or to prompt a desired change in their intimate partners when relationship conflict is present (Nada-Raja & Skegg, 2013). Another study conducted with community women victims of IPV showed that 29.7% presented NSSI; of those 13.7% reported current NSSI and 16% reported past NSSI (Jaquier et al., 2013). This study showed that current NSSI was associated with higher depression and posttraumatic numbing stress symptoms, and with higher mean scores on IPV (physical, psychological, and sexual) and childhood abuse, compared to those without NSSI or with just past NSSI. The authors of this study suggested that these findings were consistent with emotion regulation deficits (Jaquier et al., 2013).

Another study conducted with women psychiatric inpatient victims of IPV, found that 64.3% of the victims endorsed some form of NSSI, and that IPV victimization was a significant predictor of NSSI after controlling for demographic variables (Sansone et al., 2007). The authors of this study suggested that the link between NSSI and IPV victimization
might be explained by histories of childhood trauma, given its association with both adult re-
victimization and self-injury (Sansone et al., 2007). Also, it was suggested that IPV victims
might engage in NSSI due to disturbances of body image and low self esteem, which might
contribute to increase tolerance to body maltreatment. Lastly, it was suggested that IPV
victims may engage in NSSI due to underlying psychopathology, such as borderline
personality disorder or dysthymia, which are disorders that have been associated with NSSI
(Sansone et al., 2007). Another study conducted with battered women referred by social
service agencies also reported alarming rates of NSSI, with up to 88% victims endorsing at
least one method of NSSI (Etzel, 2005). This study found that NSSI was a way to avoid,
suppress, or escape from negative feelings, in this study in particular, from feelings of shame
(Etzel, 2005).

Lastly, a study conducted by Wong and colleagues (2011) examined the role of self-
harm (suicidal and non-suicidal) in female IPV victims by conducting a thematic analysis of
the calls made to a crisis hotline. Although this study is not restricted to assessing the
relationship between NSSI and IPV, it is relevant to the present discussion because it is the
only study in the literature that has assessed motives or functions of self-harm in the IPV
context. This study found that NSSI was most often triggered by specific episodes of
violence and that the main motivations to self-harm were to express intense distress or
painful emotions, and to end unbearable states of exhaustion and hopelessness. The authors
of this study suggested that NSSI functioned both as a self-soothing strategy to alleviate
internal pain, and as a self-regulating strategy to avoid speaking out against abusive partners
(Wong et al., 2011).
In summary, these findings provide support for the association between NSSI and IPV victimization. Some of these studies have showed that IPV victims who engage in NSSI have higher levels of negative emotions and emotional difficulties compared to people who do not engage in this behaviour (Etzel, 2005; Jaquier et al., 2013; Swahn et al., 2010). The majority of studies have suggested emotion regulatory difficulties and maladaptive coping strategies to explain why IPV victims might engage in NSSI (Etzel, 2005; Levesque et al., 2010; Murray et al., 2008; Sansone et al., 2007; Wong et al., 2011); in this scenario NSSI would act as an effective, although maladaptive, strategy to regulate IPV-related affective disturbances. Some studies also have pointed to the use of NSSI as a way to influence or manipulate intimate partners to prompt a change in their behaviour (Murray et al, 2008; Nada-Raja & Skegg, 2013). Lastly, it has been suggested that childhood abuse might be a potential factor that could connect NSSI and IPV victimization (Murray et al., 2008; Sansone et al., 2007); this issue already has been addressed by several studies (Etkind, 2010; Gladstone et al., 2004; Noll, Horowitz, Bonanno, Trickett, & Putnam, 2003).

1.3.2 NSSI and IPV perpetration

The relationship between NSSI and IPV perpetration has been assessed by only two studies: one conducted with high school students (Swahn et al., 2010), and one conducted with college students (Murray et al., 2008). The study of Swahn and colleagues (2010) found a positive association between past year NSSI and past year dating violence perpetration (physical and sexual) for males and females, even after controlling for demographic and psychosocial variables. This study also found that both NSSI and dating violence perpetration were related to emotional difficulties, peer violence perpetration, risk behaviours, and child maltreatment (Swahn et al., 2010).
Murray and colleagues (2008) found a positive association between recent NSSI and past year IPV perpetration (physical and psychological) in males and females undergraduate students; however, IPV perpetration was no longer a significant predictor of NSSI after controlling for demographic variables and attitudes towards violence. In this study authors pointed to coping strategies or histories of traumatic experiences as factors that might connect NSSI and IPV perpetration. This study suggested that NSSI might be used as a maladaptive strategy to cope with relationship distress, or as a way to manipulate or influence intimate partners (Murray et al., 2008).

These two studies provide support for the association between NSSI and IPV perpetration (Murray et al., 2008; Swahn et al., 2010).

1.4 Emotion dysregulation

Although negative emotionality has been associated with both NSSI and IPV perpetration (e.g., Chan et al., 2008; Graham, Bernards, Flynn, Tremblay, & Wells, 2012; Kakhnovets, et al., 2010; Jacobson & Gould, 2007; Renner & Whitney, 2012; Ross & Heath, 2002, 2003; Swahn et al., 2010; Wilcox et al., 2012), the mere existence of negative emotions or the intensity of those emotions do not offer sufficient explanation of the mechanisms through which NSSI and IPV perpetration occur; to this, it has been suggested that difficulties in emotion regulation processes (i.e., emotion dysregulation), may be the likely mechanism underlying the manifestation of both NSSI (Cawood & Huprich, 2011; Grazt & Roemer, 2004; Heath et al, 2008; Wilcox et al., 2012) and IPV perpetration (Gratz et al., 2009; Tager, Good, & Brammer, 2010).

Emotion dysregulation is a multidimensional construct that involves the experience of (a) difficulties in awareness, understanding, and acceptance of emotions; (b) problems to
engage in goal-directed behaviour and to restrain impulsive behaviour when experiencing negative emotions; (c) and deficits in the use of appropriate strategies to regulate the intensity and/or duration of emotional responses according to personal goals and situational demands (Gratz, 2007; Gratz & Roemer, 2004). Several studies have found emotion dysregulation as a consistent correlate and predictor of NSSI in clinical and non-clinical populations, including college students (Cawood & Huprich, 2011; Gratz & Roemer, 2004; Heath et al, 2008; Wilcox et al., 2012). Within this population, higher levels of emotion dysregulation have been found among individuals performing NSSI (Heath et al., 2008).

Some studies have found an association between NSSI and individual dimensions of emotion dysregulation, such as the use maladaptive coping strategies (Andover, Pepper, and Gibb 2007; Cawood & Huprich, 2011; Evans, Hawton, and Rodham, 2005), or the experience of problems with the awareness and understanding of emotions (Gratz & Roemer, 2004, 2008). Also, there is a large body of research that has found that the most reported motivation in the engagement of NSSI is the regulation affective states (Klonsky, 2007b).

Emotion dysregulation also has been associated with IPV perpetration in clinical (Tager, Good, & Brammer, 2010) and college male populations (Gratz, Paulson, Jakupcak, & Tull, 2009; Gratz & Roemer, 2004). Also, studies of current typologies of IPV perpetrators have consistently identified a type of perpetrator characterized by emotional instability, usually called the borderline type, in clinical and community samples (Holtzworth-Munroe & Stuart, 1994; Holtzworth-Munroe et al., 2000; Walsh et al, 2010; Waltz et al., 2000). Some studies have found an association between IPV perpetration and individual dimensions of emotion dysregulation, such as non-acceptance emotional experience (Jakupcak, Tull, & Roemer, 2005), and impulsive behaviour (Holtzworth-Munroe & Stuart, 1994; Shorey,
Brasfield, Febres, & Stuart, 2011). In light of these findings, it has been suggested that the perpetration of violence against intimate partners may serve an emotion regulatory function (Gratz et al., 2009; Jakupcak, Lisak, & Roemer, 2002).

All these findings point to emotion dysregulation as a risk factor for perpetration of violence towards the self and towards others, in this case intimate partners. Difficulties in regulating intense overwhelming emotions may lead individuals to use violence (either towards themselves or towards intimate partners) as a maladaptive strategy to cope with distressing feelings and situations (Gratz & Roemer, 2004; Jakupcak, Tull, & Roemer, 2005). Therefore, emotion dysregulation may be a shared factor underlying both NSSI and IPV perpetration, and it may account for the relationship between these variables.

1.5. Aims and hypotheses

Past studies have identified a positive association between NSSI and IPV victimization (Levesque et al., 2010; Nada-Raja & Skegg, 2013; Murray et al., 2008; Sansone et al., 2007; Swahn et al., 2010) and perpetration (Murray et al., 2008; Swahn et al., 2010). However, this relationship was assessed without taking into consideration the directionality of IPV. This is problematic because past research has established that unidirectional and bidirectional IPV have different associated prevalence, characteristics (i.e., severity of violence, likelihood of escalation of violence), and correlates, which may influence how the prevalence and functions of NSSI are manifested in unidirectional vs. bidirectional IPV. Also, considering that bidirectional IPV accounts for nearly half of the couples that engage in IPV (e.g., Hines & Saudino, 2003; Orcutt et al., 2005; Prospero, 2008; Straus & Ramirez, 2007; Straus, 2008), it is likely that some of the individuals considered by past studies as perpetrators might be victims as well, and vice versa. Indeed, one of these studies found that dating
violence victimization was associated with perpetration as well; however, this study did not account for directionality of IPV when analyzing the association between NSSI and IPV victimization and perpetration (Swahn et al., 2010). The current research was designed to overcome the limitations of past studies regarding directionality of violence by assessing NSSI across individuals who exhibited unidirectional perpetration (UV), unidirectional victimization (UV), bidirectional IPV (BD), and individuals that did not engage in IPV (non-violent; NV). Specifically, high levels of bidirectionality of IPV complicate the interpretation of prior studies that have identified associations between NSSI and both IPV perpetration and victimization, but have overlooked bidirectionality. That is, the apparent association between IPV victimization and NSSI may in fact reflect the presence of perpetrators among the victim group (i.e. bidirectional IPV), whereas conversely the apparent association between IPV perpetration and NSSI may reflect high levels of victimization among putative perpetrators. Given this potentially important confound in prior research the present studies consideration of bidirectionality represents a distinct contribution to the study of NSSI and IPV.

The present research had several complimentary aims. The first aim of this study was to examine the prevalence of NSSI across the four groups. Although past studies have assessed the prevalence of NSSI in the context of IPV (Etzel, 2005; Jaquier et al., 2013; Sansone et al., 2013), these studies have examined NSSI prevalence only in IPV victims (Etzel, 2005; Jaquier et al., 2013; Sansone et al., 2013); the prevalence of NSSI in unidirectional IPV perpetrators and in individuals who exhibit bidirectional IPV still remains unknown. Nonetheless, prior research has identified a robust association between NSSI and IPV, and therefore, it was hypothesized that individuals in the UP, UV, and BD group would
have higher NSSI prevalence than individuals in the NV group (hypothesis 1). Also, from an exploratory perspective I was interested in the extent to which the three IPV groups may differ with regard to prevalence of NSSI.

The second aim of this study was to analyze the functions of NSSI across the four groups. Past studies have suggested that NSSI might be used as a maladaptive strategy to deal with overwhelming, distressing feelings or situations, and that victims or perpetrators may engage in this behaviour to regulate their emotions (Levesque et al., 2010; Murray et al., 2008; Sansone et al., 2007; Wong et al., 2011). Given that intrapersonal functions mainly serve to alter or regulate affective states, it was hypothesized that there would be no differences between the groups with regard to intrapersonal functions (hypothesis 2a). Past studies also have suggested that NSSI might be used to manipulate or influence intimate partners, to resolve conflicts in the relationship, or to elicit a change in the partner’s behaviour (Nada-Raja & Skegg, 2013; Murray et al., 2008). Therefore, it is likely that in a relationship context, the interpersonal functions of interpersonal influence or revenge may be greater endorsed than other interpersonal functions (e.g., sensation-seeking, interpersonal boundaries). With regard to interpersonal influence, unidirectional victims may turn to NSSI as a way to elicit a change in their partners by letting them know the extent of their suffering. In the case of unidirectional perpetrators or individuals that engage in bidirectional IPV, NSSI may be used as a strategy to obtain attention or care, to stop partners from abandoning them. Therefore, it was hypothesized that there would be no differences between the UP, UV, and BD group with regard to this function, and that these groups would be more likely to endorse this function than the NV group (hypothesis 2b). It is possible that IPV perpetrators (unidirectional and bidirectional) may use NSSI as an alternative way to hurt or
get back at intimate partners. Therefore, it was hypothesized that the interpersonal function of revenge would be greater endorsed by the UP and BD groups in comparison with the UV and NV groups (hypothesis 2c). Also, given that intrapersonal functions are more often endorsed than interpersonal functions, it was hypothesized that all the groups would have higher mean levels of intrapersonal functions than interpersonal functions (hypothesis 2d).

The third aim of this study was to analyze the levels of emotion dysregulation across the four groups, and examine the role of emotion dysregulation in explaining the relationship between IPV perpetration (unidirectional and bidirectional) and NSSI. Emotion dysregulation has been associated with both NSSI (Cawood & Huprich, 2011; Grazt & Roemer, 2004; Heath et al., 2008; Wilcox et al., 2012) and IPV perpetration (Gratz, Paulson, Jakupcak, & Tull, 2009; Tager, Good, & Brammer, 2010), and past studies has pointed to emotion dysregulation as a factor that may underlie NSSI in IPV victims (Levesque et al., 2010; Jaquier et al., 2013). However, none of these studies have concurrently examined the relationship among all these variables (NSSI, IPV, and emotion dysregulation), also taking into consideration the directionality of IPV. Given that higher levels of emotion dysregulation have been found in individuals with NSSI (Cawood & Huprich, 2011; Grazt & Roemer, 2004; Heath et al, 2008; Wilcox et al., 2012), it was hypothesized that individuals in each of the groups who engage in NSSI will have higher levels of emotion dysregulation compared to their counterparts without NSSI (hypothesis 3a). Also, past studies have pointed to emotion dysregulation as a shared factor that may underlie both NSSI and IPV perpetration. Therefore, it was hypothesized that emotion dysregulation would account for (mediate) part of the relationship between the UP and BD groups and NSSI (hypothesis 3b).
CHAPTER 2 Methods

2.1 Participants

Participants were undergraduate psychology students from the University of British Columbia (UBC). To be eligible to participate in the study, participants had to be at least 18 years old, fluent in English, and must have been involved in a relationship (dating, marital, or cohabiting) in the past year. The original sample was composed of 1348 participants, of which 108 failed to complete any of the study measures aside from the demographic questions, and 209 failed to complete either one or both measures (the Revised Conflict Tactics Scale and the Inventory of Statements About Self-injury) needed to classify participants into groups; these participants were excluded from the analyses. A group of 11 participants referred to their NSSI behaviours as just bad habits or related to a skin condition (e.g., eczema) that led them to NSSI; these participants failed to comply with the intentional part of the NSSI definition and were also removed from the analyses. Therefore, the final sample was comprised of 1018 participants, of which 69.6 % were females and 30.4% were males. The mean age of the participants was 19.84 (SD= 2.95). The sexual orientation most commonly reported was heterosexual (94.9%), followed by bisexual (3.8%) and homosexual (1.4%). With regard to relationship status, 52.8% of the participants indicated they were dating, 41.1% were single, 3.8% were common-law, and 1.8% were married; the remainder 2.3% indicated other types of relationship status (e.g., ex-common law, divorced, engaged).

2.2 Procedure

Participants were recruited through a research participant database, which listed the study as an online survey and provided a brief description of the project and procedures of the study. Participation in the study was voluntarily, and participants were offered extra course credits
for their participation. The study survey consisted of 238 items comprised by 3 self-report measures. This study was embedded in a larger project studying personality and relationships, and participants completed a more comprehensive set of measures than the ones required for this study. The time completion of the entire set of questionnaires was approximately 90 minutes.

2.3 Materials

2.3.1 Revised Conflict Tactics Scale (CTS2).

IPV was assessed with the Revised Conflict Tactics Scale (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996), which is the most widely used scale to assess IPV (Langhinrichsen-Rohling, 2010). The CTS2 is composed of 39 item pairs that group into five subscales: negotiation, physical violence, psychological violence, sexual violence, and injury. The item pairs in all the subscales, except for the negotiation subscale, assess the experience and perpetration of violence by both the respondent (e.g., I twisted my partner’s arm or hair) and the respondent’s partner (e.g., My partner did this to me). Subscale items are classified further into minor and severe acts of violence; an example of a minor item in the injury subscale is “I had a sprain, bruise, or small cut because of a fight with my partner”, and “I passed out from being hit on the head by my partner in a fight” is an example of a severe item. Participants are asked to report the frequency of each situation in the past year using an 8-point scale ranging from 0 to 7, with response options reading: “this has never happened”, “once in the past year”, “twice in the past year”, “3-5 times in the past year”, “6-10 times in the past year”, “11-20 times in the past year”, “more than 20 times in the past year”, and “not in the past year, but happened before”, respectively. IPV frequency was calculated according to the CTS2 manual guidelines, transforming the response options 0 to
6 into: 0, 1, 2, 4, 8, 15, 25, respectively. The frequency for the response options 3 to 6 was calculated by taking the median score of the frequency range displayed in the response option. The response option “not in the past year, but it happened before”, was coded as 0 in order to obtain IPV prevalence for the past year. The CTS2 yields scores for each of the subscales for both perpetration and victimization. In the study sample, the CTS2 demonstrated good internal consistency of its subscales for both perpetration ($\alpha = .84 – .95$) and victimization ($\alpha = .82 – .95$) (Table 1); these reliability coefficients are consistent with past studies using college populations (Straus et al. 1996).

The CTS2 was used in this study to classify individuals into four groups: unidirectional perpetration (UP; perpetration only), unidirectional victimization (UV; victimization only), bidirectional IPV (BD; both perpetration and victimization), and non-violent (NV; neither perpetration nor victimization). Membership was determined using the severe and minor items of the physical and injury subscales, and the severe items of the psychological and sexual subscales. Individuals were classified in the UP, UV, and BD group if they reported one or more incidents of IPV; this criterion to classify individuals in the different groups is consistent with past studies (Hines & Saudino, 2003; Orcutt et al., 2005; Prospero, 2008; Straus, 2008).

2.3.2 Inventory of Statements about Self-Injury (ISAS).

NSSI was assessed with the Inventory of Statements about Self-Injury (ISAS; Klonsky & Glenn, 2009). The ISAS is a comprehensive measure of NSSI, especially recommended to assess NSSI functions given the wide array of functions it encompasses (Klonsky & Weinberg, 2009). The ISAS is made up of two sections, and has a total of 60 items. The first section is composed of 19 behavioural items that assess lifetime frequency, methods (e.g.
cutting, burning, pulling hair, interfering with wound healing), and descriptive and contextual factors of NSSI, such as age of onset and feelings experienced while self-harming. The second section is composed of 39 items that assess thirteen possible NSSI functions: affect-regulation, anti-dissociation, anti-suicide, self-punishment, marking distress, autonomy, interpersonal boundaries, interpersonal influence, peer-bonding, self-care, revenge, sensation seeking, and toughness. The first five functions correspond to the intrapersonal scale, whereas the remaining functions make up the interpersonal scale. Each function is a subscale within its corresponding scale. Participants are asked to indicate, on a 3-point Likert scale ranging from 0 (not relevant) to 2 (very relevant), how important each function is to their self-harming experience. Scores for each of the thirteen functions (subscales) range from 0 to 6. The total score for the intrapersonal scale ranges from 0 to 30, and for the interpersonal scale from 0 to 48. Two optional open-ended questions where individuals can provide more accurate description of their experience conclude the measure. The ISAS demonstrated good internal consistency in this sample for both the intrapersonal ($\alpha=0.90$) and interpersonal ($\alpha=0.93$) scale (Table 2), which is consistent with previous studies with university samples (Glenn & Klonsly, 2011; Klonsky & Glenn, 2009).

The ISAS was used to classify individuals into two groups: individuals with NSSI, and individuals without NSSI. Membership to the group with NSSI was determined if individuals reported NSSI in the past year. Past year NSSI was determined by comparing the current age of the individuals with the age reported for the last time they performed NSSI; if the two ages coincided, or the last time reported was a year less than the age of the individuals, participants were classified into the group with NSSI (e.g., if an individual is 19
and reported that the last time NSSI was performed was at the age of 19 or 18, this individual would be classified in the group with NSSI).

2.3.3 Difficulties in Emotion Regulation Scale (DERS).

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) was used to assess emotion dysregulation. The DERS is a 36-item questionnaire that evaluates six dimensions of difficulties in regulating emotions: non-acceptance of emotional responses (e.g., “When I’m upset, I become angry with myself for feeling that way”), difficulties engaging in goal-directed behaviour (e.g., “When I’m upset, I have difficulty getting work done”), impulse control difficulties (e.g., “When I’m upset, I become out of control”), lack of emotional awareness (e.g., “When I’m upset, I acknowledge my emotions (reverse”), limited access to effective emotion regulation strategies (e.g., “When I’m upset, my emotions feel overwhelming”), and lack of emotional clarity (e.g., “I am confused about how I feel”). Participants are asked to indicate, on a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always), how often each statement applies to them. This measure yields a total score that ranges from 36 to 180, with higher scores indicating greater levels of emotion dysregulation. Scores for each of the subscales are also provided. In this sample the DERS demonstrated high internal consistency for the total score ($\alpha = .93$), as well as for the subscales ($\alpha = .81 - .90$) (Table 2), which is consistent with previous studies (Gratz & Roemer, 2004).

2.4 Analytic plan

A series of 2x2 Chi-square analyses were performed to assess whether NSSI prevalence in the UP, UV, and BD groups was significantly different from the NV group. The two categorical variables used in these analyses were NSSI (with/without), and IPV group
(yes/no). For the IPV group variable, “yes” represented people belonging to the UP, UV, and BD, respectively in each analysis; and “no” represented people belonging to the NV group in all of the analyses. Pearson’s Chi-square is a statistical procedure that assesses the association between two categorical variables. This procedure compares the observed frequencies in specific categories to the frequencies that might be expected in those categories by chance (Field, 2009). If the observed chi-square value is greater than the expected (critical) chi-square value, a significant association between variables can be established, and the null hypothesis of independence between variables is rejected. Standardized residuals aid the interpretation of a significant chi-square and determine where the differences in prevalence between the groups are; this is indicated with a standardized residual value greater than $\pm 1.96$ at a significance level of $p > .05$. The phi coefficient and the odds ratio are common indices used to evaluate the effect size of this relationship (Field, 2009).

Two sets of one-way analysis of variance (ANOVA) were performed to assess mean differences between the IPV groups with regard to NSSI functions and emotion dysregulation. ANOVA is an omnibus test that indicates whether there are significant mean differences between groups. Significant ANOVAs were followed by post-hoc tests to determine where the differences between groups occurred. Also, dependent-sample $t$-tests were conducted to evaluate mean differences in endorsement of intrapersonal and interpersonal NSSI functions in each of the IPV groups.

Regression analyses and the Sobel test were used to analyze the potential mediation effect of emotion dysregulation between IPV perpetration (unidirectional and bidirectional) and NSSI. When testing for mediation effects, it is hypothesized that the relationship
between a given predictor (X) and a given outcome (Y) is due primarily to the influence of a third variable, which is the proposed mediator (M). Mediation analyses are typically conducted in four steps, in which several regression analyses are conducted to examine the relationships between the variables included in the mediation model (Figure 1). In each step the significance of the regression coefficients is examined. The first step is determining a significant association between X and Y (path c in figure 1); the regression coefficient obtained from this analysis represents the total effect of X on Y. The second step is determining a significant association between X and M (path a in figure 1). The third step is determining a significant association between M and Y when X is controlled for (path b in figure 1). In general, if any of the coefficients on these steps are not significant it is concluded that the mediation is not likely to occur. The fourth step is determining a significant association between X and Y when M is controlled for (path c’ in figure 1); the regression coefficient obtained from this analysis represents the direct effect of X on Y (Kenny, 2013). If the coefficient of path c’ is zero, the relationship between X and Y is completely mediated by M; if the coefficient is not zero but it is reduced (compared to the coefficient of path c), the relationship between X and Y is partially mediated by M (Kenny, 2013). The portion of the relationship between X and Y that is mediated by M represents the indirect effect of X on Y. The indirect effect is calculated by subtracting Path c’ from Path c, or by multiplying path a by path b; both methods yield the same results (except when the outcome is binary, in which ab typically is not equal to \(c-c’\); Hayes, 2013). The Sobel test is used to determine the significance of the indirect effect; it is used to determine if the relationship between X and Y is significantly reduced when the potential mediator is included in the equation. In this study, regression analyses were conducted with the same
categorical variables that were used for Chi-square analyses. Therefore, logistic regression analyses were conducted to determine paths c, c’, and b given that the outcome variable was binary; and linear regression analyses were used to determine path a, given that the proposed mediator was a continuous variables.
Table 1

*Reliability Coefficients (CTS2 Subscales).*

<table>
<thead>
<tr>
<th>CTS2 Subscales</th>
<th>Alpha</th>
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<tbody>
<tr>
<td>Perpetration Subscales</td>
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<tr>
<td>Physical</td>
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</tr>
<tr>
<td>Injury</td>
<td>.95</td>
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<tr>
<td>Sexual</td>
<td>.84</td>
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<tr>
<td>Psychological</td>
<td>.84</td>
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<tr>
<td>Negotiation</td>
<td>.90</td>
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<tr>
<td>Victimization Subscales</td>
<td></td>
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<tr>
<td>Physical</td>
<td>.95</td>
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<td>Injury</td>
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<td>Sexual</td>
<td>.82</td>
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<td>Psychological</td>
<td>.84</td>
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<td>Negotiation</td>
<td>.89</td>
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</tbody>
</table>

*Note.* CTS2 = revised conflict tactics scale.

Table 2

*Reliability Coefficients (ISAS Functional Scales and the DERS).*

<table>
<thead>
<tr>
<th>Scales</th>
<th>Alpha</th>
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<tbody>
<tr>
<td>ISAS Functional Scales</td>
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<tr>
<td>Intrapersonal Scale</td>
<td>.90</td>
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<tr>
<td>Interpersonal Scale</td>
<td>.93</td>
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<tr>
<td>DERS</td>
<td></td>
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<tr>
<td>Non-acceptance of emotional responses</td>
<td>.89</td>
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<tr>
<td>Difficulties engaging in goal-directed behaviour</td>
<td>.87</td>
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<td>Impulse control difficulties</td>
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<tr>
<td>Lack of emotional awareness</td>
<td>.81</td>
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<td>Limited access to effective emotion regulation strategies</td>
<td>.90</td>
</tr>
<tr>
<td>Lack of emotional clarity</td>
<td>.81</td>
</tr>
<tr>
<td>Total Scale</td>
<td>.93</td>
</tr>
</tbody>
</table>

*Note.* ISAS = inventory of statements about self-injury; DERS = difficulties with emotion regulation scale.
Figure 1. Theoretical mediation model adapted from Preacher and Hayes (2004). Path $c$ represents the total effect of X on Y. Path $c'$ represents the direct effect of X on Y when M is accounted for. Path $a$ represents the direct effect of X on M. Path $b$ represents the direct effect of M on Y when X is accounted for. The portion of the relationship between X and Y that is mediated by M represents the indirect effect of X on Y ($c - c'$ or $a \times b$).
CHAPTER 3 Results

3.1 Preliminary analyses

3.1.1 Outliers.

Outliers were analyzed separately for each of the groups. Five participants in the BD group were identified as outliers, with scores greater than 3 standard deviations above the group mean in the perpetration and victimization subscales of the CTS2. A recommended technique to reduce the influence of extreme cases without discarding those participants from the analyses is to transform extreme scores to values 3 standard deviations above the group mean (Tabachnick & Fidell, 2007). Analyses were conducted with the transformed scores of the extreme cases. No extreme scores were identified in the other groups for any of the measures used in this study.

3.1.2 Assumptions.

The assumptions for each of the significant tests used to investigate the study hypotheses were examined prior to conducting the analyses. The assumptions of Pearson Chi-square analyses, which are independence of data and expected frequencies greater than 5 for each of the cells, were met in each of the analyses conducted. With regard to the ANOVA assumptions, the independence of data and the normality assumption were met for each of the outcome variables analyzed (NSSI functions and emotion dysregulation). The assumption of homogeneity of variances was violated in some of the analyses; in those cases, pairwise comparisons were conducted with the Games-Howell post-hoc test instead of Tukey’s. Also, the assumptions for dependent-sample t-tests were met.
3.2 Descriptive statistics.

3.2.1 NSSI.

Two hundred and forty-six participants (24.2%) within the study sample reported past year NSSI. The majority of these participants (88.7%) reported a longer history of NSSI, with a mean age of onset of 13.21 years; only 14 (5.7 %) reported the onset of NSSI within the past year, and 14 participants (5.7 %) failed to report age of onset. The NSSI prevalence found in this study lies inbetween the range of prevalence reported by other studies (12-38%; Cawood & Huprich, 2011; Gratz, 2001; Gratz, et al., 2002; Heath et al., 2008; Kakhnovets et al., 2010; Whitlock et al., 2006). The average number of NSSI methods reported was 4.10 (SD = 2.48), and the methods most commonly reported were interfering with wound healing (67.9%), banging or hitting self (54.9%), and pinching (47.1%), (Table 3).

Gender differences were not found with regard to NSSI within the total sample, $\chi^2 (1, N = 1016) = 1.83, p = .176, \phi = .04$.

3.2.2 IPV.

Three hundred and fifty-nine participants (35.3%) within the study sample indicated some form of IPV in the past year, with bidirectional IPV most commonly reported, representing 65% of the IPV sample; these results are consistent with previous studies (Hines & Saudino, 2003; Straus, 2008; Straus & Ramirez, 2007; Testa et al., 2011). With regard to type of violence, physical and psychological violence were the most commonly reported forms of IPV by people in the UP and UV group, followed by sexual violence and physical injury; this last one was rarely reported. In the BD group the type of violence most commonly reported for both victimization and perpetration was physical violence, closely followed by sexual violence; psychological violence and physical injury were the forms of violence less reported
by this group, but were higher than in the UP and UV group (Table 4). Participants in the BD group reported on average more incidents of perpetration and victimization in all the CTS2 subscales than people in the UP and UV group (Table 5). Within the BD group similar average number of incidents were found both for perpetration and victimization.

Gender analyses indicated that males were more likely than females to exhibit unidirectional victimization, $\chi^2 (1, N = 714) = 5.94, p = .015, \phi = .09$, and bidirectional IPV, $\chi^2 (1, N = 892) = 14.73, p < .001, \phi = .13$; and less likely than females to exhibit unidirectional perpetration, $\chi^2 (1, N = 726) = 7.93, p = .005, \phi = .11$

3.2.3 NSSI and IPV.

NSSI was examined for each of the groups separately (see Table 6 for a summary of the number of participants in each of the groups with and without NSSI). The group with the highest past year NSSI prevalence was the BD group (36.6%), followed by the UP group (32.4%), the UV group (28.6%), and the NV group (18.5%). The methods most frequently reported were interfering with wound healing, banging or hitting self, pinching, pulling hair, and cutting, regardless of group membership (Table 7). The average number of NSSI methods was equivalent across the groups, $F(3, 242) = 1.56, p = .20, \eta^2 = .02$ (Table 8). Over 80% of participants in all the groups reported a history of NSSI, with an average age of onset in early adolescence (Table 9). None of the participants in the UP and the UV group reported performing NSSI for the first time in the previous year, and only a small portion of participants in the BD (5.8%; $n = 5$) and the NV group (5.7%; $n = 7$) reported so. A small portion of participants failed to provide age of onset in the UV group (18.8 %; $n = 3$), the BD group (5.8%; $n = 5$), and the NV group (4.1%; $n = 5$).
3.3 Hypotheses.

3.3.1 NSSI prevalence

Hypothesis 1: Chi-square analyses showed a significant association between UP and NSSI, $\chi^2 (1, N = 727) = 7.43, p = .006, \phi = .10$, and between BD and NSSI, $\chi^2 (1, N = 894) = 31.73, p < .001, \phi = .19$. NSSI prevalence was significantly higher in the UP and BD compared to the NV group (Figure 2); the odds ratio indicated the odds of performing NSSI were 2.10 times higher in the UP group than in the NV group, and were 2.54 times higher in the BD group than in the NV group. Although chi-square analysis indicated no significant association between UV and NSSI, $\chi^2 (1, N = 715) = 3.35, p = .067, \phi = .07$, the odds ratio indicated that the odds of performing NSSI were 1.76 times higher in this group than in the NV group. No differences in NSSI prevalence were found between the UP, UV, and BD group, $\chi^2 (2, N = 359) = 1.46, p = .481, \phi = .06$. In general, although the association between UV and NSSI was only a trend toward significance, results support the hypothesis that all IPV groups would demonstrate higher levels of NSSI than non-violent individuals.

3.3.2 NSSI functions

Prior to conducting any analyses, the scores on the intrapersonal and interpersonal subscales were pro-rated as they were in different measurement units. There were five intrapersonal subscales and eight interpersonal subscales. Therefore, the scores on the intrapersonal subscales were divided by 5, and the scores on the interpersonal subscales were divided by 8 (Klonsky & Glenn, 2009). All the scores were then multiplied by 10 to facilitate the presentation of results.

Hypothesis 2a: One-way ANOVAs indicated no significant mean differences between the groups with regard to intrapersonal NSSI functions in the total scale, $F(3, 236) = .26, p =$
.851, $\eta^2 = .003$ (Figure 3), and in each subscale (Table 10). On average the intrapersonal functions most frequently reported by all the groups were affect regulation and self-punishment (Table 11).

With regard to interpersonal functions, one-way ANOVA showed significant mean differences between the groups in the total scale, $F(3, 236) = 5.24, p = 002, \eta^2 = .062$. The Games-Howell post-hoc test indicated that the BD group was more likely to report engaging in NSSI to serve interpersonal functions than the rest of the groups (Figure 3). Additional one-way ANOVAs were conducted to evaluate each of the subscales of interpersonal functions (Table 10). Two interpersonal functions were of special interest: interpersonal influence and revenge. There were no significant mean differences between the groups on interpersonal influence $F(3, 236) = 2.30, p = .078, \eta^2 = .028$ (hypothesis 2b). Significant mean differences were found between the IPV groups with regard to revenge $F(3, 236) = 5.65, p = .001, \eta^2 = .067$ (hypothesis 2c). The Games-Howell post-hoc test indicated that the BD group was more likely to report engaging in NSSI for revenge motives than the rest of the groups. The rest of the individual interpersonal functions showed no significant mean differences between the groups except for peer-bonding; this function was more likely to be reported by the BD group than the rest of the groups (Tables 10 and 11).

Hypothesis 2d: dependent-sample t-tests indicated significant mean differences in the endorsement of intrapersonal and interpersonal functions; for all the groups the intrapersonal functions more likely to be endorsed than the interpersonal functions (Table 12).

### 3.3.3 Emotion dysregulation

Hypothesis 3a: one-way ANOVAs indicated that individuals with NSSI in the UV, BD, and NV group had significantly higher levels of emotion dysregulation when compared to their
counterparts without NSSI; this was not the case of the UP group, where individuals with and without NSSI reported similar mean levels of emotion dysregulation (Figure 4). Individuals with NSSI did not differ in their mean levels of emotion dysregulation, regardless of group membership. With regard to individuals without NSSI, in general, no mean differences were found between the groups; the only exception was the BD group, whose mean levels were significantly higher than the NV group (Figure 4).

Hypothesis 3b: regression analyses were conducted in order to test the potential mediating effect of emotion dysregulation in the relationship between UP and NSSI, and between BD and NSSI. Figure 5 illustrates the mediation model for the UP group. For this group all the path coefficients were significant, and path $c'$ showed a reduction in the magnitude of the coefficient from path $c$, which indicated that the effect of UP on NSSI was reduced when the emotion dysregulation was included as a mediator (Table 13). The Sobel test determined that this reduction in the magnitude of the coefficient was very close to be significant, $z' = 1.91, p = .056$. These results indicate that emotion dysregulation partly accounted for the relationship between UP and NSSI.

With regard to the BD group (Figure 6), all the path coefficients were significant, and the relationship between BD and NSSI was attenuated when emotion dysregulation was included as a mediator (Table 13). The Sobel test indicated that this reduction on the magnitude of coefficient from path $c$ to path $c'$ was significant $z' = 2.14, p = .032$. These results indicate that emotion dysregulation significantly accounted for part of the relationship between BD and NSSI.
Table 3

Methods of NSSI (Rate of Endorsement).

<table>
<thead>
<tr>
<th>NSSI Methods</th>
<th>n (246)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banging or hitting self</td>
<td>135</td>
<td>54.9</td>
</tr>
<tr>
<td>Biting</td>
<td>79</td>
<td>32.1</td>
</tr>
<tr>
<td>Burning</td>
<td>30</td>
<td>12.2</td>
</tr>
<tr>
<td>Carving</td>
<td>21</td>
<td>8.5</td>
</tr>
<tr>
<td>Cutting</td>
<td>93</td>
<td>37.8</td>
</tr>
<tr>
<td>Interfering with wound healing</td>
<td>167</td>
<td>67.9</td>
</tr>
<tr>
<td>Pinching</td>
<td>116</td>
<td>47.1</td>
</tr>
<tr>
<td>Pulling hair</td>
<td>111</td>
<td>45.1</td>
</tr>
<tr>
<td>Rubbing against rough surface</td>
<td>66</td>
<td>26.8</td>
</tr>
<tr>
<td>Severe Scratching</td>
<td>104</td>
<td>42.3</td>
</tr>
<tr>
<td>Sticking needles</td>
<td>33</td>
<td>13.4</td>
</tr>
<tr>
<td>Swallowing dangerous substances</td>
<td>45</td>
<td>18.3</td>
</tr>
<tr>
<td>Other</td>
<td>22</td>
<td>8.9</td>
</tr>
</tbody>
</table>

Note. NSSI = non-suicidal self-injury
Table 4

*Means and Standard Deviations for the CTS2 Subscales in the UP, UV and BD Groups.*

<table>
<thead>
<tr>
<th>CTS2 Subscales</th>
<th>UP</th>
<th>UV</th>
<th>BD Perp.</th>
<th>BD Vict.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Physical</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Minor</td>
<td>Severe</td>
<td>Minor</td>
<td>Severe</td>
</tr>
<tr>
<td>Injury</td>
<td>4.78 (8.54)</td>
<td>0.54 (3.07)</td>
<td>2.78 (6.41)</td>
<td>1.23 (4.75)</td>
</tr>
<tr>
<td>Severe Minor</td>
<td>0.10 (0.39)</td>
<td>0.00 (0.00)</td>
<td>0.96 (4.67)</td>
<td>0.92 (4.68)</td>
</tr>
<tr>
<td>Psychological Severe Minor</td>
<td>2.57 (5.95)</td>
<td>0.01 (0.12)</td>
<td>1.83 (4.72)</td>
<td>1.71 (7.72)</td>
</tr>
<tr>
<td>Sexual</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>2.57 (5.95)</td>
<td>0.01 (0.12)</td>
<td>1.83 (4.72)</td>
<td>1.71 (7.72)</td>
</tr>
<tr>
<td></td>
<td>11.35 (16.67)</td>
<td>4.55 (10.39)</td>
<td>4.42 (9.43)</td>
<td>8.58 (15.27)</td>
</tr>
<tr>
<td></td>
<td>10.98 (16.12)</td>
<td>4.21 (9.31)</td>
<td>4.64 (9.67)</td>
<td>8.12 (14.03)</td>
</tr>
</tbody>
</table>

*Note.* CTS2 = revised conflict tactics scale; UP = unidirectional perpetration; UV = unidirectional victimization; BD = bidirectional IPV; Perp. = perpetration; Vict. = victimization.
Table 5

*Group Mean Differences on CTS2 Subscales (BD Perpetration - UP and BD Victimization - UV).*

<table>
<thead>
<tr>
<th>Groups compared</th>
<th>$t^a$</th>
<th>$df$</th>
<th>$p$</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BD perpetration vs. UP</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor Physical</td>
<td>4.35</td>
<td>221</td>
<td>$p &lt; .001$</td>
<td>.06</td>
</tr>
<tr>
<td>Severe Physical</td>
<td>6.57</td>
<td>273</td>
<td>$p &lt; .001$</td>
<td>.12</td>
</tr>
<tr>
<td>Minor Injury</td>
<td>6.64</td>
<td>239</td>
<td>$p &lt; .001$</td>
<td>.12</td>
</tr>
<tr>
<td>Severe Injury</td>
<td>6.68</td>
<td>232</td>
<td>$p &lt; .001$</td>
<td>.13</td>
</tr>
<tr>
<td>Severe Psychological</td>
<td>4.87</td>
<td>277</td>
<td>$p &lt; .001$</td>
<td>.07</td>
</tr>
<tr>
<td>Severe Sexual</td>
<td>7.16</td>
<td>234</td>
<td>$p &lt; .001$</td>
<td>.14</td>
</tr>
<tr>
<td><strong>BD victimization vs. UV</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor Physical</td>
<td>5.98</td>
<td>226</td>
<td>$p &lt; .001$</td>
<td>.11</td>
</tr>
<tr>
<td>Severe Physical</td>
<td>5.55</td>
<td>279</td>
<td>$p &lt; .001$</td>
<td>.10</td>
</tr>
<tr>
<td>Minor Injury</td>
<td>2.68</td>
<td>117</td>
<td>.008</td>
<td>.02</td>
</tr>
<tr>
<td>Severe Injury</td>
<td>3.75</td>
<td>172</td>
<td>$p &lt; .001$</td>
<td>.04</td>
</tr>
<tr>
<td>Severe Psychological</td>
<td>5.63</td>
<td>259</td>
<td>$p &lt; .001$</td>
<td>.10</td>
</tr>
<tr>
<td>Severe Sexual</td>
<td>2.42</td>
<td>101</td>
<td>.017</td>
<td>.02</td>
</tr>
</tbody>
</table>

*Note. CTS2 = revised conflict tactics scale; UP = unidirectional perpetration; UV = unidirectional victimization; BD = bidirectional IPV.*

*a Homogeneity of variances was not assumed in any of the analyses.*
### Table 6

*With and Without NSSI Rates Across the Groups.*

<table>
<thead>
<tr>
<th></th>
<th>UP</th>
<th>UV</th>
<th>BD</th>
<th>NV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>With NSSI</td>
<td>22 (32.4)</td>
<td>16 (28.6)</td>
<td>86 (36.6)</td>
<td>122 (18.5)</td>
</tr>
<tr>
<td>Without NSSI</td>
<td>46 (67.6)</td>
<td>40 (71.4)</td>
<td>149 (63.4)</td>
<td>537 (81.5)</td>
</tr>
</tbody>
</table>

*Note.* UP = unidirectional perpetration; UV = unidirectional victimization; BD = bidirectional IPV; NV = non-violent; NSSI = non-suicidal self-injury.

### Table 7

*Methods of NSSI (Rate of Endorsement) Across the Groups.*

<table>
<thead>
<tr>
<th>NSSI Methods</th>
<th>UP (n = 22)</th>
<th>UV (n = 16)</th>
<th>BD (n = 86)</th>
<th>NV (n = 122)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banging or hitting self</td>
<td>14 (63.3)</td>
<td>9 (56.2)</td>
<td>57 (66.3)</td>
<td>58 (47.5)</td>
</tr>
<tr>
<td>Biting</td>
<td>7 (31.8)</td>
<td>4 (25.0)</td>
<td>33 (38.4)</td>
<td>40 (32.8)</td>
</tr>
<tr>
<td>Burning</td>
<td>4 (18.1)</td>
<td>0 (0.0)</td>
<td>11 (12.8)</td>
<td>14 (11.5)</td>
</tr>
<tr>
<td>Carving</td>
<td>1 (4.54)</td>
<td>2 (12.5)</td>
<td>12 (13.9)</td>
<td>7 (5.7)</td>
</tr>
<tr>
<td>Cutting</td>
<td>10 (45.4)</td>
<td>7 (43.7)</td>
<td>32 (37.2)</td>
<td>46 (37.8)</td>
</tr>
<tr>
<td>Interfering with wound healing</td>
<td>18 (81.8)</td>
<td>12 (75.0)</td>
<td>59 (68.6)</td>
<td>83 (68.0)</td>
</tr>
<tr>
<td>Pinching</td>
<td>12 (54.5)</td>
<td>9 (56.2)</td>
<td>42 (48.8)</td>
<td>57 (46.7)</td>
</tr>
<tr>
<td>Pulling hair</td>
<td>10 (45.4)</td>
<td>8 (50.0)</td>
<td>42 (48.8)</td>
<td>53 (43.4)</td>
</tr>
<tr>
<td>Rubbing against rough surface</td>
<td>6 (27.2)</td>
<td>5 (31.2)</td>
<td>25 (29.1)</td>
<td>34 (27.8)</td>
</tr>
<tr>
<td>Severe Scratching</td>
<td>11 (50.0)</td>
<td>5 (31.25)</td>
<td>39 (45.3)</td>
<td>50 (41.0)</td>
</tr>
<tr>
<td>Sticking needles</td>
<td>5 (22.7)</td>
<td>0 (0.0)</td>
<td>11 (12.8)</td>
<td>17 (13.9)</td>
</tr>
<tr>
<td>Swallowing dangerous substances</td>
<td>5 (22.7)</td>
<td>4 (25.0)</td>
<td>24 (27.9)</td>
<td>9 (7.4)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (9.0)</td>
<td>1 (6.2)</td>
<td>7 (8.1)</td>
<td>12 (9.8)</td>
</tr>
</tbody>
</table>

*Note.* UP = unidirectional perpetration; UV = unidirectional victimization; BD = bidirectional IPV; NV = non-violent; NSSI = non-suicidal self-injury.
Table 8

*Average Number of NSSI Methods Across the Groups.*

<table>
<thead>
<tr>
<th>Group</th>
<th>(M) (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP</td>
<td>4.77 (2.22)</td>
</tr>
<tr>
<td>UV</td>
<td>4.12 (2.33)</td>
</tr>
<tr>
<td>BD</td>
<td>4.58 (2.93)</td>
</tr>
<tr>
<td>NV</td>
<td>3.93 (2.16)</td>
</tr>
</tbody>
</table>

Note. UP = unidirectional perpetration; UV = unidirectional victimization; BD = bidirectional IPV; NV = non-violent; NSSI = non-suicidal self-injury.

Table 9

*NSSI History and Age of Onset across the Groups.*

<table>
<thead>
<tr>
<th>Group</th>
<th>NSSI History</th>
<th>Age of Onset</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP ((n = 22))</td>
<td>22 (100.0)</td>
<td>12.33 (2.06)</td>
</tr>
<tr>
<td>UV ((n = 16))</td>
<td>13 (81.2)</td>
<td>13.82 (1.60)</td>
</tr>
<tr>
<td>BD ((n = 86))</td>
<td>70 (81.4)</td>
<td>12.86 (3.11)</td>
</tr>
<tr>
<td>NV ((n = 122))</td>
<td>103 (84.4)</td>
<td>13.43 (2.51)</td>
</tr>
</tbody>
</table>

Note. UP = unidirectional perpetration; UV = unidirectional victimization; BD = bidirectional IPV; NV = non-violent; NSSI = non-suicidal self-injury.
Table 10

*Group Comparisons on the ISAS Intrapersonal and Interpersonal Scales and Subscales.*

<table>
<thead>
<tr>
<th>NSSI functional scales</th>
<th>$F$ (3,236)</th>
<th>$p$</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intrapersonal scale</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affect regulation</td>
<td>.26</td>
<td>.851</td>
<td>.003</td>
</tr>
<tr>
<td>Anti-dissociation/Feeling generation</td>
<td>.37</td>
<td>.772</td>
<td>.005</td>
</tr>
<tr>
<td>Anti-suicide</td>
<td>1.60</td>
<td>.189</td>
<td>.020</td>
</tr>
<tr>
<td>Self-punishment</td>
<td>.78</td>
<td>.506</td>
<td>.010</td>
</tr>
<tr>
<td>Marking distress</td>
<td>.38</td>
<td>.766</td>
<td>.005</td>
</tr>
<tr>
<td><strong>Interpersonal scale</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal boundaries</td>
<td>5.24</td>
<td>.002</td>
<td>.062</td>
</tr>
<tr>
<td>Self-care</td>
<td>2.35</td>
<td>.073</td>
<td>.029</td>
</tr>
<tr>
<td>Sensation seeking</td>
<td>1.56</td>
<td>.199</td>
<td>.019</td>
</tr>
<tr>
<td>Peer-bonding</td>
<td>3.67</td>
<td>.013</td>
<td>.045</td>
</tr>
<tr>
<td>Interpersonal influence</td>
<td>4.74</td>
<td>.003</td>
<td>.057</td>
</tr>
<tr>
<td>Toughness</td>
<td>2.30</td>
<td>.078</td>
<td>.028</td>
</tr>
<tr>
<td>Revenge</td>
<td>1.47</td>
<td>.223</td>
<td>.018</td>
</tr>
<tr>
<td>Autonomy</td>
<td>5.65</td>
<td>.001</td>
<td>.067</td>
</tr>
</tbody>
</table>

*Note.* UP = unidirectional perpetration; UV = unidirectional victimization; BD = bidirectional IPV; NV = non-violent.
# Table 11

**Means and Standard Deviations for the ISAS Intrapersonal and Interpersonal Scales and Subscales Across the Groups.**

<table>
<thead>
<tr>
<th>NSSI functional scales</th>
<th>UP</th>
<th>UV</th>
<th>BD</th>
<th>NV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intrapersonal scale</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affect regulation</td>
<td>16.72 (11.26)</td>
<td>17.00 (14.12)</td>
<td>18.60 (12.32)</td>
<td>17.15 (13.14)</td>
</tr>
<tr>
<td>Anti-dissociation/Feeling generation</td>
<td>6.45 (3.65)</td>
<td>5.50 (3.90)</td>
<td>5.70 (3.4)</td>
<td>6.02 (3.70)</td>
</tr>
<tr>
<td>Anti-suicide</td>
<td>1.27 (1.90)</td>
<td>2.63 (3.48)</td>
<td>2.86 (3.14)</td>
<td>2.27 (3.32)</td>
</tr>
<tr>
<td>Self-punishment</td>
<td>1.55 (3.20)</td>
<td>1.88 (3.30)</td>
<td>2.50 (3.30)</td>
<td>1.93 (3.16)</td>
</tr>
<tr>
<td>Marking distress</td>
<td>5.18 (4.26)</td>
<td>4.25 (3.99)</td>
<td>4.86 (3.89)</td>
<td>4.4 (4.22)</td>
</tr>
<tr>
<td><strong>Interpersonal scale</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal boundaries</td>
<td>6.14 (6.26)</td>
<td>5.86 (7.26)</td>
<td>10.09 (9.66)</td>
<td>5.60 (7.48)</td>
</tr>
<tr>
<td>Self-care</td>
<td>0.63 (1.43)</td>
<td>1.09 (2.28)</td>
<td>1.45 (2.01)</td>
<td>0.84 (1.68)</td>
</tr>
<tr>
<td>Sensation seeking</td>
<td>1.19 (1.66)</td>
<td>1.41 (2.13)</td>
<td>1.67 (1.68)</td>
<td>1.15 (1.65)</td>
</tr>
<tr>
<td>Peer-bonding</td>
<td>1.02 (1.88)</td>
<td>0.63 (1.37)</td>
<td>1.32 (1.72)</td>
<td>0.65 (1.21)</td>
</tr>
<tr>
<td>Interpersonal influence</td>
<td>0.51 (1.26)</td>
<td>0.39 (1.56)</td>
<td>0.88 (1.62)</td>
<td>0.22 (0.74)</td>
</tr>
<tr>
<td>Toughness</td>
<td>0.68 (1.20)</td>
<td>0.63 (1.37)</td>
<td>1.18 (1.65)</td>
<td>0.66 (1.36)</td>
</tr>
<tr>
<td>Revenge</td>
<td>1.42 (2.16)</td>
<td>0.70 (1.37)</td>
<td>1.50 (1.67)</td>
<td>1.14 (1.57)</td>
</tr>
<tr>
<td>Autonomy</td>
<td>0.28 (0.66)</td>
<td>0.39 (0.88)</td>
<td>1.12 (1.72)</td>
<td>0.41 (1.07)</td>
</tr>
</tbody>
</table>

*Note. UP = unidirectional perpetration; UV = unidirectional victimization; BD = bidirectional IPV; NV = non-violent; NSSI = non-suicidal self-injury.

*This group significantly differed from the rest of the groups.*
Table 12

**Mean Differences in the Endorsement of Intrapersonal and Interpersonal NSSI functions Across the Groups.**

<table>
<thead>
<tr>
<th>Group</th>
<th>Intrapersonal scale</th>
<th>Interpersonal scale</th>
<th>t</th>
<th>df</th>
<th>p</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP</td>
<td>16.73 (11.26)</td>
<td>6.14 (6.26)</td>
<td>4.22</td>
<td>21</td>
<td>p &lt; .001</td>
<td>.45</td>
</tr>
<tr>
<td>UV</td>
<td>17.00 (14.12)</td>
<td>5.86 (7.26)</td>
<td>3.88</td>
<td>15</td>
<td>.001</td>
<td>.50</td>
</tr>
<tr>
<td>BD</td>
<td>18.60 (12.32)</td>
<td>10.09 (9.66)</td>
<td>7.58</td>
<td>83</td>
<td>p &lt; .001</td>
<td>.41</td>
</tr>
<tr>
<td>NV</td>
<td>17.15 (13.14)</td>
<td>5.59 (7.48)</td>
<td>11.15</td>
<td>117</td>
<td>p &lt; .001</td>
<td>.51</td>
</tr>
</tbody>
</table>

*Note.* UP = unidirectional perpetration; UV = unidirectional victimization; BD = bidirectional IPV; NV = non-violent.

Table 13

**Indirect Effects of the UP and BD Groups on NSSI through Emotion Dysregulation.**

<table>
<thead>
<tr>
<th>X</th>
<th>M</th>
<th>Y</th>
<th>Value</th>
<th>SE</th>
<th>SE</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP</td>
<td>ED</td>
<td>NSSI</td>
<td>0.159</td>
<td>0.084</td>
<td>-0.004</td>
<td>0.324</td>
<td>1.91</td>
</tr>
<tr>
<td>BD</td>
<td>ED</td>
<td>NSSI</td>
<td>0.329</td>
<td>0.066</td>
<td>0.199</td>
<td>0.459</td>
<td>4.97</td>
</tr>
</tbody>
</table>

*Note.* X = predictor/independent variable; M = mediator; Y = outcome/dependent variable; SE = standard error; CI = confidence intervals; UP = unidirectional perpetration; UV = unidirectional victimization; BD = bidirectional IPV; ED = emotion dysregulation; NSSI = non-suicidal self-injury.
Figure 2. NSSI prevalence for each of the groups. The BD and the UP group had significantly higher prevalence than the NV group, and a trend to significance was found for the UV group when compared to the NV group. No differences in prevalence were found between the UP, UV, and BD group.
Figure 3. Means for the Intrapersonal and Interpersonal scales of the ISAS for each of the groups. There were no significant mean differences between the groups with regard to intrapersonal functions. There were significant mean differences with regard to the interpersonal functions; the mean of the BD group was significantly higher than the rest of the groups.

**p < .002.**
Figure 4. Mean DERS scores for each of the groups with and without NSSI. The numbers at the top of each column indicate the groups with significant mean differences.

**p < .001.
Figure 5. This figure shows the mediation effect of emotion dysregulation in the relationship between UP and NSSI. This model shows the unstandardized regression coefficients for Paths $a$, $b$, $c$ and $c'$. The magnitude of the relationship between UP and NSSI was significantly ($p = .056$) reduced when emotion dysregulation was included as a mediator. These results indicate that emotion dysregulation partly accounted for the relationship between UP and NSSI.

$* = p < .05; ** = p < .01; *** = p < .001$
Figure 6. This figure shows the mediation effect of emotion dysregulation in the relationship between BD and NSSI. This model shows the unstandardized regression coefficients for Paths $a$, $b$, $c$ and $c'$. The magnitude of the relationship between BD and NSSI was significantly reduced when emotion dysregulation was included as a mediator. These results indicate that emotion dysregulation partly accounted for the relationship between BD and NSSI.

$* = p < .05; ** = p < .01; *** = p < .001$. 
CHAPTER 4 Discussion

The present study aimed to investigate NSSI in the context of unidirectional and bidirectional IPV; specifically this study aimed to determine the prevalence and functions of NSSI, and the extent to which these two factors varied according to the directionality of violence. This study also examined how the levels of emotion dysregulation varied between individuals with and without NSSI across the groups; and the role of emotion dysregulation in explaining the relationship between IPV perpetration (unidirectional and bidirectional) and NSSI.

Regarding IPV, findings were consistent with past studies, pointing to differences in prevalence and characteristics between unidirectional and bidirectional IPV (e.g., Hines & Saudino, 2003; Orcutt, et al., 2005; Renner & Whitney, 2012; Straus & Ramirez, 2007; Testa et al., 2011; Whitaker et al., 2007). Approximately one third of the study sample engaged in IPV, of which more than half was bidirectional IPV. Also, individuals who engaged in bidirectional IPV exhibited higher frequency of perpetration and victimization across all forms of IPV (physical, psychological, sexual, injury) for both minor and severe incidents when compared to unidirectional perpetrators and unidirectional victims. These findings highlight the importance of taking into account directionality of violence when assessing IPV. This is further supported by findings regarding NSSI, given that significant differences where found between unidirectional and bidirectional IPV in some aspects of NSSI.

Findings regarding NSSI prevalence indicate that being in a violent relationship increase the likelihood of engaging in NSSI, especially in the case of unidirectional perpetrators and individuals who engage in bidirectional IPV. Directionality of violence did not seem to affect NSSI prevalence, as no differences were found between unidirectional and bidirectional IPV perpetration and victimization to this regard. From a theoretical
perspective these novel findings indicate that NSSI risk should be considered within the broader context of relationship conflict rather than primarily as a correlate of victimization, as is inferred by the majority of studies of NSSI and IPV that have focused exclusively on victimization. Further, these findings suggest that prior studies that have identified associations between IPV victimization and NSSI without considering bidirectionality of violence may have conflated the effect of victimization with the effects of perpetration and thereby, reported inflated estimates of the distinct association between IPV victimization and NSSI. At a more general level, these findings highlight the importance of considering bidirectionality of violence when examining the correlates of IPV.

In terms of NSSI functions, intrapersonal functions were more often endorsed than interpersonal functions, regardless of group membership; this is consistent with the proposed hypothesis and with previous research (Nock, 2008; Nock & Prinstein 2004; Klonsky & Glenn, 2009). As for intrapersonal functions, there were no differences between individuals in violent and non-violent relationships, which suggest that being in a violent relationship does not influence the main motivations that drive individuals to engage in NSSI. Consistent with past literature (Klonsky, 2007b), the most reported intrapersonal functions were affect regulation and self-punishment. Thus, in the context of violent relationships, unidirectional victims may engage in NSSI to alleviate overwhelming emotions which may result, in part, from being victimized, or to express anger towards oneself, maybe, for allowing the violence to continue. In the case of unidirectional perpetrators, NSSI may be a strategy to deal with intense negative emotions derived from relationship conflict, or to express anger or punish oneself for being violent with the intimate partner. Individuals that engage in bidirectional IPV may perform NSSI for the same reasons of both unidirectional perpetrators and victims
depending on the situation. In addition, perpetrators (unidirectional and bidirectional) may engage in NSSI as a way redirect their violent impulses inwards; in this scenario, it is possible that NSSI may serve similar functions as IPV perpetration, especially in terms of affect regulation. Some of the most widely reported motives for engaging in IPV perpetration are anger and retaliation for being emotionally hurt (Follingstad et al., 1991; Makepeace, 1986; Leisring, 2013; Shorey et al., 2010). These motives involve negative intense emotions, which seem to be in line with the emotional states that appear to play an important role in leading many of the perpetrators (unidirectional or bidirectional) in this study to engage in NSSI. Therefore, perpetrators (unidirectional and bidirectional) may regulate emotional states derived from relationship conflict by using violence against intimate partners or against themselves. This interesting proposition is consistent with recent work that points to shared risk factors for self and other directed violence (e.g. Swogger, Walsh, Homaifar, Cane & Connor, 2012)

Differences between the groups were found with regard to interpersonal functions. In general, individuals that engaged in bidirectional IPV were more likely to endorse interpersonal functions than were unidirectional perpetrators, unidirectional victims, and non-violent individuals. However, when each interpersonal function was assessed independently, significant differences were found only for two functions: revenge and peer-bonding. With regard to the revenge function, it was hypothesized that unidirectional perpetrators and individuals that exhibit bidirectional IPV would be more likely to endorse this function; but that was only the case for bidirectional IPV. This might be explained by the existing differences between unidirectional perpetration and bidirectional IPV in terms of likelihood of escalation of violence. Given that violence is more likely to escalate when both
partners are violent (Testa et al., 2011), individuals that engage in bidirectional IPV may be more likely to enter into a cycle of retaliation against intimate partners, in which NSSI may be considered another tactic to avenge being physically or emotionally hurt. In the context of a violent relationship, NSSI might be considered as an alternative way to hurt intimate partners, and as such it might be considered a form of psychological violence. This is consistent with research that has identified retaliation as a commonly reported motive for engaging in violence towards intimate partners (Follingstad et al., 1991; Leisring, 2013). Therefore, retaliation against intimate partners might be expressed through violence towards intimate partners or towards oneself. Individuals that engage in bidirectional IPV were also more likely to engage in NSSI to bond with peers/loved-ones; in the context of relationship conflict, these individuals might engage in NSSI to make amendments for the hurt inflicted on the partner or to express they are sorry. Taken together, these findings suggest that NSSI may be understood, in part, as a form of communication among violent couples.

Another interpersonal function that was of interest in this study was the interpersonal influence function. When individuals engage in NSSI to serve this function their main motivation is to influence other’s behaviour, as a way to obtain help or care from others or to avoid abandonment. Contrary to what was hypothesized, this function was not endorsed more highly than other interpersonal functions by individuals in violent relationships. Nonetheless, although individuals may not engage in NSSI primarily to exert interpersonal influence, their behaviour may end up influencing others’ behaviour, which in turn will end up reinforcing NSSI. Therefore, interpersonal influence may not be the main motivation to engage in NSSI, but may be considered as a “secondary gain” (Gratz, 2003), of which
individuals may be unaware. Future research that directly assesses the influence of NSSI on partner behaviour may be helpful to clarify this issue.

Findings regarding emotion dysregulation were consistent with past research that has identified an important role for this construct in both IPV and NSSI (Cawood & Huprich, 2011; Gratz & Roemer, 2004; Heath et al, 2008; Wilcox et al., 2012). Among unidirectional victims, bidirectional IPV, and non-violent groups, individuals that engaged in NSSI were more emotionally dysregulated than were those that did not perform this behaviour. These findings provide further support for emotion dysregulation as a factor that underlies the engagement in NSSI. Emotion dysregulation also seems to underlie the engagement in bidirectional IPV, given that individuals with and without NSSI in this group had significantly higher levels of emotion dysregulation than nonviolent individuals without NSSI. This may also explain why there are higher levels of violence and why violence is more likely to escalate in bidirectional IPV. Also, emotion dysregulation accounted for a significant amount of the relationship between NSSI and bidirectional IPV. However, given the partial relationship assumed by emotion dysregulation between these variables, more research is need to determine other factors potentially accounting for this relationship. With regard to unidirectional perpetration, emotion dysregulation did not differentiate between individuals with and without NSSI, and emotion dysregulation accounted for a relatively small amount of the relationship between NSSI and unidirectional perpetration. Therefore, there should be other factors that differentiate between perpetrators with and without NSSI.

4.1 Limitations and future directions

The present research has several limitations. Although, past studies have suggested that interpersonal stressors usually precede NSSI (Prinstein et al., 2009), and it is likely that a
conflict or a violent episode with an intimate partner may trigger the engagement in NSSI, the cross-sectional nature of this study impedes establishing the temporal order of these two factors. Therefore, until longitudinal studies address this issue, it is impossible to determine what happens first, NSSI or IPV; and which leads to the other, if that is the case.

Also, it is important to note that the fact that individuals in violent relationships are more likely to engage in NSSI does not necessarily mean that NSSI is more likely to be performed in the context of relationship conflict; there might be other situations in the life of the self-injurer that may lead to NSSI. Given that the majority of IPV victims and perpetrators (unidirectional and bidirectional) of this study first engaged in NSSI in adolescence, it is likely that NSSI may be used as a strategy to deal with problems inside and outside of the relationship, because NSSI might have been an effective strategy to deal with distressing feelings or situations, or to influence others’ behaviour, since then. Therefore, future research should determine if individuals in violent relationship with a history of NSSI, are more likely to engage in NSSI in the context of relationship conflict than in other contexts (e.g., conflicts with family members, problems at school). Also, future research should examine which factors lead perpetrators (unidirectional and bidirectional) to use violence towards intimate partners in some instances, and NSSI in others, in the context of relationship conflict, in order to determine when and under what circumstances it is more likely to use one type of violence over the other.

Gender is another important factor that future research should address when examining the relationship between NSSI and IPV. In this study the sample size and the number of groups prevented reliable examination of the relationship between NSSI and IPV among males and females. Future research should examine the prevalence and NSSI
functions separately for males and females to determine if the pattern of relationship between NSSI and IPV found in this study remains consistent across gender. It is important to take gender into account as prior research has indicated more detrimental consequences of IPV for females (Langhinrichsen-Rohling, 2010; Straus 2011; Straus & Ramirez, 2007; Whitaker et al., 2007), which might influence the manifestation of NSSI. Also, along with the assessment of gender, future research should examine severity and frequency of both IPV (unidirectional and bidirectional) and NSSI, to determine how they are related to each other.

Another limitation involves the generalizability of the study findings. Specifically, a robust literature attests (Johnson, 1995, 2006) to differences between the situational couple violence that is observed in community and college samples and the more severe intimate terrorism observed in clinical and forensic populations. The study sample likely consisted primarily of couples that engaged in situational couple violence and, therefore, further research is required before extrapolating these findings to correctional and shelter based samples where intimate terrorism may be more prominent.

Lastly, future studies should try to obtain information regarding IPV perpetration and victimization from both members of the couple, rather than from one member, as it was done in this study. This would ensure the information provided is reliable, and violence is not underreported or overreported by one or both members of the couple. Also, the study of IPV and NSSI would be benefited from an interview format rather than self-report measures, given that such a format permits specific questions regarding the relationship between the these variables to be asked.
4.2 Implications and conclusions

The novel findings of this research have theoretical, methodological, and clinical implications. At a theoretical level, findings suggest that the association between NSSI and IPV occurs in the context of general relationship violence, rather than just in the context of victimization. These findings highlight the need to broaden the focus from IPV victimization to include perpetration (unidirectional and bidirectional) when studying NSSI, and to incorporate violent dynamics as an important element in theoretical explanations regarding the use of NSSI by individuals involved in IPV. More broadly, these findings encourage conceptualizations of IPV that include the potential influence of perpetration on consequences thought to emerge primarily, or exclusively, from victimization. In terms of research methodology, the study findings highlight the importance of examining both unidirectional and bidirectional IPV when assessing NSSI, as there are differences between these types of IPV with regard to the motivations that trigger the engagement in NSSI. Failing to account for directionality of IPV might obscure the relationship between NSSI and IPV, and thereby impede understanding. In general, these findings highlight the importance of assessing both victimization and perpetration when conducting research on NSSI. In terms of implications at a clinical level, the study findings suggest that individuals in violent relationships that engage in NSSI, especially unidirectional victims and individuals that engage in bidirectional IPV, might benefit from interventions addressing emotion dysregulation, as this factor seems to underlie the engagement in NSSI in both groups, and also the engagement in bidirectional IPV. Therefore, interventions addressing emotion dysregulation might be used to reduce both NSSI and IPV in individuals that engage in bidirectional IPV. Also, given that these individuals might use NSSI as a form of
communication with intimate partners, intervention efforts to reduce NSSI in this context should take this potential motivation into account and consider the potential helpfulness of developing alternative means to communicate emotional charged material between intimate partners.
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