

**PEER INFLUENCE AND NON-SUICIDAL SELF-INJURY IN ADOLESCENCE:  
EXPLORING THE ROLE OF CO-RUMINATION**

by

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## ABSTRACT

The main purpose of this study was to investigate the relationship between co-rumination and non-suicidal self-injury (NSSI) in a community sample of adolescents. Analysis of the data from 92 adolescent self-injurers, 51 female and 41 male, indicated that there was a significant, positive correlation of small effect size between adolescents' level of co-rumination and their frequency of self-injury in the past year. When genders were examined separately, this positive correlation of small effect size remained significant solely for male participants. Contrary to expectations, co-rumination failed to moderate the relationship between depression and NSSI frequency, and stressful life events failed to moderate the relationship between co-rumination and NSSI frequency. Results from further post-hoc analyses and related research on peer socialization suggest possible reasons for these results and future research avenues. The strengths, contributions, and clinical implications of this study are also discussed.

*Keywords:* Non-suicidal self-injury; co-rumination; adolescents; depression; stressful life events

## **PREFACE**

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## **CHAPTER I: INTRODUCTION**

Clinicians, researchers, and the media alike are all too aware that non-suicidal self-injury (NSSI), a pervasive and potentially dangerous group of behaviours, may be increasing in prevalence, particularly among adolescents. Non-suicidal self-injury is defined as “the deliberate direct destruction or alteration of body tissue without conscious suicidal intent” (Favazza, 1998, p.260) and is not for religious or cultural purposes (Heilbron & Prinstein, 2008). Whereas past research did not separate NSSI from suicidal self-injury, the intent behind NSSI behaviour differentiates it from suicidal behaviours; whereas “the suicidal person wants to eliminate consciousness permanently; the self-injurer wants to modify consciousness, to reduce distress, in order to live another day” (Walsh, 2006, p.8). While researchers now strive to distinguish between these two behaviours, they may nevertheless co-exist, as research shows that adolescents who engage in NSSI show elevated rates of suicidal ideation and attempts (Cuellar & Curry, 2007; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006).

Additionally, it is important to note that while the social acceptability of NSSI is expanding (Favazza, 2009), NSSI is not a culturally-sanctioned behaviour performed for display, aesthetic purpose, or religious practice (Nixon & Heath, 2009). In fact, there is great concern regarding the large proportion of adolescents in the community who engage in NSSI and that this behaviour has also been reported to have a contagion effect among adolescents who believe it to be a helpful coping strategy (Derouin & Bravender, 2004; Hodgson, 2004). Adding to this concern is the emerging developmental research which has started to illustrate how internet discussion forums about NSSI (i.e., methods, associated feelings) have increased in popularity and are most likely occupied by

adolescents (Whitlock, Powers, & Eckenrode, 2006). These findings, along with the significant association between NSSI and affective distress (i.e., NSSI is used to diminish affective distress and is associated with symptoms of depression and anxiety; e.g., Klonsky, Oltmans, & Turkheimer, 2003), are concerning and highlight the need to further study adolescent NSSI in the community.

In the past, research on NSSI focused on clinical populations, specifically within the context of borderline personality disorder (BPD; Favazza, 1998). However, while the prevalence of NSSI in clinical samples is high, focus has started to shift as evidence has shown NSSI to be more common among community samples. In particular, an alarmingly high lifetime prevalence rate of 15-20% has been reported in community samples of adolescents (Heath, Schaub, Holly, & Nixon, 2009). Research specifically examining NSSI in adolescents continues to grow, whereas past research used to merge results from adolescent and adult studies into discussions of NSSI (Lofthouse, Muehlenkamp, & Adler, 2009). Yet, adolescence is a period with distinct developmental and environmental differences that offer a unique context within which to study the onset, maintenance, and potential transmission of NSSI behaviour (Whitlock & Knox, 2009).

Of particularly significant impact during adolescence are peer relationships. Considering their importance in adolescent socioemotional development (e.g., Bukowski, Newcomb, & Hartup, 1996), it is essential to investigate social processes which may influence the frequency and prevalence of NSSI. One process of particular interest is co-rumination, which is defined as “excessively discussing personal problems within a dyadic relationship” (Rose, 2002). While supportive adolescent friendships have traditionally been viewed as protective against affective distress (Bukowski et al., 1996),

the tendency to co-ruminate may in fact be maladaptive and increase risk for the development of affective distress.

The relationship between co-rumination and NSSI has not yet been investigated and thus, will be the main purpose of this study. Specifically, this study will explore the possibilities that corumination is either directly linked to the frequency of NSSI in adolescents or moderates the association between affective distress (i.e., depression) and NSSI. This study will also examine whether the number of stressful events moderates the proposed direct relationship between NSSI and co-rumination. The dependent variable in this study is adolescent NSSI and the three independent variables are depression, co-rumination, and stressful life events.

This study is expected to further expand upon the burgeoning research on NSSI in adolescents in the community. While research has started to show the importance of adolescents' interpersonal experiences as relevant for understanding and treating NSSI (Prinstein, Guerry, Browne, & Rancourt, 2009), this study seeks to provide empirical evidence to further support and expand on this area of research, specifically regarding the unique role of co-rumination. The association between these two constructs has not yet been investigated and offers promising insight into the significance of peer influence effects in adolescent NSSI; any findings can be used to guide treatment and aide clinicians in their understanding of NSSI behaviours. Indeed, determining the relationship between co-rumination and NSSI in adolescents will further elucidate how peers influence NSSI behaviour in adolescents and will aid in the design of interventions that maximize the emotional health of adolescents who self-injure.

## Definition of Terms

As previously noted in this introduction, for the purposes of this study NSSI is defined as “the deliberate direct destruction or alteration of body tissue without conscious suicidal intent” (Favazza, 1998, p.260). In addition, co-rumination is defined as “excessively discussing personal problems within a dyadic relationship” (Rose, 2002).

While affect, emotion, and mood are used in different ways by different researchers, for the purpose of this study the term *affect* is predominately used. Larson (2000) defines affect as the “felt aspect of mood and emotion...[and] thus the feeling tone associated with mood and emotion, and it is primarily evaluative. Affect is felt as good or bad, as pleasant or unpleasant, as a felt tendency to approach or to avoid” (p. 129). This definition parallels that given by Klonsky and Wienberg (2009) in their chapter on the assessment of NSSI; that affect “refers to the emotions or feelings one might have before, during, or after NSSI. Understanding these feelings is vital for understanding one’s motivations for NSSI” (p.185; Klonsky & Wienberg, 2009).



## **CHAPTER II: LITERATURE REVIEW**

### **Nonsuicidal Self-Injury**

Nonsuicidal self-injury is a complex and multidimensional construct with a clear and pervasive presence in community settings (Heath et al., 2009). With NSSI becoming part of our social landscape (Favazza, 2009), identifying variables that may contribute to the onset or maintenance of this behaviour should prove useful in case conceptualization and in developing effective intervention and prevention approaches. Peer relationships are a particularly salient domain of influence during adolescence, and often are a significant source of social support (Furman & Buhrmester, 1992). Research examining the impact of social processes on adolescent NSSI has started to proliferate. This study seeks to expand upon this promising area of research by examining co-rumination, a potentially maladaptive form of peer social interaction that has been linked to an increased risk for the development of affective distress (e.g., Rose, 2002; Rose et al., 2007; Stone, Hankin, Gibb, and Abela, 2011), and its possible contribution to NSSI in adolescents.

In order to understand how co-rumination may contribute to NSSI behaviour in adolescents a review of both NSSI and co-rumination research will be completed. A general discussion of NSSI prevalence and its association with affective distress will be followed by a review of its many functions, with particular emphasis on its affect regulating function which has particular relevance for this study. Following this, three models which include the affect regulating function and attempt to provide clinically useful conceptualizations of NSSI will be reviewed. Specifically, the emotional cascade model (ECM; Selby, Anestis, & Joiner, 2008; Selby & Joiner, 2009) is a promising

theoretical framework that has recently been proposed as helpful in understanding NSSI in individuals (Selby, Connell and Joiner, 2010). The ECM not only clarifies *why* individuals may engage in NSSI but also proposes a pathway for *how* NSSI works to regulate affect. Importantly, the ECM will not be tested in this study, but will be used to support a possible link between co-rumination and NSSI in adolescents.

Following a review of NSSI, a review of co-rumination and the research that supports its role in increasing affective distress and its possible connection to NSSI behaviour in adolescents will be conducted. After reviewing research supporting the role of corumination in increasing affective distress in adolescents, this review will explore the possibilities that corumination is either directly linked to the frequency of NSSI or moderates the association between distress (i.e., depression) and NSSI. Lastly, the possible impact of stressful life events, gender, age, and peer NSSI behaviour on the proposed relationships between adolescent NSSI and co-rumination will also be discussed.

**Prevalence of NSSI.** When perusing the literature regarding the prevalence of NSSI the significant variability in rates reported can be confusing. Essentially, due to the study of NSSI being relatively new, there has been little consistency concerning methodology in the study of self-injury. In critically reviewing the literature, it is important to take into account the variations in methodology concerning measurement, sample selection (i.e., community vs. clinical) and sample composition (i.e., gender, race, and sexual orientation), and how NSSI is defined (Nixon & Heath, 2009).

A critical distinction when evaluating prevalence is whether participants were taken from community or clinical settings. Clinical settings have higher prevalence rates

while community settings offer much more variability (i.e., schools vs. general population; urban vs. rural). For adolescents in the community, lifetime prevalence rates average around 15-20% (Heath et al., 2009). Results that have markedly higher prevalence rates (e.g., Gratz, 2006; Gratz, Conrad, & Roemer, 2002; Hilt, Cha, Nolen-Hoeksema, 2008; Lloyd, 1997; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007) likely diverged due to the use of checklists which included all possible self-injurious behaviours. In providing a list of many possible types of self-injury resulting in tissue damage (e.g., biting; sticking needles in skin; scraping skin) researchers have to rely on participants understanding of the construct of NSSI, and participants may endorse every behaviour they have engaged in whether for NSSI purposes or not. Understandably, researchers (Heath et al., 2009) are calling for follow-up interviews to assist in clarifying participants' understanding of whether the tissue damage was indeed NSSI or due to other behaviours (e.g., drug use). After follow-up interviews, the rate of NSSI in Ross and Heath (2002) was substantially reduced from 21.2% to 13.9%. In addition, some researchers ask for "lifetime" prevalence (e.g., Kumar, Pepe, & Steer, 2004; Ross & Heath, 2002), while others limit prevalence to the past year (e.g., Nock & Prinstein, 2004). This highlights how variation in measurement of NSSI affects prevalence ratings.

The setting in which we gather our participants will also influence the gender distribution we are likely to see among self-injurers. While significant gender differences are expected in clinical settings, it remains unclear whether significant gender differences in NSSI prevalence will be found in community samples. Certain community based studies have found significant gender differences (Evans, Hawton, Rodham, & Deeks, 2005; Hawton, Rodham, Evans, Weatherall, 2002; Muehlenkamp & Gutierrez, 2007;

Ross & Heath, 2002), while others have found no significant gender differences in NSSI prevalence (e.g., Jacobsen, Muehlenkamp, Miller, & Turner, 2008; Nixon, Cloutier, & Aggarwal, 2002). In clinical samples, females predominately engage in higher rates of NSSI. This difference is attributed to females being more prone to seek help than males and due to the inclusion of predominately female behaviours as NSSI (i.e., overdose and medication abuse without suicidal intent; Briere & Gil, 1998; Rodham, Hawton, & Evans, 2004). Indeed, studies within the community which have found gender differences (Laye-Gindhu & Schonert-Reichl, 2005; Nixon, Cloutier, & Jansson, 2008; Patton et al., 1997) have included overdose and medication abuse without suicidal intent, while community studies that limited their NSSI to forms of tissue damage such as cutting, burning, or self hitting failed to find a gender difference (Lloyd-Richardson et al., 2007; Muehlenkamp & Gutierrez, 2004, 2007; Izutsu et al., 2006; Zoroglu et al., 2003). While research suggests that NSSI is more prevalent among females, in both clinical and community settings (Nock, 2009); females are more likely to cut themselves and injure their wrists or thighs, while males more likely to self-hit, bang, or burn and injure their hands (Claes, Vandereycken, & Vertommen, 2005; Heath, Toste, Nedecheva, & Charlebois, 2008; Holly, Heath, Toste, & Schaub, 2007; Izutsu et al., 2006; Laye-Gindhu & Schonert-Reichl, 2005; Whitlock, Eckenrode, & Silverman, 2006). Thus, gender appears to partially predict who is likely to engage in NSSI, and is also associated with the location of and type of self-injury utilized.

Additionally, ethnicity and sexual orientation have been found to influence prevalence rates. Community based studies show that NSSI may be more common in Caucasian, than in African-American and African-Canadian, adolescents (Lloyd-

Richardson et al., 2007; Muehlenkamp & Gutierrez, 2004, 2007; Ross & Heath, 2002; Whitlock, Eckenrode, et al., 2006). The prevalence of NSSI in Aboriginal adolescents in Canada is unknown, but an international literature review (Evans et al., 2005) suggests that among American adolescents the prevalence of self-injury is higher in Native American adolescents than in Black or White adolescents. Caution is required in generalizing this finding though, since self-injury with suicidal intent was included in this review. Furthermore, preliminary findings with young adults in the community indicate that NSSI may occur more frequently in individuals who are gay, lesbian, or conflicted about their sexual orientation (e.g., Gratz, 2006; Whitlock, Eckenrode, et al., 2006).

While cultural awareness of NSSI has increased, and the media, researchers, and clinicians alike claim that the prevalence of NSSI is increasing in adolescents (e.g., Derouin & Bravender, 2004; Plener & Muehlenkamp, 2007; Walsh, 2006; White Kress, 2003), empirical evidence to endorse this assertion is lacking thus far. As pointed out by Heath et al. (2009), support for the claim that self-injury is increasing has arisen from trend studies in the United Kingdom on “self-harm”, which utilizes an extensive definition which includes all nonfatal self-inflicted harm (e.g., suicide attempts; e.g., Hawton et al., 2003; Olfson, Gameroff, Marcus, Greenberg, & Shaffer, 2005). Furthermore, Heath et al., (2009) point out that it would also be difficult to evaluate literature on NSSI from the last 15 years because “in clinical settings, this behaviour was often subsumed under personality disorders and not reported separately” (p.23). Furthermore, it may be that the reporting and identification of self-injury has been influenced by increased media coverage over the past 15 years and increased help seeking for self-injuring behaviours by youth (Whitlock, Ells, Cummings, & Purington, 2008).

The assertion that NSSI, as defined for the current study – “the deliberate direct destruction or alteration of body tissue without conscious suicidal intent” (Favazza, 1998, p.260) – is increasing cannot be made at this time. Yet, researchers agree that NSSI is a pervasive and potentially dangerous group of behaviours and adolescence appears to be a period of increased risk for NSSI. The majority of adolescents first engage in self-injury between the ages of 13 and 15 (e.g., Muehlenkamp & Gutierrez, 2007; Ross & Heath, 2002; Sourander et al., 2006), though studies have shown that a considerable amount begin earlier. For example, in Ross and Heath’s (2002) study, 59% of their high school student sample indicated they first engaged in self-injury at age 12, while 24% were age 11 or younger.

**NSSI and distress.** Besides finding an increase in the proportion of youth who engage in NSSI throughout early and mid adolescence, it has also been suggested that individuals who engage in NSSI are at increased risk of later dying by suicide (Joiner, 2005). In fact, individuals who engage in NSSI consistently report elevated rates of suicidal ideation and attempts (Cueller & Curry, 2007; Nock et al., 2006). Moreover, 30 and 15-fold increases in risk for suicide have been found, respectively by Cooper et al. (2005) and Sakinofsky (2005), for those who engage in NSSI compared with those who do not.

In addition, the majority of adolescents who self-injure have also been found to meet criteria for current mental and personality disorders (Nock et al., 2006). In fact, various psychiatric conditions appear to confer heightened risk for the development of NSSI (Klonsky & Glenn, 2009). Clinical samples of adolescents who have engaged in NSSI have shown elevated rates of major depressive disorder (MDD), externalizing

disorders, substance use, and borderline personality disorder (BPD) when compared with those who do not self-injure (Jacobsen et al., 2008; Kumar et al., 2004; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). Only one community-based study (Garrison, Addy, McKeown, & Cuffe, 1993) formally assessed both NSSI and psychiatric disorders; the researchers found that diagnoses of MDD, specific phobia, obsessive-compulsive disorder, or a combination of these was associated with an elevated risk of engaging in NSSI. In other community based studies with adolescents, without formal assessment of psychiatric disorders, NSSI was most frequently associated with suicidal behaviour followed by depression and substance use, hostility and anger, and then anxiety (Laye-Gindhu & Schoner-Reichl, 2005; Lloyd-Richardson et al., 2007; Muehlenkamp & Gutierrez, 2004, 2007; Ross & Heath, 2002). Eating disorder features have also been found to be significantly more common in adolescent self-injurers than non-injurers (Ross, Heath, & Toste, 2009).

Of particular relevance for this study, NSSI has been found to be associated with symptoms of depression and anxiety (Andover, Pepper, Ryabchenko, Orrico, & Gibb, 2005; Hawton et al., 2002; Nixon et al., 2002; Nock et al., 2006; Klonsky et al., 2003; Ross & Heath, 2002). This association may be due to the possible presence of emotion dysregulation in both of these disorders (Gross & Munoz, 2005; Mennin, Heimberg, Turk, & Fresco, 2005). In order to understand the association between affective distress and engaging in NSSI, it is imperative to review the functions of NSSI.

**Functions of NSSI.** When considering the literature on the functions of NSSI, it is important to consider that NSSI is contextually complex. Essentially, individuals are tied to their environment and as Suyemoto (1998) states in her review of functional

models of NSSI, “one of the most difficult tasks in attempting to understand any pathological behavior is discerning why this particular behavior, at this particular time, serves this particular function, for this particular patient” (p.537). Thus, the reasons an individual engages in NSSI may vary over time and context. Additionally, NSSI is likely overdetermined; it may fulfill multiple functions simultaneously. While the following review presents the functions separately, they may occur at the same time and be conceptually related (Klonsky, 2007).

Examining the literature on the functions of NSSI can be a challenging process, with researchers utilizing different definitions for the same function. Klonsky (2007) has identified seven functions that have been researched most consistently, labeling and providing descriptions for each. The seven functions are labeled as anti-suicide, self-punishment, sensation-seeking, interpersonal boundaries, interpersonal influence, anti-dissociation, and affect-regulation. While all will be reviewed, emphasis and further elaboration will be made for the affect-regulation function which has particular relevance for this study.

***Anti-suicide.*** The anti-suicide function depicts NSSI as a maladaptive coping mechanism that aids an individual in preventing or avoiding suicidal thoughts or behaviours (Klonsky, 2007). In the anti-suicide function, NSSI is a “morbid form of self-help” (Favazza, 1998) where an individual makes a compromise and replaces suicidal behaviour with NSSI (Suyemoto, 1998) in order to ease his/her distress instead of ending his/her life.

***Self-punishment.*** Another function with partial support (Klonsky, 2007) is the self-punishment function (Briere & Gil, 1998; Himber, 1994; Klonsky et al., 2003). This



function suggests that NSSI is used to articulate self-hatred and self-directed anger, well-known characteristics of self-injurers (Herpertz, Sass, & Favazza, 1997; Klonsky et al., 2003). Specifically, NSSI appears to be used to punish or invalidate oneself. Linehan (1993) hypothesizes that this need to punish and invalidate oneself was modeled after experiences in an early invalidating environment.

***Sensation-seeking.*** The sensation-seeking function considers NSSI as a collection of behaviours that trigger exhilaration and excitement for the individual (Nixon et al., 2002; Osuch, Noll, & Putnam, 1999; Shearer, 1994). This rush of excitement is reported to be similar to that felt when sky-diving or bungee jumping. This function is not readily evident in clinical populations which may explain the scarcity of literature examining this model (Klonsky, 2007).

***Interpersonal influence.*** The interpersonal influence function depicts NSSI as a means of communication and/or expression or way to provoke a response from others in the self-injurer's environment (Briere & Gil, 1998; Chwanec, Josephson, Coleman, & Davis, 1991; Himber, 1994). In this sense, self-injury is hypothesized to be a means by which an individual expresses their desire for help, to prevent others from abandoning them, or to convince others to take them more seriously (Allen, 1995). Once others respond to the self-injuring behavior this form of communication is reinforced.

***Interpersonal boundaries.*** Klonsky (2007) described how the interpersonal boundaries function depicts individuals who engage in NSSI as striving to affirm their autonomy or establish a sense of self (Carroll, Schaffer, Spensley, & Abramowitz, 1980; Suyemoto, 1998). Klonsky speculates that those who use NSSI for this function experienced insecure attachments and poor individuation from their primary caregivers,

and therefore view NSSI as a means of establishing these missing boundaries. It may be that “intense emotional reactions to perceived abandonment threaten the boundaries of the “self,” and [NSSI] functions to re-affirm or strengthen these boundaries” (p. 374; Chapman, Gratz, & Brown, 2006).

***Anti-dissociation.*** Additionally, Klonsky (2007) described the anti-dissociation function of NSSI which depicts self-injury as an attempt to stop periods of dissociation (Briere & Gil, 1998) or depersonalization; to stop feeling nothing or unreal. Alternately, experiences of dissociation or depersonalization may be the result of the intense affect present during self-injury (Klonsky). It is suggested that the act of NSSI, with the associated sight of blood (Simpson, 1975) or the physical sensation (Gunderson, 1984), shocks the system and disrupts episodes of dissociation allowing the individual to recover a sense of self (i.e., to feel real and alive again).

***Affect regulation.*** NSSI is most frequently conceptualized as an affect regulation mechanism. Klonsky’s (2007) comprehensive review of research on NSSI motivations found strong evidence that episodes of overwhelming or intense negative affect or affective arousal precede NSSI, diminished negative affect and feelings of relief and calm occur after NSSI, and self-injury proxies (e.g., visualizing self-injury or completing a painful task) also result in reduced negative affect in laboratory settings (see Brain, Haines, & Williams, 1998).

Studies have shown that individuals who self-injure report greater subjective levels of experienced affective distress when faced with stressful events (Najmi, Wegner, & Nock, 2007; Nock, Wedig, Holmberg, & Hooley, 2008). In fact, “a key assumption of the affect regulation model is that self-injurers are less able (or less willing) to tolerate

intense distress than non-injurers, regardless of whether the experience of greater reactivity is subjective or physiologically based, and that they use NSSI as a means of escaping from the experience of intense distress” (Nock & Mendes, 2008, p.29). This inability to tolerate distress is believed to be an essential facet in the development and maintenance of self-injury (Chapman, et al., 2006; Favazza, 1996; Klonsky, 2007). Indeed, the most common reason individuals give for engaging in NSSI is to alleviate, or escape from, overwhelming affective distress (Brown, Comtois, & Linehan, 2002; Chapman et al., 2006; Favazza, 1992; Gratz, 2003; Haines, Williams, Brain, & Wilson, 1995; Klonsky, 2007; Nock & Prinstein, 2004, 2005). Specifically, affect regulation (“to cope with feelings of depression”; “to release unbearable tension”) was the most frequently endorsed reason for NSSI among hospitalized adolescent self-injurers (Nixon, Cloutier, & Aggarwal, 2002). Evidence indicates that as a result of self-injurers’ inability to deal with overwhelming affective states, such as feelings of anger, anxiety, frustration, depression, tension, loneliness, or emptiness, NSSI is carried out in order to achieve the goal of diminishing affective distress (Austin & Kortum, 2004; Briere & Gil, 1998; Gratz, 2003; Haines et al., 1995; Himber, 1994). Paralleling these findings, there is also evidence that NSSI is less prevalent in individuals who experience negative affect less intensely and less often, though individuals who experience positive affect more intensely and more often do not appear to have lower risk (Klonsky et al., 2003).

Recent research (Gratz et al., 2011) further clarifies the relationships between NSSI and the willingness to experience emotional distress and tolerate physical pain. These researchers found that following interpersonal stressors, women who engage in self-injury are less willing to tolerate emotional distress and show a greater tolerance for

physical pain. Gratz and colleagues propose that when self-injurers' ability to self-regulate is depleted in the face of a stressor they turn to NSSI since they are more willing to tolerate physical pain than emotional distress.

One recent study (Muehlenkamp et al., 2009) expanded upon current understanding of the emotional consequences of NSSI by looking at real-time data of both positive and negative affect states before and after acts of NSSI. This study found that NSSI serves as a real-time affect regulating mechanism in individuals with bulimia nervosa. Negative affect increased and positive affect decreased prior to individuals engaging in NSSI, while positive affect increased following NSSI, supporting previous findings that NSSI is used to manage affective distress (Laye-Gindhu & Schonert-Reichl, 2005; Nock & Prinstein, 2004).

**Explanatory models of NSSI.** While NSSI likely has multiple determinants (Suyemoto, 1998) and many individual functions have been proposed, the following models attempt to provide clinically useful conceptualizations of NSSI by either cohesively integrating functions, or elaborating on how NSSI fulfills these functions. Following is a review of three models which have attempted to further our understanding of why an individual may want to self-injure. The following models will not be tested in this study, but provide a theoretical basis to support the hypotheses of this study.

***Experiential avoidance model.*** Chapman et al.'s (2006) experiential avoidance model (EAM) of NSSI shows how the leading three functions (e.g., affect regulation, anti-dissociation, and interpersonal boundaries; Klonsky, 2007) are all joined by the notion that NSSI helps the individual to control their affect. Specifically, when an individual experiences emotion dysregulation and negative affect they engage in NSSI as

a way of escaping, or avoiding, the negative affect they are experiencing. For instance, while the affect regulation function of NSSI directly allows an individual to control overwhelming affect, the anti-dissociation function suggests that NSSI regulates affect through an interaction with dissociative behavior to terminate an aversive dissociative state. Additionally, the interpersonal boundaries function suggests that when intense affective distress occurs due to an individual's boundaries of the "self" being threatened; NSSI is used to reaffirm or strengthen a sense of self.

Essentially, experiential avoidance includes behaviors that allow an individual to either avoid, or escape from, distressing internal experiences (i.e., thoughts, feelings, somatic sensations) or the external experiences that trigger them (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Importantly, while Chapman et al. (2006) propose that NSSI is utilized primarily to avoid unwanted affect, it also may aid in avoiding other distressing internal experiences (i.e., thoughts, memories, somatic sensations) due to their linkage with the unwanted affect. According to the EAM, NSSI "is maintained and strengthened through the process of escape conditioning and powerful negative reinforcement" (p.374; Chapman et al., 2006). Basically, when a distressing level of affective arousal is triggered by an internal or external emotionally distressing experience an individual engages in NSSI in order to escape the overwhelming state of arousal. NSSI is thus negatively reinforced when it successfully diminishes or terminates the emotional arousal. Over time, through repeated negative reinforcement, NSSI may become an automatic avoidance behaviour associated with eliminating unpleasant affective states.

This behavioral theory of NSSI was developed to apply to NSSI across various populations, rather than focusing solely on certain clinical populations (e.g., BPD; see

Linehan, 1993). The authors claim the EAM integrates various pieces of the puzzle of NSSI, with supportive psychophysiological studies showing that NSSI reduces physiological and affective arousal (Brain et al., 1998; Haines et al., 1995), and research showing the single most common reason for engaging in NSSI being to obtain affective relief or to regulate affect (Brown et al., 2002). Furthermore, Chapman et al., (2006) provide three possible mechanisms (i.e., the opioid, distraction, and self-punishment hypotheses; see Chapman et al., 2006), along with supportive research, which underlie the EAM to explain why individuals who engage in NSSI experience affective relief.

Although this proposed theoretical framework is promising, and contributes to the understanding of why an adolescent may engage in NSSI, evaluation of the EAM in adolescents and the pathways through which it facilitates the avoidance or escape of emotional experience is needed. This further evaluation may help clarify why other behaviors (e.g., taking a cold shower, listening to music) are not used instead of NSSI, and why adolescents do not engage in NSSI every time they wish to avoid the negative affect they experience when faced with a distressing event.

***Four function model.*** Lloyd-Richardson, Nock, and Prinstein (2009) view the research evaluating functions of NSSI as being limited. Specifically, NSSI functions have not been sufficiently evaluated in adolescent populations and the EAM model solely emphasizes the negatively reinforced properties of NSSI while ignoring the other possible functions of NSSI. Furthermore, they find that the term *function* has been used too loosely and should be used solely to specify those which fit the traditional *functional analyses* definition, of learning theory and behaviour therapy, which refers to the examination of the antecedents and consequences of the NSSI behaviour with the purpose

of understanding and treating it. Accordingly, Nock and Prinstein (2004, 2005) have “recently proposed and evaluated a comprehensive, four-function model of NSSI among adolescents that is consistent with and draws from prior work on learning theory and behavior therapy” (p.33; Lloyd-Richardson et al., 2009).

The four functional model (FFM; Nock & Prinstein, 2004, 2005) conceptualizes NSSI as having both automatic (i.e., emotion-regulation) and social (i.e., interpersonal) functions; the automatic functions regulate internal experiences, while the social functions regulate the external environment. An orthogonal dimension of the model suggests that NSSI can be maintained by either positive or negative reinforcement. These two dimensions result in four types of NSSI functions; engaging in NSSI for (a) automatic negative reinforcement (ANR; e.g., “To stop bad feelings”), (b) automatic positive reinforcement (APR; e.g., “To feel something, even if it is pain”), (c) social negative reinforcement (SNR; e.g., “To avoid doing something unpleasant you do not want to do”), and (d) social positive reinforcement (SPR; e.g., “To get attention”). In addition, individuals may engage in self-injury behaviors for multiple functions; the four types of functions are not mutually exclusive (Nock & Prinstein, 2004, 2005; Nock & Cha, 2009).

Evidence supporting the FFM has been found through self-report, physiological, and behavioural research in adolescent populations. Self-report research in adolescent clinical (Nock & Prinstein, 2004, 2005) and community (Lloyd-Richardson et al., 2007) samples supports the structure of the FFM and helps explain the wide range of correlates associated with NSSI by linking them with specific FFM functions. For example, individuals who have endorsed the ANR function of NSSI, report greater levels of

affective states from which they want to escape (i.e., emotion reactivity, hopelessness) and methods of escape from intolerable cognitive and affective states (i.e., thought suppression and suicide). The APR function, where an individual engages in NSSI to “feel something”, has been strongly linked with the clinical correlates of anhedonia, inactivity, and numbness (Nock & Prinstein, 2005; Weierich & Nock, 2008).

Researchers have also correlated social concerns with the endorsement of social functions of NSSI (Nock & Prinstein, 2005). Moderating factors have also started to be elucidated; peer communication and rumination have been identified as moderators between social functions (i.e., SNR and SPR) and interpersonal distress and between APR and internal distress, respectively (Hilt, Cha et al., 2008).

Complementing earlier findings, that those who engage in NSSI display decreased arousal when imagining engaging in NSSI (Haines et al., 1995), Nock and Mendes (2008) found that adolescents with recent histories of NSSI had greater physiological arousal (i.e., skin conductance) in response to, and poorer ability to tolerate, a stressor than individuals without a history of NSSI. This effect was found to be strongest for self-injurers who endorsed the ANR function of NSSI, as would be expected considering their need to escape the experience of increasingly distressing arousal. In the same study, Nock and Mendes evaluated a behavioural aspect of NSSI. Specifically, they looked at the social problem solving skills of those who self-injure and found that there were no deficits in the quantity or quality of solutions generated. Rather, self-injurers were more likely to choose maladaptive solutions or report lower self-efficacy for applying adaptive solutions when it came time to select specific solutions for socially challenging situations.



While the FFM has gathered empirical support for its structure, and provides for a new understanding of NSSI in adolescents, it does not address how NSSI is used to resolve affective distress or communicate with others. Further elaboration is needed to explain how NSSI fulfills these four functions and clarify the questions also raised by the EAM (i.e., why is NSSI chosen over other behaviours to cope and why is it not used all the time for the proposed functions?)

***Emotional cascade model.*** The Emotional Cascade Model (ECM; Selby et al., 2008; Selby & Joiner, 2009) is a recent theoretical model that proposes the relationship between affective and behavioral dysregulation in individuals with borderline personality disorder (BPD) may be explained by rumination, the cognitive process that involves repetitive focus of attention on one's thoughts and emotions (Nolen-Hoeksema and Morrow, 1991). Selby et al. (2010) have also recently proposed that this theory is helpful for understanding NSSI in individuals without BPD. It may be that a process like an emotional cascade, as described by Selby et al. (2008) and Selby and Joiner (2009), may occur and trigger NSSI. The emotional cascade model suggests that once an individual starts to ruminate about an affect eliciting event they experience heightened negative affect. As the intensity of the negative affect increases, the individual finds it increasingly difficult to divert attention away from the emotional event, and rumination about the event increases. Essentially, rumination and negative affect interact in a positive feedback loop; this ever intensifying loop drives the individual to engage in other, more compelling ways, of distracting themselves, like NSSI, to break free from the cascade and experience affective relief (Selby, Anestis, Bender, Joiner, 2009).

The role of rumination in the ECM is vital; it alludes to who is capable of self-injury and why they may do so. Rumination amplifies and prolongs negative affect (Moberly and Watkins, 2008; Thomsen, 2006), whether it is sadness, anger, or fear, and thus predicts why individuals engage in NSSI (Selby et al., 2010). Essentially, rumination may account for low distress tolerance; explaining why minute negative emotional stimuli result in an extreme affective response, heightened emotional intensity and slow return to baseline in self-injurers. As a result, events that appear insignificant to others may trigger an intense self-perpetuating cycle that is resistant to mild distractions (e.g., talking to a friend, taking a shower) or other cognitive strategies (e.g., cognitive reappraisal). Thus, a self-injurer uses a dysregulated behavior (i.e., cutting arm) strong enough to shift the focus of their attention to the sensations (i.e., pain or sight of blood) associated with it, breaking the cascade and allowing negative affect to subside. Due to the intense physical sensations of NSSI behaviours they may be particularly salient distractions from rumination (Selby et al., 2009).

Additionally, opponent processes may work so that an individual will habituate to the pain of NSSI and alternatively experience feelings of relief (Joiner, 2005); an individual will recognize that NSSI regulates their affect. These effects may be temporary, however, and any resulting feelings of shame or embarrassment may trigger another cascade. The ECM also clarifies why self-injurers do not use NSSI every time they feel negative affect (Selby & Joiner, 2009); if an individual does not ruminate, the negative feelings are likely to fade without requiring self-injury. For example, if a youth who regularly engages in self-injury feels anger after a hurtful social interaction, but is prevented from ruminating due to a strong distraction (e.g., taking part in a sporting event

or demands of an academic project at school), the youth may not feel compelled to engage in NSSI to feel relief if his/her anger has already diminished due to inattention.

While evidence supporting the ECM is relatively nascent (see Selby et al., 2009 and Selby & Joiner, 2009), NSSI is well-established as having an affect regulation function and has also been tied to rumination in adolescents without BPD (Hilt, Cha et al., 2008) and in adults with (Brown et al., 2002; Selby et al., 2009) and without BPD (Armey & Crowther, 2008; Borrill, Fox, Flynn, & Roger, 2009; Selby et al., 2010). A few of these recent studies have examined the role of rumination in maintaining NSSI directly. Borrill et al. (2009) examined coping style, rumination, and alexithymia, with 617 undergraduate students in the UK and found that those who engaged in each type of self-injury had higher levels of self-reported rumination, and rumination significantly predicted self-injury status. It should be noted though that this study included overdose as a form of self-injury which does not fit with the current study's definition of NSSI. Prior to this, Armey and Crowther (2008) gathered self-report data on aversive self-awareness (which included rumination), dissociation and NSSI from 225 undergraduate students in the US. Upon evaluating the results of their study, they proposed that rumination intensifies negative affect in self-injurers through contributing to aversive self-awareness. This suggests that the self-critical focus of rumination, rather than a constructive reflection on a problem, is what contributes to increasing negative affect. Most recently, Selby et al. (2010) examined the interaction between rumination and painful life events in predicting NSSI in 94 undergraduate students. Self-report data indicated that there was an interaction effect of painful events and rumination on the

frequency of NSSI. Higher levels of rumination combined with a greater number of painful events predicted a higher frequency of NSSI.

Lastly, the sole study with adolescents as participants (Hilt, Cha et al., 2008) utilized the FFM to examine self-report data to determine whether rumination moderated the relationship between depressive symptoms and the use of NSSI for affect regulation. It was determined that while rumination moderated the relationship between depression and engaging in NSSI for APR (i.e., to feel something rather than dissociating) it did not moderate the relationship between depression and engaging in NSSI for ANR (i.e., to stop bad feelings). This finding challenges the hypothesized function of NSSI in the ECM (e.g., to diminish negative affect), but there is a possibility that rumination is directly related to using NSSI to stop affective distress as rumination was found to be significantly correlated with engaging in NSSI for ANR. Also, this finding highlights how the ECM does not account for dissociation, a complex phenomenon which has been repeatedly tied to NSSI (e.g., Osuch et al., 1999). It may be that dissociation results from such “an extreme emotional cascade that the individual shuts his or her mind down” (Selby & Joiner, 2009, p.227) and NSSI serves to disrupt episodes of dissociation (i.e., through the associated sight of blood or pain) and bring the individual out of this unpleasant state.

Complementing these findings, there may be neurobiological foundations to support that dysregulated behaviors like NSSI distract from rumination. According to Ray et al. (2005) when non-BPD participants underwent an induced rumination procedure (i.e., ruminated on negative affect) this correlated with increased activation in neural structures (i.e., the left ventrolateral prefrontal cortex and left amygdale) which

activate during the experience of negative affect (Phan et al., 2003). Additionally, through a self-injury proxy in patients with BPD, Schmahl et al. (2006) found that increases in pain decreased activity in the amygdala. Based on the findings of these studies, Selby and Joiner (2009) propose that emotional cascades may increase activity in the amygdala, while dysregulated behaviors such as NSSI may then decrease activity in this same area.

The ECM is a promising theoretical framework that clarifies why individuals may engage in NSSI rather than other behaviours to cope with intense negative affect and why individuals do not always use NSSI to regulate their affect. Also, it goes further than previous models in proposing a pathway for *how* NSSI works to regulate affect. Importantly, although the ECM focuses on the dissipation of rumination as the key to the affect regulating property of a dysregulated behaviour, in the case of NSSI other potential mechanisms have been proposed (e.g., opioid; Chapman et al., 2006). Future research on the ECM is needed to clarify how it relates to these other potential affect regulating mechanisms. Further evaluation of the ECM in adolescents and how other correlates (e.g., dissociation) of NSSI relate to it is also needed.

### **Co-Rumination**

Having reviewed literature pertaining to the prevalence, correlates, functions, and models of NSSI, it is apparent that while literature on this subject is burgeoning, much remains to be discovered regarding NSSI behaviour in adolescence. Adolescence is a period with distinct developmental and environmental differences that offer a unique context within which to study the onset, maintenance, and potential transmission of NSSI behaviour (Whitlock & Knox, 2009). In adolescence, there are considerable

interpersonal transitions (Cyranowski, Frank, Young, & Shear, 2000; Hankin & Abramson, 2001; Rudolph & Hammen, 1999) and adolescent friendships are high in intimacy and emotional disclosure, particularly among girls (Buhrmester & Furman, 1987; Furman & Buhrmester, 1992). When faced with stressful experiences adolescents are also more likely to rely on peers for social support (Harter, Stocker, & Robinson, 1996), and thus discussions of problems and associated negative feelings are frequent (Rose, 2002). Traditionally, these supportive friendships have been viewed as protective (Bukowski et al., 1996); however, Rose (2002) has proposed that certain facets of these friendships, specifically the tendency to co-ruminate, may be maladaptive and increase risk for the development of affective distress.

Following is a review of co-rumination and the research that supports its role in increasing affective distress and its possible connection to NSSI behaviour in adolescents. Specifically, upon reviewing the research which supports the role of co-rumination in increasing affective distress in adolescents, this review will explore the possibilities that co-rumination is either directly linked to the frequency of NSSI or moderates the association between distress (i.e., depression) and NSSI. Additionally, the role of stressful life events as a moderator of the proposed direct relationship between NSSI and co-rumination will be explored.

**What is co-rumination?** Co-rumination is defined as “excessively discussing personal problems within a dyadic relationship” (Rose, 2002). Like self-disclosure, co-rumination involves sharing personal thoughts and feelings. However, whereas self-disclosure can involve any personal topic and can be brief, co-rumination involves an excessive focus on problems and concerns and involves mutual encouragement of

problem talk. Co-rumination is similar to rumination in that they both involve a negative focus on the details of problems or dwelling on negative affect. However, whereas rumination is a cognitive, solitary process, co-rumination is a social, conversational process. While co-rumination and depressive rumination are distinct constructs (Rose, 2002; Calmes & Roberts, 2008), “co-rumination’s negative, repetitive, non-solution-focused nature, as opposed to its overlap with intimate sharing or self-disclosure, accounts for the relationship between friend-based co-rumination and depressive outcomes. In other words, it is the manner in which friendship pairs are discussing problems, as opposed to the fact that they are discussing problems that makes co-rumination depressogenic” (Calmes & Roberts, p.587).

Observational research (Rose, Schwartz, & Carlson, 2005) has shown that friends in relationships characterized by high co-rumination responded to problems with more support and acknowledgement than those in relationships low in co-rumination. This finding suggests that “to the casual observer co-rumination might appear to be a pleasant supportive process, which would make it a process that could be easily overlooked as a contributor to negative outcomes like depression” (Bukowski, Adams, & Santo, 2006, p.27). Yet, in co-rumination, friends focus on negative affect and excessively discuss, revisit, and speculate on problems, mentioning unanswerable questions and concerns about a problem and its potential implications. For example, consider an adolescent who has just experienced criticism from a peer and then repeatedly talks about what happened with a friend, focusing on details of the experience, their negative feelings, and speculating about possible causes and consequences of this experience. These friends converse throughout their day at school and then continue the conversation on the phone

after school. While such an intense emotional conversation may initially increase feelings of closeness within the friendship, and may appear like normal self-disclosure to adults, “peer relations based on coruminative strategies may not only fail to buffer individuals from more internalized distress but actually provide a venue for developing greater risk” (Stone, Uhrllass, & Gibb, 2010, p.597).

**Co-Rumination, friendship quality, and affective distress.** Rose (2002) initially found support for the maladaptive role of co-rumination using a sample of 608 students in third, fifth, seventh, and ninth grade. Co-rumination was found to be more common within female than male relationships in childhood and adolescence and was positively correlated with internalizing symptoms (i.e., depression and anxiety). The differing levels of co-rumination between genders also became more pronounced in adolescence, coinciding with the emergence of gender differences in depression (Nolen-Hoeksema & Girgus, 1994). Additionally, higher levels of co-rumination predicted greater quality, close friendships. In other words, co-rumination acted as a mediator for the relationships between gender and emotional distress, and gender and friendship satisfaction. In particular, higher levels of co-rumination in females’ friendships contributed to females’ having higher levels of depression and anxiety, as well as greater friendship satisfaction compared to males, suggesting that an individual’s gender may determine whether friendship is protective in nature.

Rose et al.’s (2007) study sought to extend upon Rose’s (2002) research using a longitudinal design in order to determine the temporal relationships between co-rumination and friendship and emotional adjustment. On two separate occasions, six months apart, 813 adolescent participants in third, fifth, seventh, and ninth grade, filled



out a series of questionnaires. Again, females reported greater levels of co-rumination than did males. Also, coinciding with the appearance of gender differences in level of depressive symptoms in adolescence (Clark & Ayers, 1993) there was an interaction effect where level of co-rumination was predicted by grade level and gender. The researchers also described a transactional relationship between co-rumination and adjustment. In females, co-rumination was found to predict both an increase in friendship quality and depressive and anxiety symptoms, which in turn predicted an increase in co-rumination. In males, though, co-rumination did not predict an increase in depression and anxiety; it only predicted an increase in friendship quality. While neither the inclusion of only two time points, nor a time frame of only six months, makes for an ideal longitudinal study, this research provided an important first indication of the possible impact of co-rumination over time. Overall, this study concluded that co-rumination is likely more problematic for females than males, and while females who co-ruminate likely experience friendships of greater self-reported quality and appear to have strong support systems, their risk for depression and anxiety is greater and needs to be assessed.

The link between co-rumination and affective distress was expanded upon in a recent study by Stone et al. (2010). While previous research (Rose, 2002; Rose et al., 2007) correlated co-rumination with depressive symptoms, Stone et al. found that this relation generalizes to diagnosable episodes of depressive disorders. Specifically, in a retrospective, behavioral high-risk design, where participants were 81 mother-child pairs, current levels of co-rumination were found to predict children's history of depressive episodes. Children who reported currently engaging in high levels of co-rumination were significantly more likely to have a history of at least one depressive episode, when

compared with children reporting lower current levels of co-rumination. Contrary to previous studies (Rose, 2002; Rose et al., 2007), no significant gender differences in co-rumination were found. Also, gender did not significantly moderate the link between co-rumination and history of depressive disorders.

Starr and Davila (2009) recently completed a study which further elucidates co-rumination's relation to both affective distress and friendship adjustment. While attempting to replicate, and expand upon, previous findings made by Rose and colleagues (Rose, 2002; Rose et al., 2007), Starr and Davila followed a sample of 83 early adolescent girls, grades 7 and 8, over a one-year period. The self-report data replicated previous findings made by Rose and colleagues; a positive cross-sectional association between co-rumination and both depressive symptoms and positive friendship qualities was found. Contrary to Rose et al.'s (2007) findings, co-rumination was not found to predict increases in depressive symptoms over time. The researchers do note, however, that while their effect sizes were statistically insignificant they were very similar to those of Rose et al. (2007).

Stone et al. (2011) further investigated the unique role of co-rumination in predicting the development and course of depression in adolescents. In a two year prospective follow-up study, 106 early adolescent – parent pairs participated and completed baseline measures of co-rumination, rumination, depressive symptoms, and current and past history of clinically significant depressive episodes (including episode duration and severity). Follow-ups at 6-, 12-, 18-, and 24-months assessed for onset of new depressive episodes. As predicted, co-rumination was found to predict time to depression onset over the 2-year follow-up and depressive episode duration and severity;

higher levels of co-rumination were associated with significantly shorter time to onset and episodes of greater severity and duration. Furthermore, co-rumination was also found to mediate the relationship between gender and depression onset, with girls reporting significantly higher levels of co-rumination and exhibiting a significantly shorter time to onset of depression than boys. These relationships were “maintained even after baseline depressive symptoms and rumination were covaried, suggesting that the influence of co-rumination is not simply due to its relation with these other variables” (p.4). Co-rumination was found to be a stronger predictor of depression risk than rumination in this study, highlighting the idea that, while co-rumination is associated with higher friendship quality and closeness (Calmes & Roberts, 2008; Rose, 2002; Rose et al., 2007; Starr & Davila, 2009) it appears to increase vulnerability to depression in adolescents.

In endeavoring to expand upon co-rumination research Starr and Davila (2009) found evidence that co-rumination may be depressogenic when it corresponds with stressful events. Basically, when examining the association between co-rumination and romantic experiences in adolescent girls, romantic involvement was found to be positively correlated with co-rumination and moderated the effect of co-rumination on depressive symptoms. Essentially, “co-rumination predicted increases in depressive symptoms for girls with greater romantic experiences and decreases for girls with fewer” (p.31) demonstrating that the maladaptive nature of co-rumination may not occur for all girls, but those with greater levels of romantic activities. Starr and Davila suggest that early adolescent girls are unprepared for and become stressed when they attempt to manage the challenges of romantic experiences, and hypothesize that co-rumination may

be predictive of depressive symptoms only when it corresponds with a stressful experience. Starr and Davila support their idea citing literature in which rumination was found to be associated with prolonged and greater levels of depressed mood in response to severe (e.g., earthquake) and mild (e.g., every day) stressors across a variety of populations (Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema, Parker, Larson, 1994; Nolen-Hoeksema, Morrow, & Fredrickson, 1993).

While Starr and Davila suggest that co-rumination may be predictive of depressive symptoms only when it corresponds with a stressor, Byrd-Craven, Geary, Rose, and Ponzi (2008) found evidence that co-rumination about a problem elicits a biological stress response. Specifically, Byrd-Craven et al. examined whether a possible biological correlate of co-rumination would help explain its association with affective distress and friendship adjustment. Their study also addressed the methodological weakness of relying solely upon self-report questionnaires for findings, used by the majority of the above mentioned research. Participants were 48 undergraduate females (24 friendship dyads) either assigned to a “problem talk” condition, where they were to discuss a problem experienced by one of the participants, or to a control condition where they were told to design a recreation center. Prior to engaging in either condition participants completed questionnaires and provided saliva samples to measure their level of the stress hormone cortisol. Following a 17 min discussion period, the friends in both conditions were separated and given irrelevant magazines (e.g., home, garden, furniture magazines) to read. After 15 min of reading, the participants’ saliva was collected again to measure for peak post-stressor cortisol levels.

Byrd-Craven and colleagues (2008) found that even after controlling for self-reported levels of co-rumination and pre-stressor cortisol levels, individuals in the problem talk condition experienced significant increases in cortisol levels. Interestingly, while both conditions involved dwelling on problems it was solely the Problem Talk condition that elicited an increase in cortisol levels. It appears that co-rumination “may need to be about personal problems to be meaningful enough to elicit a biological stress response” (p.491). In addition, while this lab experiment does not mirror what would occur naturally, it does provide initial experimental evidence that co-rumination intensifies women’s stress response. It is unknown though whether it was solely the dwelling on negative affect, rather than engaging in the more analytical aspects of co-rumination (e.g., wondering about the possible causes and consequences of problems; Byrd-Craven et al., 2008), that resulted in increased cortisol, or whether cortisol increases were also amplified by the social nature of co-rumination. Apparently, the mere discussion of a problem without actively problem solving within a friendship dyad can be problematic.

Byrd-Craven et al.’s (2008) study provides a possible explanation for the connection between co-rumination and emotional adjustment. Byrd-Craven et al. point out how research has shown that a more accurate memory of problem details results from a mild to moderate release of cortisol (Abercrombie, Kalin, Thurow, Rosenkranz, & Davidson, 2003). A more accurate memory of problem details could have either a positive or negative influence. Positively, a more accurate memory of problem details could aid in problem solving efforts. Negatively, a more accurate memory of problem details and subsequent distress could contribute to the higher levels of depressive and

anxious symptoms that often occur with co-rumination (Rose, 2002; Rose et al., 2007). Overall, Byrd-Craven et al.'s study contributes to the growing literature on co-rumination which states that co-rumination is linked with increased vulnerability to affective distress.

### **Co-rumination and NSSI in Adolescents**

Upon reviewing literature pertaining to both NSSI and co-rumination it is apparent that both are positively associated with affective distress. Given the role of co-rumination in increasing affective distress in adolescents, the following section argues that co-rumination either moderates the association between depression and NSSI or is directly linked to the frequency of NSSI. Additionally, the role of stressful life events as a potential moderator of the proposed direct relationship between co-rumination and NSSI will be presented.

**Does co-rumination moderate the relationship between NSSI and depression?** Research on co-rumination, NSSI, and the ECM suggest that co-rumination may act as a moderator between NSSI and depression. First, both co-rumination and NSSI have been linked to depression. Studies have shown current levels of co-rumination to be positively correlated with depression (Rose, 2002; Rose et al., 2007; Starr & Davila, 2009), predictive of children's history of depressive episodes (Stone et al., 2010), and predictive of increases in depressive symptoms over a 6 month period (Rose, Carlson, & Waller, 2007). Furthermore, co-rumination was found to be a stronger predictor of depression risk than rumination in a recent study with early adolescents (Stone et al., 2011). Also, NSSI has been found to be associated with symptoms of depression (Andover, Pepper, Ryabchenko, Orrico, & Gibb, 2005; Hawton et al., 2002; Nixon et al., 2002; Nock et al., 2006; Klonsky et al., 2003; Ross & Heath, 2002) and is

most frequently carried out in order to diminish affective distress. For example, Nixon, Cloutier, and Aggarwal (2002) found that affect regulation (e.g., “to cope with feelings of depression”) was the most frequently endorsed reason for NSSI among hospitalized adolescent self-injurers.

Second, as discussed by Starr and Davila (2009), co-rumination may function similarly to rumination in exacerbating depressive symptoms in dysphoric individuals, yet not exerting any affect on mood in non-dysphoric individuals (Nolen-Hoeksema, 1991). Therefore, adolescents who are not vulnerable to emotion dysregulation would not experience any significant change in mood when co-ruminating, while emotionally dysregulated adolescents like those who engage in NSSI, would experience heightened depressive symptoms. It may be that co-rumination exacerbates depressive symptoms and this drives adolescents to engage in NSSI for relief.

Third, further research on rumination and co-rumination suggest that co-rumination may moderate the relationship between depression and NSSI. Rumination has been found to predict the onset and exacerbation of depression in children and adolescents (Abela, Brozina, et al., 2002; Abela & Hankin, 2007; Nolen-Hoeksema, Stice, Wade, & Bohon, 2007) and is proposed to do this by intensifying the impact of negative affect on cognitive processing and by hindering the use of effective, problem-solving behaviors that could alleviate depressive symptoms (Nolen-Hoeksema 1987, 1991). Recently, Arney and Crowther’s (2008) findings indicate that the self-critical focus of rumination, rather than a constructive reflection on a problem, is what contributes to increasing negative affect. Co-rumination, with its focus on the negative event and associated negative affect, is also linked to elevated depressive symptoms and

is not associated with constructive problem solving. These similarities suggest that co-rumination may similarly lead to NSSI behaviour in adolescents as described in the ECM (e.g., Selby & Joiner, 2009). Examining the impact of co-rumination on adolescent NSSI separately from rumination is justified since co-rumination has been found to mediate the gender difference in depression during adolescence and to be a strong predictor of depression risk, even after covarying for rumination, suggesting that it uniquely predicts an increase in vulnerability for depression in adolescents (Stone et al., 2011).

In summary, research indicates that co-rumination is predictive of depression, depression is predictive of NSSI behaviour in adolescents, and suggests co-rumination may function similarly to rumination in the ECM. Accordingly, this study examined whether co-rumination moderated the relationship between depression and NSSI in adolescents.

**Is co-rumination directly linked with NSSI?** This study also explored whether co-rumination is directly related to NSSI behaviour. With self-injurers' lower distress tolerance (Najmi et al., 2007; Nock & Mendes, 2008; Nock et al., 2008), the spike in cortisol levels recorded by Byrd-Craven et al. (2008) following co-rumination may be enough to activate an emotional cascade as described in the ECM (Selby et al., 2008; Selby & Joiner, 2009). Alternatively, in a hyperaroused state due to an increase in cortisol, a self-injurer may be incapable of utilizing more adaptive problem solving and coping strategies. Recent research (Nock & Mendes, 2008) has supported the hypothesis that since self-injurers are more prone to emotional reactivity and emotion dysregulation they would have greater difficulty using social problem-solving skills when distressed. Adolescent self-injurers were found to be less able to generate solutions to hypothetical



dilemmas after a stress-inducing task. Furthermore, while they were able to create the same number of solutions relative to non-self injurers they gave more maladaptive solutions and reported lower self-efficacy for utilizing adaptive solutions. While the repetitive focus on problems in co-rumination may lead to the generation of solutions in non-self-injurers, it may hinder effective problem solving in self-injurers. As a result, self-injurers may be more likely to engage in NSSI after co-rumination due to an increase in negative affect (as previously discussed) or due to the inability to generate, or follow through on, any adaptive alternative solutions to difficulties.

Also, as described during the section on the ECM, research suggests that rumination is directly linked with NSSI. Borrill et al., (2009) found that undergraduate students who engaged in self-injury had higher levels of self-reported rumination, and rumination significantly predicted self-injury status. Another study by Hilt, Cha et al., (2008) found that rumination did not moderate the relationship between depression and engaging in NSSI to stop affective distress, but may be directly related since rumination was found to be significantly correlated with engaging in NSSI to stop affective distress. Considering these findings, this study explored whether co-rumination between friends acts similarly to rumination and determined whether co-rumination is directly linked with NSSI behaviour in adolescents.

In addition, this study looked at how the number of stressful events experienced impacted the proposed direct association between co-rumination and NSSI. Specifically, this study examined whether stressful life events moderated the association between co-rumination and NSSI behaviour in adolescents. First, research states that individuals who self-injure report greater subjective levels of experienced emotional distress when faced

with stressful events (Najmi et al., 2007; Nock et al., 2008) and have been found to be less able to tolerate distress than non-injurers (Nock & Mendes, 2008). It is possible that even a small stressful event would be sufficient to trigger emotional dysregulation (i.e., emotional cascade according to the ECM; Selby et al., 2008; Selby & Joiner, 2009) in a self-injurer, and drive an adolescent to engage in NSSI. Second, a recent study by Hankin and Abela (2011) also found more stressful life events significantly differentiated youth who engaged in NSSI from those who did not. Following, it is likely that the more stressful events an individual experiences, the more likely an individual will engage in co-rumination and trigger an emotional cascade and thus engage in NSSI. Third, again turning to research involving rumination, Selby et al. (2010) found that higher levels of rumination combined with a greater number of painful events predicted a higher frequency of NSSI in undergraduate students.

In addition, the type of stressor experienced by an adolescent may be relevant to the relationship between co-rumination and adolescent NSSI. Research suggests that stressful interpersonal events are linked to episodes of NSSI in adolescents (Hilt, Cha et al., 2008). Interpersonal stressors, particularly those that are dependent interpersonal stressors have also been found to contribute to increased co-rumination (Hankin, Stone, & Wright, 2010). Dependent interpersonal stressors are those that the individual may have contributed to through their own characteristics or behaviors (e.g., fight with friend).

**The effects of gender, age, and peer NSSI.** Past research indicated that gender, age, and peer NSSI would influence the outcome of this study. While the majority of studies have found co-rumination to be more common within female than male relationships in childhood and adolescence (Rose, 2002; Rose et al., 2007), one study

found no gender differences in level of co-rumination (Stone et al., 2010). The prevalence of co-rumination also increases from childhood through adolescence (e.g., Rose, 2002; Rose et al., 2007). Depression, similarly, is more common in females than males (e.g., Hankin et al., 1998; Hankin, Wetter, & Cheeley, 2008; Wichstrom, 1999), and becomes more prevalent in adolescence (Nolen- Hoeksema & Girgus, 1994). In regards to NSSI, research suggests that NSSI is more prevalent among females, in both clinical and community settings (Nock, 2009), though this gender difference may not be clinically significant.

Lastly, this study also attempted to control for peer NSSI. Youth may imitate NSSI behaviours that they observe in their peers. Indeed, the contagion of NSSI has been observed in psychiatric (Rosen & Walsh, 1989; Walsh & Rosen, 1985) and community based samples (Prinstein et al., 2007) of adolescents and there is growing evidence that the contagion of NSSI is more common than previously believed (Fennig et al., 1995). NSSI has been reported to have a contagion effect among adolescents who believe it to be a helpful coping strategy (Derouin & Bravender, 2004; Hodgson, 2004) and recent research suggests that “adolescents also may be socialized into engaging in NSSI behaviour within their close friendships” (Heilbron & Prinstein, 2008, p.170). Among 102 adolescent psychiatric inpatients it was found that an adolescents’ increasing NSSI behaviour was longitudinally associated over 18 months with their perception of friends’ NSSI behaviour. Results from a community-based sample of adolescents revealed similar results. Increases in adolescents’ own NSSI behaviour was longitudinally associated with their best friends’ reports of NSSI over a two year period (Prinstein et al., 2007). This study attempted to control for the NSSI behaviour of adolescents’ best

friends to help ensure that the findings of this study were due to the relationship between co-rumination and NSSI, not due to peer NSSI behaviour.

### **The Current Study**

This study further expanded upon the burgeoning research on NSSI in adolescents. Specifically this study delineated the relationship between NSSI and a relatively new construct in the literature, co-rumination. The association between these two constructs had not yet been investigated and offers promising insight into the significance of peer influence effects in adolescent NSSI. First, this study investigated whether co-rumination was directly related to NSSI behaviour in adolescents. Second, this study investigated whether co-rumination moderated the association between affective distress (i.e., depression) and NSSI. Third, this study investigated whether the number of stressful events experienced influenced the proposed direct association between NSSI and co-rumination. The following hypotheses were proposed:

*Hypothesis 1: Adolescent co-rumination will be positively correlated with the frequency of adolescent NSSI behaviour.*

*Hypothesis 2: Co-rumination will moderate the association between depression and the frequency of NSSI behaviour in adolescents. Specifically, co-rumination was hypothesized to enhance the positive correlation between adolescent depression and the frequency of adolescent NSSI behaviour.*

*Hypothesis 3: Stressful life events will moderate the association between co-rumination and the frequency of NSSI behaviour in adolescents. Specifically, stressful life events was hypothesized to enhance the positive correlation between adolescent co-rumination and the frequency of adolescent NSSI behaviour.*

## CHAPTER III: METHODOLOGY

### Research Design

**Single Time Point Survey Design.** This study was conducted using a single time point survey design. In this manner, differences between groups at a single point in time were examined with this descriptive, cross-sectional approach (Mertens, 2005); it was only necessary for the participants to complete one set of questionnaires. Being a correlational design, this study is only able to convey the relationships between variables, but is unable to declare any causal effects. The correlational approach allows for the exploration of co-rumination in the proposed population. Additionally, in establishing the relationships between co-rumination and NSSI, and depression, this study provides a basis from which to ascertain any possible causal relationships through future study.

### Participants

**Sample Size.** In order to establish generalizability, a power analysis determined that a sample size of 89 ( $N = 89$ ) would be required. This sample size was established by recognizing the two predictors in this study and using the conventional alpha level of significance ( $\alpha = .05$ ), a high degree of power ( $\beta = 0.95$ ) and a medium effect size ( $f^2 = 0.15$ ). A medium effect size was chosen based on research reporting significant correlations between NSSI and depression and co-rumination and depression that are of low-moderate to large strength. NSSI has been found to have a significant positive correlation with depression (i.e.,  $r = .215$  at baseline and  $r = .199$  at 6 months,  $p < .001$ ; O'Connor et al., 2010,  $r = .52$ ,  $p < .05$  at baseline and  $r = .44$ ,  $p < .01$  at 9 months; Guerry & Prinstein, 2010). Co-rumination has been found to have a significant positive

concurrent association with depression (i.e.,  $r = .33$  at baseline and  $r = .20$  at 6 months,  $p < .0001$ ; Rose et al., 2007).

**Inclusion and exclusion criteria.** Criterion sampling was utilized for this study. Eligible participants for this study consisted of adolescents, grades 7 through 12, from the participating secondary schools. Furthermore, the sample was inclusive of both adolescents who engage in NSSI and those who do not. It was the researcher's desire that this open inclusion would increase the representativeness of the sample and help avoid selection bias. Essentially, by going into classrooms rather than advertising for participants, it was hoped that there would be less systematic error due to differences among the true population and study population. Ethically, in order for an adolescent to be eligible, they must have been (a) able to read and comprehend English, (b) 13 through 18 years old and, (c) have the consent of a parent/guardian and (d) personally assent to participate in the study. Once the data was collected, and the prevalence of NSSI in the community sample calculated, only data pertaining to individuals who engaged in NSSI was retained for further analyses.

**Characteristics.** Participants in this study were students from the middle and high schools in Fort St. John, British Columbia. Adolescents were recruited from mainstream and alternate programs in order to more broadly reflect the population within the community. Of the 770 students (544 in middle school, grades 7 to 9, and 226 in high school, grades 10 to 12) who were given a parent consent form, 35.6% (186 from the middle schools and 88 from the high school) returned a signed parent consent form and 85.4% of these (149 from the middle schools and 85 from the high school; 55.6 % female) completed the survey.

It was expected that between 7 and 16 percent of community-based adolescent participants would endorse that they had engaged in NSSI in the past 12 months (Hilt, Nock, Lloyd-Richardson, & Prinstein, 2008; Muehlenkamp & Gutierrez, 2004), while lifetime prevalence was expected to center around 15-20% (Heath et al., 2009). Within the overall sample of adolescent students in this study who completed the survey, 136 (58.1%) of the 234, reported that they had physically hurt themselves on purpose in the past year, and an additional 10 (4.3%) reported they had engaged in NSSI prior to the past year. Overall, a lifetime frequency of 62.4% was found in the overall sample. This percentage is high, though other studies have reported similarly high percentages (e.g., 56% lifetime rate and 36% in previous year Hilt, Cha et al., 2008; 46.5% in previous year Lloyd-Richardson et al., 2007). In addition, two adolescent participants reported NSSI behaviour, but reported that this behaviour was done with suicidal intent and they were not included in the 136. Of the 136 participants who reported they had engaged in NSSI in the past year, 92 fully completed the survey.

### **Procedure**

Permission to conduct this survey was obtained from relevant school district #60 personnel. With the collaboration of school administrators and teachers, participating classes were determined based on grade and teacher interest.

#### **Student recruitment, class presentations, and questionnaire administration.**

The researcher contacted teachers at the middle and high schools and asked to visit their classrooms for 5-10 min at a pre-determined date to give a brief overview of the study (Appendix A) and to distribute the parental consent form (Appendix B). Rather than being introduced as a study on NSSI, students were informed that the purpose of the

study was to investigate the different ways they cope with stress and how stress impacts how they feel. It was described in this manner in order to avoid acquiring a self-selected sample, to prevent any stigmatization about NSSI, and to address the potential ethical concerns that may arise regarding the social influence and contagion effects of NSSI (Gratz, 2006; Hodgson, 2004). Students were informed that all their answers on the questionnaires would be confidential and that participating in the study was completely voluntary. They were encouraged to participate, but were notified that they could withdrawal from participating at any time. Students were instructed to return a signed parental consent form by a pre-determined date.

On the pre-determined date, a brief presentation (Appendix C) was made to each class including: a review of the objectives of study, parent and participant consent, questionnaire administration procedures, incentives, confidentiality/ anonymity, and question answering. Afterwards, survey packages were distributed to the participants during their class. It was expected that the six questionnaires would take approximately 30-40 min. Students were offered the opportunity to fill out a prize draw form if they had agreed to participate in the survey. Students were made aware that they were entering a draw to win one of three 50-dollar gift cards for iTunes. If students withdrew from the study their prize draw form would remain eligible. Students who did not return parent consent forms or who chose not to participate were directed to quietly work on a class assignment. All participating students were asked to first read the Adolescent Assent Form (Appendix D) attached to the front of the survey package which reiterates all information presented orally. Following this, students were asked to give personal assent by signing the assent form. Students were informed that the researcher would be



available to answer questions related to comprehension during the class period given to complete the survey. A follow up option was included on the last page of the survey (Appendix E) so students could indicate if they would like to be contacted at a later date to learn the results of the study.

Upon completion of the survey, consent forms and follow up requests were removed from the survey package and paired with parent consent forms to ensure anonymity. Following the completion of the survey package a short debriefing conversation (Appendix F) with students was facilitated by the researcher to determine student reactions. Questionnaires were stored according to the university's ethics committee regulations. All item responses from the questionnaires were entered into and stored within the Statistical Package for Social Sciences (SPSS). The SPSS data files only included the participant's assigned ID number and no identifiable information.

**Offers to school administration.** To compensate school personnel for the time and effort invested in the research project they were offered a variety of services dependent on individual needs and interests of the school. The researcher was prepared to provide a review of the literature in the areas of peer influence and non-suicidal self-injury (NSSI) and a lecture to staff on the topic of NSSI.

## **Measures**

Students were given a questionnaire package that included the following: demographic questions, Center for Epidemiological Studies-Depression Scale (CES-D), Co-Rumination Questionnaire (CRQ), Functional Assessment of Self-Mutilation (FASM), Peer NSSI questionnaire, and Adolescent Life Events Questionnaire (ALEQ).

**Demographic information.** Initial items of the questionnaire package relate to the collection of demographic information (see Appendix G). Questions answered by all participants focused on categorical responses to gender, age, grade level, ethnicity, and socio-economic status.

**Depression.** The Center for Epidemiological Studies-Depression Scale (CES-D; Radloff, 1978) is a widely used 20-item self-report measure for the assessment of depression symptoms (see Appendix H). It has been used in both normative and clinical samples of adolescents (Hogue & Steinberg, 1995; Roberts, Andrews, Lewinsohn, & Hops, 1990). The CES-D asks respondents to indicate the number of days during the past week that they had experienced a range of feelings or behaviours (0 = less than 1 day/rarely or none of the time to 3 = 5-7 days/most or all of the time). All items are summed; positive emotion items are reverse coded. Scores range from 0 to 60, with higher scores indicating higher levels of depressive symptoms. The suggested cutoff score is 15 (Weissman, Orvaschel, & Padian, 1980); that is, scores over 15 can be indicative of significant levels of depressive symptoms in children and adolescents. The CES-D has been reported as a four factor model in both adults and adolescents (Chabrol, Montovany, Chouicha, & DuConge, 2002; Hales et al., 2006; Radloff, 1978) and (the factor structure) has been shown to be stable when re-administered 1 month later (Roberts et al., 1990). The four factors are depressed affect (DA), positive affect (PA), somatic and retarded activity (SR), and interpersonal (IP; Hales et al., 2006). The factor structure and reliability of the CES-D has been validated in screening for depression in adult and adolescent populations in clinical, community, and Internet settings, as well as across African-Americans and Caucasian-Americans (Carpenter et al., 1998; Chabrol et al.,

2002; Cuijpers, Boluijt, & van Straten, 2008; Hales et al., 2006; Radloff, 1991). Good psychometric data exist for the use of the CES-D with adolescents, including high internal consistency (e.g., Cronbach's alpha .85 – .92; Chabrol et al., 2002 and Prinstein, Boergers, & Spirito, 2000, respectively).

**Co-rumination.** The 27-item Co-Rumination Questionnaire (CRQ; Rose, 2002) was used to assess the extent to which youths typically co-ruminate with close same-sex friends (see Appendix I). There are three items for each of nine content areas assessed: (a) frequency of discussing problems, (b) discussing problems instead of engaging in other activities, (c) encouragement by the focal child of the friends' discussing problems, (d) encouragement by friend of the focal child discussing problems, (e) discussing the same problem repeatedly, (f) speculation about causes of problems, (g) speculation about consequences of problems, (h) speculation about parts of the problem that are not understood, and (i) focusing on negative feelings. Participants rate each item on a 5-point Likert scale. Co-rumination scores are the mean ratings of the 27 items. Examples are "When we talk about a problem that one of us has, we usually talk about that problem every day even if nothing new has happened" and "when we talk about a problem that one of us has, we try to figure out everything about the problem, even if there are parts that we may never understand." The CRQ was initially developed by Rose (2002) to assess the extent that children, grades 3 to 9, co-ruminate with close same sex friends. The CRQ has been used with children grades 3 through 11, with mother-daughter dyads and in undergraduate populations (e.g., Byrd-Craven et al., 2008; Calmes & Roberts, 2008; Rose et al., 2007; Starr & Davila, 2009; Stone et al., 2011; Waller & Rose, 2009). Preliminary findings indicated support for the convergent validity of the construct of co-

rumination; it has been found to be positively correlated to measures of both rumination and self-disclosure ( $r_s = .46$  and  $.61$ , respectively; Rose, 2002). The CRQ has demonstrated moderate retest reliability (6 months,  $r = .54$ ; Rose et al., 2007), and excellent internal consistency in nonclinical samples ( $\alpha_s = .96-.97$ ; Byrd-Craven et al., 2008; Rose, 2002; Rose et al., 2007).

**Non-suicidal self-injury.** Participants' engagement in NSSI over the last 12 months was evaluated using the Functional Assessment of Self-Mutilation (FASM; Lloyd, 1998). The FASM (see Appendix J) is a self-report measure that assesses the frequency, methods and function of NSSI and includes information about the age of onset, suicidal intent, degree of physical pain experienced, how long they thought about it before doing it, whether or not they were taking drugs or alcohol during NSSI, and whether or not medical treatment was received. As in other studies (e.g., Hankin & Abela, 2011), the 23 questions on the FASM used to ascertain the function of NSSI were not included for this study. The measure was developed using psychiatric and normative samples of self-injuring adolescents thereby justifying its use in a community sample.

The FASM has demonstrated adequate psychometric properties in adolescent populations (Guertin, Lloyd-Richardson, Spirito, Donaldson, & Boergers, 2001; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007). It has been used in normative and psychiatric samples, and has adequate internal consistency of  $\alpha = .65$  (Guertin et al., 2001; Nock & Prinstein, 2004). The FASM has demonstrated concurrent validity as evidenced by significant associations with measures of suicide ideation, past suicide attempt (Guertin et al., 2001), recent suicide attempt, hopelessness and depressive symptoms (Nock & Prinstein, 2005).

**Peer NSSI.** Questions to tap social influence, specifically peer engagement in NSSI were developed and added to the end of the FASM (see Appendix K). These questions stated, “Think of your best or closest friends. Have your friends deliberately harmed themselves in any of the above ways (without intending to kill themselves)?” If yes, how many times would you estimate they have hurt themselves in the past year? Similar questions have been developed in previous research to tap social influence (e.g., Heath et al., 2009).

**Stressful life events.** The Adolescent Life Events Questionnaire (ALEQ; Hankin & Abramson, 2002; see Appendix L) was designed to assess the occurrence of a broad range of negative events/stressors typically reported by adolescents, including school problems (i.e., “You got into trouble with the teacher or principal”), relationship difficulties (i.e., “You found out your boyfriend/girlfriend was cheating on you”), and family problems (i.e., “you fought with your parents over your personal goals, desires, or choice of friends”). Each of the 57 events is rated for frequency over a period of time predetermined by the researcher (e.g., 5 weeks; Hankin et al., 2010, one month; Skitch & Abela, 2008, 3 months; Hankin & Abela, 2011) on a Likert type scale ranging from 0 (*never*) to 4 (*always*), with higher scores reflecting a greater number of negative life events. A time frame of 12 months was chosen for the present study to correspond with the time frame over which NSSI was also assessed. These 57 events can be categorized into interpersonal (e.g., family) and noninterpersonal domains (e.g., academics, see Hankin & Abramson, 2002) and independent (i.e., not related to the individuals characteristics) versus dependent (i.e., individual’s characteristics or behavior may have contributed) types of events. In Hankin and Abramson’s original (2002) study, with a

sample of adolescents aged 13 to 18, the ALEQ had an internal consistency of .94 and test re-test over 2 weeks was .65. More recent research has further established the reliability and validity of the ALEQ in adolescent populations (e.g., Hankin, Wetter, Cheely, & Oppenheimer 2008; Hankin et al., 2010) and shown that it has high internal consistency ( $\alpha = .92-.93$ ; e.g., Auerbach, Abela, Ho, McWhinnie, & Czaikowska, 2010; Skitch & Abela, 2008).

### **Screening of the Data**

Prior to analyzing the hypotheses of this study, the research data was checked for errors in coding, missing data, outliers, and violations of the applicable statistical assumptions involved in the planned analyses: bivariate correlation and hierarchical multiple regression. All statistical analyses were performed using data from those adolescents who had engaged in NSSI in the past year and had fully completed the survey ( $N = 92$ ).

Of the 92 adolescents who had engaged in NSSI in the past year, no data was missing for the Center for Epidemiological Studies-Depression Scale (CES-D), Co-Rumination Questionnaire (CRQ), Functional Assessment of Self-Mutilation (FASM), or the Adolescent Life Events Questionnaire (ALEQ). The Peer Nonsuicidal Self-Injury (NSSI) Questionnaire contained missing data for 12 participants. While all 92 participants completed the question of whether a peer had engaged in NSSI or not (yielding a complete dichotomous categorical variable), 12 did not report a frequency of NSSI for their peers. These 12 missing values were replaced with the mean value.

Variables were examined for potential univariate outliers using boxplots. Scatterplots, histograms, and box plots were visually examined to look for skewed

distributions and non linear relationships. These examinations revealed that the CESD, FASM and Peer NSSI scales were positively skewed, with both frequency scores from the FASM and Peer NSSI scales showing extreme positive skews, with skewness values of 4.04 ( $SE = .25$ ) and 5.05 ( $SE = .25$ ), respectively.

The CESD, FASM, and Peer NSSI were positively skewed and violated the assumption of normal distribution of scores. The positive direction of the skew appeared reasonable considering a non clinical sample of adolescents was used. The FASM and Peer NSSI box plots also showed numerous extreme outliers (i.e., more than three interquartile ranges from the box in the boxplot). A logarithmic transformation of the FASM and Peer NSSI total scores was performed, which removed all extreme outliers. Since 29 participants indicated that their peers did not engage in self-injury, a logarithmic transformation of these variables was not possible, removing 29 participants from the data set. Of the remaining 63 values, there were no longer any extreme outliers present, though the Peer NSSI box plot continued to show 4 outliers (at the high upper limit). The 10 high scores subsequent to these outliers were examined to see what intervals they were increasing at; on average Peer NSSI scores were increasing in increments of 11. Peer NSSI outliers were changed to the next highest score plus 11 in order to more accurately reflect the distribution shape. Changing the value of the outliers, rather than removing the data, was the preferred method because the data may have been an accurate representation of the construct being assessed and there was no other explanation for the elevated scores (Field, 2005). After changing the values of the outliers, two outliers remained at the high upper limit. Upon examination, the 5% Trimmed Mean (i.e., 1.19) and the Mean (i.e., 1.19) values were determined to be the same; given this, these two

remaining outliers were retained in the data file. The mean value of the CESD underwent square root transformation, resulting in an approximately normal distribution of the data. The box plot of the transformed data for the CESD showed 3 outliers (at the lower limit). These outliers were changed to the next lowest score minus the average interval found when examining the bottom 10 intervals of the CESD. It was determined that the transformed data for the CESD was decreasing in increments of 0.05, and the outliers were changed accordingly. Once the CESD, FASM, and Peer NSSI underwent these transformations, a visual examination of the normality plots and histograms indicated that the distributions were more normal. The transformed variables were used for all statistical analyses.

### **Reliability of Research Measures**

To obtain an estimate of internal consistency and therefore evaluate the reliability of the research measures, Cronbach's Alpha coefficients were calculated for each measure (see Table 1). The Cronbach's Alpha for the use of different forms of NSSI was  $\alpha = .63$  for self-injurers; this reliability is consistent with past research (Lloyd-Richardson et al., 2007) and while low, it is consistent with previous research findings which has shown that just because an individual engages in one form of NSSI, does not necessarily mean he or she will engage in another (Selby et al., 2010). All the remaining measures exhibited acceptable to very good (ranging from .74 to .96) internal consistency scores.



Table 1

*Cronbach's Alpha for Research Measures for the all Participants and Separately for Self-Injuring Participants*

| Scale        | Cronbach's Alpha (NSSI only) | Items |
|--------------|------------------------------|-------|
| 1. CES-D     | .91 (.89)                    | 20    |
| 2. CRQ       | .96 (.96)                    | 27    |
| 3. FASM      | .77 (.63)                    | 12    |
| 4. Peer NSSI | .84 (.81)                    | 12    |
| 5. ALEQ      | .94 (.93)                    | 57    |

*Note.* CES-D = Center for Epidemiological Studies-Depression Scale (square root transformation); CRQ = Co-Rumination Questionnaire; FASM = Functional Assessment of Self-Mutilation (log transformation); Peer NSSI = Peer Non-Suicidal Self-Injury Questionnaire (log transformation); ALEQ = Adolescent Life Events Questionnaire (ALEQ).

## CHAPTER IV: RESULTS

Results presented from this study include the demographic statistics regarding the prevalence, frequency, and characteristics of nonsuicidal self-injury (NSSI) behaviours used and the level of depressive symptoms, co-rumination, and stressful life events experienced in the sample of adolescent students. In regards to the main purpose of this study, a Pearson correlation was conducted to determine whether there was a relationship between co-rumination and NSSI frequency in adolescents. Additionally, two hierarchical multiple regression analyses were conducted to determine whether co-rumination moderated the relationship between depression and NSSI frequency, and whether stressful life events moderated the relationship between co-rumination and NSSI frequency. Further post-hoc analyses were also included.

### **Descriptive Statistics**

**Description of NSSI participants.** Table 2 presents the descriptive data (means and standard deviations) associated with the demographic variables. Self-injuring participants were 55.4% female; 80.4% White, 8.7% Mixed Ethnicity, 4.3% Aboriginal, 3.3% Asian, 2.2% Black, and 1.1% other. Self-injuring participants had a mean age of 14.7 (SD = 1.9) years and 56.5% attended middle school (i.e. grades 7 to 9) while the remaining 43.5% attended the local high school (i.e. grades 10 to 12). The majority of these self-injuring participants resided with two parents (78.3%), who were married (71.7%), lived in a house owned by their family (75.0%), and had mothers (48.9%) and fathers (87.0%) who were employed full time.

Table 2

*Demographic Variables of Participants who Engaged in NSSI in the Past Year*

| Variable                               | Percentage  | Mean  | SD   |
|--|-------------|-------|------|
| Age                                    |             | 14.70 | 1.88 |
| Gender (% female)                      | 55.4        |       |      |
| Grade (% Middle School; grades 7 to 9) | 56.6        | 9.33  | 1.91 |
| Ethnicity                              |             |       |      |
| Aboriginal Person                      | 4.3         |       |      |
| Asian                                  | 3.3         |       |      |
| Black                                  | 2.2         |       |      |
| White                                  | 80.4        |       |      |
| Mixed Ethnicity                        | 8.7         |       |      |
| Other                                  | 1.1         |       |      |
| Housing                                |             |       |      |
| Rented House/Duplex                    | 14.1        |       |      |
| Rented Apartment                       | 3.3         |       |      |
| Own House/Duplex                       | 75.0        |       |      |
| Foster Home                            | 2.2         |       |      |
| Other                                  | 4.3         |       |      |
| Who Live With                          |             |       |      |
| Live with single parent                | 15.2        |       |      |
| Live with two parents                  | 78.3        |       |      |
| Live with non relatives                | 3.3         |       |      |
| Live with relatives                    | 2.2         |       |      |
| Other                                  | 1.1         |       |      |
| Parent's Marital Status                |             |       |      |
| Married                                | 71.7        |       |      |
| Separated                              | 2.2         |       |      |
| Divorced                               | 10.9        |       |      |
| Never married                          | 12.0        |       |      |
| Not Known                              | 3.3         |       |      |
| Employment (Mother / Father)           |             |       |      |
| Working full time                      | 48.9 / 87.0 |       |      |
| Working part time                      | 26.1 / 1.1  |       |      |
| Home duties                            | 13.0 / 0.0  |       |      |
| Not working                            | 6.5 / 2.2   |       |      |
| Student                                | 1.1 / 1.1   |       |      |
| Retired                                | 1.1 / 1.1   |       |      |
| Other                                  | 0.0 / 1.1   |       |      |
| Not Known                              | 3.3 / 6.5   |       |      |

Table 3 summarizes the scores (i.e., ranges, means, standard deviations) on the measures for the sample of adolescents who engaged in NSSI in the past year, as well as separately by gender. To determine whether the mean scores on the variables were significantly different between males and females an independent samples *t* test was used. Overall, mean depression and co-rumination scores were significantly different between genders. Females ( $M = 22.96$ ,  $SD = 10.36$ ) scored significantly higher than males ( $M = 16.68$ ,  $SD = 11.38$ ) on depressive symptoms (CES-D),  $t(90) = -2.78$ ,  $p < .01$  (two-tailed). Females ( $M = 2.75$ ,  $SD = .78$ ) also had significantly higher levels of co-rumination (CRQ) than males ( $M = 2.17$ ,  $SD = .84$ ),  $t(90) = -3.42$ ,  $p = .001$  (two-tailed). These gender differences are consistent with past research (e.g., Rose, 2002; Rose et al., 2007; Hankin et al., 1998; Hankin, Mermelstein, & Roesch, 2007; Hankin et al., 2008). The intercorrelations among the study variables are presented in Table 4. Linearity was established between the variables by examining scatterplots.

A chi square analysis showed a significant gender difference in the prevalence of NSSI (as endorsed on the FASM) in the overall sample of adolescent students, with 53% of males and 68% of females indicating an engagement in NSSI behaviours in the past year;  $\chi^2(1, n = 222) = 4.62$ ,  $p = .03$ ,  $\phi = .15$ . The most frequently cited methods of NSSI on the FASM were picking at a wound (63.0%), biting self (58.7%), hitting self on purpose (40.2%), scraping skin (27.2%), cutting or carving skin (23.9%), picking at areas of body until drawing blood (20.7%), pulling hair out (17.4%), and burning skin (17.4%). Other methods that were reported include inserting objects under skin (12.0%) other methods (8.7%; e.g., snapped wrist with elastic band), erasing skin (7.6%), and giving

Table 3

*Range, Means and Standard Deviations for Measures by Gender in Self-Injuring Participants (N = 92)*

| Scale                    | Range        | Mean   | SD     |
|--------------------------|--------------|--------|--------|
| 1. CES-D                 | 0.10-2.40    | 1.01   | 0.56   |
| Males ( <i>n</i> = 41)   | 0.10-2.40    | 0.84   | 0.56   |
| Females ( <i>n</i> = 51) | 0.15-2.20    | 1.15   | 0.52   |
| 2. CRQ                   | 1.04-4.37    | 2.50   | 0.85   |
| Males                    | 1.04-4.30    | 2.17   | 0.84   |
| Females                  | 1.19-4.37    | 2.75   | 0.78   |
| 3. FASM                  | 1.00-1300.00 | 88.25  | 198.24 |
| Males                    | 1.00-200.00  | 28.71  | 43.63  |
| Females                  | 2.00-1300.00 | 136.12 | 254.47 |
| 4. Peer NSSI             | 0.00-174.00  | 20.08  | 35.52  |
| Males ( <i>n</i> = 38)   | 0.00-174.00  | 13.02  | 28.89  |
| Females ( <i>n</i> = 42) | 0.00-174.00  | 25.75  | 39.44  |
| 5. ALEQ                  | 0.07-2.39    | 1.23   | 0.55   |
| Males                    | 0.07-2.39    | 1.11   | 0.57   |
| Females                  | 0.25-2.30    | 1.32   | 0.52   |

*Note.* CES-D = Center for Epidemiological Studies-Depression Scale (square root transformation); CRQ = Co-Rumination Questionnaire; FASM = Functional Assessment of Self-Mutilation (log transformation); Peer NSSI = peer non-suicidal self-injury questionnaire (log transformation); ALEQ = Adolescent Life Events Questionnaire (ALEQ).

self a tattoo (4.3%). More than one method of NSSI was used by 80.4% of females and 63.4% of males. A Mann-Whitney *U* test revealed that there was also a significant gender difference in adolescents' frequency of NSSI in the past year. Females (*Md* = 54.93, *n* = 51) indicated they had engaged in a significantly greater number of NSSI behaviours than males (*Md* = 36.01, *n* = 41) on the FASM, *U* = 615.50, *z* = -3.38, *p* = .001, *r* = -0.35.

Table 4

*Correlations Between the Study Variables (N = 92)*

| Scale        | 1  | 2    | 3    | 4    | 5    |
|--------------|----|------|------|------|------|
| 1. CES-D     | -- | .283 | .263 | .089 | .663 |
| 2. CRQ       |    | --   | .291 | .001 | .298 |
| 3. FASM      |    |      | --   | .290 | .209 |
| 4. Peer NSSI |    |      |      | --   | .067 |
| 5. ALEQ      |    |      |      |      | --   |

*Note.* CES-D = Center for Epidemiological Studies-Depression Scale (square root transformation); CRQ = Co-Rumination Questionnaire; FASM = Functional Assessment of Self-Mutilation (log transformation); Peer NSSI = peer non-suicidal self-injury questionnaire (log transformation); ALEQ = Adolescent Life Events Questionnaire (ALEQ). NSSI is the total frequency count from section A of the FASM; Peer NSSI is the total frequency count from the Peer NSSI questionnaire.

The mean age of participants at their first NSSI experience was 11.2 years ( $SD = 2.8$ ), the youngest being 5 years old. Results showed that of participants who engaged in NSSI, 29.3% reported their first NSSI experience at age 10 or younger, 32.6% started between the ages of 11 and 13 years, 18.5% started between 14 and 16 years of age, and 19.6% did not report when they first engaged in NSSI. The majority of self-injurers stated that they did not think about NSSI before engaging in it (59.8%), they did not engage in NSSI while taking alcohol or drugs (92.4%), experienced no (23.9%) to little pain (60.9%), and did not receive any medical attention for their NSSI (89.1%). No gender differences were found in age of first NSSI experience or whether these acts resulted in participants requiring medical attention.

Additionally, 68.5% ( $n = 63$ ) of NSSI participants reported that they had a close peer or peers who also engaged in NSSI, and of those, 51 reported an approximate frequency for how many times their peer engaged in different NSSI behaviours. These behaviours, starting with the most frequent were: picking at wounds (69.8%), self-cutting (50.8%), biting themselves (39.7%), burning themselves (33.3%), hitting self on purpose (31.7%), scraping their skin (30.2%), and picking at areas of the body until they bleed (28.6%). Other methods reported included pulling out hair (15.9%), erasing their skin (19.0%), inserting objects under their skin or nails (12.7%), giving themselves a tattoo (9.5%), and other (3.2%).

## Analysis Results

### Correlation.

***Hypothesis 1: Co-Rumination positively correlated with the frequency of NSSI in adolescents.*** The relationship between adolescents' logarithmically transformed self-injury scores (i.e. log of frequency count from FASM questionnaire) and their co-rumination scores was examined with a one-tailed Pearson correlation. As hypothesized, results indicated that there was a significant, positive correlation of small effect size between adolescents' level of co-rumination and their frequency of self-injury in the past year,  $r = .291$ ,  $n = 92$ ,  $p < .01$ . Co-rumination explained 8.47% of the variance in self-injury. Adolescents who displayed higher levels of co-rumination reported on the FASM that they had engaged in self-injury to a greater extent over the past year than those who displayed lower levels of co-rumination. This relationship did not remain significant for females  $r = .122$ ,  $n = 51$ ,  $p > .05$ , and the effect size was small. There was a significant, positive correlation of small effect size for males  $r = .283$ ,  $n = 41$ ,  $p < .05$ .

**Hierarchical multiple regression.** Two hierarchical multiple regressions were completed to examine the final two hypotheses. No violation of the statistical assumptions of normality, linearity, multicollinearity, homoscedasticity, and independent errors was detected. Specifically, tolerance and variance inflation factor (VIF) statistics were examined; tolerance was well above 0.1 and VIF was well below 10 indicating that the assumption of multicollinearity was not violated (Field, 2005). The Normal Probability Plot (P-P) of the Regression Standardized Residual was relatively linear and normal and the scatterplot was roughly rectangular in distribution; no violations of linearity, normality, or homoscedasticity were detected. The Durbin-Watson tests had values around 2, indicating that the residuals were uncorrelated and errors were independent (Field).

The data was examined for multivariate outliers. There were no multivariate outliers; the standardized residual was less than positive or negative 3 and Cook's distance was less than 1 (Field, 2005). In order to determine whether there was an overly influential case that would reduce the generalizability of the results, Cook's distance and Leverage values were assessed. While the Leverage value for case number 4 was over .2 indicating that it may be an overly influential case that would reduce the generalizability of the results, the Cook's distance was less than 1, indicating that this case did not need to be removed (Field, 2005).

***Hypothesis 2: Co-rumination moderates the relationship between depression and the frequency of NSSI in adolescents.*** A hierarchical regression analysis was performed to determine whether co-rumination moderated the relationship between depression and the frequency of NSSI in adolescents. The criterion variable came from



the FASM; it was the frequency of NSSI a participant had engaged in, within the past year. The predictors included gender and the means of the CESD and CRQ total scores. Gender was entered as a covariate in block 1 in order to determine the unique variance that depression and co-rumination account for in adolescent NSSI, above and beyond that already accounted for by gender. The substantial theoretical and empirical support for the relationship between depression and self-injury (Andover et al., 2005; Hawton, Rodham, Evans, & Weatherall, 2002; Nixon, Cloutier, & Aggarawal, 2002; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006; Klonsky et al., 2003; Ross & Heath, 2002) suggested that depression would be a more powerful predictor of NSSI than co-rumination. Additionally, given the exploratory nature of the role of co-rumination with regard to NSSI, the unique contribution of this variable was sought above and beyond that of depression. Considering this, depression was entered in block 2 and co-rumination was entered in block 3. This order of variable entry ensured that elements of co-rumination were not actually tapping those more appropriately understood as depression, and resulting in an inflated predictive relationship. The interaction term was entered in the final block in order to determine the moderating effect of co-rumination on the frequency of NSSI. Specifically, this allowed the researcher to determine whether the addition of co-rumination explained additional variance in an individual's level of NSSI beyond the main effects of depression.

Gender was entered in block 1, explaining 13.8% of the variance in the frequency of NSSI. After entry of depression in block 2, the model explained 16.2% of the variance and after entry of co-rumination in block 3, the model explained 18.3% of the variance. In block 4, the depression and co-rumination interaction term was entered and results

indicated that the overall model significantly predicted frequency of NSSI engagement  $F(4, 87) = 5.66, p < .001$ . However, the second, third, and fourth steps did not contribute any significant unique variance. In the final model, only gender ( $\beta = .30, p < .01$ ) made a statistically significant unique contributions to the variance of NSSI frequency. Neither co-rumination ( $\beta = .13, p = .21$ ) or depression ( $\beta = .17, p = .11$ ) uniquely accounted for any variance in NSSI frequency once gender was included as a covariate. The analysis did not provide support for co-rumination as a moderator of depression and NSSI ( $\beta = .16, p = .12$ ); the interaction term did not significantly account for any unique variance in NSSI. The regression coefficients for all variables, along with bivariate and partial correlation coefficients are presented in Table 5 and 6, respectively.

***Hypothesis 3: Stressful life events moderates the relationship between co-rumination and the frequency of NSSI in adolescents.*** A hierarchical regression analysis was performed to determine whether stressful life events, as measured by the ALEQ, acted as a moderator of the relationship between co-rumination and the frequency of NSSI in adolescents. The criterion variable, taken from the FASM, was the frequency of self-injury in the past year. The predictors included gender and the means of the ALEQ and CRQ total scores. Gender was entered as a covariate in block 1 in order to determine the unique variance that stressful life events and co-rumination account for in adolescent NSSI, above and beyond that already accounted for by gender. Given the empirical support for the relationship between stressful life events and self-injury (e.g., Hankin & Abela, 2011) and the exploratory nature of the role of co-rumination with regard to NSSI, the unique contribution of co-rumination was sought above and beyond that of stressful life events. Considering this, stressful life events was entered in block 2

Table 5

*Hierarchical Regression Analysis for Gender, Depression, Co-Rumination, and Depression X Co-Rumination Predicting Adolescent NSSI (N = 92)*

| Step   | <i>R</i> | <i>R</i> <sup>2</sup> | <i>R</i> <sup>2</sup> <sub>adj</sub> | $\Delta R^2$ | <i>F</i> <sub>chg</sub> | <i>p</i> | <i>df</i> <sub>1</sub> | <i>df</i> <sub>2</sub> |
|--|----------|-----------------------|--------------------------------------|--------------|-------------------------|----------|------------------------|------------------------|
| Step 1:<br>Gender  | .371     | .138                  | .128                                 | .138         | 14.356                  | .000     | 1                      | 90                     |
| Step 2:<br>Gender<br>Depression  | .402     | .162                  | .143                                 | .024         | 2.569                   | .000     | 2                      | 89                     |
| Step 3:<br>Gender<br>Depression<br>Co-Rumination                               | .428     | .206                  | .170                                 | .022         | 2.336                   | .000     | 3                      | 88                     |
| Step 4:<br>Gender<br>Depression<br>Co-Rumination<br>Depression X Co-Rumination | .454     | .206                  | .170                                 | .023         | 2.525                   | .000     | 4                      | 87                     |

*Note.* Depression measured by the Center for Epidemiological Studies-Depression Scale (square root transformation); Co-Rumination measured by the Co-Rumination Questionnaire; NSSI = non-suicidal self-injury and was measured by the Functional Assessment of Self-Mutilation (log transformation).

Table 6

*Coefficients for Final Model in Hierarchical Multiple Regression Analysis for Gender, Depression, Co-Rumination, and Depression X Co-Rumination Predicting Adolescent NSSI (N = 92)*

|                            | <i>B</i> | $\beta$ | <i>t</i> | Bivariate <i>r</i> | Partial <i>r</i> | Part <i>r</i> |
|----------------------------|----------|---------|----------|--------------------|------------------|---------------|
| Gender                     | .425     | .297    | 2.818*   | .371               | .289             | .269          |
| Depression                 | .407     | .172    | 1.629    | .263               | .172             | .156          |
| Co-Rumination              | .111     | .132    | 1.260    | .291               | .134             | .120          |
| Depression X Co-Rumination | .431     | .159    | 1.589    | .080               | .168             | .152          |

\* $p < .05$

*Note.* Depression measured by the Center for Epidemiological Studies-Depression Scale (square root transformation); Co-Rumination measured by the Co-Rumination Questionnaire; NSSI = non-suicidal self-injury and was measured by the Functional Assessment of Self-Mutilation (log transformation).

and co-rumination was entered in block 3. This order of variable entry ensured that elements of co-rumination were not actually tapping those more appropriately understood as stressful life events, and resulting in an inflated predictive relationship. The interaction term was entered in the final block in order to determine the moderating effect of stressful life events on the frequency of NSSI. Specifically, this allowed the researcher to determine whether the addition of stressful life events explained additional variance in an individual's level of NSSI beyond the main effects of co-rumination.

Gender was entered in block 1, explaining 13.8% of the variance in the frequency of NSSI. After entry of stressful life events scores in block 2, the model explained 15.7% of the variance in the frequency of NSSI. After entry of co-rumination scores (i.e. centered CRQ total) in block 3, the model explained 17.8% of the variance. In block 4,

the co-rumination and stressful life events interaction term was entered and results indicated that the overall model significantly predicted frequency of NSSI engagement  $F(4,87) = 4.82, p = .001$ . However, the second and third steps did not contribute any significant unique variance. In the final model, only gender ( $\beta = .31, p < .01$ ) made a statistically significant unique contribution to the variance of NSSI frequency. Co-rumination ( $\beta = .17, p = .13$ ), no longer uniquely accounted for any variance in NSSI frequency once gender was included as a covariate. The analysis did not provide support for stressful life events as a moderator of the relationship between co-rumination and NSSI; the interaction term did not account for a statistically significant amount of unique variance ( $\beta = .06, p = .55$ ). The regression coefficients for all variables, along with bivariate and partial correlation coefficients are presented in Table 7 and 8, respectively.

### **Post-Hoc Analyses**

**Gender, age, and peer NSSI.** Past research indicated that gender, age, and peer NSSI might influence the outcome of this study. These variables were to be included as predictors in the post hoc analyses of the hierarchical regressions, ultimately only gender was included due to the following findings. First, this study did not replicate the findings that depression and co-rumination increased with age (e.g., Nolen- Hoeksema & Girgus, 1994, Rose, 2002; Rose et al., 2007); while this study focused solely on adolescent subjects, other studies have found an increase in depression and co-rumination over an age range which included children (i.e., younger than 12). For example, this study looked at grades 7 through 12, while previous studies looked at grades 3, 5, 7, and 9. When entered in the first block as a predictor in the hierarchical regressions, it did not significantly account for any variance in adolescent NSSI.

Table 7

*Hierarchical Regression Analysis for Gender, Co-Rumination, Stressful Life Events and Co-Rumination X Stressful Life Events Predicting Adolescent NSSI (N = 92)*

| Step   | <i>R</i> | <i>R</i> <sup>2</sup> | <i>R</i> <sup>2</sup> <sub>adj</sub> | $\Delta R^2$ | <i>F</i> <sub>chg</sub> | <i>p</i> | <i>df</i> <sub>1</sub> | <i>df</i> <sub>2</sub> |
|--|----------|-----------------------|--------------------------------------|--------------|-------------------------|----------|------------------------|------------------------|
| Step 1:<br>Gender  | .371     | .138                  | .128                                 | .138         | 14.356                  | .000     | 1                      | 90                     |
| Step 2:<br>Gender<br>Stressful Life Events   | .397     | .157                  | .138                                 | .020         | 2.075                   | .000     | 2                      | 89                     |
| Step 3:<br>Gender<br>Stressful Life Events<br>Co-Rumination  | .422     | .178                  | .150                                 | .021         | 2.239                   | .001     | 3                      | 88                     |
| Step 4:<br>Gender<br>Co-Rumination<br>Stressful Life Events<br>Co-rumination X Stressful Life Events | .426     | .182                  | .144                                 | .003         | .358                    | .001     | 4                      | 87                     |

*Note.* Co-Rumination measured by the Co-Rumination Questionnaire; Stressful Life Events measured by the Adolescent Life Events Questionnaire; NSSI = non-suicidal self-injury and was measured by the Functional Assessment of Self-Mutilation (log transformation).

Table 8

*Coefficients for Final Model in Hierarchical Multiple Regression Analysis of Gender, Co-Rumination, Stressful Life Events and Co-Rumination X Stressful Life Events Predicting Adolescent NSSI (N = 92)*

|                             | <i>B</i> | $\beta$ | <i>t</i> | Bivariate <i>r</i> | Partial <i>r</i> | Part <i>r</i> |
|-----------------------------|----------|---------|----------|--------------------|------------------|---------------|
| Gender                      | .438     | .306    | 2.920    | .371               | .299             | .283          |
| Stressful Life Events (SLE) | .132     | .102    | .995     | .209               | .106             | .097          |
| Co-Rumination               | .139     | .165    | 1.540    | .291               | .163             | .149          |
| SLE X Co-Rumination         | .097     | .059    | .598     | -.091              | .064             | .058          |

\* $p < .05$

*Note.* Co-Rumination measured by the Co-Rumination Questionnaire; Stressful Life Events (SLE) measured by the Adolescent Life Events Questionnaire; NSSI = non-suicidal self-injury and was measured by the Functional Assessment of Self-Mutilation (log transformation).

Second, recent research suggested that increases in adolescents' own self-injurious behaviour is associated over time with their best friends' reports of NSSI (Prinstein et al., 2007). Since only 63 participants had peer NSSI data that could be included in the analyses, there was not enough power to complete a hierarchical regression with the original frequency variable. Instead, to control for peer self-injury in the hierarchical regressions, this continuous variable was changed into a dichotomous variable. T-tests revealed that there were no differences between the participants who fully completed the Peer NSSI questionnaire and those who did not on any of the other variables in this study. As a covariate in the hierarchical regression analyses, the dichotomous Peer NSSI variable was not found to account for any variance in adolescent NSSI and so was removed. In making the Peer NSSI variable dichotomous, data regarding the frequency of peer self-injury was lost and its potential impact greatly

minimized. This is highlighted in post-hoc analyses with self-injuring participants who had fully completed the questionnaire regarding peer NSSI frequency ( $N = 63$ ); peer NSSI frequency was significantly correlated with adolescent NSSI frequency,  $r = .29, p < .05$ . This finding suggests that peer NSSI frequency may have significantly accounted for variance in adolescence NSSI in the hierarchical regressions if all participants had completed the questionnaire and there was no reason to convert it to a dichotomous variable.

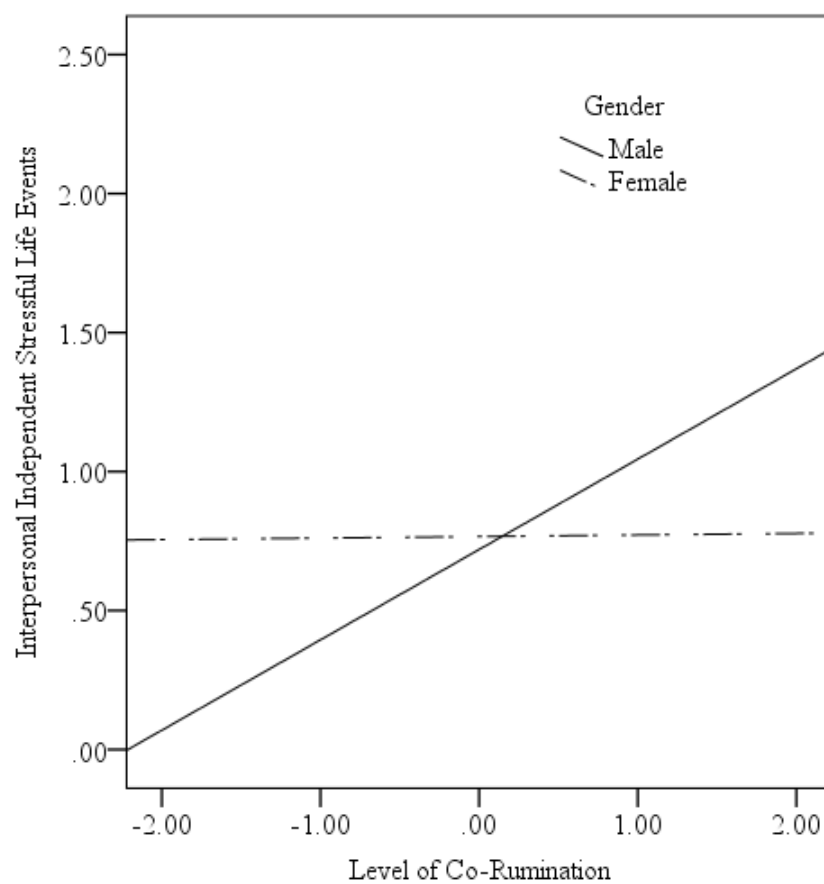
***Gender differences.*** Due to the gender differences on the majority of the variables in this study and the different outcomes for each gender for the relationship between co-rumination and self-injury, further analyses were completed. Correlations between co-rumination and the other study variables were examined for each gender separately and exploratory moderation analyses were also completed.

First, upon examining the correlations between co-rumination and other variables in this study, it became apparent that the effect sizes were larger and significant for males who self-injured, and small and non-significant for females that self-injured. Specifically, the correlation between co-rumination and depression had a medium effect size for males,  $r = .31, n = 41, p < .05$ . On the other hand, the correlation for females was of a very small effect size,  $r = .08, n = 51, p > .05$ . While the overall effect size for the genders together,  $r = .28, n = 92, p > .01$ , was of a larger effect size than in previous research (i.e., .13 and .20; Rose et al., 2007), the difference between genders is particularly contrary to previous research which has found co-rumination to be predictive of increases or greater levels of depressive symptoms in females, not males (Rose et al., 2007).



Second, hierarchical regression analyses were used to determine if gender acted as a moderator of the relationships between the variables in this study. Analyses revealed that gender only acted as a moderator of the relationship between co-rumination and the interpersonal independent stressful life events subscale of the ALEQ. Previous studies have shown that co-rumination is longitudinally associated with an increase in interpersonal dependent stressors (Hawkin et al 2010). While gender did not moderate the association between co-rumination and ALEQ total or the interpersonal dependent subscale, analyses revealed that gender acted as a moderator of the relationship between co-rumination and the interpersonal independent stressful life events subscale of the ALEQ. Gender was entered in block 1, explaining 4.1% of the variance in interpersonal independent stressful life events. After entry of co-rumination scores in block 2, the model explained 13.9% of the variance. In block 3, the gender and co-rumination interaction term was entered; the interaction term ( $\beta = -.793, p < .05$ ) accounted for an additional 5.6% of the variance,  $p < .05$ . The overall model significantly predicted interpersonal independent stressful life events  $F(3, 88) = 7.10, p < .001$ . A graph of gender as a moderator of the relationship between co-rumination and stressful life events is presented in Figure 1. The regression coefficients for all variables, along with bivariate and partial correlation coefficients are presented in Table 9 and 10, respectively.

The relationship between the interpersonal independent events subscale and co-rumination for each gender was further examined with one-tailed Pearson correlations. The correlation between co-rumination and the interpersonal independent events subscale of the ALEQ was positive and had a large effect size for males,  $r = .52, n = 41, p < .001$ .



*Figure 1.* Simple slopes of co-rumination predicting interpersonal independent stressful life events for males and females.

Table 9

*Hierarchical Regression Analysis for Co-Rumination, Gender and Co-Rumination X Gender Predicting Interpersonal Independent Stressful Life Events (N = 92)*

| Step   | <i>R</i> | <i>R</i> <sup>2</sup> | <i>R</i> <sup>2</sup> <sub>adj</sub> | $\Delta R^2$ | <i>F</i> <sub>chg</sub> | <i>p</i> | <i>df</i> <sub>1</sub> | <i>df</i> <sub>2</sub> |
|--|----------|-----------------------|--------------------------------------|--------------|-------------------------|----------|------------------------|------------------------|
| Step 1:<br>Gender  | .202     | .041                  | .030                                 | .041         | 3.848                   | .053     | 1                      | 90                     |
| Step 2:<br>Gender<br>Co-Rumination                           | .373     | .139                  | .120                                 | .098         | 10.142                  | .002     | 1                      | 89                     |
| Step 3:<br>Gender<br>Co-Rumination<br>Gender X Co-Rumination | .441     | .195                  | .167                                 | .056         | 6.083                   | .016     | 1                      | 88                     |

*Note.* Co-Rumination measured by the Co-Rumination Questionnaire; Interpersonal Independent Stressful Life events was measured by a subscale of the Adolescent Life Events Questionnaire (square root transformation).

Table 10

*Coefficients for Final Model in Hierarchical Multiple Regression Analysis of Co-Rumination, Gender and Co-Rumination X Gender Predicting Interpersonal Independent Stressful Life Events (N = 92)*

|                        | <i>B</i> | $\beta$ | <i>t</i> | Bivariate <i>r</i> | Partial <i>r</i> | Part <i>r</i> |
|------------------------|----------|---------|----------|--------------------|------------------|---------------|
| Gender                 | .052     | .077    | .761     | .202               | .081             | .073          |
| Co-Rumination          | .430     | 1.094   | 3.368*   | .363               | .338             | .322          |
| Gender X Co-Rumination | -.197    | -.793   | -2.466*  | .275               | -.254            | -.236         |

\* $p < .05$

*Note.* Co-Rumination measured by the Co-Rumination Questionnaire; Interpersonal Independent Stressful Life events was measured by a subscale of the Adolescent Life Events Questionnaire (square root transformation).

On the other hand, the correlation for females was of a very small effect size,  $r = .01$ ,  $n = 51$ ,  $p > .05$ . As well, the mean scores on the interpersonal independent events subscale (square root transformation) were not significantly different between genders; females ( $M = .83$ ,  $SD = .29$ ) scored similarly to males ( $M = .69$ ,  $SD = .37$ ),  $t(90) = -1.96$ ,  $p > .05$  (two-tailed).

**The impact of whether peers engage in self-injury on the relationship between co-rumination and self-injury.** Further post hoc analyses were completed to determine whether the relationship between co-rumination and self-injury in adolescents differed depending on whether they had peers who also engaged in self-injury. Increases in adolescents' own self-injurious behaviour has been shown to be longitudinally associated with their best friends' reports of self-injury over a two year period (Prinstein et al., 2007). Specifically, if an adolescent has peers who engage in self-injury and also engages in co-rumination with these peers, they may be socialized to engage in self-injury as well (Giletta, Burk, Scholte, Engels, & Prinstein, 2013; Heilbron & Prinstein, 2008). Knowing this, it was expected that the correlation between co-rumination and self-injury would be stronger among those who had peers who self-injured. Since not all participants completed the peer NSSI questionnaire regarding the frequency of their peers' self-injury, there was not enough power to complete a hierarchical regression to determine whether the frequency of peer NSSI moderated the relationship between co-rumination and adolescent NSSI. Rather, using the dichotomous variable of Peer NSSI, participants were divided into those who had peers who engaged in self-injury and those who did not.

The relationship between adolescent self-injury and co-rumination scores was re-examined for each group with a one-tailed Pearson correlation. There was a small, non-significant correlation between co-rumination and self-injury in those adolescents that reported they did not have peers who self-injured,  $r = .06$ ,  $n = 29$ ,  $p > .05$ . For those who had peers who self-injured, there was a significant, positive correlation of moderate effect size between the level of co-rumination and the frequency of self-injury in the past year  $r = .41$ ,  $n = 63$ ,  $p < .001$ . Co-rumination explained 16.8% of the variance in self-injury in those who had peers who self-injured. This relationship did not remain significant for females,  $r = .24$ ,  $n = 40$ ,  $p > .05$ , and the effect size was small. There was a significant, positive correlation of large effect size for males  $r = .55$ ,  $n = 23$ ,  $p < .005$ . A post-hoc power analysis was conducted using G\*Power. Results indicated that a power of .96 was achieved for the Pearson correlation involving all 63 participants who had peers who engaged in self-injury, and .45 was achieved for females and of .88 was achieved for males. Following Cohen's (1992) recommendations that a power of .8 is ideal to detect any effects that might exist, the analysis with female participants would require more participants and further replication to determine whether the effect size remains small and non-significant.

The next chapter will examine the results of this study within the context of existing literature on adolescent co-rumination and NSSI. The strengths and limitations of this study, as well as its implications for NSSI theory and counselling practice will be discussed.

## CHAPTER V: DISCUSSION

Nonsuicidal self-injury (NSSI) is a pervasive challenge for today's youth; it is becoming a part of our communities' social landscape, with a high lifetime prevalence rate of 15-20% reported in community samples of adolescents (Favazza, 2009; Heath et al., 2009). For the purposes of the present study, NSSI was defined as "the deliberate direct destruction or alteration of body tissue without conscious suicidal intent" (Favazza, 1998, p.260) and is not for religious or cultural purposes (Heilbron & Prinstein, 2008).

This complex phenomenon is undeniably concerning to researchers and clinicians alike and can be significantly distressing to youth who utilize these behaviours as a coping strategy. Identifying variables that may contribute to the onset or maintenance of this behaviour should prove useful in case conceptualization and in developing effective intervention and prevention approaches. While numerous factors may influence why an adolescent first engages in and the frequency of their NSSI, this study seeks to provide empirical evidence to further support and expand research on the impact of peer relationships on these behaviours. Specifically, this study sought to examine the unique impact of co-rumination on NSSI in adolescents for the first time. The results for each of the three hypotheses of the present study, as well as post hoc analyses, are interpreted below and discussed with respect to relevant research findings in the NSSI literature, as well as related fields. The clinical implication of the findings for prevention, assessment, and intervention, as well as the limitations of the study and possible future research are also discussed.

## **Prevalence of NSSI**

Based on similar studies, it was expected that between 7 and 16 percent of community-based adolescent participants would have engaged in NSSI in the past 12 months (Hilt, Nock et al., 2008; Muehlenkamp & Gutierrez, 2004), requiring between 550 and 1300 students to be recruited in order to obtain the required 89 self-injurers for this study. In the end, of the 770 students who were approached, 234 completed the survey and 136 of these indicated they had engaged in NSSI in the past year; a very high overall frequency of 58.1%. Of the 136 who engaged in NSSI in the past year, 92 correctly and fully completed the self-injury questionnaire; 39.3% of the total sample. An additional 10 (4.3%) reported they had engaged in NSSI prior to the past year; overall, a lifetime frequency of 62.4% was found in the total sample of participants.

The frequency rates of NSSI in this sample are higher than some studies in adolescent populations with similar survey techniques (Hilt, Nock et al., 2008; Muehlenkamp & Gutierrez, 2004), but comparable to others (Hilt, Cha et al., 2008; Lloyd-Richardson et al., 2007). Specifically, these comparable studies reported a lifetime rate of 56% (Hilt, Cha et al., 2008; all female participants), and rates of NSSI engagement in the past year of 36% (Hilt, Cha, Nolen-Hoeksema, 2008; all female participants) and 46.5% (Lloyd-Richardson et al., 2007). Certain aspects of the methodology used in the current study may explain why such a high frequency was found. For instance, this study had a fairly large age range for participation, compared to other adolescent studies. While Hilt, Nock, et al. (2008) looked at students in grades 6 through 8 and Muehlenkamp and Gutierrez (2004) at students grades 9 through 12, this study looked at



students in grades 7 through 12. This study had 3 and 2 years greater age range, respectively, than these two similar studies.

In addition to a larger age range, community based studies show that NSSI may be more common overall in Caucasian, than in African-American and African-Canadian, adolescents (Lloyd-Richardson et al., 2007; Muehlenkamp & Gutierrez, 2004, 2007; Ross & Heath, 2002; Whitlock, Eckenrode, et al., 2006). The current study consisted of 80.4% Caucasian participants which may have contributed to the higher percentage of self-injurers in this study.

In addition to the broad age range and ethnicity of this sample, the high rates of self-injury may reflect a self-selected sample due to how the study was presented to students. While this study did not recruit students by advertising it as one examining self-injury, which has been the cause of high rates in other studies (Gratz, 2006, Gratz et al., 2002; Hasking et al., 2008), it did advertise as one examining how adolescents cope with stress. Similarly, studies which advertised as investigating mental health still had relatively high rates of NSSI (~20%; Whitlock, Eckenrode, et al., 2006). It is plausible that some self-selection occurred in the current study, though it was hoped that advertising as a study on coping with stress would allow for a more anonymous recruitment of self-injurers and limit any stigmatization about NSSI. Similar to an individual with mental health concerns becoming interested in a study on mental health or self-injurers in a study on self-injury; it is possible that an individual who engages in self-injury would be interested in a study on stress, coping, and peer relationships.

Indeed, self-injurers report a greater number of stressful experiences (Hankin & Abela, 2011) and difficulty with coping with stress (Chapman, et al., 2006; Favazza,

1996; Klonsky, 2007; Nock & Mendes, 2008) and social problem solving (Nock & Mendes, 2008). In addition to having a greater awareness of or experience with stress and attempting to cope with stress, they likely have a greater interest in topics related to stress and wellbeing. Self-injurers also have a greater likelihood of having certain mental health disorders (e.g., depression, anxiety, BPD; Andover et al., 2005; Hawton et al., 2002; Nixon et al., 2002; Nock et al., 2006; Klonsky et al., 2003; Ross & Heath, 2002) and possibly due to these concerns would have interest in a study being conducted in the field of counselling psychology. It is also possible that those teachers who agreed to have the researcher enter their class may have noticed a greater degree of stress or mental health concerns in their students and agreed to have their classes participate because of this.

Inflated rates of self-injury may have occurred due to the environment where participants were recruited. While a lower rate of self-injury is expected from participants recruited from schools in the community compared to those recruited from clinical samples (Nixon & Heath, 2009), teachers, other school personnel, and community counsellors (P. Lorenz, personal communication, May 29, 2012) indicate that within the last 7 years the frequency of self-injury has increased and remained high within the community. It may be that this northern BC community has an inflated number of students who self-injure compared to other communities and further emphasizes the importance of studying self-injury in community settings, perhaps even more so in smaller communities, where self-injury may quickly become part of the social landscape.

Lastly, the operational definition of NSSI in this study was broader than in others that found a lower rate of NSSI (Hilt, Nock, et al., 2008; Ross & Heath, 2002). The

FASM includes a wide range of NSSI behaviours in checklist format and allows for participants to include an additional “other” behaviour, which would lead to students reporting a greater frequency of NSSI. The frequency rate of NSSI in this study is similar to studies which have used the same assessment measure (i.e. FASM; e.g., Hilt, Cha et al., 2008; Lloyd-Richardson et al., 2007). A greater number of NSSI behaviours on survey measures have been consistently related to higher rates of reporting (Heath, et al., 2009); it is likely that participants are primed to report a greater number of methods. In this study 72.8% utilized more than one method of NSSI which is similar to that found by Gratz et al., (2012) at 78%. Additionally, researchers have to rely on participants’ understanding of the construct of NSSI, and participants may endorse all behaviours they have engaged in whether for NSSI purposes or not. In this study a few participants’ reports of NSSI were removed from the data set when written notes on the questionnaires by participants indicated the behaviour was not NSSI (i.e., accidentally cut hand). These findings indicate that the questionnaire may not have been understood by some participants, resulting in false positives in the NSSI data set and thus inflating the frequency.

In summary, while the present study results of 58.1% are higher than rates obtained in other recent studies with adolescents in the community (Hilt et al., 2008; Muehlenkamp & Gutierrez, 2004), it can at least partly be explained by methodological aspects of the study. Clarifying why the rates are higher in this study is important when interpreting rates of NSSI among adolescents amongst different studies. Overall, the lifetime prevalence rate of NSSI in adolescents in the community is considered to be around 15-20% (Favazza, 2009; Heath et al., 2009); with the current community

reporting a much higher rate this is particularly concerning and particularly widespread. It may be that this sample does not accurately represent the population of self-injuring adolescents in the community but personal communication with school administration and counsellors indicate that self-injury is a common form of coping amongst adolescents in the community. Indeed, consistently higher rates of NSSI are reported in high school populations (Claes et al., 2009; Laye-Gindhu & Schonert-Reichl, 2005; Ross & Heath, 2002; Zoroglu et al., 2003) and the results of this study further confirm that resources and attention are best targeted towards this age group and the importance of continuing to examine the factors associated with NSSI among nonclinical populations in general.

### **Characteristics of Self-Injuring Participants**

While the prevalence of NSSI within the total participant sample was high, certain characteristics of self-injuring participants were similar to that of other studies which improves the comparability of the findings in this study. Similar to other community based studies (Evans et al., 2005; Hawton et al., 2002; Muehlenkamp & Gutierrez, 2007; Ross & Heath, 2002) this study found a significant gender difference in NSSI prevalence; females were significantly more likely to engage in NSSI than male participants. While in clinical samples, females have been found to engage in higher rates of NSSI than males, this finding is likely due to a difference in help-seeking behaviour and the inclusion of predominately female behaviours as NSSI (i.e., overdose and medication abuse without suicidal intent; Briere & Gil, 1998; Rodham et al., 2004). It remains unclear overall whether there is a significant gender difference in NSSI prevalence in community samples, as other studies have found no significant gender differences (e.g., Jacobsen et al., 2008; Nixon et al., 2002). While this study lends support to those studies

which have found a gender difference in community settings, it is possible the gender differences in this study may be reflective of help-seeking behaviour, rather than a true difference in NSSI engagement.

The majority of adolescents in this study first engaged in self-injury before the age of 13. This finding is similar to other studies which have shown that the majority of individuals who report that they self-injure often first engaged in the behaviour before age 15, with a considerable number reporting they had done so before age 12 (e.g., Muehlenkamp & Gutierrez, 2007; Ross & Heath, 2002; Sourander et al., 2006). Research suggests it is difficult to treat NSSI behaviour when it had an early age of onset and was also overdetermined (i.e. a variety of NSSI methods were used for multiple functions; Klonsky & Olino, 2008). These findings emphasize the importance of studying young adolescent NSSI behaviour in the hope of developing effective prevention and early intervention measures.

In addition, the majority of participants (72.8%) utilized more than one method of NSSI (similar to Gratz et al., 2012 at 78%). The majority of NSSI participants in the study (68.5%) also reported that they had a close peer or peers who also engaged in NSSI, a finding consistent with research on peer socialization effects and contagion of self-injury in adolescents (Heilbron & Prinstein, 2008; Prinstein et al., 2007) which has shown that within their close friendships adolescents may be socialized into engaging in NSSI.

With the majority of recent research focusing on older adolescents (e.g., Lloyd-Richardson et al., 2007; Muehlenkamp & Gutierrez, 2004; Ross & Heath, 2002), and only recently looking at younger adolescents (e.g., Hilt, Cha et al., 2008; Hilt, Nock, et

al., 2008), this study expands upon existing research data by examining both age groups simultaneously. While this study did not find any age related differences, contrary to recent findings by Gratz and colleagues (2012) in a comparable age group, this may partially be due to the difference in ethnicities involved (i.e., this study was 80% Caucasian, while 67% were Caucasian in Gratz et al., 2012). Specifically, Gratz found that racial/ethnic background moderated the gender differences in rates of NSSI.

Self-injurers in this study had similar characteristics to those found in other studies. This is encouraging as this indicates that the results of this study may be comparable to other populations of a similar ethnic composition. These findings further support research in adolescent community populations and emphasize the need to further elucidate what characteristics of adolescents' social environment contribute to their learning, and continued use, of NSSI behaviours.

### **Co-Rumination and NSSI**

**Co-rumination positively correlated with NSSI in adolescents.** This is the first study to provide preliminary evidence that co-rumination is positively correlated with nonsuicidal self-injury in adolescents and it also further supports the mounting research evidence of the impact of social relationships on nonsuicidal self-injury in adolescents (e.g., Muehlenkamp, Brausch, Quigley, & Whitlock, 2012). In accordance with the hypotheses, adolescents who displayed higher levels of co-rumination reported that they had engaged in self-injury to a greater extent over the past year than those who displayed lower levels of co-rumination. Overall, co-rumination explained 8.47% of the variance in the frequency of self-injury in the overall sample of self-injurers in this study.

The concept of distress tolerance clarifies how co-rumination may exert its influence on the frequency of nonsuicidal self-injury in adolescents. Studies have shown that individuals who self-injure report greater subjective levels of experienced affective distress when faced with stressful events (Najmi et al., 2007; Nock et al., 2008). This inability to tolerate distress is believed to be an essential facet in the development and maintenance of self-injury (Chapman et al., 2006; Favazza, 1996; Klonsky, 2007). In accordance with the Experiential Avoidance Model (EAM; Chapman et al., 2006) and the automatic negative reinforcement (ANR) function of the Four Function Model (FFM; Nock & Prinstein, 2004, 2005), it may be that co-rumination exacerbates depressive symptoms and this drives adolescents to engage in NSSI for relief (Starr and Davila, 2009). It is possible that the spike in cortisol levels recorded by Byrd-Craven and colleagues (2008; in female participants) following co-rumination may be strong enough to activate an emotional cascade (e.g., Selby et al., 2008; Selby et al., 2010). According to the Emotional Cascade Model (ECM), the individual will seek to escape their increasingly negative affect by engaging in NSSI (e.g., Selby et al., 2008). Alternatively, findings by Nock and Mendes (2008) suggest that the increase in cortisol following co-rumination may render a self-injurer incapable of utilizing more adaptive problem solving and coping strategies when distressed; adolescent self-injurers have been found to be less able to generate solutions to hypothetical dilemmas after a stress-inducing task and gave more maladaptive solutions and reported lower self-efficacy for utilizing adaptive solutions. The repetitive focus on problems in co-rumination may hinder effective problem solving in self-injurers. As a result, self-injurers may be more likely to engage in NSSI after co-rumination due to an increase in negative affect or due to the inability to

generate, or follow through on, any adaptive alternative solutions to difficulties. Further research is clearly needed though, as the research on co-rumination and cortisol was completed with female participants and cannot be generalized to male participants. Additionally, the ECM model has only started to be evaluated in research, and only recently among self-injurers (Selby et al., 2010).

Research on the related construct rumination, also suggests why co-rumination is positively correlated with self-injury. It may be that co-rumination, characterized by its lack of constructive problem solving, focus on the negative event and associated negative affect, and its link to elevated depressive symptoms (e.g., Calmes & Roberts, 2008; Rose, 2002), acts similarly to rumination. Co-rumination may intensify the impact of negative affect on adolescents' cognitive processing and hinder the use of effective, problem solving behaviours that could alleviate depressive symptoms; much like rumination has been proposed to do (Nolen-Hoeksema 1987, 1991). Doing so, co-rumination would exacerbate depressive symptoms in adolescents who have a tendency to co-ruminate about their problems with their peers and increase the likelihood that they would engage in unhealthy, dysregulated behaviours like NSSI to cope with these distressing feelings. While co-rumination is hypothesized to act similarly to rumination (Calmes & Roberts, 2008; Rose, 2002; Rose et al., 2007), it would be important in future research to include rumination in analyses in order to ensure a more stringent test for the role of co-rumination; future research should examine whether co-rumination uniquely predicts NSSI behaviour even after controlling for rumination.

Additionally, research on peer socialization also suggests how co-rumination may influence adolescent NSSI. Co-rumination may be an indirect form of peer socialization;



it may be that an adolescent's engagement in NSSI is influenced indirectly through another characteristic of their friends (Brechwalk & Prinstein, 2011). When adolescents are exposed to certain characteristics of their friends, this creates an environment that puts the adolescents' own development at risk. As research has shown, co-rumination increases stress in the relational partners (Byrd-Craven et al., 2008), which increases the likelihood that they will experience greater depressive symptoms (i.e. direct form of peer influence related to depression; Van Zalk et al., 2010) and will engage in dysregulated behaviours such as NSSI (Giletta, Burk, Scholte, Engels, & Prinstein, 2013). This indirect form of NSSI socialization was supported in recent research (Giletta et al., 2013), which found that "friends' depressive symptoms had an additive effect on adolescents' NSSI above adolescents' depressive symptoms. Thus, having friends with depressive symptoms may be particularly harmful for those adolescents with underlying predispositions to endorse NSSI, for instance adolescents having difficulties in regulating their emotions (Nock & Prinstein, 2004)" (p.21).

***The relationship between co-rumination and self-injury in male participants.***

Contrary to research which has shown that co-rumination has a greater negative impact on females than males in regards to emotional adjustment (i.e., symptoms of anxiety and depression, Rose et al., 2007), this study indicates that co-rumination may influence self-injurious behaviours in males to a greater degree than in females. When genders were examined separately, the positive correlation between co-rumination and NSSI frequency did not remain significant for females and the effect size was small, with co-rumination explaining 1.49% of the variance in frequency of self-injury in females. The effect size for males was also small (approaching medium), with co-rumination explaining 8.00% of

the variance in self-injury frequency in males. It may be that the effect size would increase with a larger sample size.

Beyond the possible explanations previously mentioned for how co-rumination may influence self-injury, this result suggests that there may be another factor influencing this relationship, specific to males. Further expanding on indirect peer socialization, it may be that adolescent male NSSI behaviour is influenced by other related psychological characteristics of their friends, such as impulsivity. Recent research has shown that impulsivity among male adolescents' friends is associated with increases in male adolescents' own NSSI (Giletta, Burk, Scholte, Engels, & Prinstein, 2013). While co-rumination has been tied to greater friendship quality (Rose et al., 2007) in males, it may be that co-rumination in male friendships creates an environment which encourages them to act impulsively (i.e. engage in NSSI) in response to distress, rather than focusing on effective problem solving (Nock & Mendes, 2008).

***Co-rumination and stressful life events in male self-injurers.*** Another result from post-hoc analyses provides a different hypothesis for the stronger effect size of the relationship between co-rumination and self-injury among male participants. Among male self-injurers there was a large effect size for the relationship between co-rumination and interpersonal independent stressful life events. In fact, gender acted as a moderator variable of the relationship between co-rumination and the interpersonal independent stressful life events subscale of the ALEQ. While previous studies have shown that co-rumination is longitudinally associated with an increase in interpersonal dependent stressors (Hawkin et al., 2010), it is unlikely that co-rumination would actually increase the number of interpersonal independent stressors that occur. Perhaps, among male self-

injurers, the more they engage in co-rumination, the more stressors become a salient part of their experience (Rose et al., 2007). It is possible that when co-rumination increases the salience of any stressors they experience this will increase their depressive symptoms; stressors have been tied to higher depressive symptoms (e.g., Hankin et al., 2007). It is possible that in amplifying the stressors experienced this would chip away at individuals' ability to effectively cope with and problem-solve the stressors that are accumulating in their lives (Hankin et al., 2010). Due to self-injurers' difficulty tolerating distress (e.g., Klonsky, 2007), they would likely engage in self-injury to alleviate their increased feelings of depression (Klonsky, 2007). This correlates with past research which has found that more stressful life events significantly differentiated adolescents who engaged in NSSI from those who did not (Hankin & Abela, 2011) and NSSI is most frequently carried out in order to diminish affective distress (Nock et al., 2006).

**Co-rumination, peer self-injury, and adolescent self-injury.** Evaluation in post-hoc analyses further highlights the role of socialization processes in explaining the relationship between co-rumination and the frequency of self-injury in adolescents, specifically among male participants in this study. The relationship between adolescent self-injury and co-rumination scores was re-examined for those who had peers who engaged in self-injury and those who did not. While there was a small, non-significant correlation between co-rumination and self-injury in those adolescents that reported they did not have peers who self-injured, there was a significant, positive correlation of moderate effect size between adolescents' level of co-rumination and their frequency of self-injury in the past year for those who had peers who self-injured. Further, when genders were examined separately this relationship did not remain significant for females,

and the effect size was small, but there was a significant, positive correlation of large effect size for males. While results must be interpreted with caution as there was not enough power to detect effects among female participants, they further suggest that peer socialization may also be impacting adolescent engagement in self-injury, particularly among males. That is, increases in adolescents' own NSSI behaviour has been shown to be longitudinally associated with their best friends' reports of NSSI over a two year period (Prinstein et al., 2007). Specifically, if an adolescent has peers who engage in self-injury and also engages in co-rumination with these peers, they may be socialized to engage in self-injury as well (Giletta, Burk, Scholte, Engels, & Prinstein, 2013; Heilbron & Prinstein, 2008). It could be direct socialization, whereby an adolescent's engagement in self-injury is directly influenced by their peers' engagement in NSSI (Prinstein et al., 2010), though this finding was solely for adolescent females self-injurers. On the other hand, as previously discussed, it could be indirect socialization, with an adolescent engaging in NSSI like his/her peers due to "related psychological characteristics, dispositions, attitudes, or values of his/her friends" (p.8; Giletta et al., 2013). Longitudinal research is needed to determine which processes may be influencing this relationship and the mechanisms involved.

**Co-rumination as moderator variable.** Hypotheses two and three were not supported; co-rumination failed to moderate the relationship between depression and NSSI frequency, and stressful life events failed to moderate the relationship between co-rumination and NSSI frequency. Although contrary to the study's hypotheses, other results from this study suggest a possible explanation. There were significant gender differences in the previously reviewed results; results were significant and had greater

effect sizes for male self-injurers. With only 41 male self-injurers and 51 female self-injurers the moderation analyses could not be completed separately for each gender due to a lack of statistical power. From the results of hypothesis 1, it is possible that with enough male participants the moderation analyses would be significant. Further research is obviously needed to determine whether this would be the case. Additionally, this study solely utilized the frequency of self-injury and did not take into account the function of the self-injury for each individual. While primarily used for affect regulation (e.g., Klonsky, 2007) the reasons an individual engages in NSSI may vary over time and context (Suyemoto, 1998) making it difficult to discern the factors that contribute to the initiation and maintenance of this behaviour. It would be important to replicate this study, and further elucidate the relationship between co-rumination and NSSI in adolescents for different functions of self-injury. The impact of co-rumination may differ depending on the function of self-injury primarily endorsed. It may be that co-rumination has a higher correlation with the social functions of NSSI. Co-rumination is a social process and other researchers have correlated social concerns with the endorsement of social functions of NSSI (Nock & Prinstein, 2005); peer communication and rumination have been identified as moderators between social functions (i.e., social negative reinforcement; SNR and social positive reinforcement; SPR) and interpersonal distress and between automatic positive reinforcement (APR) and internal distress, respectively (Hilt, Cha, et al., 2008). These results were only found in female participants though, and need to be further studied in male self-injurers. It is possible however that co-rumination, which has features of peer communication and rumination, would also act as a moderator between social functions and interpersonal distress and between APR and internal

distress. It would be interesting if the strength of the effect size increased among females for the social function of self-injury, as females have been shown to experience more stressors in interpersonal contexts and react more strongly to these stressors in the form of depression (Hankin et al., 2007). The impact of co-rumination on self-injury in female adolescents may be more specific to these factors.

Another avenue of research would involve looking at the distinct self-injurer subgroups that can be “identified on the basis of NSSI method, function, and contextual features” (Klonsky & Olino, 2008, p.22). While evaluating the differing levels of co-rumination within these four distinct subgroups is beyond the scope of this study, co-rumination may have a differing effect on different subgroups of self-injurers. For instance, two of the four groups identified by Klonsky and Olino exhibited increased clinical symptomology, earlier onset, and deliberate (rather than experimental) engagement in self-injury for multiple functions (i.e., not solely for affect regulation). Other studies distinguish between single versus repetitive (e.g., Muehlenkamp, Brausch, Quigley, & Whitlock, 2012) self-injurers or those who engage in Low NSSI versus High NSSI (e.g., MacLaren & Best, 2010). Dividing self-injurers in this manner has revealed that those in the repetitive or High NSSI groups exhibit elevated clinical concerns (e.g., alcohol and drug abuse, disordered eating, lower perceived social support, heightened psychiatric concerns; Klonsky & Olino, 2008; MacLaren & Best, 2010; Muehlenkamp et al., 2012). These findings suggest that co-rumination, which has been found to be positively correlated with an increase in affective distress (Rose, 2002; Rose et al., 2007; Starr & Davila, 2009) and may exacerbate depressive symptoms in dysphoric individuals (i.e. those individuals who engage in a higher frequency of self-injury; Starr and Davila,

2009), may be present at a greater level in those who engage in repetitive, or a higher frequency of self-injury.

Alternatively, the finding that co-rumination did not moderate the relationships as hypothesized suggests that co-rumination may be involved in a more distal manner to self-injury. For example, it is possible that co-rumination would moderate the relationship between stressors and depression and in this fashion, akin to indirect socialization effects, worsen depression and in turn contribute to an increased likelihood that an individual would engage in self-injury for symptom relief. Co-rumination has been found to precede depression; in fact this relationship appears to be transactional in nature with the effect of co-rumination building and accumulating over time (Hankin et al., 2010). Co-rumination has been found to have a similar interaction with stressors; co-rumination predicts interpersonal stressors and these stressors in turn predict an increase in co-rumination (Hankin et al., 2010). This transactional relationship “likely amplifies the stressors experienced and chips away at individuals’ ability to effectively cope with and problem solve the stressors that are accumulating in their lives” (p.230, Hankin et al., 2010). These findings confirm the importance of longitudinal research examining factors that may increase adolescent vulnerability to engaging in self-injurious behaviour.

### **Limitations**

While the findings of the present study represent a valuable addition to the literature on adolescent NSSI, they need to be interpreted with certain limitations in mind. This investigation was cross-sectional in nature limiting the ability to make causal inferences. While the correlational results of this study are appropriate for the initial exploration of the relationship between co-rumination and NSSI in adolescents, future

research using longitudinal designs would help determine causality. Furthermore, a quasi-experimental design would help researchers determine causal relationships providing further understanding regarding the effects of co-rumination on NSSI.

The use of self-report measures presents some potential problems such as social desirability. Although most researchers investigating NSSI behavior use self-report measures (e.g., Arney & Crowther, 2008; Gratz et al., 2011; Hankin & Abela, 2011; Nock & Prinstein, 2004; Ross & Heath, 2002; Selby et al., 2010), social desirability could lead to underreporting of this behaviour. It is unlikely that underreporting occurred in this study, considering the high rate of NSSI obtained. With NSSI becoming part of our social landscape (Favazza, 2009) it may be that adolescents are comfortable in reporting their self-injurious behaviour. It is possible that participants may have responded carelessly; the validity of the data depends upon the honesty of the respondent even though statistical analyses can be of some help (Mertens, 2005). In addition, the self-report measures of co-rumination used in the present research might not have adequately distinguished between co-rumination and more positive forms of self-disclosure and relationship satisfaction. Observational data in future research may prove useful in separating co-rumination, self-disclosure, and relationship satisfaction.

Using a self-report measure for NSSI also means that the research has to rely on participants' understanding of the construct of NSSI as described in the FASM; participants may endorse every behaviour they have engaged in whether for NSSI purposes or not and this will affect the validity of our findings as everyone who self-reports as a self-injurer may in fact not be. While not feasible for this study, it has been recommended that follow-up interviews be used to assist in clarifying participants'



understanding of whether the tissue damage was indeed NSSI or due to other behaviours (e.g., drug use; Heath et al., 2009). While a self-report measure is insufficient to properly explore the nature and meaning of NSSI behaviours, in order to preserve anonymity and obtain an unbiased sample, the self-report method was nevertheless used. Knowing that questionnaires without follow-up interviews inflate NSSI reporting (Ross & Heath, 2002), results will be interpreted with this caveat in mind.

In addition, it was noted in this study that participants had difficulty estimating the number of times they had engaged in a particular NSSI behaviour; some participants instead wrote comments like “a lot” or “many” or “all the time” for frequency rather than a number resulting in their data being unusable in this study. This was particularly noted in younger grades, though it may be that other participants who left the frequency blank, and also had their data removed from the study, also decided not to provide an answer due to the difficulty in estimating their frequency of self-injurious behaviour in the past year. It is possible, that the participants who did not complete the questionnaires properly and had their data removed from the study were in some way different from those who completed the study; this limits the generalizability of the results of this study. A recent study using the FASM (Guan, Fox, & Prinstein, 2012) provided anchors (i.e., 1 = Never, 2 = 1-2 times, 3 = 3-5 times, 4 = 6-9 times, 5 = 10 or more times) for this scale to aid in more accurate reporting. This would likely have made the questionnaire more easily answered by participants.

In addition, as outlined by Heilbron and Prinstein (2008) the source of our data needs to be considered. This study asks participants to report on their peers’ NSSI behaviour, essentially assuming that participants’ assumption of what their friends are

doing is as important as what their friends are actually doing. In response, it has been argued that adolescents are more influenced by their own perceptions than by their friends' actual behaviour (Bauman & Fisher, 1986) and adolescents' own behaviour is more strongly correlated to their perception of their friends' behaviour than their friends' actual behaviour (see Kandel, 1996, for a review).

This study is also limited in focusing solely on one individual's perception and report of co-rumination. Given that the interpersonal and emotional impact of this process may vary between individuals within the same dyad, it would be important to examine co-rumination from the perspective of both members of the relationship dyad in future research. Even further, future research may want to examine co-rumination behaviour among groups involving more than two individuals.

The cross-sectional design limits the conclusions that can be drawn about the role of co-rumination in the development and maintenance of NSSI. Findings were not based on longitudinal data, and as such do not merit statements regarding causality. Also, findings with regard to gender related differences should be interpreted with caution. Specifically, it is not clear whether the difference in the relationship between co-rumination and self-injury between genders is due to actual gender differences and can be generalized to other populations. Further study to confirm these findings is required.

Characteristics of this sample of participants also limit the generalizability of these results. The overall participant sample comprised of 234 volunteers, of the possible 770 given consent forms. It may be that there are differences between those which decided to complete the study and those who did not. In addition, participants were

predominately middle class and Caucasian, further limiting the generalizability of the results.

### **Strengths and Contribution**

Despite these limitations, this study also has strengths and makes a valuable contribution to the existing literature on nonsuicidal self-injury in adolescents in the community. While research has started to show the importance of adolescents' interpersonal experiences as relevant for understanding and treating NSSI (e.g., Muehlenkamp et al., 2012, Prinstein et al., 2009), this study contributes to the literature in important, novel ways, specifically regarding the unique role of co-rumination. The association between these two constructs had not been investigated previously and this is the first study to provide preliminary evidence that co-rumination is positively correlated with nonsuicidal self-injury in adolescents.

In addition to uniting research on self-injury and co-rumination in adolescents, a valuable contribution of this study was the inclusion of male adolescent participants. Research on both NSSI and co-rumination has been completed primarily with female participants because research has shown that they are at greater risk for internalizing emotional problems starting in adolescence (e.g., Hankin & Abramson, 1999; Hankin & Abramson, 2001; Rose et al., 2007) and suggests that they have higher rates of self-injury (Nock, 2009). As a result, researchers may be overlooking the distress experienced by adolescent males, particularly those who engage in self-injury. In fact, this study suggests that certain processes, specifically co-rumination, may in fact lead to greater vulnerability in males who self-injure, than in females who self-injure. This study indicates that co-rumination is also involved in male affective distress (i.e., depressive

symptoms) and NSSI. Specifically, it appears that adolescent male self-injurers are more likely to have elevated symptoms of depression, higher levels of stressors, and a heightened frequency of self-injury, the more they engage in co-rumination. If the findings of this study hold in replication, it would further support the need to study self-injury and co-rumination in males, not solely in females. In addition, despite the significant gender differences in this study, it is important to remember that there was a large degree of variability within gender; therefore, identifying other individual difference characteristics related to co-rumination and self-injury will also be important.

While this study does not elucidate how co-rumination impacts self-injurious behaviour, other results from this study and past research suggest that co-rumination may intensify the negative affect and the salience of stressors that adolescents experience. This, combined with self-injurers' difficulty tolerating distress (e.g., Klonsky, 2007) and inability to generate or follow through on adaptive coping strategies (Nock & Mendes, 2008) would likely lead them to engage in self-injury to alleviate their increased feelings of depression (Klonsky, 2007).

It is also possible that co-rumination impacts self-injury frequency through direct or indirect socialization. Through direct socialization, whereby co-rumination with peers provides an opportunity for an adolescent to learn about NSSI and have their use of NSSI as a coping strategy reinforced by their peers' mutual engagement in NSSI (Prinstein et al., 2010). Indirectly, co-rumination may create an environment which increases stress in the relational partners (Byrd-Craven et al, 2008; Giletta et al., 2013) thus increasing feelings of depression, or promotes male self-injurers to act impulsively in response to distress, rather than focusing on effective problem solving (Nock & Mendes, 2008). In

turn, these changes would increase the likelihood of engaging in other emotionally dysregulated behaviours, such as NSSI (Giletta et al., 2013).

Longitudinal research is needed to determine which processes may be influencing the relationship between co-rumination and self-injury and the mechanisms involved. Research is also needed to replicate these results and elucidate why male self-injurers appear to be more vulnerable to the influence of co-rumination than female self-injurers, especially with past research showing co-rumination to be more deleterious for females (i.e., greater risk of depression and anxiety; Rose et al., 2007).

### **Clinical Implications**

In addition to advancing knowledge in the field, the results of this study have the potential to improve clinical practice. While it is not known how co-rumination impacts the frequency of NSSI, results suggest that adolescents, especially males, who self-injure may engage in NSSI to a greater degree the more they engage in co-rumination within their friendships. These results suggest several factors that might lead to more comprehensive and effective intervention, prevention, and treatment plans for counsellors working with adolescents who engage in nonsuicidal self-injury.

Co-rumination is a socially rewarding process, associated with greater feelings of satisfaction in friendships (Calmes & Roberts, 2008; Rose 2002; Rose et al., 2007; Starr & Davila, 2009). Nevertheless, as this study and others (e.g., Calmes & Roberts, 2008; Rose, 2002) have shown, co-rumination not only fails to defend against distress but may actually be involved in increasing risk for affective distress and using dysregulated behaviours like NSSI. Knowing this, assessment of co-rumination among dysphoric individuals such as self-injurers is recommended as it may lead to increased distress and a

greater likelihood they will engage in self-injury. It would be particularly important to assess male self-injurers as they may be particularly vulnerable to the detrimental effect of this style of communication.

Certainly, adolescents should not be discouraged from talking with their friends. Rather, peers are an important social support in adolescence (Muehlenkamp et al., 2012) and this research suggests that counsellors should increase adolescents' awareness of the potential risk of negative and ruminative talk about problems with their peers. It should be noted too that youth at risk for problems associated with co-rumination may be overlooked precisely because they do have seemingly positive, open communication with peers. It would be important for counsellors to evaluate the interaction styles of their clients' friendships to determine whether they may be high in co-rumination. Possible interventions in such cases might include re-directing adolescents to more constructive communication through problem-solving training and practicing more effective and adaptive ways of communicating and self-disclosure with peers.

Results also suggest that co-rumination may have a possible influence through direct socialization. For instance, co-rumination may provide an opportunity for adolescents to learn about self-injury from their peers, or have it reinforced by peers' mutual engagement in NSSI (Prinstein et al., 2010). The influence of peer self-injury and possible contagion should be carefully considered in treatment, as those adolescents who have peers who engage in self-injury are particularly at risk to engage in these behaviours as well (Prinstein et al., 2010). This study suggests that male self-injurers who engage in higher levels of co-rumination and also have peers who self-injure are at particular risk for higher levels of self-injury.

In addition, findings in this study and others suggest that co-rumination may be involved in increasing the salience of stressors, increasing the number of stressors encountered over time, and in increasing the intensity of negative affect (Hankin et al., 2010). Knowing this, and that self-injurers' have difficulty tolerating distress (e.g., Klonsky, 2007) and effectively generating or following through on adaptive coping strategies (Nock & Mendes, 2008) in response to stressors, suggests further interventions. The use of interventions that address how adolescents respond to stress, cope with distress and regulate their affect (i.e., whether they ruminate with others) may be particularly helpful. Certain treatment modalities such as Dialectical Behaviour Therapy (DBT; Linehan, 1993) have particular utility. DBT has been adapted for work with adolescents (e.g., Miller, Rathus, & Linehan, 2007); it focuses on strategies and tools that aid self-injurers in tolerating distress and regulating their emotions and teaches effective problem solving skills. Given the prevalence of self-injury in the community, these skill deficits may also be addressed by school wide programs that teach healthy and adaptive ways of coping and emotion regulation and would allow for intervention without stigmatization.

Prevention and intervention efforts may be particularly challenging given the subtle nature of co-rumination and that its association with positive relationship quality may be reinforcing. Results from this study suggest that co-rumination is linked to the frequency of self-injury in adolescent self-injurers and highlight the need to adopt a more careful evaluation of the role of friendships and social support in the lives of adolescents who self-injure. While further research is needed to elucidate how this relationship functions and to determine causality, it emphasizes the importance of peer relationships

on adolescents' emotional development and choice of coping strategies. This study also highlights areas that clinicians and school personnel alike can target in hopes of facilitating healthy interactions with peers and maximizing the emotional health of adolescents who self-injure.



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## **Appendix A**

### **Introduction and Overview of Study**

Hello. My name is Sarah Lloyd and I'm a student in the Counselling Psychology program at Trinity Western University in Langley. I am conducting a study with my supervisors, Dr. Joan Kimball and Dr. Derrick Klaassen, on how friendships influence how teens cope with stress. I would very much appreciate your participation.

Specifically, this study will investigate the relationship between how you talk about your problems and feelings with your friends and how you cope with stress. It will also look at the link between how you cope with stress and your feelings of depression.

For this study, it is required that your parents sign a consent form for you to participate. This consent form needs to be returned by\_\_\_\_. Your participation is optional and it will have no impact on your grade in this class. If you participate in this study you will be entered in a draw for 1 of 3 \$50.00 gift certificates for iTunes.

In \_\_ weeks, once your parental consent forms have been received, I will return to hand out the questionnaires which you will complete during class. The questionnaires will take approximately 40 minutes to complete and are completely confidential. The questionnaires used in this study have been used in other studies. The questionnaires ask about stress, the different ways that you cope with stress and about feelings of depression. They also ask about the way you discuss your problems with your friends and how often you do this.

***Any questions will be answered at this time.***



## Appendix B

April 29, 2012

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**Faculty of Graduate Studies**  
**Master of Arts Counselling Psychology**

**Parent Consent Form**

**Dear Parent,**

You are being asked to consent to your teen's participation in a research study, which will be completed during class time at their school. This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your teen's participation will involve. If you would like more detail about something mentioned here, or information not included here, please ask. Take the time to read this carefully to understand any accompanying information. You will receive a copy of this form.

**Title:** Peer Relationships and Coping with Stress in Teens

**Principal Investigator:** Sarah Lloyd, M.A. Counselling Psychology student,  
(250) 787-3344, sarah.lloyd@mytwu.ca

**Supervisors:** Dr. Joan Kimball, (360) 319-1805, joan.kimball@twu.ca  
Dr. Derrick Klaassen, (604) 513-2034, derrick.klaassen@twu.ca  
Graduate Program in Counselling Psychology  
Trinity Western University

**Purpose of this Study:**

Friendships are very important in the lives of teens and when stressed teens may use a number of different behaviours to cope (e.g., listen to music, play videogames, talk to someone, eat, physically hurt themselves on purpose, or smoke). This study will seek to understand how your son/daughter's close friendships influence how they cope with stressful events. Specifically, this study will investigate the relationship between how your son/daughter talks about their problems and feelings with their friends and how they cope with stress. It will also look at the link between how they cope with stress and their feelings of depression.

**What Will My Teen Be Asked to Do?**

In this study, your son/daughter will be asked to complete a questionnaire **by themselves** while in class. This will take about 30-40 minutes. Your son/daughter's participation is entirely voluntary. They are free to stop the study at any time. If they do not feel comfortable answering certain questions, they may leave them blank.

April 29, 2012

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April 29, 2012

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**What Happens to the Information I Provide?**

No information that will identify or name your son or daughter will be collected. No one except the researchers will be allowed to see any of the answers to the questionnaires. Only group data will be summarized for presentation or publication. All questionnaires will be identified only by code number and will be stored in a locked filing cabinet. No names or identifying information will be linked to the data. Data will be stored, in anonymous form, for possible future use after the completion of this study.

**Are there Risks or Benefits if I Participate?**

The questionnaires used in this study have been used in other studies. The questionnaires ask about stress, whether your son/daughter copes with stress using certain behaviours, and any feelings of depression that they experience. They also ask about the way in which they discuss their problems with their friends and how often they do this. This study will help us to understand whether the way teens talk about their problems with their friends is linked to how they cope with stress and to their feelings of depression. This knowledge may help us to develop programs that result in improved coping strategies and decreased depression in teens.

There are minimal risks involved in participating in this study; there is a possibility that your son/daughter may be sensitive to, or uncomfortable answering, some of the questions due to their personal nature. Taking part in the study is completely voluntary. Your son/daughter is free to skip any question and to stop taking part in this study at any time without penalty. If they decide to withdraw from the study their answers will be shredded. The school counsellors are aware of this research study and are available to talk to your son/daughter should they become distressed. A list of counselling agencies will also be provided.

Potential benefits for your teen include gaining a greater awareness of their feelings, the different ways they cope with stress, and how they talk about their problems and feelings with their friends. If your teen participates in the study, his or her name will be entered into a draw for 1 of 3 \$50.00 gift certificates for iTunes. If they withdraw from the study, their name will still be eligible for the draw.

**Signatures**

Your signature below indicates that you have had your questions about the study answered to your satisfaction and have received a copy of this consent form for your own records. In no way does this waive your legal rights nor release the investigators, or the involved institutions from their legal and professional responsibilities. You are free to withdraw your teen from the study at any time without jeopardizing their education. If you have further questions concerning matters related to this research please contact: Sarah Lloyd, Dr. Joan Kimball, or Dr. Derrick Klaassen.

***I consent/I do not consent (circle one) to my child's participation in this study.***

**Signatures (written consent)** Your son/daughter's name: (please print) \_\_\_\_\_

Parent/Guardian's Name: (please print) \_\_\_\_\_

Parent/Guardian's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Researcher's Name: Sarah Lloyd \_\_\_\_\_

Researcher's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

April 29, 2012

April 29, 2012

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If you have any questions or concerns about the way you've been treated as a research participant, please contact Ms. Sue Funk, Office of Research and Faculty Development, Trinity Western University at (604) 513-2142. Email: [sue.funk@twu.ca](mailto:sue.funk@twu.ca).

If you have any questions or desire further information with respect to this study, you may contact Sarah Lloyd or one of her supervisors, Dr. Joan Kimball or Dr. Derrick Klaassen, through the phone numbers and e-mail addresses provided at the beginning of this consent form.

-----  
If you are interested in the findings of this study please complete the form below, understanding that this allows the researcher to retain this information until you have been sent a summary of the research findings.

Name (please print): \_\_\_\_\_

E-mail or mailing address (please print):  
\_\_\_\_\_  
\_\_\_\_\_

April 29, 2012

7600 Glover Road, Langley, British Columbia, Canada V2Y 1Y1

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[www.twu.ca](http://www.twu.ca)

## Appendix C

### Review of Study, Consent, Confidentiality, Risk and Benefits

***Assent forms and questionnaire packages will be passed out while delivering speech. Questionnaires will be completed during class time.***

This study will look at how friendships influence how teens cope with stress. Friendships are very important in our lives and when stressed we may use a number of different behaviours to cope (e.g., listen to music, play videogames, talk to someone, eat, physically hurt themselves on purpose, or smoke). Specifically, this study will investigate the relationship between how you talk about your problems and feelings with your friends and how you cope with stress. It will also look at the link between how you cope with stress and your feelings of depression.

The questionnaires will take approximately 30-40 minutes to complete and are completely confidential. The questionnaires used in this study have been used in other studies. The questionnaires ask about stress, the different ways that you cope with stress and about feelings of depression. They also ask about the way you discuss your problems with your friends and how often you do this.

The risks in participating in this study are minimal. There is a possibility that you may find answering some of the questions uncomfortable or upsetting due to their personal nature. Taking part in the study is completely voluntary. You may choose not to answer a question if it makes you uncomfortable and you are also free to withdraw from the study at any time. The school counsellors are aware of this research study and are available to talk to you should you feel distressed after participating in this study. A list of counselling agencies will also be provided.

In order to participate, your parent/guardian must have signed the consent form. The first page is an assent form. Please read it carefully and sign it if you agree to participate. At the end of the study you will be given another copy of the assent form to keep. Your names and consent forms will be stored separately from your responses and only the researchers will have access to this confidential information. Once you have signed the assent form, please fill out the questionnaire package silently and turn it over when you have finished. It is very important that there be no talking and that the questions be filled out individually. If you have questions raise your hand and I will come to you.

Your participation is optional and it will have no impact on your grade in this class. If you choose not to participate, just hold on to it until everyone is done and then hand it in blank. There are activity pages at the end of the questionnaire package that you can do while waiting or you can quietly read or work on a class assignment. If you participate in this study you will be entered in a draw for 1 of 3 \$50.00 gift certificates for iTunes. If you decide to withdrawal you will still be entered in the prize draw.  
Thank you very much for your time.

## Appendix D

April 29, 2012

1 of 1



**Faculty of Graduate Studies**  
**Master of Arts Counselling Psychology**

### Adolescent Assent Form

**Title:** Peer Relationships and Coping with Stress in Teens

**Principal Investigator:** Sarah Lloyd, M.A. Counselling Psychology student,  
 (250) 787-3344, sarah.lloyd@mytwu.ca

**Supervisors:** Dr. Joan Kimball, (360) 319-1805, joan.kimball@twu.ca  
 Dr. Derrick Klaassen, (604) 513-2034, derrick.klaassen@twu.ca  
 Graduate Program in Counselling Psychology  
 Trinity Western University

You have been asked to take part in a study that will look at how friendships change the way teens cope with stress. Friends are very important in our lives and when stressed we may do different things to feel better (e.g., listen to music, play videogames, talk to someone, eat, hurt themselves, or smoke).

You agree to answer questions about yourself, your friends, your feelings, and how you cope with stress. This will take about 30-40 minutes. You will answer each question **by yourself** and try to answer truthfully. Your name will not be on the set of questions you answer, so that not even the researchers will know who you are or how you answered the questions. Your answers will be kept and may be used again in the future.

You do not have to take part in this study and deciding to take part, or not, will not change your grade in this class. You can choose not to answer a question if you do not want to answer it. You can stop and decide not to finish the study at any time.

This study will help the study researchers learn more about how friendships change how teens cope with stress. You may learn more about how you feel, how you cope with stress, and about your friendships. By participating in this study, your name will be entered in a draw for 1 of 3 \$50.00 gift certificates for iTunes. If you withdraw from the study your name will still be entered in the draw. You will be given a copy of this form to keep. **Signing your name below shows that you agree to take part in this study.**

\_\_\_\_\_  
 Participant's Name (please print)

\_\_\_\_\_  
 Signature and Date

\_\_\_\_\_  
 Researcher's Name

\_\_\_\_\_  
 Signature and Date

April 29, 2012

7600 Glover Road, Langley, British Columbia, Canada V2Y 1Y1

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## **Appendix E**

### **Follow-Up**

Thank you for participating in this survey! If you would like to receive a summary of the research findings once this study is complete please fill out the form below. Your signature below indicates that you agree to have the researcher retain your name and contact information until a copy of the research findings has been sent to you and that you understand that this information will be kept separate from your survey answers.

Name (please print): \_\_\_\_\_

E-mail or Mailing Address (please print):

\_\_\_\_\_

## Appendix F

### Peer Relationships and Coping with Stress in Teens: Debriefing Information Sheet

Dear Participant,

Thank you for taking part in our survey. The information you provided will help us to understand the relationship between how you talk about your problems and feelings with your friends and how you cope with stress. If you wish to withdrawal from the study now that you have completed the questions, let the researcher know and your survey package will be removed from the study.

As a thank you for your time and cooperation, you will be entered in our draw for 1 of 3 \$50.00 gift certificates for iTunes and your school principal will contact you if you win.

Some of the questions that you were asked to fill out deal with very personal and sensitive issues. For this reason, the school counsellors are aware of this research study and are available to talk to you should you feel distressed. A list of counselling agencies is also provided below. **Please talk to your school counsellor or make use of the resources below should you require any additional support. Do not hesitate to call our research team if you have any questions or concerns.**

Thank you,  
Sarah Lloyd, Dr. Derrick Klaassen, and Dr. Joan Kimball

#### **Counselling Resources**

Below is a list of different counselling agencies in Fort St. John, if you or your parents would like to make your own arrangements.

- Ministry of Children and Family Development - Child and Youth Mental Health: (250) 787-3344
- North Peace Community Resources Society: (250) 785-6021

This list is not complete and you are welcome to search for your own counsellor instead, if you prefer. Good places to begin such a search include:

- BC Association of Clinical Counselors (<http://www.bc-counsellors.org/memgate.htm>)
- BC Association for Marriage and Family Therapy (<http://www.bcamft.bc.ca/consumer-info/choose-therapist.htm>)
- Canadian Counselling Association (<http://www.ccacc.ca/cccdire.php>)

## Appendix G

### Demographic Information

**1. How old are you?** \_\_\_\_\_

**2. Gender** (please circle):    **male**        **female**

**3. Grade level at school:** \_\_\_\_\_

**4. Ethnicity** (please circle):

Aboriginal Person  
Asian  
Black  
Latino  
White  
Mixed Ethnicity  
Other

**5. Where I live** (please circle):

Rented House/Duplex  
Rented Apartment  
Own House/Duplex  
Group Home  
Foster Home  
Other

**6. Who I live with** (please circle):

Live alone  
Live with single parent  
Live with two parents  
Live with non relatives  
Live with relatives  
Other

**7. Parent's marital status** (please circle):

Married  
Separated  
Divorced  
Never married  
Widowed  
Not known

**8. Mother's current work** (please circle):

Working full time  
Working part time  
Home duties  
Not working  
Student  
Retired  
Other  
Not Known

**9. Father's current work** (please circle):

Working full time  
Working part time  
Home duties  
Not working  
Student  
Retired  
Other  
Not known



## Appendix H

### Center for Epidemiologic Studies Depression Scale (CES-D)

Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week. (please  $\checkmark$  or X in the appropriate box)

#### During the Past Week

|  | <b>Rarely or<br/>none of the<br/>time<br/>(less than 1<br/>day )</b> | <b>Some or a<br/>little of the<br/>time<br/>(1-2 days)</b> | <b>Occasionally<br/>or<br/>a moderate<br/>amount of<br/>time<br/>(3-4 days)</b> | <b>Most or all<br/>of the time<br/>(5-7 days)</b> |
|--|--|--|---|---|
| 1. I was bothered by things that usually don't bother me.                                |  |  |   |   |
| 2. I did not feel like eating; my appetite was poor.                                     |  |  |   |   |
| 3. I felt that I could not shake off the blues even with help from my family or friends. |  |  |   |   |
| 4. I felt I was just as good as other people.  |  |  |   |   |
| 5. I had trouble keeping my mind on what I was doing.                                    |  |  |   |   |
| 6. I felt depressed.   |  |  |   |   |
| 7. I felt that everything I did was an effort.   |  |  |   |   |
| 8. I felt hopeful about the future.  |  |  |   |   |
| 9. I thought my life had been a failure.   |  |  |   |   |
| 10. I felt fearful.  |  |  |   |   |
| 11. My sleep was restless.   |  |  |   |   |
| 12. I was happy.   |  |  |   |   |
| 13. I talked less than usual.  |  |  |   |   |
| 14. I felt lonely.   |  |  |   |   |

|                                     |  |  |  |  |
|-------------------------------------|--|--|--|--|
| 15. People were unfriendly.         |  |  |  |  |
| 16. I enjoyed life.                 |  |  |  |  |
| 17. I had crying spells.            |  |  |  |  |
| 18. I felt sad.                     |  |  |  |  |
| 19. I felt that people disliked me. |  |  |  |  |
| 20. I could not get “going.”        |  |  |  |  |

CESD Scoring: zero for answers in the first column, 1 for answers in the second column, 2 for answers in the third column, 3 for answers in the fourth column. The scoring of positive items (i.e. 4, 8, 12, and 16) is reversed. Possible range of scores is zero to 60, with the higher scores indicating the presence of more depressive symptoms. Weissman et al. (1980), the developers of the CESD, have used the cutoff score of 15 as being suggestive of depressive symptoms in children and adolescents. That is, scores over 15 can be indicative of significant levels of depressive symptoms.

## Appendix I

### Co-Rumination Questionnaire

#### When We Talk About Our Problems

Think about the way you usually are with your best or closest friends who are girls if you are a girl or who are boys if you are a boy and circle the number for each of the following statements that best describes you.

1. We spend most of our time together talking about problems that my friend or I have.

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

2. If one of us has a problem, we will talk about the problem rather than talking about something else or doing something else.

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

3. After my friend tells me about a problem, I always try to get my friend to talk more about it later.

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

4. When I have a problem, my friend always tries really hard to keep me talking about it.

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

5. When one of us has a problem, we talk to each other about it for a long time.

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

6. When we see each other, if one of us has a problem, we will talk about the problem even if we had planned to do something else together.

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

7. When my friend has a problem, I always try to get my friend to tell me every detail about what happened.

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

8. After I've told my friend about a problem, my friend always tries to get me to talk more about it later.

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**9. We talk about problems that my friend or I are having almost every time we see each other.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**10. If one of us has a problem, we will spend our time together talking about it, no matter what else we could do instead.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**11. When my friend has a problem, I always try really hard to keep my friend talking about it.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**12. When I have a problem, my friend always tries to get me to tell every detail about what happened.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

\*\*\*\*\*  
\*\*\*\*\*

***When we talk about a problem that one of us has....***

**1. ... we will keep talking even after we both know all of the details about what happened.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**2. ... we talk for a long time trying to figure out all of the different reasons why the problem might have happened.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**3. ... we try to figure out every one of the bad things that might happen because of the problem.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**4. ... we spend a lot of time trying to figure out parts of the problem that we can't understand.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**5. ... we talk a lot about how bad the person with the problem feels.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**6. ... we'll talk about every part of the problem over and over.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**7. ... we talk a lot about the problem in order to understand why it happened.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**8. ... we talk a lot about all of the different bad things that might happen because of the problem.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**9. ... we talk a lot about parts of the problem that don't make sense to us.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**10. ... we talk for a long time about how upset is has made one of us with the problem.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**11. ... we usually talk about that problem every day even if nothing new has happened.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**12. ... we talk about all of the reasons why the problem might have happened.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**13. ... we spend a lot of time talking about what bad things are going to happen because of the problem.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**14. ... we try to figure out everything about the problem, even if there are parts that we may never understand.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

**15. ... we spend a long time talking about how sad or mad the person with the problem feels.**

|                 |               |               |             |             |
|-----------------|---------------|---------------|-------------|-------------|
| 1               | 2             | 3             | 4           | 5           |
| Not At All True | A Little True | Somewhat True | Mostly True | Really True |

CRQ Scoring: Mean rating of the 27 items

## Appendix J

### FASM

**A. In the past year, have you engaged in the following behaviors to deliberately harm yourself (check all that apply):**

|   | No | Yes | How many times? | Have you gotten medical treatment? |
|---|----|-----|-----------------|------------------------------------|
| 1. cut or carved on your skin   |    |     |                 |                                    |
| 2. hit yourself on purpose  |    |     |                 |                                    |
| 3. pulled your hair out   |    |     |                 |                                    |
| 4. gave yourself a tattoo   |    |     |                 |                                    |
| 5. picked at a wound  |    |     |                 |                                    |
| 6. burned your skin (i.e., with a cigarette, match or other hot object) |    |     |                 |                                    |
| 7. inserted objects under your nails or skin                            |    |     |                 |                                    |
| 8. bit yourself (e.g., your mouth or lip)                               |    |     |                 |                                    |
| 9. picked areas of your body to the point of drawing blood              |    |     |                 |                                    |
| 10. scraped your skin   |    |     |                 |                                    |
| 11. "erased" your skin  |    |     |                 |                                    |
| 12. other: _____  |    |     |                 |                                    |

**B. If not in the past year, have you EVER done any of the above acts?**

\_\_\_\_\_ Yes  
 \_\_\_\_\_ No

**If yes to any of the above behaviors in the past year, please complete the questions (C-H) below:**

**C. While doing any of the above acts, were you trying to kill yourself?**

\_\_\_\_\_ Yes  
\_\_\_\_\_ No

**D. How long did you think about doing the above act(s) before actually doing it?**

\_\_\_\_\_ none  
\_\_\_\_\_ "a few minutes"  
\_\_\_\_\_ < 60 minutes  
\_\_\_\_\_ > 1 hour but < 24 hours  
\_\_\_\_\_ more than 1 day but less than a week  
\_\_\_\_\_ greater than a week

**E. Did you perform any of the above behaviors while you were taking drugs or alcohol?**

\_\_\_\_\_ Yes  
\_\_\_\_\_ No

**F. Did you experience pain during this self-harm?** \_\_\_\_\_ severe pain  
\_\_\_\_\_ moderate pain  
\_\_\_\_\_ little pain  
\_\_\_\_\_ no pain

**G. How old were you when you first harmed yourself in this way?**

\_\_\_\_\_

## FASM Scoring

## Part A:

-Whether engaged in self-injury (1) or not (0) – if indicated “yes” for any self-injurious behaviours A1 through A12; given a 1, if not, given a 0.

-Total Frequency: Add total # of times given for items A1 through A12.

-Whether received medical treatment (1) or not (0) – if indicated “yes” then rated (1) and if “no” rated (0), then numbers summed for total.

## Part B:

Yes = 1

No = 0

## Part C:

Yes = 1

No = 0

## Part D:

1 = None

2 = “A few minutes”

3 = < 60 minutes

4 = > 1 hour but < 24 hours

5 = More than one day but less than a week

6 = Greater than a week

## Part E:

Yes = 1

No = 0

## Part F:

4 = severe pain

3 = moderate pain

2 = little pain

1 = no pain

## Part G:

Participant puts age in blank.



## Appendix K

### Peer Self-Injury

**Think of your best or closest friends. Have your friends deliberately harmed themselves in any of the ways listed below (without intending to kill themselves)? Check Yes or No in the chart below.**

**If Yes, how many times (give a number) would you estimate they have hurt themselves in the past year? (Answer in chart below)**

|  | No | Yes | How many times in the past year? |
|--|----|-----|----------------------------------|
| 1. cut or carved on their skin   |    |     |                                  |
| 2. hit themselves on purpose   |    |     |                                  |
| 3. pulled their hair out   |    |     |                                  |
| 4. gave themselves a tattoo  |    |     |                                  |
| 5. picked at a wound   |    |     |                                  |
| 6. burned their skin (i.e., with a cigarette, match or other hot object) |    |     |                                  |
| 7. inserted objects under their nails or skin                            |    |     |                                  |
| 8. bit themselves (e.g., your mouth or lip)                              |    |     |                                  |
| 9. picked areas of their body to the point of drawing blood              |    |     |                                  |
| 10. scraped their skin   |    |     |                                  |
| 11. "erased" their skin  |    |     |                                  |
| 12. other: _____   |    |     |                                  |

### Peer Self-Injury Scoring

- Whether peer engaged in self-injury (1) or not (0) – if indicated “yes” for any self-injurious behaviours A1 through A12; given a 1, if not, given a 0.
- Total Frequency: Add total # of times given for items A1 through A12.

## Appendix L

**ALEQ**

**INSTRUCTIONS:** In this questionnaire we are interested in whether certain events have happened to you in the past **3 months**. Please answer how often the following events have happened to you in the past **3 months** using this scale:

|       |        |           |            |        |
|-------|--------|-----------|------------|--------|
| 0     | 1      | 2         | 3          | 4      |
| Never | Rarely | Sometimes | Frequently | Always |

**FAMILY AND PARENTS**

1. Your parents divorced. \_\_\_\_\_
2. A close family member (parent, brother, sister) hospitalized for serious injury/illness. \_\_\_\_\_
3. A close family member (parent, brother, sister) died. \_\_\_\_\_
4. A close family member (parent, brother, sister) was arrested. \_\_\_\_\_
5. You and your family moved to a new town, but you didn't want to move. \_\_\_\_\_
6. You had an argument with a close family member (parent, brother, sister). \_\_\_\_\_
7. A close family member (parent, brother, sister) lost their job. \_\_\_\_\_
8. A close family member (parent, brother, sister) can't work due to injury/illness. \_\_\_\_\_
9. Have to do chores/ work you don't want to do. \_\_\_\_\_
10. Have to take care of brothers/ sisters when you don't want to. \_\_\_\_\_
11. Don't spend as much time with close family members as you want to. \_\_\_\_\_
12. You can't seem to please your parents. \_\_\_\_\_
13. Did something you didn't want to do to please a close family member. \_\_\_\_\_
14. Parents put you down. \_\_\_\_\_
15. Seems like your parent are disappointed with you. \_\_\_\_\_
16. Close family member has significant medical or emotional problems (examples: heart disease, cancer, depression, etc.). \_\_\_\_\_
17. Don't receive the love, respect, or interest from parents that you wanted (example: parents didn't notice or compliment you on a good job). \_\_\_\_\_
18. Fight with parents over personal goals, desires, or choice of friends. \_\_\_\_\_
19. Your parents force you to achieve things you don't want to do. \_\_\_\_\_
20. Close family members withdraws love or affection from you. \_\_\_\_\_
21. Parents criticized you or yelled at you for not doing well in school. \_\_\_\_\_
22. Your parents grounded you. \_\_\_\_\_
23. Your parents won't let you go out with your friends. \_\_\_\_\_
24. You get in a fight with your parents over friends/ boyfriend/ girlfriend. \_\_\_\_\_

**RELATIONSHIPS**

25. A boyfriend/girlfriend breaks up with you, but you still want to go out with them. \_\_\_\_\_
26. Don't have a boyfriend/ girlfriend when you want one. \_\_\_\_\_
27. Got in a fight/ argument with a boyfriend/ girlfriend. \_\_\_\_\_
28. Can't seem to please girlfriend/ boyfriend when you want to. \_\_\_\_\_
29. Girlfriend/ boyfriend criticizes you. \_\_\_\_\_
30. Found out that boyfriend/ girlfriend has been cheating on you. \_\_\_\_\_
31. Did something to please you boyfriend/ girlfriend that you didn't want to do. \_\_\_\_\_

**SCHOOL AND CLASSES**

32. Did poorly on, or failed, a test or class project. \_\_\_\_\_
33. Do not have time to do well in school (example, working too many hours at work). \_\_\_\_\_
34. Got a bad report card. \_\_\_\_\_
35. Didn't get to take a class you wanted to take. \_\_\_\_\_

- 36. Didn't make the honor roll when you wanted to. \_\_\_\_\_
- 37. Had a bad teacher. \_\_\_\_\_
- 38. Didn't understand the material the teacher was teaching you. \_\_\_\_\_
- 39. Have to attend a class that you don't like. \_\_\_\_\_
- 40. Didn't complete required homework assignment for class. \_\_\_\_\_
- 41. Got in trouble with the teacher or principal. \_\_\_\_\_
- 42. Didn't get accepted for an extracurricular activity you wanted to be a part of. \_\_\_\_\_

**FRIENDS AND SOCIAL ACTIVITIES**

- 43. Don't have as many friends as you would like to. \_\_\_\_\_
- 44. Aren't friends with the people you want to be friends with. \_\_\_\_\_
- 45. Don't get invited to parties or dances. \_\_\_\_\_
- 46. Didn't have anyone to go out with on the weekends when you wanted to go out. \_\_\_\_\_
- 47. You had an argument with a close friend. \_\_\_\_\_
- 48. Your friends don't seem to understand you. \_\_\_\_\_
- 49. Don't have time to spend with your friends when you want to be with them. \_\_\_\_\_
- 50. Don't talk or share feelings with your friends. \_\_\_\_\_
- 51. Got in a fight/ argument with your friends. \_\_\_\_\_
- 52. Friends pressure you to do things you don't want to do. \_\_\_\_\_
- 53. A close friend was arrested. \_\_\_\_\_
- 54. A close friend was hospitalized for a serious injury/illness. \_\_\_\_\_
- 55. A close friend died. \_\_\_\_\_
- 56. A close friend moved away. \_\_\_\_\_
- 57. Close friends withdraw their affection from you. \_\_\_\_\_

## ALEQ SPSS Syntax for Scoring

Overall independent events, regardless of dependence

```
COMPUTE interp1 =
(calq01_1+calq02_1+calq03_1+calq04_1+calq06_1+calq08_1+calq10_1+calq11_1+calq
12_1
+calq13_1+calq14_1+calq16_1+calq17_1+calq18_1+calq20_1+calq22_1+calq23_1+cal
q24_1
+calq25_1+calq26_1+calq27_1+calq28_1+calq29_1+calq30_1+calq31_1+calq43_1+cal
q44_1
+calq47_1+calq48_1+calq49_1+calq50_1+calq51_1+calq52_1+calq53_1+calq54_1+cal
q55_1
+calq56_1+calq57_1).
EXECUTE.
```

Overall achievement events. These cannot be separated into dependence vs independence

```
COMPUTE achieve1 =
(calq09_1+calq15_1+calq19_1+calq21_1+calq32_1+calq33_1+calq34_1+calq35_1
+calq36_1+calq38_1+calq42_1).
EXECUTE.
```

Interpersonal dependent events

```
COMPUTE interdep1 = (calq06_1+calq10_1+calq11_1+calq12_1
+calq13_1+calq14_1+calq18_1+calq20_1+calq22_1+calq23_1+calq24_1
+calq25_1+calq26_1+calq27_1+calq28_1+calq29_1+calq31_1+calq41_1+calq43_1+cal
q44_1
+calq47_1+calq48_1+calq49_1+calq50_1+calq51_1+calq52_1).
EXECUTE.
```

Interpersonal independent events

```
COMPUTE interind1 = (calq01_1+calq02_1+calq03_1+calq04_1+calq08_1+
calq16_1+calq17_1+calq30_1+calq53_1+calq54_1+calq55_1+calq56_1+calq57_1).
EXECUTE.
```