THE RELATIONSHIP BETWEEN NON-SUICIDAL SELF-INJURY AND SUICIDALITY

by

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Abstract

The overall purpose of this study was to explain the overlap and distinctiveness of non-suicidal self-injury (NSSI) and suicidality from a diathesis-stress perspective. The first part of this study evaluated the third variable theory as an explanation for the high rates of lifetime co-occurrence between NSSI and suicidality. Specifically, it was hypothesized that these forms of self-harm share a common vulnerability profile comprised of five affective, cognitive and behavioural diatheses. The second part of this study tested the hypothesis that NSSI and suicidality become distinguishable on the basis of immediate, proximal stressors, namely psychache and survival and coping beliefs (SCB). Participants (N = 262) were community individuals aged 16-24 years who reported either no history of self-harm (i.e., no history of NSSI, suicidality, or both), a history of NSSI, suicidality or both, or current NSSI-only or current NSSI+suicidality. They were recruited online to complete an online battery of questionnaires. Using a set of discriminant function analyses, it was found that the vulnerability profile was unable to distinguish between the three self-harm groups, but was able to differentiate the no self-harm group from a collated self-harm group. Result patterns were also analyzed for gender differences. It was also found that a current NSSI+suicidality group exhibited significantly higher psychache and lower SCB (for women only) than a current NSSI-only group. These results suggest that NSSI and suicidality may tend to co-occur because they have similar long-term diatheses, but that they may become more distinct with respect to immediate psychological stressors.
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CHAPTER 1—INTRODUCTION

General Introduction

The relationship between NSSI (non-suicidal self injury) and suicidality is complex, allowing for both similarities and differences. This has led to a research movement that aims to more precisely characterize the relationship between the two forms of self-harm\(^1\), demarcating both their overlap and distinctiveness. This is an essential goal for both research and intervention. In clinical settings, failing to distinguish NSSI from attempted suicide can, as Klonsky, May, and Glenn (2012) noted:

lead to unnecessary hospitalizations, inaccurate case conceptualization and treatment planning, and misallocation of valuable emergency resources. At the same time, a perspective that overemphasizes the behaviors’ independence and ignores potential comorbidity between NSSI and attempted suicide could mean ignoring a valuable indicator of suicide risk (p. 2).

Accordingly, this research had several goals:

1. The identification of a vulnerability profile that is shared by the various self-harm groups, and that distinguishes self-harm groups from no self-harm groups.

2. The identification of proximal risk factors that distinguish those with concurrent NSSI and suicide ideation, from those with NSSI only.

3. The supplementary goal of analyzing whether result patterns are influenced by gender.

4. Lastly, a comparison of the various study groups on demographic characteristics and features of self-harm. Not only may this aid in contextualizing the present results, it can further

\(^1\)In this study, ‘NSSI’ refers to the intentional, self-inflicted injury in the absence of suicidal intent. ‘Suicidality’ refers to either suicidal ideation (i.e., thoughts about suicide), suicide attempts, or both. ‘Self-harm’ is an umbrella term to describe any form of self-harm, from NSSI to suicidal ideation to suicide attempts, to both NSSI and suicidality.
contribute to delineating the extent to which self-harm groups are similar and distinct.

**Non-Suicidal Self-Injury**

Non-suicidal self-injury (NSSI) refers to the intentional, self-inflicted damage to one’s own body tissue in the absence of both suicidal intent and socially or religiously sanctioned motivations (Klonsky & Olino, 2008). Methods of self-injury can vary, ranging from skin-cutting and burning, to banging or hitting. Although it is not uncommon for self-injurers to engage in more than one method (Gratz, 2001), skin-cutting represents the most pervasive form, reported among an estimated 46-97% of individuals who self-injure (Gratz, 2006; Klonsky, 2007). Self-hitting is also among the most common methods (Laye-Gindhu & Schonert-Reichl, 2005; Muehlenkamp & Gutierrez, 2004).

The average age of onset of NSSI lies within the early-to-mid teen years, typically between the ages of 12 and 14 (Muehlenkamp & Gutierrez, 2004, 2007; Nock & Prinstein, 2004), although risk for NSSI does not begin to decline until after the age of 25 years (Rodham & Hawton, 2009). It is therefore unsurprising that NSSI occurs disproportionately among youth aged 12-24. Although rates of NSSI are highest in clinical samples, including individuals with borderline personality disorder and major depressive disorder (Kerr, Muehlenkamp & Turner, 2010), recent epidemiological data clearly highlight that NSSI is not simply confined within the bounds of specific psychiatric diagnostic classifications. In community samples, recent years have witnessed a concerning rise in the incidence of NSSI among youth (Olfson, Gameroff, Marcus et al., 2005), with 14-40% of youth reporting a history of NSSI (Klonsky, Oltmanns & Turkheimer, 2003; Muehlenkamp & Guttierrez, 2004; Whitlock, Eckenrode, & Silverman, 2006). Studies have estimated that over 13% of high school students (Center for Disease Control and Prevention [CDC], 2010; Miller, Muehlenkamp, & Jacobson, 2009) and over 14% of university students
students had engaged in NSSI in the previous year (Serras, Saules, Cranford, & Eisenberg, 2010). Although it is commonly believed that NSSI peaks in mid-adolescence and declines in adulthood (Klonsky & Glenn, 2007), only one study has examined the prospective course of NSSI. In individuals with borderline personality disorder, NSSI engagement was found to reduce over a 6-year period, although the generalizability of these findings to individuals without borderline personality is unclear.

A review by Jacobson and Gould (2007) noted that whether there are gender differences in the prevalence of NSSI is inconclusive, with three studies having found NSSI to be more common in women than men, and three studies finding no difference. There is some suggestion that if there are any gender differences, they may be levelling off as men increasingly engage in NSSI (Camp, Desmet, & Verhaeghe, 2011), as a greater variety of NSSI methods are examined, and as studies focus more on non-clinical samples, including college and high school students, and military recruits (Gratz, Conrad & Roemer, 2002; Klonsky, Oltmanns, & Turkheimer, 2003; Muehlenkamp & Gutierrez, 2004). Although gender differences in prevalence rates remain unclear, numerous studies have found both similarities and differences in specific aspects of NSSI. One study found that female and male college students both begin NSSI engagement in early adolescence, but that the specific age of onset is earlier in girls (Andover, Primack, Gibb, & Pepper, 2010). Men were also found to exhibit more uniformity than women in terms of number of lifetime NSSI episodes and frequency of episodes per year (Andover et al., 2010). With respect to method, women have been shown to be more likely to endorse cutting or scratching as their method of NSSI (Briere & Gil, 1998; Claes, Vandereycken, Vertommen et al., 2007), while men may be more likely to endorse self-hitting or burning (Andover et al.).
Theories regarding the reasons for NSSI engagement center on positive and negative reinforcement processes in both intra- and inter-personal realms. Specifically, individuals appear to engage in NSSI for intrapersonal motivations, including the reduction of negative emotions, punishment of the self, expression of anger towards the self, and feeling generation, as well as interpersonal motivations, including garnering support from others, reducing harsh treatment or criticism from others, bonding with peers, creating interpersonal boundaries, physically expressing/communicating pain to others, and seeking revenge (Gratz, 2003; Nock, 2010). Research has documented that intrapersonal motivations are the most common among self-injurers (Klonsky & Glenn, 2009), and may be more strongly endorsed by women than men in university samples (Klonsky & Glenn).

**Suicidality**

Suicidality, comprised of suicidal ideation (thoughts of suicide, with or without suicidal plans), attempts, and completions, is also a serious public health concern among this population. It is the second leading cause of death among youth after accidents (Canadian Psychiatric Association, 2002), with as many as 4-8% of [youth] reporting at least one lifetime suicide attempt (Muehlenkamp & Gutierrez, 2007; Nock et al., 2008; Whitlock & Knox, 2007). The onset of suicidal behaviour is typically in late adolescence (Nock et al., 2008), with adolescents reporting the highest levels of suicide ideation (Krug et al., 2002; Nock et al., 2008).

A consistent finding regarding gender differences is that considering the general population, men die by suicide more often than women, while women are more likely to make suicide attempts than men (National Center for Health Statistics, 1994). It is important to consider that this may not reflect differences in intent, but rather, differences in chosen method with varying levels of lethality (Garland & Zigler, 1993). Thus, it may be that men and women
make a comparable number of suicide attempts, but that a greater of proportion of attempts result in completion for men than for women. For instance, women may be more likely to choose ‘feminine-compatible’ methods, such as pills, that do not result in disfigurement. However, it is also important to note that there is some uncertainty regarding gender differences in suicide (Phillips & Ruth, 1993). For example, women may be more likely to die by suicide methods that are less clearly ‘suicidal’, and thus more likely to be labeled as accidental.

**Part 1: Identification of a Vulnerability Profile**

**Co-occurrence of NSSI and Suicidality**

On the surface, NSSI and suicidal behaviour are experientially similar, in that they are both forms of self-inflicted physical injury, subsumed under a general category of self-harm (Klonsky, May, & Glenn, 2012). It is thus unsurprising that NSSI and suicidal thoughts and behaviours often co-occur over the life span in both clinical and community samples (e.g., Andover & Gibb, 2010; Glenn & Klonsky, 2009; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006; Whitlock & Knox, 2007; see Hamza, Stewart, & Willoughby, 2012 for a review). For instance, it has been found that 70% of adolescents engaging in NSSI also reported at least one suicide attempt, while 55% reported multiple attempts. Other studies have found 16-25% of young adults with a history of NSSI to also have a history of suicide attempt (Bebbington et al., 2010; Wilcox et al., 2011). This overlap in occurrence extends to suicidal ideation as well, with an estimated 28-41% of self-injurers reporting a history of suicidal ideation (Favazza, 1996; Pattison & Kahan, 1983). NSSI is also a simultaneous correlate of suicidal thoughts and behaviours, with higher frequencies of NSSI evidencing a concurrent association with higher levels of suicide ideation (Andover & Gibb, 2010; Klonsky & Olino, 2008).
In fact, a review by Hamza, Stewart, and Willoughby (2012) concluded that NSSI is a robust predictor of suicidal thoughts and behaviours, whereby individuals engaging in NSSI are significantly more likely to report greater suicide ideation and a history of suicide attempt than non-self-injurers. Importantly, these findings hold across participant gender, age, and socioeconomic status. Although a few of the studies reviewed by Hamza et al. (2012) were able to establish the temporal precedence of NSSI by way of longitudinal design, the majority of these studies were cross-sectional. As such, the reasons for their association remain unclear.

**Theoretical Explanations for the Relationship Between NSSI and Suicidality**

Several theories have been proposed to account for the high rates of life-span co-occurrence between NSSI and suicidality. One such theory is the Third Variable Theory. It proposes that NSSI and suicidality are merely spuriously related, co-occurring because of their association with a third variable (Hamza et al., 2012). Thus, it may be that NSSI does not directly increase one’s risk for suicidality, but rather, another third variable increases risk for both forms of self-harm (Hamza et al.). This theory, too, allows for the conceptualization of a self-harm continuum on which both NSSI and suicidality manifestations fall, although it suggests that their placement on the continuum is determined by shared underlying factors.

**Third variables identified**

A variety of mental health, psychological, behavioural, and social vulnerability and risk factors for both types of self-harm have been empirically identified. In the clinical realm, these include depression, borderline personality disorder, anhedonia, oppositional defiant disorder, dysthymia, and post-traumatic stress disorder (Favazza, 1998; Guertin, Lloyd-Richardson, Spirito, Donaldson, & Boergers, 2001; Jacobson, Muehlenkamp, Miller, & Turner, 2008; Langbehn & Pföhl, 1993). Shared psychological risk factors may include negative self-
evaluation, impulsivity, loneliness, hopelessness, lowered self-esteem, and anger (Guertin et al., 2001; Hawton, Saunders, & O’Connor, 2012; Lynam, Miller, Miller, Bornovalova, & Lejuez, 2011; Muehlenkamp, Ertelt, Miller, & Claes, 2010). Both NSSI and suicidal behaviour are also associated with risk-taking and reckless behaviour, in addition to elevated alcohol use (Hawton et al., 2012). Finally, a history of NSSI, suicidal behaviour, or both is also associated with a history of childhood sexual or physical abuse, as well as lowered parental support (Boxer, 2009; Muehlenkamp, Kerr, Bradley, & Adams, 2010a).

Although a broad range of ‘third variables’ have been uncovered in previous studies, a comprehensive review by Evans, Hawton, and Rodham (2004) aptly noted that very few of these studies have analyzed these factors in aggregation. Efforts in this direction may aid in uncovering a profile comprised of long-standing tendencies that act as a diathesis, increasing one’s vulnerability to the various forms of self-harm. Additionally, a limited number of studies have investigated vulnerability factors across the entire postulated spectrum of self-harm, from no self-harm to current and lifetime NSSI, current suicide ideation, lifetime suicide attempts, and combinations of NSSI and suicidality (Hargus, Hawton, & Rodham, 2009). By aiming to incorporate a wide-spanning spectrum, we can simultaneously isolate a vulnerability profile that separates those within and beyond the self-harm spectrum, while investigating the extent to which aggregated vulnerability overlaps across the spectrum.

In this study, I am therefore testing the ‘third variable theory’ by proposing an aggregated vulnerability profile for the spectrum of self-harm that is delineated on the basis of past research on shared vulnerabilities of NSSI and suicidality, the functions of self-harm, and its affective and social precipitants. The emphasis will also be on factors that transcend the boundaries of the various theoretical models of self-harm, all of which have received some support. Given that
factors across a variety of affective, cognitive and behavioural domains have been implicated in self-harm (Linehan, 1993; Slee et al., 2008), it may be that an integrated model will be most comprehensive in its contribution to understanding self-harm. To this end, discriminant function analysis will be employed, in order to determine the optimal combination of variables that can be used to predict group membership.

Many studies contribute to explaining why NSSI and suicide co-occur by uncovering shared risk factors that are proximal in time to the self-harm events. Although this goal is of merit, co-occurrence of these forms of self-harm does not always manifest at a single or overlapping period of time. Identification of shared vulnerabilities may thus shed light on co-occurrence across the life span, helping to account for lifetime risk of self-harm. Given the relative persistence of the tendencies comprising the vulnerability cluster, its identification may offer more constructive targets for the proactive reduction of long-term risk of self-harm, in lieu of waiting until self-harm has been triggered (Hawton, Saunders, & O’Connor, 2012). This might mean that preventative measures can be taken to reduce the risk of self-harm in vulnerable individuals, which is particularly important given that self-harming behaviours do not always lead to treatment seeking.

Additionally, many studies limit their analysis of vulnerability to the relation between NSSI and suicide and psychiatric disorders or symptoms. This is a goal of merit as high rates of psychiatric diagnoses have been reported in both individuals who have died by suicide (90%; Cavanagh, Carson, Sharpe, & Lawrie, 2003) and inpatient adolescents engaging in NSSI (87%; Nock et al., 2006), and may very well help to explain the high rates of overlap between NSSI and suicidality. There are limitations to this approach, however. Self-harm is not limited to one disorder, but rather, occurs across a multitude of disorders, including anxiety disorders (Jacobson
& Gould, 2007; Nock & Mendes, 2008), eating disorders (Claes, Vandereycken, & Vertommen, 2001), borderline personality disorder (Zanarini, Franken burg, Hennen et al., 2005), depressive disorders (Jacobson, Muehlenkamp, & Miller, & Turner, 2008; Nock, Joiner, Gordon et al., 2006) and impulse control disorders (Nock & Mendes). Self-harm is also not consistently found in individuals meeting criteria for these diagnostic categories. Together, these points suggest that psychiatric symptoms may reflect immediate risk factors that vary across different individuals, or that they fail to capture the true underlying, shared vulnerability processes that cut across diagnostic boundaries. On the other hand, the aim of the presently proposed vulnerability profile is to uncover a vulnerability for self-harm that is diagnostically independent and consistently present.

**Impulsivity: urgency**

Impulsivity typically refers to a predisposition to yielding to one’s impulses, acting and reacting in rapid-onset ways with little to no regard for potentially resultant consequences (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). Impulsivity is one of the psychological characteristics that is figured consistently and prominently in both theories of suicide (Lynam et al., 2011) and guidelines for the assessment of suicidal risk (Bryan & Rudd, 2005; Joiner et al., 1999). Impulsivity has also been theorized as an essential precursor to self-injury (Lynam, Miller, Miller, Bornovalova, & Lejuez, 2011), with some researchers even arguing that NSSI should be classified as an impulse control disorder (Pattison & Kahan, 1983).

Although it is intuitive to expect that individuals who respond to internal and external stimuli with thoughts and actions that may result in harm to oneself are high in impulsivity, research findings on the link between impulsivity and both NSSI and suicidal behaviour have been mixed. With respect to suicide, several studies have reported strong associations in both
community and clinical samples (Brodsky, Malone, Ellis, Dulit, & Mann, 1997; Gorlyn, 2005; Horesh, 2001; Kingsbury, Hawton, Steinhardt, & James, 1999; Mann, Waternaux, Haas, & Malone, 1999; Nock & Kessler, 2006; Sanislow et al., 2003), and impulsivity has been found to increase one’s risk for death by suicide (Dougherty et al., 2004). Impulsivity has also been related to biological mechanisms of suicidality (Kety, 1990; Mann et al., 2001). Conversely, mixed or null findings have been found in other studies, which researchers have struggled to reconcile (Horesh, 2001; Keilp et al., 2006; Oquendo et al., 2000). Similarly, several studies have found impulsivity to be greater in self-injurers than non-self-injurers (Baetens, Claes, Willem, Muehlenkamp, & Bjittebier, 2011; Castille, Prout, Marczyk, Shmidheiser, Yoder, & Howlett, 2007; Glenn & Klonsky, 2010; Homqvist, Carlberg, & Hellgren, 2008; Nock, 2009), and impulsivity has been found to be a superior predictor of NSSI than Axis I diagnoses (Muehlenkamp, Jacobson, & Miller, 2005). Impulsivity may also represent a characteristic feature of the self-injurious event itself, with 70-78% of self-injurers reporting both an absence of impulse control over the act of self-injury (Favazza & Conterio, 1989) and a lack of time being devoted to planning the self-injurious act (Favazza & Conterio, 1989; Muehlenkamp, 2005). As with suicide, however, not all studies have found self-injurers to have elevated impulsivity relative to control participants (Darche, 1990; Simeon et al., 1992).

Because impulsivity is operationalized differently across these conflicting studies (Anestis, Selby, & Joiner, 2007; Whiteside & Lynam, 2001), a common explanation for such mixed findings is that impulsivity is more appropriately conceptualized as comprising distinguishable dimensions. Adopting the “artificial umbrella term” of impulsivity (Whiteside & Lynam, 2001, p. 687) may ignore the fact that an impulsive behavioural outcome may be arrived at through different pathways (Lynam, Miller, Miller, Bornovalova, & Lejuez, 2011). In accordance with
this notion, Whiteside and Lynam (2001) factor analyzed the NEO-Personality Inventory-Revised (NEO-PI-R; Costa & McCrae, 1992) and multiple measures of impulsivity. Out of this analysis was born the Impulsive Behavior Scale (UPPS), measuring four uncovered dimensions of impulsivity: Urgency (a tendency towards impulsive acts during negative affective states); Lack of Premeditation (a generalized tendency to engage in an act without reflecting and considering its consequences); Sensation Seeking (Seeking, pursuing, and enjoying novel, exciting, and possibly dangerous activities); and finally, Lack of Perseverance (a lack of perseverance when faced with monotony, frustration, or fatigue) (Whiteside & Lynam).

Importantly, the distinctiveness of these dimensions is supported by research demonstrating the differential relationships of these factors to a variety of behavioural outcomes, including alcohol/substance use (Magid & Coler, 2007), eating disorders (Fischer, Smith, & Anderson, 2003), and borderline personality (Whiteside, Lynam, Miller, & Reynolds, 2005). This more nuanced model of impulsivity thus has the potential to clarify the relationship between impulsivity and self-harm.

Only two studies to date have examined the UPPS model in NSSI or suicide. Klonsky and May (2010) found, in two separate samples of high school students and college students, that both suicide ideators and attempters had significant elevations in urgency, but not sensation seeking or lack of perseverance. Only attempters exhibited poor premeditation. Lynam et al. (2011) found negative urgency and lack of premeditation to have the “largest and most consistent effect sizes” in predicting suicidal behaviour and NSSI (p. 157).

The dimension that thus appears to hold the most promise as a shared vulnerability for NSSI and suicidality (and the one included in the proposed vulnerability cluster) is urgency. For individuals who self-harm, impulsivity may be particularly likely to manifest during
dysregulating negative affective states, which play a central role in self-harm (Klonsky, 2007). The influence of urgency on risk for self-harm may be especially pronounced when expectations for the effectiveness of self-harm in reducing negative affect are also high, as has been found for other dysregulated behaviours (Fischer & Smith, 2008). Additionally, urgency has been shown to predict other behaviours with ultimately self-harming aspects, including binge eating and purging, aggression, and drinking for the purposes of coping (Anestis et al., 2007; Fischer et al., 2003; Miller et al., 2003; Lynam & Miller, 2004; Verdejo-Garcia et al., 2008), all of which are also behavioural correlates of both NSSI and suicide. Considering suicidality, specifically, urgency may directly increase the likelihood of rapid-onset, unplanned suicide attempts, which rarely occur without a negative emotional context. Urgency may also exert an indirect influence by way of creating the behavioural conditions for painful, dependent life events that increase one’s likelihood of considering or attempting suicide (Joiner, 2005).

**Emotional reactivity**

The second vulnerability factor proposed is emotional reactivity. It consists of three facets: Emotional sensitivity (the tendency for one’s negative emotions to be easily triggered); negative affective intensity (the tendency for one’s negative emotions to be experienced with great intensity); and emotion persistence (the tendency for one’s negative emotions to endure) (Nock, Wedig, Holmberg, & Hooley, 2008).

Most of the support for the centrality of emotional reactivity, however, is derived from work examining only one aspect of emotional reactivity—emotional intensity. Several theories have highlighted the role of emotional experiences in both NSSI and suicide, all converging on the notion that self-harm is preceded and triggered by intense, aversive affective and/or cognitive experiences. In suicide, escape from intolerable affective experiences has been cited as a leading
reason for suicide attempts (Boergers, Spirito, & Donaldson, 1998; Shneidman, 1993). In fact, intense psychological pain has been found to be a superior predictor of suicidality manifestations than depression and hopelessness (Troister & Holden, 2010). In self-injury, affect regulation models that explain NSSI as an expression of overwhelming, intense affect and an attempt to control such affect have been found to be among the most accurate explanatory models of NSSI (Suyemoto & MacDonald, 1995). In support of this, studies have found escape from aversive feelings or thoughts to be the primary motivation for NSSI engagement (Nock & Prinstein, 2004, 2005), and have also found significant associations between greater affective intensity and emotion regulation functions of self-injury (Turner, Chapman, & Layden, 2012). It is thus intuitive to expect that individuals who are characteristically inclined to experience emotions with great intensity would be more susceptible to the kind of intense affective experiences that precipitate self-harm. Indeed, a recent study found that individuals with either a current or past history of NSSI reported greater affective intensity than those who have never engaged in self-injury (Anderson & Crowther, 2012), highlighting the particularly long-standing nature of this affective vulnerability.

There is preliminary work suggesting the relevance of examining the more comprehensive emotional reactivity proposed by Nock, Wedig, Holmberg, and Hooley (2008). Not only may it more thoroughly capture the affective vulnerabilities of individuals who self-harm, research has demonstrated that heightened emotional reactivity is indeed related to NSSI engagement, suicidal ideation, and suicide attempts (Nock, Wedig, Holmberg, & Hooley, 2008). Examining emotional reactivity partitioned into factors of emotional sensitivity, intensity, and persistence, Glenn, Blumenthal, Klonsky and Hajcak (2011) found each of these dimensions to distinguish self-injurers from noninjuring controls. Another study also found higher levels of
emotional reactivity to predict the experience of positive or negative affect following NSSI, suggesting that emotional reactivity may play a role in the extent to which one experiences the reinforcement processes of NSSI (Jenkins & Schmitz, 2012). There is also evidence to suggest that emotional reactivity may be one mechanism by which psychological disorders increase the likelihood of self-harm engagement. For example, Nock et al. (2006) found emotion reactivity to mediate the relationship between a psychopathology variable (consisting of mood, anxiety, and eating disorder variables) and both NSSI and suicide ideation. In a similar vein, emotional sensitivity is characteristic of individuals with borderline personality disorder (Korfine & Hooley, 2000), which is also a common diagnosis in individuals who self-injure and/or exhibit suicidality.

**Emotion dysregulation: strategies**

In keeping with a characteristic emotional experience of hyperreactivity is the third included vulnerability factor—emotion dysregulation, or an absence of various adaptive means of responding to negative emotions. Although the construct of emotional reactivity describes the immediate experience of emotions (i.e., their intensity, length, and ignitability), the construct of emotion dysregulation captures the ways in which an individual responds to or regulates these emotions. More recently, emotion dysregulation has gained acceptance as a multidimensional rather than singular process. Accordingly, Gratz and Roemer (2004) developed a comprehensive concept of emotion dysregulation, comprised of emotional awareness and understanding (Awareness); acceptance of one’s reactions to emotions (Acceptance); emotional clarity (Clarity); an ability to limit impulsive behaviour and engage in goal-directed behaviour (Impulse) and pursue goals (Goals) when affectively distressed; and lastly, the ability to use
effective emotion management strategies to modulate emotional reactions (Strategies) (Gratz & Roemer, 2008).

The dimension that appears to be particularly and most consistently central to both self-injury and suicidality is a lack of emotion regulation strategies. In fact, Linehan’s (1993) model of self-harm positions this aspect of emotion dysregulation at the root of self-harm vulnerability, arguing that individuals who are vulnerable to self-harm have an inability to effectively and adaptively manage negative emotions, thus motivating the use of or reliance on self-harm as a means of emotion modulation.

Considering NSSI, there is indeed considerable evidence that NSSI primarily serves an emotion regulation function (Briere & Gil, 1998; Chapman et al., 2006; Gratz, 2003; Klonsky, 2007). Self-injurious acts are often preceded by intense negative affect, prompting the use of self-injury as an effort to escape from, avoid, or manage such affective experiences (Klonsky, 2009). It follows that the use of self-injury as an emotion regulation strategy would be particularly likely in individuals who have limited access to alternative, effective strategies (Linehan, 1993).

As with NSSI, suicidality may also entail an emotion regulation function, representing a response to negative affective states when effective regulatory strategies cannot be accessed or are perceived as unavailable (Levinger, Holden, & Ben-Dor, 2015; Zlotnick, Donaldson, Spirito, & Pearlstein, 1997). Similarly, the Cry of Pain model of self-harm (Williams, 1997) suggests that suicidality is a response to feelings of defeat and entrapment within one’s present stressful situation, which are partly triggered by a perceived inability to effectively solve one’s problems. This is akin to the Strategies dimension of emotion dysregulation, whereby defeat and
entrapment may be triggered by a belief that one does not have the strategies to modulate one’s reaction to distressing situations, thereby leading to suicidality (Williams et al., 2006).

Although many studies have empirically linked emotion dysregulation to NSSI (e.g., Gratz & Roemer, 2008), much fewer studies have examined a multidimensional emotion dysregulation. Gratz and Roemer (2004) found that emotion dysregulation was positively correlated with NSSI frequency, and improved the prediction of NSSI above and beyond other factors such as affect intensity/reactivity, emotional inexpressivity, and childhood maltreatment (Gratz & Roemer, 2008). Strategies and Clarity were found to be particularly relevant in this regard (Gratz & Roemer, 2004). In another study, Strategies, Impulse, and Goals were found to significantly differentiate a self-injury from non-self-injury group of college students, with the most pronounced difference manifesting in Strategies (Heath, Toste, Nedeccheva, & Charlebois, 2008). Lastly, in a study by Perez, Venta, Garnaat, and Sharp (2012), Strategies was the only subscale to retain a significant correlation with NSSI after the effect of other types of emotion regulation, gender and psychopathology were controlled for.

Previous research has also implicated emotion dysregulation in suicidality, with an emphasis on the insufficient management of affect. One study found a negative association among university students between suicide ideation and the ability to manage emotions (Ciarrochi et al., 2002), while another study found that the risk of suicidal ideation, plans, and attempts increased as endorsement of adaptive responses to negative emotion decreased and maladaptive responses increased (Tama et al., 2007). Only two known studies have examined suicidality and Gratz and Roemer’s (2004) six-dimensional model of emotion regulation. In a study of high school students, Weinberg and Klonsky (2009) found that while each of the six dimensions, except Awareness, was associated with suicidal ideation, Strategies showed the
strongest relation. The second study by Rajappa et al. (2011) investigated emotion regulation among college students with histories of suicidality. Again, Strategies was the dimension most strongly associated with current suicidal ideation. In fact, after adjusting for psychiatric diagnosis and depressive symptoms, it was the only dimension that significantly predicted current suicidal ideation. Strategies was also found to differentiate controls from both single and multiple attempters.

**Negative Attribution style**

Not only are emotional reactions central to self-harming behaviours, an individual’s cognitive experience of aversive events may also play a developmental role. Specifically, a negative attribution style, or the extent to which one attributes negative life events to internal, stable, and global causes, may render one vulnerable to engaging in self-injury or suicidal thoughts and behaviours in the face of stress.

Despite the well-supported centrality of cognitions to mental health and adaptive behaviour, a surprisingly few number of studies have investigated the cognitive vulnerability of attribution style in the context of self-harm. In the area of self-injury, the cognitive content of self-injurers is commonly biased and maladaptive, relative to those without a history of self-harm (Slee et al., 2008). Cognitive errors, including catastrophizing, overgeneralization, selective abstraction, and personalization have been found to predict NSSI in a sample of inpatient adolescents (Weismore & Esposito-Smythers, 2010). Only one known study has investigated the relationship between NSSI and attribution style, specifically. Guerry and Prinstein (2010) investigated a cognitive vulnerability-stress model in the longitudinal prediction of NSSI among psychiatric inpatient adolescents. They found that those who experienced interpersonal stressors, and attributed such stressors to internal, global, and stable causes, reported an escalating
trajectory of NSSI over time, as much as 18 months later. Importantly, this effect remained significant after accounting for depressive symptoms, and this effect was not significantly mediated by depressive symptoms (Guerry & Prinstein, 2010).

In the area of suicidality, only one known study has examined attributional style as a diathesis for suicidality. In a sample of undergraduate students, it was found that although a stressor (a failed exam) was significantly related to depressive symptoms and hopelessness, it only emerged as a significant predictor of suicide ideation when examined in interaction with negative attributional style (Priester & Clum, 1992).

In spite of limited empirical evidence, there are theoretical grounds for the inclusion of negative attribution style in a self-harm vulnerability profile. Cognitive distortions, including a negative attribution style, often occur with high frequency, becoming increasingly stable and pervasive with repeated exposure to unfavourable stressors (Kendall & Dobson, 1993). This may promote a recurring atmosphere of negative affect that may prompt one to turn to maladaptive means of coping or escaping (Weismore & Esposito-Smythers, 2010). Negative attribution style as a vulnerability factor is also consistent with the Cry of Pain model of self-harm, which highlights perceptions of entrapment within an aversive experience as a key determinant of self-harm engagement (Rasmussen et al., 2010). Attributing negative life events to internal causes which are unlikely to change and will impede on all areas of life may trigger perceptions of entrapment during times of distress (SAMS – Johnson et al., 2008), rendering conceivable NSSI or suicidality as temporary or permanent solutions, respectively. Finally, from a clinical perspective, the treatment of both NSSI and suicidality has emphasized the restructuring of negative cognitions as a key mechanism of change. Indeed, cognitive behaviour therapy and dialectical behaviour therapy, both of which involve the targeting of maladaptive cognitions,
have been found to be effective for both NSSI (James et al., 2008; Kliem, Kroger, & Kosfelder, 2010; Muehlenkamp, 2006) and suicide (Katz et al., 2004; Rathus & Miller, 2002; Spirito, Esposito-Smythers, Wolff, & Uhl, 2011).

**Self-compassion**

Self-compassion is an orientation to treat oneself with kindness, tolerance, non-judgement, and care when faced with experiences that may threaten one’s sense of self, including failures, hardship, losses, and rejections (Neff, 2003a). No known studies have examined self-compassion as it relates to NSSI, and only one study has examined self-compassion and suicidality. This single study investigated the links between childhood maltreatment, self-compassion, and mental health patterns among older adolescents receiving child protective services (Tanaka, Wekerle, Schmuck, Paglia-Boak, & MAP Research Team, 2011). It was found that those who had low self-compassion were more likely to have made a serious suicide attempt than those with high self-compassion, suggesting that self-compassion may represent a protective orientation in psychosocial contexts potentially predisposing to suicide (Tanaka et al., 2011).

Despite the relative absence of evidence to support self-compassion’s inclusion in the proposed self-harm vulnerability profile, there are several reasons why low self-compassion may increase susceptibility to self-harm. First, self-compassion is significantly related to established correlates of both NSSI and suicidality that are counter to or supportive of psychological resiliency and mental health. Self-compassion has demonstrated negative associations with depression, anxiety, and neuroticism (Neff, 2003), and positive associations with satisfaction with life (Neff, 2003), psychological well-being (Akin, 2008), social connectedness (Neff), happiness, optimism, and positive affect (Neff, Rude, & Kirkpatrick, 2007). Taken together, it is
possible that self-compassion may convey or support protection against common predictors of self-harm engagement.

Self-compassion may, in fact, confer superior psychological benefits to a similar construct found to be related to self-harm—that of high self-esteem (Overholser, Adams, Lehnert, & Brinkman, 1995; Wichstrom, 2009). In contrast to what is afforded by high self-esteem, self-compassion is independent of self- and other-evaluations and the meeting of one’s standards, allowing one to experience positive emotions even within a context of perceived shortcomings (Neff, 2003). Self-compassion thus entails many of the advantages of self-esteem but with fewer of its associated costs, including narcissism and a sensitive, conditional sense of self-worth (Neff, 2003; Neff & Vonk, 2009). In fact, Neff (2003) emphasizes that “self-compassion circumvents the entire [positive or negative] evaluation process altogether, focusing instead on feelings of kindness and understanding.” (p. 226). Additionally, although self-compassion and self-esteem are unsurprisingly related (Neff, 2003b), they have been shown to be distinct, with low self-compassion contributing unique variance in depression and anxiety when the effect of self-esteem is removed (Neff, 2003).

Third, self-compassion is, by its very definition, an orientation towards self-care in times when self-care is needed most, which stands in stark contrast to the self-destructive nature of self-injury and suicide. It is plausible that individuals who do not treat themselves with kindness and compassion may be more vulnerable to undertaking maladaptive and harmful behavioural responses to distressing psychosocial precipitants, in favour of more charitable alternatives. In individuals with low self-compassion, the self-destructive nature of self-harm is more likely to become personally conceivable.
Additionally, self-compassion is theoretically incompatible and negatively correlated with the many manifestations of self-derogation common to individuals with both self-injury and suicidality. High levels of worthlessness, self-hatred, and perceived inadequacy have been associated with self-injury (Adams, Rodham, & Gavin, 2005; Chapman & Dixon-Gordon, 2007; Glassman, Weierich, Hooley, Deliberto, & Nock, 2007), and both self-criticism (Glassman, Weierich, Hooley, Deliberto, & Nock, 2007) and negative self-evaluation (Brausch & Gutierrez, 2010) have been found to distinguish adolescents with and without a history of NSSI. This is consistent with the fact that self-punishment is another major function of NSSI in addition to emotion regulation (see Klonsky, 2007 for a review). The self-perceptions of suicidal individuals are similarly derogative. In a sample of undergraduate students who had attempted suicide, the suicide attempts of highly self-critical participants were characterized by greater levels of lethality and intent to die than those with alternative personality styles (Fazaa & Page, 2003). Maladaptive perfectionism—another negative correlate of self-compassion—is also often observed in individuals with suicidality (see O’Connor, 2007 for review), and has been found to distinguish eating disorder patients with and without NSSI.

Finally, self-compassion may represent an important vulnerability factor in self-harm because of its attenuating effects on the impact of sources of distress. There is some evidence that self-compassion may moderate reactions to negative life events (Leary et al., 2007; Neff, Kirkpatrick, & Rude, 2007). This may suggest that individuals who are low in self-compassion may lack an important buffer against negative life stress, which often precedes suicidality (Baetens, Claes, Muehlenkamp, Grietens, & Onghena, 2011; Konick & Gutierrez, 2005; Wong, Stewart, Yo, & Lam, 2007) and may be associated with increased engagement in NSSI (Rosen, Walsh, & Rode, 1990).
Hypotheses

The hypotheses for the first part of this dissertation are as follows:

(1) Using Discriminant Function Analysis, the vulnerability cluster will distinguish between those with a history of NSSI, those with a history of suicidality, those with a history of NSSI and suicidality, and those without a history of self-harm (i.e., those with no history of NSSI, suicidality or both). Most of its distinguishing power will be in separating self-harm groups from the no self-harm group, with little differentiation between the three self-harm groups. Additionally, the self-harm groups will score higher on the vulnerability cluster than the no self-harm group. As the vulnerability cluster includes variables that are each supported by theory and research, no a priori hypotheses were made regarding which variables would emerge as the strongest discriminators.

(2) A single collated group of individuals with a history of self-harm (i.e., those with a history of NSSI, suicidality or both) will be distinguished from those without a history of self-harm (i.e., those with no history of NSSI, suicidality or both) on the basis of the vulnerability cluster.

(3) Those with a history of NSSI, suicidality or both will not differ on the vulnerability profile.

(4) As an additional test of the third variable theory, bootstrapping mediation analysis will be used to determine whether the vulnerability profile, alone, can account for the relationship between NSSI history and suicidality history. As full mediation is highly rare, it is hypothesized that the vulnerability profile will demonstrate only partial mediation.
(5) A secondary exploratory goal will be to determine whether the profile shows similar distinguishing patterns for men and women.

**Part 2: Identification of Distinguishing Proximal Risk Factors**

In spite of the evidence of overlap, there does not exist a 1:1 relationship between NSSI and suicidality, because not all self-injurers evidence suicidal thoughts and/or behaviour across the life span, or vice versa (Kessler, Borges, & Walters, 1999). The overlap between NSSI and suicidality therefore cannot be overestimated. By very definition, they are conceptualized as being phenomenologically distinct, with the various manifestations of suicidality converging on a desire or intent to end one’s life—a motivation that is necessarily absent from NSSI. Individuals who engage in NSSI also conceptualize their behaviour as being distinct from suicide (Favazza, 1996; Favaza & Conterio, 1989; Walsh & Rosen, 1988). Many who self-injure report an absence of suicidal ideation before or during the self-injurious event, and they also report that death is not the intent or perceived result of their self-injury (Andover & Gibb, 2010; Favazza, 1998; Simeon & Favazza, 2001).

There are several additional dimensions along which NSSI and suicidal behaviour (particularly, suicide attempts) may be differentiated. NSSI is more prevalent; it may occur at a considerably higher frequency within individuals; is associated with different methods (e.g., self-cutting is more typical of NSSI, while self-poisoning, hanging and drug overdoses are more characteristic of suicide attempts); and is less severe, rarely causing injuries warranting medical attention (Favazza, 1998; Klonsky & Muehlenkamp, 2007; Muehlenkamp, 2005).

Although it is important to understand why self-injury and suicidality often co-occur, it is also important to understand why co-occurrence is not always certain (Muehlenkamp & Gutierrez, 2007). To this end, it is necessary to identify proximal correlates that may differentiate
youth who evidence both forms of self-harm from those who only self-injure. This may elevate our understanding of the distinctiveness of these two forms of self-harm, and enhance clinicians’ ability to assess and clarify suicide risk in an at-risk group (Muehlenkamp & Guttierez).

Additionally, the suicidal intent of NSSI acts may be difficult to discern at times. Distinguishing NSSI acts from suicide attempts may thus entail subjectivity and ambiguity (Linehan, 2000). Proximal correlates that distinguish self-injurers who are also elevated in suicidality from self-injurers who are not, may provide additional markers of suicide risk when information about suicide intent is unavailable (Claes, Muehlenkamp, Vandereycken, Hamelinck, Martens, & Claes, 2010).

Although a growing body of research has attempted to differentiate suicide from self-injury, a surprisingly small number of studies have investigated differentiation from the perspective of determining what psychosocial factors may signal suicide risk among self-injurers (i.e., what factors distinguish NSSI+suicide from NSSI-only). Several authors have argued that this should be a pre- eminent empirical question, potentially uncovering critical points for intervention.

Generally, past research has found that individuals with both NSSI+suicide are more clinically, socially and psychologically impaired than those with NSSI-only. Various distinguishing social factors have been identified, including levels of family conflict, parental support, and a history of physical/sexual abuse (Asarnow et al., 2011; Brausch & Gutierrez, 2010; Whitlock & Knox, 2007). Distinguishing psychological factors have included negative self-evaluations, lowered self-esteem, reasons for living, help-seeking, attraction to life, and fear of suicide, as well as greater anhedonia, depression, depressive reactions, hopelessness, post-traumatic stress disorder symptoms, and borderline personality disorder symptoms (Brausch &
Almost all of the above studies have attempted to distinguish self-injury from suicide on the basis of proximal risk factors by comparing individuals with a history of suicide attempts and self-injury, and those with a history of self-injury alone. This means that these two self-harm groups may consist of a mixture of those with current or recent self-injury and suicidality, and those for whom self-harm occurred well into the past. These self-harm groups are then compared on their current standing on proximal risk factors (e.g., current depressive symptoms). This methodological approach is less than ideal, because it mistakenly assumes that their current differentiation on what are typically more state-like factors is representative of the extent to which they differ during the time of their self-injury or suicide attempt. In other words, although current differences on state-like factors between groups may be found, this does not mean that those differences were present when they were actually self-injuring or making a suicide attempt. The ideal method of identifying risk factors that explain why suicidality does not always occur concomitantly with self-injury is by examining individuals who are currently or reasonably recently engaging in self-harm.

The second goal of the present study is to therefore examine novel psychosocial risk factors that may potentially differentiate a current NSSI-only group from a current NSSI+suicidality group. Because it is practically unfeasible to obtain a sufficiently sizeable sample of individuals with both recent suicide attempts and self-injury, suicide ideation will be used as a proxy for suicide. Suicide ideation refers to thoughts of suicide, ranging from vague considerations of taking one’s own life to the formulation of suicidal plans, and from fleeting thoughts to recurrent or persistent ideation (Milos, Spindler, Hepp, & Schynder, 2004). In
addition to advantages of pragmatism, suicidal ideation is conceptualized as the commencement of a trajectory toward suicide attempts and completions for many individuals (Tarrier, Taylor, & Gooding, 2008). Thus, although ideation is not invariably followed by a suicide attempt, the majority of attempts are preceded by ideation (McAuliffe, 2002). Additionally, greater intensity of ideation has been found to predict an increased likelihood of suicide attempts and eventual death by suicide (Beck, Brown, & Steer, 1989; Brown et al., 2000), and increases in suicidal ideation frequency have been found to predict an attempt in the near future (Lewinsohn, Rhode & Seeley, 1996). Suicide ideation may also represent the more pervasive, long-standing aspect of suicidality, with studies finding as much as 44% of adolescents hospitalized for a suicide attempt reporting continued ideation six to eight years later (Pfeffer et al., 1991). However, in acknowledgement of the fact that more severe ideation is more closely representative of suicide attempts, a series of exploratory analyses will examine the influence of suicide ideation severity on result patterns.

**Psychache**

Psychache, or psychological pain, has recently emerged as a psychological construct that is critical to understanding suicide. It may be defined as the “hurt, anguish, soreness, aching, psychological pain in the psyche, the mind” (Shneidman, 1993, p. 145). It is intense and intolerable psychological pain that forms the common proximal stimulus to suicide. Once the resultant mental pain reaches a subjectively unendurable intensity, desires to cease and escape from one’s pain transpire. When halting consciousness of one’s pain is perceived as the sole means of escape, suicide emerges as the only viable solution. As suicidologist Edwin Shneidman (1989) concluded, “Reduce the level of suffering, often just a little bit, and the individual can choose to live.” (p. 17).
A growing body of research is supporting the relevance of psychache to suicide. Several studies have found that among both university and psychiatric populations, psychache is a unique statistical predictor of suicidality, when controlling for hopelessness and depression (e.g., Berlim et al., 2003; DeLisle & Holden, 2004; Holden, Kerr, Mendonca, & Velamoor, 1998). In fact, psychache has been found to demonstrate the strongest predictive relationship with suicidality (e.g., Berlim et al., 2003; DeLisle & Holden, 2004; Holden et al., 2001; Troister & Holden, 2010). Psychache has also been found to mediate associations between other known suicide predictors and suicidality, including perfectionism (Flamenbaum & Holden, 2007) and hopelessness (Holden, Mehta, Cunningham, & McLeod, 2001).

However, there are no known studies that have investigated how psychache may affect suicidality in at-risk, self-injuring samples. If psychache is the pre-eminent factor fuelling the need to escape via suicide (Shneidman, 1993), its relationship of necessity with suicidality should mean that it will distinguish suicidality from other forms of self-harm, namely, non-suicidal self-injury. Although both forms of self-harm involve intense negative affect, psychache in suicidality is a more persistent, rather than time- or situation-constricted affective state. It is also conceptualized as pain that is so overwhelming that it causes suffering so severe that only the cessation of consciousness is perceived as a solution (Shneidman, 1987). If suicidality represents the end point on a continuum of self-harm, Shneidman’s conception of psychache would suggest that psychache similarly represents the end point on a continuum of negative affect. As such, it is a pain of utmost intensity and intolerability that it becomes uniquely tied to the most extreme manifestation of self-harm—suicidality. In support of the suggested distinctiveness of suicide’s relationship with psychache, several studies have found that psychache becomes increasingly more important than hopelessness as the intentional lethality of
suicidal thoughts increases, and thus, as attempts of suicide become more likely (Holden & Kroner, 2003; Troister & Holden, 2012).

**Survival and Coping Beliefs**

It is also important to identify protective factors that may distinguish NSSI from suicidality. One protective characteristic that is uniquely tied to suicide is reasons for living, as measured by the Reasons for Living Inventory (RFL; Linehan, Goodstein, Nielsen, & Chiles, 1983). These are the adaptive, life-sustaining characteristics of non-suicidal individuals that promote a desire to live even when faced with a level of adversity and hardship that has the potential to threaten that desire and lead to suicidality (Linehan et al., 1983). Six subscales of the RFL have been delineated: Survival and Coping Beliefs, Child Related Concerns, Fear of Suicide, Fear of Social Disapproval, Responsibility to Family, and Moral Objections (Linehan et al.)

The protective nature of reasons for living against suicidality has been supported in both adolescent and adult samples (Gutierrez, Osman, Kopper, et al., 2000; Osman, Downs, Kopper, et al., 1998). Only one known study has examined how reasons for living impacts suicide risk among self-injurers. Using a version of the RFL that attempts to identify additional, unique reasons for living for adolescents (RFL-A; Osman et al., 1998), Muehlenkamp and Guttierez (2007) found that self-injuring high school students who did not attempt suicide had greater scores on all but one of the subscales of the RFL-A, including self-acceptance, future optimism, suicide related concerns (fears of suicide), and family alliance (beliefs about family support). The fact that a wide range of reasons for living was able to distinguish between NSSI only and NSSI+SA groups lends support to the notion that such adaptive belief symptoms may represent important clinical indices of suicide risk among those at particular risk for suicide.
The present study examines one such reason for living, namely, Survival and coping beliefs (SCB), comprised of beliefs that promote survival in the face of hardship. These include beliefs that life is inherently worth living (e.g., “I care enough about myself to live”; “I have the courage to face life”; “I do not want to die”); a curiosity and inclination or attachment to one’s future (e.g., “I am curious about what will happen in the future; “I still have many things left to do”); and beliefs in one’s ability to cope and in the futility of suicide as a coping strategy (e.g., “I believe I can find other solutions to my problem”; “I believe killing myself would not really accomplish or solve anything”) (Linehan et al., 1983).

Survival and Coping Beliefs appears to be the RFL subscale with the strongest and most consistent relationship with suicide in both adult and adolescent, and psychiatric and non-psychiatric populations (Goldston et al., 2001; Linehan, 1985). Survival and coping beliefs are negatively related to various suicidality indices, including suicidal ideation, suicide attempts, and estimated likelihood of future attempts (Cole, 1989b). This subscale has been found to distinguish serious ideators from non-ideators (Linehan et al., 1983), and is the RFL subscale that most strongly differentiates suicidal from non-suicidal adolescents (Pinto, Whisman, & Conwell, 1998). Greater survival and coping beliefs have also been found to lower the risk for repeat suicide attempts among adolescents who were previously hospitalized for an attempt (Goldston, Daniel, Rehoussin, Rehoussin, Frazier, & Harris, 2001). Finally, Strosahl et al. (1983) found that SCB could discriminate among low, medium, and high levels of suicidal intent (i.e., the intensity of the desire to die at the time of a suicide attempt), even among hospitalized individuals who were high in hopelessness. In fact, SCB emerged as a stronger predictor of suicidal intent than depression, hopelessness, and negative life events (Strosahl et al., 1992).
Given the particular salience of SCB to suicide, it is possible that SCB may be greater among those who exhibit self-injury but without concomitant suicidality. If NSSI is an emotion regulation strategy (Nock & Prinstein, 2004), it is conceivable that although individuals engaging solely in NSSI may have difficulty with distress coping, they may still perceive value in living and surviving in the face of distress. Consistent with this notion, adolescents with a history of NSSI have been found to have greater positive attitudes towards life than adolescents with a history of suicide attempts (Muehlenkamp & Gutierrez, 2004). Thus, in the absence of a critical safeguard against suicide, namely SCB, suicidality may emerge among vulnerable individuals.

**Hypotheses**

1. Psychache will distinguish a current NSSI+suicidality group and current NSSI-only group. Specifically, the current NSSI+suicidality group will report higher levels of psychache than the current NSSI-only group.

2. Survival and coping beliefs will distinguish a current NSSI+suicidality group and current NSSI-only group. Specifically, the current NSSI+suicidality group will report lower levels of survival and coping beliefs than the current NSSI-only group.

3. A secondary exploratory goal will be to determine whether similar or different result patterns will be found for males and females.

**CHAPTER 2—METHOD**

**Participants**

A minimum of 200 participants were targeted for recruitment, with a minimum of 20 participants in each group. For the purposes of identifying a self-harm vulnerability profile, four groups were recruited: (a) Individuals with a history of NSSI (n = 51), (b) individuals with a history of a suicide attempt and/or current ideation in the past week (n = 62), (c) individuals with
a history of both NSSI and suicidality (recent or past attempt and/or current ideation) \( (n = 67) \),
and (d) individuals with no history of self-harm \( (n = 81) \). In order to identify distinguishing
proximal risk factors, a current NSSI-only group (NSSI in the past 6 months) \( (n = 28) \) was
compared to a current NSSI + suicidality (current ideation or recent attempt in past 6 months)
group \( (n = 41) \). The individuals comprising these two groups were selected from the total sample
that was initially recruited; these analyses thus utilized some of the same participants that were
utilized in the vulnerability profile analyses.

All study groups were recruited from Kijiji, Craigslist, psychology research websites (e.g.,
About.com psychology forum; Psychological Research on the Net), and Mechanical Turk—an
internet marketplace in which users are paid to participate in a variety of projects, including
research studies. The current self-harm, lifetime self-harm, and current NSSI+suicidality groups
were also recruited from online self-injury forums. The ages of recruitment were 18-24 years.

Procedure

The online assessment was created using www.surveymonkey.com. The assessment was
provided with a unique website address which participants could access in order to complete the
survey. All participants were asked to complete all measures, regardless of which group they
were considered to belong to.

Recruitment messages were then posted in the online portals inviting prospective
participants to participate in a psychology research study about the relationship between self-
injury and suicide in youth aged 18-24 years. It was specified that participants did not have to
have a current or past history of NSSI, suicidal thoughts, or suicide attempts in order to
participate in the study. It was communicated that participation would involve the completion of
a battery of online questionnaires that would take no more than 50-60 minutes to complete, and
that they would be compensated with $10. A link to the online assessment on www.surveymonkey.com was then provided.

Once participants accessed the study website, they were immediately provided with a letter of information and consent form. The letter of information stated that the purpose of the study was to investigate the relationship between self-injury and suicidality in youth aged 18-24 years, because previous research has shown that some people may be more likely than others to engage in self-harm. It was stated that we would like to explore how various factors may be linked to the presence or absence of self-harm, and that we hope to gain a better understanding of these behaviours which could then be used to inform treatment. The information letter then reiterated the information about the study procedure present in the recruitment message. It was also specified that they would be asked questions about self-injury and suicide, as well as questions about various psychological factors, including (but not limited to) how they experience and deal with negative emotions, how they view themselves, and their attitude towards living. It was stated that they were not required to answer any questions that they found distressing or that made them feel uncomfortable. They were also informed that while they could complete the survey on their own time using their own computer, they would not be able to return to the survey once exited.

Participants were informed that they could not be guaranteed to personally benefit from participating in this study, but that their participation may potentially result in benefits for the field of clinical psychology. Such benefits may include helping the field to learn about self-injury, suicide and why they occur, which could then be used to identify ways of reducing and/or preventing these behaviours. Prospective participants were also informed that there would be minimal risk involved in study participation, and that it was not expected to be a demanding or
stressful experience. However, they were told that some of the questions asked about potentially sensitive information which may bring about negative emotions or cause feelings of discomfort. They were again reminded that they were under no obligation to complete such questions. They were also told that should they feel the urge to self-harm when completing the questionnaires, on every page would be a link to www.squidoo.com in order to immediately turn their attention to something else. They were also urged to speak to a trusted individual, contact their health professional or contact one of the resources provided at the end of the letter of information and at the end of the survey, should they experience any distress.

Participants were also informed of the ethical aspects of participation. It was emphasized that their participation was voluntary and could be withdrawn at any time, and that if they supplied any data they would later like deleted, their request would be immediately granted. They were informed that all questionnaire responses would be kept confidential and that their personal information for the purposes of compensation would be linked to an ID Number, and stored in a separate password protected file only accessible to the principal investigators.

Lastly, participants were informed that all information gathered was for research purposes only, and that any journal publications or presentations resulting from study findings would not reveal personally identifying information. Once publications from this study were complete, all data and participant information would be destroyed.

After reading the letter of information, they were provided with a consent form. They were required to check a ‘yes’ button if they agreed to participate and a ‘no’ button if they did not agree to participate. Participants who responded ‘yes’ were then asked to proceed to completion of the battery of questionnaires.

*Participant Compensation*
Individuals recruited from Mechanical Turk were provided with $3.50 through Amazon Payments, in order to coincide with the standard compensation rate on this website. All other participants recruited elsewhere online were provided with $10 for their participation, either through Paypal (which only required their Paypal email address) or via cheque (which required their name and address). At the end of the survey, participants were asked to indicate whether they preferred to be compensated through Paypal or through cheque, and to provide the respective necessary contact details. All participants were also entered into a draw to win a $150 gift certificate to the online store of their choice.

*Ethical Considerations*

Although previous research suggests that responding to questions about self-harm does not entail iatrogenic effects (e.g., Bjarehed, Pettersson, Wangby-Lundh, & Lundh, 2012), several precautionary steps were taken to minimize any potential risks of participation, in addition to informing participants of these potential risks in the Letter of Information. Firstly, at the end of each page of the online survey was a link to a different website (www.squidoo.com) that participants may have accessed if they felt like they were being triggered to self-injure while completing the questionnaires. Secondly, in the Letter of Information and at the conclusion of the online survey, participants were encouraged to contact the researchers should they have concerns or become distressed, or to contact their family physician as an alternative means of support. They were also provided with a list of resources, including telephone hotline numbers (e.g., 1-800-DON’T-CUT; 1-800-273-TALK; 1-800-SUICIDE) and various websites that provide information regarding self-harm, the recovery from and treatment of self-harm, and coping with stress. It was emphasized that the investigators are not affiliated with the resources provided, but that other people have found them to be helpful.
Materials

*Demographic Questionnaire.* An author-constructed demographics survey was administered to assess demographic characteristics. These included participant age, gender, race and ethnicity, citizenship, marital status, and number of years of education and post-secondary education.

**Self-Harm Questionnaires**

*Beck Scale for Suicide Ideation* (BSS; Beck & Steer, 1991). The BSS is a 19-item inventory measuring one's thoughts, intentions, and motivations with respect to suicide. Each item is comprised of three statements rated on a 3-point scale, ranging from 0 to 2, on the basis of escalating intensity. Total scores may thus range from 0 to 38. High internal consistency has been demonstrated, with Cronbach alpha coefficients ranging from 0.89 to .96 in psychiatric samples (Beck, Brown, & Steer, 1979; Beck, Steer, & Ranieri, 1988). Additionally, the BSS has been found to correlate significantly with the BDI, the BHS, and the Revised Hamilton Psychiatric Rating Scale for Depression (Beck, Brown, & Steer, 1997; Beck, Steer, & Ranieri, 1988). In further support of its concurrent validity, Beck, Steer, and Ranieri (1988) found the BSS and clinical ratings of suicide ideation to correlate at .90.

In addition to yielding an overall measure of suicide ideation, the BSS can be partitioned into two subscales (Beck, Brown, & Steer, 1997). The first subscale, Motivation, is comprised of items assessing attitudes about living and dying, as well as the frequency and duration of suicidal thoughts. Preparation, the second subscale, reflects a more active component of suicidal ideation involving planning of a suicide attempt. This two-factor model was supported by a study of suicide attempters by Holden and DeLisle (2005), which yielded alpha reliability coefficients of .85 and .73 for motivation and preparation, respectively.
Self-Injurious Thoughts and Behaviors Interview (SITBI; Nock et al., 2007). This interview was adapted into a questionnaire formation. It is a brief 3-15 minute structured interview that assesses the presence, frequency and severity of behaviours on the spectrum of self-harm, including NSSI, suicidal ideation and attempts of suicide. It also asks four questions to determine the extent to which an individual has engaged in NSSI for one of four functions: automatic negative reinforcement, automatic positive reinforcement, social negative reinforcement, and social positive reinforcement. Previous studies have found strong inter-rater reliability (average $\kappa = .99$) and test-retest reliability over a 6-month period. Support for the convergent validity of the SITBI has been found through demonstrated correlations with measures of suicide ideation and suicide attempts (Nock et al., 2007).

Inventory of Statements about Self-Injury (ISAS; Klonsky & Olino, 2008; Klonsky & Glenn, 2009). This brief self-report instrument measures lifetime frequency of 12 methods of NSSI, as well as 13 NSSI functions. The latter part of the ISAS yields two factors—intrapersonal functions (self-focused functions) and interpersonal functions (other-directed functions). Each subscale is measured via three items on a scale from 0 (‘not relevant’) to 2 (‘very relevant’), yielding total scores from 0 to 6. Alpha coefficients for both scales have been reported to exceed .80 (Glenn & Klonsky, 2011). Support for the test-retest reliability and validity of the ISAS has been found (Glenn & Klonsky, 2011; Klonsky & Olino, 2008).

Functional Assessment of Self-Mutilation (FASM; Lloyd, Kelley, & Hope, 1997). The FASM is a self-report scale assessing the methods, frequency, and functions of self-injury in the previous 12 months. The first part of the FASM enquires about engagement in various methods and frequency. It yields 2 factors of severity—‘moderate/severe NSSI’ and ‘minor NSSI.’ Alpha coefficients of .65 and .66 have been reported for moderate and severe forms of NSSI,
respectively (Guertin et al., 2001). The second part of the FASM asks participants to rate, on a scale from 0 (‘Never’) to 3 (‘Often’), how often each of the 22 listed functions were motivations for engaging in self-injury. This yields four-factors of NSSI functions, including automatic-negative reinforcement (e.g., “to stop bad feelings”), automatic-positive reinforcement (e.g., “to feel relaxed”), social-negative reinforcement (e.g., “to avoid punishment or paying the consequences”), and social-positive reinforcement (e.g., “to get attention”). Alpha coefficients of these subscales ranged from .62 to .85 (Nock & Prinstein). This four-factor model has been replicated in a community sample of adolescents (Lloyd-Richardson, Perrine, Dierker, & Kelly, 2007).

Support for the psychometric properties of the FASM has been found in both community (Lloyd, 1998; Lloyd et al., 1997) and clinical samples (Guertin et al., 2001). The FASM has demonstrated significant relations with hopelessness, depression, suicidal ideation, and past and recent suicide attempts (Guertin et al., 2001; Lloyd et al., 1997; Nock & Prinstein, 2004).

Vulnerability Profile Measures

*UPPS Impulsive Behavior Scale* (UPPS; Whiteside & Lynam, 2001). The 12-item Urgency subscale was utilized in this study. Response options range from 1 (“Agree strongly”) to 4 (“Disagree strongly”), with higher scores indicating greater levels of urgency. Items include, “‘When I am upset I often act without thinking” and “I often make matters worse because I act without thinking when I am upset.” Internal consistency for this subscale is high, and the reliability and validity of this measure have been supported in several studies (Whiteside & Lynam, 2001; Whiteside et al., 2005).

*Emotion Reactivity Scale* (Nock, Wedig, Holmberg, & Hooley, 2008). This is a 21-item scale measuring an individual’s characteristic emotion reactivity, consisting of emotion intensity
(e.g., “When I experience emotions, I feel them very strongly/intensely”), sensitivity (e.g., “I tend to get emotional very easily”), and persistence (e.g., “When something happens that upsets me, it’s all I can think about it for a long time”). Items are rated on a five-point scale, ranging from “Not at all like me” to “Completely like me,” with higher scores indicating higher emotional reactivity. Factor analyses revealed in a sample of adolescents and young adults that a single emotion reactivity factor was most accurate, which showed strong internal consistency of $\alpha = .94$ (Nock et al., 2008). There is preliminary evidence for the convergent and divergent validity of the ERS, as shown by significant relations with several aspects of adolescent temperament, including behavioural inhibition, behavioural control, frustration, aggression and fearfulness. Criterion-related validity is supported by findings that individuals with an anxiety, mood, or eating disorder evidence significantly greater emotion reactivity than those without these disorders, as well as findings that individuals with a recent history of various forms of self-harm report greater emotion reactivity than those with no such history (Nock et al., 2008).

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The DERS is a 36-item self-report measure assessing six factors of emotion dysregulation. In this study, only the Strategies subscale will be administered. Items are rated on a five-point Likert scale, ranging from 1 (“Almost Never”) to 5 (“Almost Always”), with higher scores reflecting greater emotion dysregulation. Previous studies have found the strategies subscale to have a Cronbach’s alpha value exceeding 0.90 (Gratz & Roemer, 2004), and good test-retest reliability has been reported (Gratz & Roemer, 2004). In addition to demonstrating adequate predictive validity, the DERS has been found to correlate strongly with experimental tests of emotion regulation among clinical samples (Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2006).
Depressive Attributions Questionnaire (DAQ; Kleim, Gonzalo, & Ehlers, 2011). The DAQ is a brief self-report measure of depressogenic attributional style that takes approximately 2 minutes to complete. Items include “When bad things happen, I think it is my fault”, “When bad things happen to me, I think my life will never get better” and “Bad things happen in all areas of my life.” Participants indicate their level of agreement with each item on a four-point Likert scale, ranging from 0 (“not at all”) to 4 (“very strongly”). The resultant total score reflects the degree to which one espouses internal, stable, and global attributions. Internal reliability of the total score is above .90, and test-retest reliability over a 7-day period is high at .87 (Kleim et al., 2011). In both samples of depressed patients and assault survivors, construct validity of the DAQ has been supported through high correlations with depression severity, self-esteem, hopelessness, and other measures of attribution style (Kleim et al.). Further validity evidence is apparent in findings that the DAQ can distinguish individuals with and without major depressive disorder, as well as uniquely predict depressive symptoms and SCID diagnoses of major depression 6 months later.

Self-Compassion Scale (Neff, 2003a). This is a 26-item measure of self-compassion, comprised of six subscales of self-kindness (e.g., “I try to be understanding and patient towards those aspects of my personality I don’t like”); “When I’m going through a very hard time, I give myself the caring and tenderness I need”), common humanity (e.g., “When I’m down and out, I remind myself that there are lots of other people in the world feeling like I am”), mindfulness (e.g., “When I fail at something important to me, I try to keep things in perspective”), self-judgment (“When times are really difficult, I tend to be tough on myself”), isolation (e.g., “When I’m really struggling I tend to feel like other people must be having an easier time of it”), and over-identification (e.g., “When I fail at something important to me I become consumed by
feelings of inadequacy”), with higher scores indicating higher levels of self-compassion. A five-point Likert scale is used, ranging from 1 (“almost never”) to 5 “(almost always”). A single total score as well as individual subscale scores may be yielded. Cronbach’s alpha has ranged from .77 to .94 (Leary, Tate, Adams, Batts Allen, & Hancock, 2007; Neff, 2003a) and a previous internal consistency value of .92 has been reported for the total scale (Neff, 2003a). The SCS has demonstrated convergent and discriminant validity, as well as high test-retest reliability (Neff, 2003a; Neff, Rudd, & Kirkpatrick, 2007).

Proximal Risk Factor Measures

The Psychache Scale (Holden, Mehta, Cunningham, & McLeod, 2001). The Psychache Scale is a 13-item self-report questionnaire that assesses psychological pain. Items are rated on a 5-point scale, with total scores ranging from 13 to 65. Strong reliability and validity have been established in nonpsychiatric samples (Holden et al., 2001). Utilizing an undergraduate sample, Holden et al. (2001) reported an alpha reliability coefficient of .92, in addition to medium to large correlations with suicide ideation and suicide attempts, respectively. The Psychache Scale has also been found to distinguish suicide attempters from nonattempters, and to improve the statistical prediction of suicidal ideation over and above the contributions of depression and hopelessness (Troister & Holden, 2010).

Reasons for Living Inventory (RFL; Linehan et al., 1983). The 24-item Survival and Coping Beliefs (SCB) subscale of the RFL was administered. Participants indicate how important each statement is to them in promoting life on a Likert scale from 1 (“Not at all important”) to 6 (“Extremely important”). The psychometric properties of the RFL have been demonstrated extensively in both clinical and nonclinical populations (e.g., Range & Antonelli, 1990; Strosahl, Chiles, & Linehan, 1992). Previous research has reported a coefficient alpha of
.92 (Osman et al., 1998), as well as adequate test-retest reliability (Osman, Barrios, & Osman, 1994).

CHAPTER 3—STATISTICAL ANALYSES

Discriminant function analysis (DFA) is used to determine an optimal combination of predictor variables that can discriminate between two or more groups and thus predict group membership. It does so by creating one or more discriminant functions, or orthogonal linear combinations of predictors, the first of which offers the greatest maximization of differences between groups, and so forth. It involves a two-step process in which the significance of a set of discriminant functions is tested, followed by a classification of each individual into groups based on their scores on derived classification functions. This latter step then provides estimates of sensitivity and specificity, and thus the practical utility of the discriminant function. In DFA, the groups are selected a priori based on prior knowledge and a set of predictors are evaluated with respect to degree of correct identification. For the first part of the study, the groups were delineated as follows: A history of NSSI-only group (i.e., ‘yes’ to the question on the SITBI asking about prior engagement in NSSI); a history of suicidality-only group (i.e., ‘yes’ to the SITBI question asking about prior suicide attempts, and/or an affirmative response to questions 4 or 5 on the BSS); a history of both NSSI and suicidality (i.e., meeting criteria for both the NSSI and suicidality groups), and a no history of self-harm group (i.e., negative responses to all questions on the SITBI and BSS pertaining to occurrences of NSSI, suicide attempts or suicide ideation). For the second part of the study, the groups were formed as follows: A current NSSI-only group (i.e., ‘yes’ to the SITBI question enquiring about previous engagement in NSSI, as well as responses indicating that their most recent self-injurious episode was within the past 6 months); and a current NSSI+suicidality group (i.e., responses on the SITBI indicating at least 1
NSSI episode within the past 6 months, as well as at least 1 suicide attempt within the past 6 months and/or a positive response to questions 4 or 5 on the BSS).

Alternative statistical approaches include cluster analysis and latent class analysis, in which the groups are unknown, and thus delineated empirically on the basis of a set of predictors. Given that the number of groups and their membership were known in this study, and given that the essential statistical goal of this study was to evaluate the utility of specific variables in identifying group membership, as opposed to the mere classification of individuals into groups, DFA was deemed to be the appropriate analysis. Therefore, in order to identify a vulnerability cluster for self-harm, as well as to examine the distinguishing utility of psychache and survival and coping beliefs, separate DFAs were conducted. Additional DFAs were also conducted to determine whether results varied by gender.

Cohen’s kappa statistics were calculated to determine the overall classification accuracy of the discriminant functions compared to chance alone. A kappa of zero indicates that the discriminant function provides zero improvement over chance, while a kappa of one indicates perfect agreement. This is a chance-corrected procedure that takes into account differences in group sizes when estimating classification accuracy (Titus, Mosher & Williams, 1984). This is important because the probability of classification into a group based on chance is proportional to group size. Therefore, the presence of unequal group sizes may attenuate apparent improvements in classification accuracy beyond those of chance, leading to biased classification rates. For instance, if one group has 30 individuals and the other group has 70 individuals, the probability of correct classification is 70% based on chance alone, therefore leaving little room to demonstrate discriminating power above chance. The kappa formula is the sum of the observed proportion of agreement minus the sum of the chance expected proportion of
agreement, which is then divided by 1 minus the sum of the chance expected proportion of
agreement (see Figure 1).

A mediation analysis was also conducted to determine whether a third variable (i.e., the
vulnerability profile) would, in fact, completely mediate the relationship between NSSI and
suicide. To do this, the SPSS macro INDIRECT (Preacher & Hayes, 2008) was implemented
using bootstrapping approaches with 3000 samples to construct confidence intervals for the total
and indirect effects of NSSI history on suicide history, mediated by the vulnerability profile. A
statistically significant effect was indicated when its 95% confidence interval did not include
zero.

To investigate the impact of missing data on the study findings, results were also
completed using the multiple imputation method. This procedure imputes missing values several
times based on random selection of different estimates of the underlying distributions in the
population (Yuan, 2000). There were five imputations completed for each analysis, thereby
creating five new data sets with different imputed values. The discriminant function analysis
procedure was then computed on each of the imputed data sets. The impact of missing data on
the results was then examined by comparing the statistical results and associated conclusions
across the original and imputed data sets. Multiple imputation has been noted to have several
attractive features, including providing approximately unbiased estimates given the incorporation
of random error into imputation, as well as providing acceptable estimates of standard errors due
to the performing of imputation multiple times (Landerman, Land, & Pieper, 1997). To further
investigate the impact of missing data, differences between completers and non-completers were
then evaluated using a series of t-tests. A Missing Values Analysis was also conducted in SPSS
in order to identify any patterns in the missing data.
CHAPTER 4: RESULTS

Preliminary Analyses

Missing Data Analyses

A single data set started with 476 individuals. The first step of analyses screened the data for duplicate entries, the duplicates of which were deleted. Those who did not meet the clearly-indicated age criteria (i.e., those who were over the age of 24 years) were also excluded from the analyses, resulting in a sample of 347 individuals. Because the age group of 16-17 years remains an important and relevant age group for research on self-harm among youth, in spite of not being actively recruited, the 40 individuals who were between the ages of 16 and 17 years were not excluded.

Univariate outliers and multivariate outliers were then sought and deleted. Mahalanobis distances were calculated to identify multivariate outliers, while box plots were used to identify significant univariate outliers. After outliers were removed, the number of participants available for the purposes of identifying a vulnerability profile contained 331 individuals (see Figure 2). With this working data set, twenty-eight individuals (8.45%) were missing data that permitted categorization into one of the four groups, thus leaving a total of 303 individuals available for the first discriminant function analysis. Of these 303 individuals, 41 (13.5%) individuals were missing total scores on at least one of the vulnerability profile variables. Thus, the missing data rate for the vulnerability profile analyses was 20.85%. With respect to the assessments of psychache and survival and coping beliefs, 333 individuals were available for analyses after outliers were removed. Only those who completed BSS items 4 and 5 or answered the suicide attempt question were able to be categorized. Thus, 30 individuals (9%) were missing data on at least one of these categorization variables, leaving 303 individuals available for categorization.
Of these remaining 303 participants, 31 (10.23%) individuals were missing a total score for psychache and 40 (13.20%) individuals were missing a total score for survival and coping beliefs. Thus, the missing data rates were 18.32% for the psychache analysis and 21.02% for the survival and coping beliefs analysis.

Missing data analyses were then completed. Firstly, t-tests were used to compare ‘completers’ versus ‘noncompleters.’ Completers were defined as those who were included in at least one of the study analyses, while non-completers were defined as those who were not included in the study analyses due to having more than 10% of items missing on at least one scale (Langkamp, Lehman, & Lemeshow, 2010). Completers were found to be significantly older, \( t(269) = 4.49, p < .01 \) and more educated, \( t(161) = 4.81, p < .01 \) (see Table 1). No statistically significant differences were found for gender, \( \chi^2(1) = 2.18, p = .13 \). When considering indices of self-harm, no statistically significant differences were found for suicidal ideation, \( t(178) = .13, p = .80 \). The completer versus non-completer groups also did not differ on whether they desired to stop self-harming, \( \chi^2(1) = 1.96, p = .17 \), or the frequency of NSSI, \( \chi^2(3) = 3.14, p = .36 \).

A Missing Value Analysis in SPSS was also used to determine any potential missing data patterns. It was found that 8.15% of individuals were missing data permitting categorization into self-harm vs. no self-harm groups, in addition to missing data on all of the study scales analyzed in parts 1 and 2 of this study. No other significant patterns emerged, defined as more than 5% of cases exhibiting the uncovered pattern. For the majority of cases (92%), missing data can thus be considered to show a random pattern. For cases with variable-wide missing data (8%), it did not appear to be specific to one scale, but rather, it was missing equally across all scales. Such a pattern may reflect issues with boredom, difficulty sustaining attention, or loss of interest or
Table 1

*Descriptive Statistics: Completers versus Non-Completers (N = 271)*

<table>
<thead>
<tr>
<th></th>
<th>Age Mean (Years)</th>
<th>Age Range</th>
<th>Education Mean (SD)</th>
<th>Education Range</th>
<th>BSS Mean (SD)</th>
<th>BSS Range</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>21.24 (2.1)</td>
<td>16-24</td>
<td>14.45 (12.56)</td>
<td>9-20</td>
<td>10.55 (7.96)</td>
<td>0-35</td>
<td>46.8% (n = 95)</td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>53.2% (n = 108)</td>
</tr>
<tr>
<td>Non-Completers</td>
<td>19.71 (2.54)</td>
<td>16-24</td>
<td>12.56 (2.38)</td>
<td>6-16</td>
<td>13.47 (7.20)</td>
<td>2-24</td>
<td>38.2% (n = 26)</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>61.8% (n = 42)</td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Note. BSS = Beck Scale for Suicidal Ideation*
desire to participate.

**Testing Assumptions of Discriminant Function Analysis**

The next step of analyses was to determine whether the assumptions of discriminant function analysis (DFA) were met. One assumption is that all cases must be independent in groups that are mutually exclusive. This assumption was met, as the groups were delineated as follows: Individuals with a history of NSSI and not suicidality, individuals with a history of suicidality and not NSSI, individuals with a history of both forms of self-harm, and individuals whose history is negative for self-harm.

Another satisfied assumption is that the independent variables (i.e., impulsive urgency, emotional reactivity, strategies, negative attribution style, and self-compassion) are interval variables, while the dependent variable, which is the group into which participants are classified, is nominal. Additionally, the number of independent variables also satisfied DFA assumptions, as it was within the limit of the sample size minus two (i.e., 331).

A fourth assumption relates to the sample size requirements, which were deemed appropriate. Tabachnick and Fidell (2007) suggest that the number of cases in the smallest group exceeds the number of predictor variables in order to enhance the generalizability of results. It is generally recommended that there should be 4-5 times as many observations as independent variables, resulting in a requirement of 20-25 individuals in each group (Tabachnick & Fidell, 2007). However, technically the sample can be as small as the number of independent variables plus two (Poulsen & French, 2004). Regarding the permissibility of unequal sample sizes, this is considered acceptable in DFA (Poulsen & French).

Another assumption is one of multivariate normality, although DFA is robust to violations of this assumption due to skewness, as opposed to outliers (Burns & Burns, 2008;
Tabachnick & Fidell, 1996). As described previously, outliers found using Mahalanobis distance and boxplot techniques were deleted. Univariate normality of the predictor variables is also assumed in DFA, and was assessed by calculating the degree of skewness for each variable. Skewness is deemed to be present if the absolute value of the skewness is less than three times the standard error of skewness (Ye, 2008). No variables were considered to have significant skewness using this criterion, although robustness would have nonetheless been assumed when the smallest group has at least 20 individuals and there are a parsimonious number of predictor variables (Poulsen & French, 2004).

The homogeneity of variance-covariance assumption states that the variance/covariance matrices of predictor variables are homogeneous across groups. This is tested in SPSS using the Box’s M test, which tests the null hypothesis that the group variance-covariance matrices are equal. This test is notoriously sensitive (Tabachnik & Fidell, 2001) and as such, was significant for most of this study’s analyses. DFA, however, is considered robust to violations of this assumption, as long as significant outliers have been removed (Lachenbruch, 1975). An additional solution is to substitute separate covariance matrices when performing the DFA. This was found to only improve classification accuracies by a negligible amount (generally around .5%), so these results are not reported in the present result section.

The assumption of multicollinearity specifies that there must be an absence of high correlations ($r > 0.9$) between predictor variables (Pallant, 2005). Pearson correlations were calculated and did not reveal evidence of significant multicollinearity. As expected, each variable was significantly correlated with each of the remaining variables (see Table 2).
Table 2

*Correlations among Vulnerability Profile Variables (N = 282)*

<table>
<thead>
<tr>
<th></th>
<th>Urgency</th>
<th>Emotional Reactivity</th>
<th>Strategies</th>
<th>Negative Attribution</th>
<th>Self-Compassion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urgency</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional Reactivity</td>
<td>.58**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategies</td>
<td>.60**</td>
<td>.85**</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Attribution</td>
<td>.59**</td>
<td>.78**</td>
<td>.87**</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Self-Compassion</td>
<td>-.54**</td>
<td>-.59**</td>
<td>-.69**</td>
<td>-.59**</td>
<td>--</td>
</tr>
</tbody>
</table>

*Note.* **p < .01, two-tailed.*
Overall Sample Characteristics

The gender composition of the total sample was 40.5% men \((n = 140)\) and 59.5% women \((n = 206)\) out of \(N = 347\). The majority of the sample was single (92.2%) and were of white ethnicity (80%). The ethnic composition of the remaining participants who responded to this question was as follows: Black (7.3%), East Asian (5.7%), South East Asian (3.9%), South Asian (2.7%), Aboriginal (1.2%), Arab/West Asian (0.9%), Latin American (0.6%) and Pacific Islander (0.6%). The mean age was 20.72 years \((SD = 2.43)\), while the mean level of education completed was 13.03 years \((SD = 3.69)\).

A high rate of co-occurrence between NSSI and suicidality was found, with nearly 60% of self-harming individuals that were initially recruited \((n = 216)\) reporting histories of both forms of self-harm \((n = 125)\). The remaining 40% were distributed relatively evenly across the NSSI-only and Suicidality-only groups. The average age of onset for NSSI was 14.29 years \((SD = 2.94)\). The average lifetime frequency of NSSI episodes was 47.94 \((SD = 140.42)\), but showed great dispersion, while the average NSSI frequency in the past month and week were 2.41 \((SD = 7.95)\) and .78 \((SD = 2.28)\), respectively. The majority of individuals in the NSSI groups endorsed cutting as one of their main forms of NSSI (59.4%). The remaining method frequencies were as follows: biting (19.4%), banging or hitting self (15.2%), burning (17.6%), interfering with wound healing (21.2%), carving (10.9%), rubbing skin against rough surface (11.5%), pinching (9.1%), sticking self with needles (5.5%), pulling hair (7.3%), swallowing dangerous substances (3.6%), and other (1.8%). The majority of individuals reported experiencing physical pain during NSSI (59.9%), with 35.2% reporting pain ‘sometimes.’ In terms of NSSI functions, “releasing emotional pressure that has built up inside of me” (90.5%), “calming myself down” (81.8%), and
expressing anger towards the self for being worthless or stupid (78.2%) were the most commonly endorsed reasons for NSSI engagement.

The average age of onset for suicide attempts was 15.40 years ($SD = 2.76$). The average frequency of lifetime suicide attempts was 7.37 years ($SD = 11.35$), with the majority of suicide attempters reporting more than one lifetime suicide attempt (81.8%). As found previously (Gratz, 2006), the most common methods of suicide attempt were using a sharp object (22.2%), ingesting poison (12.5%) or using illicit (14.2%), prescription (13.6%) or over the counter the drugs (12.5%). The most common circumstance identified as most significantly contributing to one’s recent attempt was a dispute with a spouse/lover (20.5%), followed by dispute with family or friends (17.1%), and psychiatric symptoms (16.8%). The remaining reasons were roughly evenly endorsed, including job loss/academic failure (6.8%), financial problems (6.2%), eviction (3.1%), health problems (4.3%), death of another person (6.8%) and unknown (3.7%). A humiliating event was endorsed by less than 1% of the sample.

**Individual Group Characteristics – Part I Study Groups (History of NSSI-only; History of suicidality-only; History of NSSI+suicidality; No history of self-harm)**

Examining the four groups in the first part of the dissertation, significant differences among the groups were found for gender, $\chi^2(3) = 13.41, p < .01$. There were more women (80%) than men in the NSSI-only group, with roughly comparable numbers in the suicidality-only group (60% women) and NSSI+suicidality group (56% women). There were approximately comparable numbers in the no self-harm group (45% women). Thus, women were more greatly represented in the NSSI-only group than in the suicidality-only or NSSI+suicidality groups.

Differences were also found in completed years of education, $F(3, 200) = 4.87, p < .01$, whereby the history of suicidality-only group had a lower average years of education ($M = 12.19, SD = \ldots$
3.54) than those with no history of self-harm \((M = 14.07, SD = 2.30)\) and those with both NSSI+suicidality \((M = 14.27, SD = 2.70)\). There were no significant differences among the four groups in marital status, \(\chi^2 (12) = 10.415, p = .58\), or in age, \(F(3, 304) = 1.39, p = .24\).

Differences in several characteristics of NSSI and suicide were also compared among the following combinations of groups: Suicide-only vs. NSSI+suicidality; History of NSSI-only vs. History of NSSI+suicidality; and self-harming men vs. self-harming women.

**History of Suicidality-only vs. History of NSSI+suicidality**

No differences were found in the age of onset for suicide attempts, \(t(103) = 1.59, p = .11\), with the average age being 16.58 \((SD = 3.11)\) and 15.25 \((SD = 2.69)\) for the suicide-only and ‘both’ groups, respectively. The ‘both’ group \((M = 8.75, SD = 12.41)\) did, however, report a greater number of lifetime suicide attempts than the suicide-only group \((M = 2.15, SD = 1.06)\), \(t(106.36) = -5.30, p < .01\). No differences were found in the average intensity of suicidal thoughts, \(\chi^2(4) = 8.79, p = .07\), with both groups most commonly reporting an intensity of 3 on a 4-point scale. Significant differences were found in the circumstance identified as contributing to the most to a most recent attempt, \(\chi^2(10) = 34.89, p < .01\), with greater proportions of those in the ‘both’ group endorsing dispute with family/friends (19.64% vs. 8.16%) and psychiatric symptoms (19.64% vs. 4.08%).

**History of NSSI-only vs. History of NSSI+suicidality**

With respect to NSSI characteristics, there were no significant differences in the frequency of NSSI in the past month, \(t(148) = -1.2, p = .22\), lifetime frequency of NSSI, \(t(102) = .31, p = .37\), or frequency of NSSI in the past week, \(t (147) = -1.37, p = .17\). Specifically, the average frequencies reported by the ‘both’ group were 2.88 \((SD = 9.12)\) in the past month, 45.57 \((SD = 135.69)\) over one’s lifetime, and .84 \((2.62)\) in the past week. For the history of NSSI-only
group, the average frequencies were $1.08 \ (SD = 2.14)$ in the past month, $54.96 \ (SD = 156.24)$ over one’s lifetime, and $.26 \ (SD = .59)$ in the past week. There were also no differences in the average age of onset of NSSI, $t(143) = -.96, p = .33$, which was $13.89 \ (SD = 2.37)$ for the history of NSSI-only group, and $14.43 \ (SD = 3.12)$ for the ‘both’ group.

Although no differences were found in NSSI intrapersonal functions, $t(143) = -1.17, p = .24$, those in the ‘both’ group ($M = 39.57, SD = 12.78$) had greater levels of NSSI interpersonal functions than those in the NSSI-only group ($M = 29.97, SD = 7.80$); $t(97.60) = -5.25, p < .01$. The groups also did not significantly differ on their experience of physical pain during NSSI, $\chi^2(2) = 4.95, p = .08$. Specifically, the NSSI-only group responded ‘yes’ (45%) or ‘sometimes’ (47.50%) the majority of the time, as opposed to ‘no’ (7.50%). The ‘both’ group responded ‘yes’ (64.75%) the majority of the time, followed by ‘sometimes’ (31.14%), and ‘no’ (4.09%).

Significant differences were found for seriousness of NSSI (as indicated by whether they had ever received medical treatment for NSSI), $\chi^2(3) = 13.29, p < .01$. In the NSSI-only group, most individuals (72.5%) did not receive medical treatment in the past year, while in the ‘both’ group, a slight majority of individuals had a history of NSSI requiring treatment (56%). Cutting was the most commonly endorsed main form of self-harm (75% in the NSSI-only group; 54.5% in the ‘both’ group). In the ‘both’ group, biting (24%) and burning (19.20%) were also more commonly endorsed.

**Men vs. women**

Women ($M = 57.75, SD = 165.92$) reported greater lifetime NSSI frequency than men ($M = 11.76, SD = 14.97$), $t(105) = -2.11, p = .03$. However, no differences were found in frequency during the past month, $t(15) = -1.52, p = .13$, or week, $t(15) = -.42, p = .67$. Among women, the average frequency was $2.60 \ (SD = 9.09)$ in the past month, and $.61 \ (SD = 2.56)$ in the past week.
Among men, the average frequency was .86 (SD = 1.22) in the past month, and .43 (SD = .77) in the past week. As found previously, both men and women had their onset in adolescence, but women had an earlier mean age of onset (M = 13.48, SD = 2.28) than men (M = 15.90, SD = 4.07), t(145) = 5.07, p < .01. A greater proportion of female self-injurers (78.64%) than male self-injurers (27.40%) endorsed cutting as one of their main methods, $\chi^2(1) = 34.04, p < .01$, while a greater proportion of men (30.64%) than women (12.62%) endorsed biting, $\chi^2(1) = 6.34, p < .01$. A greater proportion of men also endorsed burning (33.87% for men; 7.76% for women), $\chi^2(1) = 14.60, p < .01$; carving (19.35% for men; 5.82% for women), $\chi^2(1) = 7.92, p < .01$; rubbing skin against a rough surface (24.19% for men; 3.88% for women), $\chi^2(1) = 14.02, p < .01$; and pinching (19.35% for men; 2.91% for women), $\chi^2(1) = 10.95, p < .01$. No differences were found in severe scratching (16.12% for men; 13.59% for women), banging or self-hitting (22.58% for men; 10.67% for women), interfering with wound healing (22.58% for men; 20.38% for women), sticking self with needles (9.67% for men; 2.91% for women), pulling hair (8.06% for men; 6.79% for women), or swallowing dangerous substances (3.22% for men; 3.88% for women).

With respect to differences in NSSI intrapersonal and interpersonal functions, as measured by the Inventory of Statements about Self-Injury (Klonsky & Olino, 2008; Klonsky & Glenn, 2009), it was expected that women would report greater intrapersonal functions, but comparable interpersonal functions as men, as found in previous research (Glenn & Klonsky, 2007). However, in the present study, no significant differences were found between men and women on endorsement of NSSI intrapersonal functions (e.g., emotion regulation; calming self down; releasing anger), with men evidencing a mean score of 27.20 (SD = 8.78) and women evidencing a mean score of 28.04 (SD = 8.23). However, relative to women (M = 31.27, SD
men ($M = 40.45, SD = 31.27$) had significantly higher scores on NSSI interpersonal functions (e.g., interpersonal communication; reducing interpersonal demands), $t(157) = 7.17, p < .01$. Men were also more likely to have a history of serious self-injury, $\chi^2(3) = 25.08, p < .01$. Specifically, the majority of NSSI men reported a history of receiving medical treatment for harm caused by NSSI (72.58%) while the majority of NSSI women did not report such a history (68%). There were significant gender differences in the experience of physical pain during NSSI, $\chi^2(2) = 12.06, p < .01$. The majority of men reported experiencing physical pain during NSSI (77.05%), with 19.7% of men experiencing pain ‘sometimes.’ Among women, roughly equal numbers of women respond ‘yes’ (49.5%) or ‘sometimes’ (44.55%) to the question of pain. In both men and women, however, the total absence of pain across NSSI episodes was uncommon (3.27% in men and 5.9% in women).

With respect to features of suicidality, men ($M = 13.53, SD = 15.27$) reported a greater number of lifetime suicide attempts than women ($M = 2.75, SD = 1.95$), $t(127) = 5.98, p < .01$. Men ($M = 16.08, SD = 2.74$) also reported a later average age of onset of suicide attempts than women ($M = 14.78, SD = 2.66$), $t(103) = 2.38, p = .01$. Men and women did not significantly differ on the average intensity of suicidal thoughts, $\chi^2(4) = 1.89, p = .45$, with both groups most commonly reporting an average intensity of 2 on a 4-point scale.

Sample Characteristics – Part II Study Groups (Current NSSI-Only and Current NSSI+Suicidality)

There were significant differences in gender, $\chi^2(1) = 18.730, p < .01$, such that the current NSSI-only group had more women (94.59%) than men (5.40%), but roughly equal numbers in the current NSSI+suicidality group. The NSSI+suicidality group ($M = 14.70, SD = 2.69$) was found to have significantly more years of education than the NSSI-only group ($M =$
12.65, SD = 2.45), $t(48) = -2.73, p < .01$. No significant differences in marital status were found, as the majority of individuals in both groups were single (91.89% in the current NSSI-only group; 92.5% in the ‘both’ group). Lastly, the ‘both’ group ($M = 20.33, SD = 2.30$) was not found to significantly differ in average age than the current NSSI-only group ($M = 19.35, SD = 2.49$).

Those with both current NSSI+suicidality ($M = 42.42, SD = 12.90$) were also found to have higher scores on interpersonal functions (i.e., they endorsed more interpersonal reasons for engaging in NSSI) than those with NSSI-only ($M = 30.88, SD = 8.60$), $t(64.880) = -4.52, p < .01$. No differences were found on intrapersonal functions, $t(71) = -1.50, p = .18$, as both groups had similar mean scores ($M =32.05, SD = 5.56$ for the current NSSI-only group; $M =34.00, SD = 5.45$ for the ‘both’ group). The average age of NSSI onset was 14.00 ($SD = 1.84$) for the current NSSI-only group, and 14.44 ($SD =3.76$) for the ‘both’ group, which did not represent a statistically significant difference, $t(56.59) = -.64, p = .52$. Additionally, there were no statistically significant differences in frequency of lifetime NSSI engagement, $t(40) = 1.18, p = .24$, frequency of NSSI in the past month, $t(73) = .13, p = .89$, or frequency of NSSI in the past week, $t(73) = .75, p = .45$. Specifically, among those with current NSSI-only, the average frequency of NSSI was 4.69 ($SD = 12.88$) in the past month, 103.32 ($SD = 235.88$) over one’s lifetime, and 1.42 ($SD = 4.23$) in the past week. Among those with both current NSSI and suicidality, the mean frequency of NSSI was 4.36 ($SD = 9.08$) in the past month, 39.00 ($SD = 101.53$) over one’s lifetime, and .87 ($SD = 1.54$) in the past week. No differences were found in the experience of physical pain during NSSI, $\chi^2(2) = 2.92, p = .23$. Specifically, in the current NSSI-only group, 57.14% endorsed ‘yes,’ 42.85% endorsed ‘sometimes,’ while 0% endorsed ‘no.’ In the current NSSI+suicidality group, 57.50% endorsed ‘yes,’ 35% endorsed ‘sometimes’,
and 7.5% endorsed ‘no.’ However, there were significant differences in the receipt of medical treatment for NSSI in the past year, $\chi^2(1) = 11.24, p < .01$. Specifically, those with both NSSI and suicidality had a greater proportion of individuals who did receive medical treatment (61.5%), while the NSSI-only group had a greater proportion of individuals not receiving medical treatment (77.1%). No differences in NSSI method were found, with the majority of individuals in both groups (78% in the NSSI-only group and 52% in the ‘both’ group) endorsing cutting as one of their main forms of self-harm.

**Results of the Primary Analyses: Part I**

**What is the Vulnerability Profile that Distinguishes Among Those with a History of NSSI-Only, Suicidality-Only, NSSI+suicidality, and No History of Self-Harm?**

A discriminant function analysis was conducted to determine whether the four study groups could be distinguished based on the vulnerability profile comprised of urgency, emotional reactivity, strategies, negative attributions and self-compassion. The first discriminant function containing all five variables was statistically significant, Wilks’ $\Lambda = .47, \chi^2 (15, N = 261) = 192.27, p < .01$, with 71% of its variation accounted for by group membership. The structure matrix revealed the strongest correlation between negative attribution style and the discriminant function (.92), followed by strategies (.88), emotional reactivity (.85), self-compassion (-.58) and urgency (.56). Examining the means computed for each group, the NSSI+suicidality group had the highest mean on function 1, followed by suicide-only, then NSSI-only, then no history of self-harm. This pattern was generally consistent with the pattern of group means on the individual variables contributing to this discriminant function (see Table 3). Most of the separation appeared to center on the no self-harm group versus the self-harm groups (see Figure 3). The second discriminant function containing only self-compassion was also found to be
Table 3

Descriptive Statistics: Function Variables by Group and Gender (N = 261)

<table>
<thead>
<tr>
<th></th>
<th>Urgency Mean (SD)</th>
<th>Emotional Reactivity Mean (SD)</th>
<th>Strategies Mean (SD)</th>
<th>Negative Attribution Style Mean (SD)</th>
<th>Self-Compassion Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NSSI-Only</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>34.57 (9.86)</td>
<td>72.87 (22.41)</td>
<td>25.42 (5.19)</td>
<td>46.71 (12.22)</td>
<td>61.28 (16.79)</td>
</tr>
<tr>
<td>Women</td>
<td>35.27 (10.43)</td>
<td>63.10 (20.61)</td>
<td>22.16 (8.04)</td>
<td>45.80 (14.44)</td>
<td>64.48 (16.96)</td>
</tr>
<tr>
<td><strong>Suicidality-Only</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>35.67 (9.23)</td>
<td>65.38 (15.33)</td>
<td>24.14 (5.67)</td>
<td>49.03 (13.18)</td>
<td>69.18 (11.65)</td>
</tr>
<tr>
<td>Women</td>
<td>38 (8.14)</td>
<td>66.07 (16.92)</td>
<td>27.07 (4.71)</td>
<td>53.21 (13.01)</td>
<td>71.34 (10.04)</td>
</tr>
<tr>
<td><strong>NSSI+Suicidality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>36.95 (8.16)</td>
<td>70.44 (15.65)</td>
<td>25.76 (5.84)</td>
<td>53.78 (11.56)</td>
<td>66.28 (15.43)</td>
</tr>
<tr>
<td>Women</td>
<td>37.74 (9.75)</td>
<td>69.12 (18.04)</td>
<td>25.87 (6.58)</td>
<td>52.26 (13.09)</td>
<td>60.59 (17.11)</td>
</tr>
<tr>
<td><strong>No Self-Harm</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>24.66 (9.41)</td>
<td>38.45 (14.56)</td>
<td>13.77 (4.91)</td>
<td>27.57 (11.05)</td>
<td>86.22 (16.18)</td>
</tr>
<tr>
<td>Women</td>
<td>26.10 (9.38)</td>
<td>39.26 (13.76)</td>
<td>14.77 (4.95)</td>
<td>31.29 (11.93)</td>
<td>83.38 (14.92)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>32.59 (10.54)</td>
<td>54.45 (21.12)</td>
<td>21.55 (7.75)</td>
<td>44.20 (16.29)</td>
<td>72.26 (17.72)</td>
</tr>
<tr>
<td>Women</td>
<td>33.66 (11.11)</td>
<td>60.01 (21.31)</td>
<td>21.53 (8.08)</td>
<td>43.41 (16.68)</td>
<td>69.37 (19.70)</td>
</tr>
</tbody>
</table>
statistically significant, Wilks’ $\Lambda = .93$, $\chi^2 (8, N = 261) = 17.71$, $p = .05$, with 21.4% of its variance accounted for by group membership. This function appeared to separate the NSSI-only group, which had the lowest score on this function, from the remaining groups. The chance-corrected procedure showed that classification was 34% better than chance ($\kappa = 0.34$, SE = 0.03, $p < 0.01$, $z = 9.33$) (see Table 4).

**Are similar results found using the multiple imputation method for missing values?**

Five separate imputed data sets were generated, each of which yielded similar results. Each analysis revealed a single significant discriminant function containing all five variables. Chance-corrected classification accuracy rates were similar, ranging from 36.7% to 38.8% improvement beyond chance levels.

**What is the Vulnerability Profile that Distinguishes Among Those with Self-harm and those with No Self-Harm?**

A discriminant function analysis was conducted to compare a single group comprised of individuals with any form of self-harm history to the no self-harm group. Only the first discriminant function containing all five variables was significant, Wilks’ $\Lambda = .52$, $\chi^2 (5, N = 261) = 168.98$, $p < .01$. All variables were significant in the function, with cognition demonstrating the highest loading (.91), followed by strategies (.88), emotional reactivity (.86), self-compassion (-.60) and urgency (.59). The history of self-harm group had the higher mean (.61) than the no history of self-harm group (-1.51). Classification accuracy was found to be 75% better than chance ($\kappa = 0.75$, SE = 0.05, $p < .01$, $z = 12.95$) (see Table 5).

**Are similar results found using the multiple imputation method for missing values?**

The multiple imputation method was once again employed to determine the impact of missing values on the results. Five data sets were generated, each yielding a single discriminant
Table 4

*Number of Individuals Classified by Group on Vulnerability Profile (N = 261)*

<table>
<thead>
<tr>
<th></th>
<th>NSSI-Only</th>
<th>Suicidality-Only</th>
<th>NSSI+Suicidality</th>
<th>No Self-Harm</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSSI-Only</td>
<td>11 (29.75%)</td>
<td>5 (13.5%)</td>
<td>12 (32.4%)</td>
<td>9 (24.3%)</td>
<td>37</td>
</tr>
<tr>
<td>Suicidality-Only</td>
<td>12 (26.1%)</td>
<td>19 (41.3%)</td>
<td>9 (19.6%)</td>
<td>6 (13.0%)</td>
<td>46</td>
</tr>
<tr>
<td>NSSI+Suicidality</td>
<td>23 (22.3%)</td>
<td>30 (29.1%)</td>
<td>44 (42.7%)</td>
<td>6 (5.8%)</td>
<td>103</td>
</tr>
<tr>
<td>No Self-Harm</td>
<td>5 (6.7%)</td>
<td>8 (10.7%)</td>
<td>2 (2.7%)</td>
<td>60 (80%)</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
<td>62</td>
<td>67</td>
<td>81</td>
<td>261</td>
</tr>
</tbody>
</table>

Wilks’ $\Lambda = .47$, $\chi^2 (15, N = 261) = 192.27, p < .01$

153.3% of original grouped cases correctly classified
Table 5

*Number of Individuals Classified by Group on Vulnerability Profile (N = 261)*

<table>
<thead>
<tr>
<th>Predicted Group Membership¹</th>
<th>Self-Harm</th>
<th>No Self-Harm</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Harm</td>
<td>162 (87.1%)</td>
<td>24 (12.9%)</td>
<td>186</td>
</tr>
<tr>
<td>No Self-Harm</td>
<td>10 (13.3%)</td>
<td>65 (86.7%)</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td>172</td>
<td>89</td>
<td>261</td>
</tr>
</tbody>
</table>

*Wilks’ $\Lambda = .52, \chi^2 (5, N = 261) = 168.98, p < .01*

¹86.9% of original grouped cases correctly classified
function containing all five variables. Classification accuracies for the five data sets ranged from 75.4% to 76.4%.

What is the Vulnerability Profile that Distinguishes Among Those with NSSI-Only, Suicidality-Only and NSSI+Suicidality?

The first discriminant function was significant, Wilks’ $\Lambda = .88$, $\chi^2(10, N = 186) = 22.21$, $p = .01$. It was comprised of negative attribution style, Wilks’ $\Lambda = .93$, $F(2, 183) = 6.27$, $p < .01$, and strategies, Wilks’ $\Lambda = .96$, $F(2, 183) = 3.41$, $p = .03$. Negative attribution style had the highest correlation with the discriminant function (.81), followed by strategies (.60). Separation appeared to occur between those with both NSSI+suicidality, who also had the highest mean, and those with NSSI- or suicidality-only (see Figure 4). Classification accuracy, however, was small at 15% beyond chance levels (kappa = 0.15, SE = 0.07, $z = 1.97, p = 0.05$) (see Table 6).

Are similar results found using multiple imputation?

Multiple imputation confirmed the pattern of results described above. Classification accuracies ranged from 16.1 to 19%.

Does the Vulnerability Profile Completely Mediate the Relationship between NSSI and Suicidality?

A principal components analysis was conducted to calculate a total score for the vulnerability profile for each participant. As expected, it extracted one component based on an eigenvalue greater than 1, and contained strategies (.95), negative attribution style (.90), emotional reactivity (.89), self-compassion (-.79) and urgency (.76). It explained 74.4% of the variance. The INDIRECT macro (Preacher & Hayes, 2008) was used to test the mediation effect of the vulnerability profile (defined by the total scores derived from the principal component analysis) on the predictive relationship between NSSI and suicide attempts. This macro estimates
Table 6

*Number of Individuals Classified by Group on Vulnerability Profile (N = 186)*

<table>
<thead>
<tr>
<th>Predicted Group Membership</th>
<th>NSSI-Only</th>
<th>Suicidality-Only</th>
<th>NSSI + Suicidality</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSSI-Only</td>
<td>20 (54.1%)</td>
<td>6 (16.2%)</td>
<td>11 (29.7%)</td>
<td>37</td>
</tr>
<tr>
<td>Suicidality-Only</td>
<td>14 (30.4%)</td>
<td>24 (52.2%)</td>
<td>8 (17.4%)</td>
<td>46</td>
</tr>
<tr>
<td>NSSI+Suicidality</td>
<td>28 (27.2%)</td>
<td>30 (29.1%)</td>
<td>45 (43.7%)</td>
<td>103</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>60</td>
<td>64</td>
<td>186</td>
</tr>
</tbody>
</table>

Wilks’ $\Lambda = .88$, $\chi^2(10, N = 186) = 22.21, p = .01$

1. 47.85% of original grouped cases correctly classified
path coefficients for the total effect of NSSI status (i.e., whether individuals have a history of NSSI; coded as 1 for positive history and 0 for negative history) on suicidality status (i.e., whether individuals have a history of suicidality; coded as 1 for positive history and 0 for negative history), and constructs bootstrap confidence intervals for the indirect mediation effect. It enables testing of dichotomous outcomes and also adjusts for the possible influence of covariates not assessed in the model. Statistical mediation requires three things, which in this case, manifest as follows: (1) NSSI status significantly predicts suicidality status; (2) NSSI significantly predicts the vulnerability profile; (3) The vulnerability profile significantly predicts suicidality status while controlling for NSSI (Baron & Kenny, 1986; Preacher & Hayes, 2004). Analyses revealed that NSSI significantly predicted suicidality status, \( c = 1.58, p < .01 \), as well as the vulnerability profile, \( a_1 = 1.03, p < .01 \). The vulnerability profile also significantly predicted suicidality status while controlling for NSSI, \( b_1 = .69, p < .01 \). Although NSSI status continued to significantly predict suicidality status while controlling for the vulnerability profile, \( c' = .99, p < .01 \), the bias-corrected 95% confidence intervals (.39, 1.18) did not contain zero. The indirect effect was thus statistically significant, suggesting a mediating effect of the vulnerability profile on the relationship between NSSI status and suicidality status (see Figure 5).

**Part I Study Results: Analyzing the Effects of Gender**

**What is the Vulnerability Profile that Distinguishes Among Those with a History of NSSI-only, Suicidality-only, NSSI+Suicidality, and No History of Self-Harm: Influence of Gender**

Examining women exclusively showed a similar pattern of results as the original four-group analysis. The first discriminant function was statistically significant, Wilks’ \( \Lambda = .49, \chi^2(15, N = 154) = 104.54, p < .01 \), with 69.5% of its variance being due to group membership. All five variables had sizeable correlations with this function, which maximally separated the no self-
harm group from the self-harm groups (see Figure 6). Once again, the strongest loading was for negative attribution style (.97), followed by strategies (.85), emotional reactivity (.74), self-compassion (.72) and urgency (.65). The means were lowest for the no self-harm group (-1.71), highest for the NSSI+suicidal group (.74), and moderate for the NSSI-only (.25) and suicidality-only (.26) groups. Classification accuracy improved to 41% beyond chance levels (kappa = 0.41, SE = 0.04, p < 0.1, z = 8.73) (see Table 7). Among women, however, the second discriminant function was not statistically significant.

Among men, group membership explained 78.3% of the variance in a single discriminant function, Wilks’ \( \Lambda = .29 \), \( \chi^2(15, N = 107) = 125, p < .01 \). Only emotional reactivity (.89), strategies (.87) and negative attribution style (.81) had significant loadings on this function. The ‘both’ group had the highest mean on this function, while the NSSI-only and suicidality-only groups had similarly moderate means, and the no self-harm group had the lowest mean. Most of the separation seemed to occur between the self-harm groups and the no self-harm group (see Figure 5). Classification accuracy improved to 56.14% (kappa = 0.56, SE = 0.06, z = 8.94, \( p < .01 \)) (see Table 8).

**What is the Vulnerability Profile that Distinguishes Among Those with Self-Harm and those with No Self-Harm: Influence of Gender**

An investigation of women found the first, five-variable discriminant function to be statistically significant, Wilks’ \( \Lambda = .54 \), \( \chi^2 (5, N = 197) = 92.16, p < .01 \). Approximately 67.8% of the variance was explained by group membership. The same direction of loadings were were found: negative attribution style (.96), strategies (.82), emotional reactivity (.75), self-compassion (.72), and urgency (.66). The mean was the highest for the history of self-harm group (.49) and lowest for the no history of self-harm group (-1.69) (see Figure 6). Classification
Table 7

**Number of Women Classified by Group on Vulnerability Profile (N = 154)**

<table>
<thead>
<tr>
<th>Predicted Group Membership</th>
<th>NSSI-Only</th>
<th>Suicidality-Only</th>
<th>NSSI+ Suicidality</th>
<th>No Self-Harm</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSSI-Only</td>
<td>11 (37.9%)</td>
<td>5 (17.2%)</td>
<td>9 (31%)</td>
<td>4 (13.8%)</td>
<td>29</td>
</tr>
<tr>
<td>Suicidality-Only</td>
<td>4 (13.3%)</td>
<td>16 (53.3%)</td>
<td>7 (23.3%)</td>
<td>3 (10.0%)</td>
<td>30</td>
</tr>
<tr>
<td>NSSI+Suicidality</td>
<td>12 (20.0%)</td>
<td>11 (18.3%)</td>
<td>31 (51.7%)</td>
<td>6 (10.0%)</td>
<td>60</td>
</tr>
<tr>
<td>No Self-Harm</td>
<td>3 (8.6%)</td>
<td>2 (5.7%)</td>
<td>0 (0%)</td>
<td>30 (85.7%)</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>34</td>
<td>47</td>
<td>43</td>
<td>154</td>
</tr>
</tbody>
</table>

Wilks’ $\Lambda = .49$, $\chi^2(15, N = 154) = 104.54, p < .01$

$^1$57.1% of original grouped cases correctly classified
Table 8

Number of Men Classified by Group on Vulnerability Profile (N = 107)

<table>
<thead>
<tr>
<th>Predicted Group Membership¹</th>
<th>NSSI-Only</th>
<th>Suicidality-Only</th>
<th>NSSI+Suicidality</th>
<th>No Self-Harm</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSSI-Only</td>
<td>4 (50.0%)</td>
<td>2 (25.0%)</td>
<td>1 (12.5%)</td>
<td>1 (12.5%)</td>
<td>8</td>
</tr>
<tr>
<td>Suicidality-Only</td>
<td>2 (12.5%)</td>
<td>9 (56.3%)</td>
<td>3 (18.8%)</td>
<td>2 (12.5%)</td>
<td>16</td>
</tr>
<tr>
<td>NSSI+Suicidality</td>
<td>3 (7.0%)</td>
<td>10 (23.3%)</td>
<td>29 (67.4%)</td>
<td>1 (2.3%)</td>
<td>43</td>
</tr>
<tr>
<td>No Self-Harm</td>
<td>3 (7.5%)</td>
<td>4 (10.0%)</td>
<td>1 (2.5%)</td>
<td>32 (80.0%)</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>25</td>
<td>34</td>
<td>36</td>
<td>107</td>
</tr>
</tbody>
</table>

Wilks’ Λ = .29, χ²(15, N = 107) = 125, p < .01

¹69.2% of original grouped cases correctly classified
accuracy improved to 75.29% beyond chance levels (kappa = 0.75, SE = 0.08, z = 8.85, p < .01) (see Table 9).

For men, the first discriminant function was statistically significant, Wilks’ Λ = .39, χ²(5, N = 107) = 96.48, p < .01. Approximately 78.1% of the variance was explained by group membership. Three variables loaded substantially onto this function: strategies (.88), emotional reactivity (.87), and negative attribution style (.78). The mean was the highest for the history of self-harm group (.95) and lowest for the no history of self-harm group (-1.60) (see Figure 7).

Classification accuracy improved to 81.33% beyond chance levels (kappa = 81, SE = 0.07, z = 10.50, p < .01) (see Table 10). In order to clarify these findings, further analyses were conducted. Specifically, women in general were found to report higher urgency, t(271.58) = 1.92, p = .05, but lower self-compassion, t(264.85) = 3.43, p < .01.

**What is the Vulnerability Profile that Distinguishes Among Those with NSSI-Only, Suicidality-Only and NSSI+Suicidality: Influence of Gender**

No discriminant functions were statistically significant when examining female self-harmers exclusively (see Figure 8). Among men, the first discriminant function, Wilks’ Λ = .63, χ²(10, N = 67) = 28.66, p < .01, which had sizeable correlations with self-compassion, Wilks’ Λ = .88, F(2, 64) = 4.08, p = .02, was able to distinguish among male self-harm groups. This function separated men with both NSSI+suicidality who had the highest score on this function, from men with NSSI-only and suicide-only (see Figure 9). Classification accuracy was 41% beyond chance levels (kappa = 0.41, SE = 0.01, z = 25.65, p < .01) (see Table 11).
Table 9

*Number of Women Classified by Group on Vulnerability Profile (N = 154)*

<table>
<thead>
<tr>
<th>Predicted Group Membership(^1)</th>
<th>Self-Harm</th>
<th>No Self-Harm</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Harm</td>
<td>103 (86.6%)</td>
<td>16 (13.4%)</td>
<td>119</td>
</tr>
<tr>
<td>No Self-Harm</td>
<td>2 (5.7%)</td>
<td>33 (94.3%)</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>105</td>
<td>49</td>
<td>154</td>
</tr>
</tbody>
</table>

Wilks’ \(\Lambda = .54\), \(\chi^2 (5, N = 197) = 92.16, p < .01\)

\(^1\)88.3% of original grouped cases correctly classified
<table>
<thead>
<tr>
<th>Predicted Group Membership</th>
<th>Self-Harm</th>
<th>No Self-Harm</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Harm</td>
<td>61 (91.0%)</td>
<td>6 (9.0%)</td>
<td>67</td>
</tr>
<tr>
<td>No Self-Harm</td>
<td>6 (15.0%)</td>
<td>34 (85.0%)</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>67</td>
<td>40</td>
<td>107</td>
</tr>
</tbody>
</table>

Wilks’ $\Lambda = .39$, $\chi^2(5, N = 107) = 96.48, p < .01$

188.8% of original grouped cases correctly classified
Table 11

Number of Men Classified by Group on Vulnerability Profile (N = 67)

<table>
<thead>
<tr>
<th>Predicted Group Membership(^1)</th>
<th>NSSI-Only</th>
<th>Suicidality-Only</th>
<th>NSSI + Suicidality</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSSI-Only</td>
<td>4 (50.0%)</td>
<td>2 (25.0%)</td>
<td>2 (25.0)</td>
<td>8</td>
</tr>
<tr>
<td>Suicidality-Only</td>
<td>3 (18.8%)</td>
<td>10 (62.5%)</td>
<td>3 (18.8%)</td>
<td>16</td>
</tr>
<tr>
<td>NSSI+Suicidality</td>
<td>4 (9.3%)</td>
<td>10 (23.3%)</td>
<td>29 (67.4%)</td>
<td>43</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>22</td>
<td>34</td>
<td>67</td>
</tr>
</tbody>
</table>

\(^1\)64.2% of original grouped cases correctly classified

Wilks’ \(\Lambda = .63, \chi(10, N = 67) = 28.66, p < .01\)
Study Results: Part II

Does Psychache Distinguish Among Current NSSI-Only and Current NSSI+Suicidalty?

A discriminant function analysis was conducted to determine whether psychache could distinguish among those with current NSSI-only \(n = 33\) and those with both current NSSI+suicidality (a recent suicide attempt in the past 6 months or current ideation) \(n = 36\). Psychache was found to be significant, Wilks’ \(\Lambda = .83\), \(\chi^2(1, N = 69) = 12.82, p < .01\). Group membership explained 42% of the variance in psychache. Those with both forms of self-harm had higher psychache levels than those with NSSI-only (see Table 12). The chance-corrected procedure found that psychache improved classification accuracy by 62% beyond chance (kappa = 0.62, SE = 0.05, \(z = 10.53, p < .01\)) (see Table 13). The results of multiple imputation found a similar pattern of results, with classification accuracies for the five data sets ranging from 60.7% to 61.32%.

Does Psychache Distinguish Among Past NSSI-Only and Past NSSI+Suicidalty?

A discriminant function analysis was also completed to determine whether the distinguishing capability of psychache would extend to those with a past history of NSSI-only \(n = 22\) or NSSI+suicidality \(n = 13\). Psychache was not significant, Wilks’ \(\Lambda = .93\), \(\chi^2(1, N = 35) = 2.27, p = .13\).

Does Survival and Coping Beliefs Distinguish Among Current NSSI-Only and Current NSSI+Suicidalty?

Survival and coping beliefs was not significant in discriminating between NSSI+Suicidalty \(n = 35\) and NSSI-only \(n = 33\), Wilks’ \(\Lambda = .98\), \(\chi^2(1, N = 68) = 1.44, p = .23\) (see Table 14). Classification accuracy was improved by a mere 2.5% (kappa = 0.02).
Table 12

*Descriptive Statistics by Group for Psychache and Survival and Coping Beliefs (N = 69)*

<table>
<thead>
<tr>
<th></th>
<th>Psychache</th>
<th>Survival and Coping Beliefs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current NSSI-Only</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>28.50 (16.26)</td>
<td>99.97 (28.31)</td>
</tr>
<tr>
<td>Female</td>
<td>39.58 (11.15)</td>
<td>87.77 (27.72)</td>
</tr>
<tr>
<td><strong>Current NSSI+Suicidality</strong></td>
<td>47.47 (6.98)</td>
<td>81.13 (22.68)</td>
</tr>
<tr>
<td>Male</td>
<td>48.52 (5.46)</td>
<td>92.77 (21.39)</td>
</tr>
<tr>
<td>Female</td>
<td>46.29 (8.39)</td>
<td>68.81 (17.11)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>44 (10.41)</td>
<td>85.81 (25.61)</td>
</tr>
</tbody>
</table>
Table 13

*Number of Individuals Classified by Group on Psychache (N = 69)*

<table>
<thead>
<tr>
<th>Predicted Group Membership</th>
<th>Current NSSI-Only</th>
<th>Current NSSI+Suicidality</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current NSSI-Only</td>
<td><strong>20 (60.6%)</strong></td>
<td>13 (39.3%)</td>
<td>33</td>
</tr>
<tr>
<td>Current NSSI+Suicidality</td>
<td>8 (22.2%)</td>
<td><strong>28 (77.7%)</strong></td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>41</td>
<td>69</td>
</tr>
</tbody>
</table>

Wilks’ $\Lambda = .83$, $\chi^2 (1, N = 69) = 12.82, p < .01$

*69.6% of original grouped cases correctly classified*
Table 14

*Number of Individuals Classified by Group on Survival and Coping Beliefs (N = 68)*

<table>
<thead>
<tr>
<th>Predicted Group Membership1</th>
<th>Current NSSI-Only</th>
<th>Current NSSI+Suicidality</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current NSSI-Only</td>
<td>14 (42.4%)</td>
<td>19 (57.6%)</td>
<td>33</td>
</tr>
<tr>
<td>Current NSSI+Suicidality</td>
<td>15 (42.8%)</td>
<td>20 (57.1%)</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>39</td>
<td>68</td>
</tr>
</tbody>
</table>

Wilks’ Λ = .98, χ² (1, N = 68) = 1.44, p = .23

169.6% of original grouped cases correctly classified
Study Results: Part II – Influence of Gender

Does Psychache Distinguish Among Current NSSI-Only and Current NSSI+Suicidality?: Influence of Gender

Examining women, psychache was significant Wilks’ $\Lambda = .91$, $\chi^2(1, N = 63) = 4.41$, $p = .03$. Psychache was higher in women with both forms of self-harm ($n = 17$) than women with NSSI-only ($n = 31$). Chance-corrected classification accuracy was 45.69%, (kappa = 0.45, SE = 0.09, $z = 4.73$, $p < .01$) (see Table 15). There were only two men in the NSSI-only group, so an analysis of men was not completed.

Does Survival and Coping Beliefs Distinguish Among Current NSSI-Only and Current NSSI+Suicidality: Influence of Gender

Men were not analyzed separately because there were only two men in the NSSI-only group. However, when women were analyzed separately, survival and coping beliefs was, in fact, significant, Wilks’ $\Lambda = .88$, $\chi^2(1, N = 48) = 6.06$, $p = .01$. Women in the NSSI+suicidality group ($n = 17$) had lower survival and coping beliefs than a female, NSSI-only group ($n = 31$). Classification accuracy improved to 51.93% (kappa = 51.93, SE = 0.10, $z = 4.90$, $p < .01$) (see Table 16).

If survival and coping beliefs loses significance when men are included (mostly in the NSSI+suicidality group), then it may be presumed, with caution, that survival and coping beliefs is a significant discriminator for women but not men. This needs to be clarified in future research using larger samples of men who engage in NSSI exclusively.
Table 15

*Number of Women Classified by Group on Psychache (N = 48)*

<table>
<thead>
<tr>
<th>Predicted Group Membership1</th>
<th>Current NSSI-Only</th>
<th>Current NSSI+Suicidality</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current NSSI-Only</td>
<td>18 (58.1%)</td>
<td>13 (41.9%)</td>
<td>31</td>
</tr>
<tr>
<td>Current NSSI+Suicidality</td>
<td>5 (29.4%)</td>
<td>12 (70.6%)</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>25</td>
<td>48</td>
</tr>
</tbody>
</table>

Wilks’ $\Lambda = .91$, $\chi^2 (1, N = 63) = 4.41, p = .03$

162.5% of original grouped cases correctly classified
Table 16

*Number of Women Classified by Group on Survival and Coping Beliefs (N = 48)*

<table>
<thead>
<tr>
<th>Predicted Group Membership</th>
<th>Current NSSI-Only</th>
<th>Current NSSI+Suicidality</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current NSSI-Only</td>
<td>21 (67.7%)</td>
<td>10 (32.3%)</td>
<td>31</td>
</tr>
<tr>
<td>Current NSSI+Suicidality</td>
<td>5 (29.4%)</td>
<td>12 (70.6%)</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>22</td>
<td>48</td>
</tr>
</tbody>
</table>

Wilks’ $\Lambda = .88$, $\chi^2(1, N = 48) = 6.06$, $p = .01$

$^168.7\%$ of original grouped cases correctly classified
CHAPTER 5: DISCUSSION

The following sections will present the findings of the current study, commencing with a summary of the characteristics of the sample in order to contextualize study results, and followed by separate discussions of Parts 1 and 2 of the study. This will be concluded with an overall discussion and review of study limitations and avenues for future research.

Overall Conclusions Regarding Sample Characteristics

The present sample was composed of slightly more women (59.5%) than men (40.5%). Consistent with past research (see Hamza, Stewart, & Willoughby, 2012 for a review), most self-harming individuals reported histories of both NSSI and suicidality (60%), with the remaining 40% being evenly distributed across the NSSI-only and suicidality-only groups. The average ages of onset for both NSSI (14.29 years) and suicide (15.40 years) were consistent with past research (e.g., Muehlenkamp & Gutierrez, 2004; Nock et al., 2008). Estimates of NSSI frequency have varied widely across research studies. Generally, the present sample seemed to endorse higher lifetime rates than those found in previous studies using high-school, college, and outpatient samples (Laye-Gindhu & Schonert-Reichl, 2005; Muehlenkamp & Gutierrez, 2007), and less than those using inpatient samples (Nock, Joiner, Gordon, Lloyd-Richardson & Prinstein, 2006). The majority of individuals in our sample who made a past suicide attempt made more than one attempt (81.8%). This fits with research indicating that a previous suicide attempt is among the strongest predictors of future suicide attempts (Joiner et al., 2005).

Consistent with other research samples (Gratz, 2006; Klonsky, 2007), the majority of individuals in all of the NSSI groups endorsed cutting as one of their main forms of NSSI (59.4%) and reported the experience of pain during self-injury (59.9%). The most common methods of suicide attempts included using sharp objects, ingesting substances, such as poison, or taking
illicit, prescription or over the counter drugs. In terms of NSSI functions, “releasing emotional pressure that has built up inside of me” (90.5%), “calming myself down” (81.8%) and expressing anger towards the self for being worthless or stupid (78.2%) were the most commonly endorsed reasons for NSSI engagement. This is consistent with studies finding NSSI to serve predominantly an intrapersonal, emotion-regulation function (Klonsky, 2007; Klonsky & Glenn, 2009; Nock & Prinstein, 2004). With respect to suicidal motivations, the most commonly endorsed reasons for attempting suicide were disputes with a spouse/lover, family or friend (37.6%), followed by psychiatric symptoms (16.8%), the former of which is consistent with the Interpersonal Theory of Suicide that positions thwarted belongingness and perceived burdensomeness as central catalysts for suicide (Van Orden et al., 2010).

As is generally well-accepted (Hamza, Stewart, & Willoughby, 2012), those exhibiting both types of self-harm, as opposed to a singular type, in many ways represented a more clinically severe group. In this study, it was found that the ‘both’ group had more lifetime suicide attempts, were more likely to endorse psychiatric symptoms as reasons for attempting suicide, and were more likely to engage in NSSI requiring treatment. However, the ‘both’ group did not represent a more ‘severe group’ with respect to age of onset for NSSI or suicidality, experience of physical pain during NSSI, and frequency of NSSI. With respect to self-harm motivations, interpersonal functions appeared to evidence greater endorsement by those with both forms of self-harm, relative to those with NSSI- or Suicidality- only.

The present sample characteristics also lend support to a body of evidence supporting the existence of gender differences in self-harm (see Klonsky & Glenn, 2007 for a review). For one, women were more likely to exhibit NSSI-only, but men appeared to be similarly likely as women to have suicidality or a combination of NSSI and suicidality. Additionally, similar to previous
findings (e.g., Andover et al., 2010), self-harming men were found to make a greater number of lifetime suicide attempts, while women reported greater lifetime NSSI frequency. However, in contrast to previous research which found no differences in occurrence of physical pain during NSSI (Andover et al., 2001), men were found to more consistently engage in painful NSSI, although the majority of women did also engage in painful NSSI either consistently or at least some of the time. As found previously (Andover, Primack, Gibb, & Pepper, 2010), women reported an earlier age of onset for both NSSI and suicide attempts than men. The reason for this is unclear, but may be attributed to an earlier onset of puberty (Hawton & Harriss, 2008), allowing for the earlier development of affective and cognitive vulnerabilities and precipitants (Coleman & Schofield, 2005).

The present results also provide further support for gender differences in NSSI method (e.g., Briere & Gil, 1998; Claes, Vandereycken, & Vertommen et al., 2007; Gratz, 2001). Although cutting remained pervasive across gender and self-harm groups, women were more likely to endorse cutting as one of their main methods. Men, on the other hand, were more likely to report alternative forms of NSSI, such as biting, burning, carving, rubbing skin against a rough surface, and pinching. Because an association between cutting and women is predominantly portrayed in the media, it may be that men perceive non-traditional NSSI methods as more masculine and gender-compatible. It is important to note, however, that no method was found to be exclusive to men or women.

In the current study, men and women were similarly likely to endorse intrapersonal functions of NSSI, but men were more likely to endorse interpersonal functions. This is in contrast to a previous study using the ISAS, which found women to more strongly endorse intrapersonal functions than men, alongside comparable endorsement of interpersonal functions.
(Glenn & Klonsky, 2007). Although the pattern of gender differences thus remains unclear, it appears unambiguously important for clinicians to consider both domains of NSSI function when working with both men and women.

**Identification of a Vulnerability Profile**

The first central goal of this dissertation was the identification of a vulnerability profile comprised of affective, cognitive and behavioural tendencies that is shared by the various self-harm groups (i.e., those with a history of NSSI, those with a history of suicidality in the form of current ideation and/or a recent or past attempt, and those with a history of both NSSI and suicidality), and that can distinguish individuals with and without a history of self-harm. This was examined by comparing all four groups on the vulnerability profile, as well as by comparing a single collated self-harm group with the no self-harm group. To aid in uncovering the extent of shared vulnerability, the self-harm groups were also compared on the vulnerability profile to determine whether they were, indeed, indistinguishable on the vulnerability profile, or whether vulnerability would increase across increasingly severe manifestations of self-harm. An added exploratory goal was to examine whether result patterns varied by gender. Discriminant function analysis was selected in lieu of similar classification-based statistical analyses, such as cluster analysis or latent class analysis, given that the number and composition of study groups was known a priori, and the statistical goal was to evaluate the identification utility of the vulnerability profile.

Ample research has pointed to a marked overlap between NSSI and suicidality. Although several theoretical viewpoints have been proposed to explain this commonly occurring relationship, the present work tested the accuracy and utility of the Third Variable Theory, which attributes the relationship between NSSI and suicidality to a common association with a third
variable. Prior theoretical and/or empirical work suggest that elevations in impulsive urgency, emotional reactivity, and negative attribution style, coupled with low emotion regulation strategies and self-compassion, may be central variables contributing to risk for all types of self-harm, regardless of modality. This is thus the first study to test the Third Variable Theory utilizing an aggregation of these five theoretically- and empirically-based variables.

The results of the discriminant analysis found that an overall model containing all five variables was significant in discriminating between the four groups. It was this comprehensive model that provided maximal separation of the four groups. Further, each variable was found to contribute significantly to discrimination, thereby supporting the inclusion of all five variables in the vulnerability profile. Those with both NSSI and suicidality were found to have the highest mean on this discriminant function, followed by those with a history of suicidality, those with a history of NSSI-only, and lastly, those without a history of self-harm. This model was able to improve classification accuracy by 34%. Importantly, this result seemed to be stable, as it was consistently uncovered across multiple imputation methods with similar levels of classification accuracy (36.7% to 38.8%). Examining the rates of classification accuracy revealed that the majority of individuals who did not have a history of self-harm were accurately categorized (80%). In contrast, high rates of miscategorization were found for self-harming individuals, ranging from 57.2% to 70.2%. Although the direction of means on the discriminant function across the self-harm groups might suggest that severity of self-harm type increases with increasing vulnerability, these mean differences did not appear sufficiently sizeable to demarcate classifiable boundaries between the three self-harm groups. Thus, while the vulnerability profile was able to identify those without a history of self-harm with high levels of accuracy, it appeared
unsuccessful at determining the type of history involved. Rather, much of the accurate
differentiation seemed to center on distinguishing those with and without a history of self-harm.

A second discriminant function containing only self-compassion was also significant, and
could thus be interpreted as a protective function. It provided the most separation between the
NSSI-only group and the remaining groups, suggesting that self-compassion is a protective trait
that may buffer against exclusive NSSI, specifically. In both NSSI and suicide, injury to the self
is the mechanism by which end goals are attained. In suicide, however, the link between self-
injury and end-state functions is more clearly, logically and necessarily linked, as the only way
to end one’s life at one’s own hands is to cause harm to the self. Thus, self-injury as a means to
attempt suicide may be contemplated or undertaken regardless of one’s level of self-compassion,
as there are no remaining alternatives to ceasing one’s life. In contrast, the link between self-
injury and NSSI functions (e.g., reducing negative emotions; reducing social demands) is less
direct and patent. The end functions of NSSI do not necessitate the use of self-injury, as do the
end functions of suicide. Thus, there may be more room for low self-compassion to play a role in
motivating the selection of NSSI to the exclusion of other means. This result does, however,
need to be interpreted with caution as this protective function was not found across all of the
imputed analyses and may therefore represent an unstable finding. Nonetheless, the possible
finding of a protective function suggests that protective variables may also provide unique
contributions to discriminating between the four groups.

To further explore the distinguishability of the self-harm groups, a second discriminant
function analysis was conducted to determine whether the vulnerability profile could
differentiate between two groups—one group comprised of individuals with a history of either
NSSI, suicidality or both, and one group comprised of those without such histories. The analysis
found that a single model containing all five variables was significant. The profile exhibited an overall classification accuracy of 75%, whereby 87.1% of those with a history of self-harm were accurately identified as such, and 86.7% of those with no history of self-harm were accurately categorized as not having a history. As expected, the self-harm group had the highest mean on this five-variable vulnerability profile. These results were stable as well, consistently found across five imputed data sets with classification rates ranging from 75.4% to 76.4%. Taken together, the vulnerability profile was not only able to statistically distinguish between the two groups, but was also able to afford meaningful differentiation in the form of accurate group categorization.

Lastly, a final discriminant analysis was conducted to compare the three self-harm groups on the vulnerability profile. The first discriminant function was significant, but only negative attribution style and low strategies were found to contribute to discriminating the self-harm groups. Specifically, those with both forms of self-harm had higher means on this function than those with an exclusive history of NSSI or suicidality. This is consistent with the study of Wolff et al. (2013) who found that youth with a history of both NSSI and suicidality reported more negative views of self, the world and the future, compared to those with either form of self-harm alone. As negative attribution style also involves negative attributions regarding one’s future, it is also consistent with findings of greater hopelessness among those with both NSSI and suicide, as compared to those with NSSI-only (Claes et al., 2010) or suicidality-only (Guertin et al., 2001). As individuals with combined NSSI and suicidality have been shown to represent a more clinically severe group, there are at least two possibilities. Individuals with greater negative attribution style and lower strategies may be more vulnerable to more pathological social and psychological contexts, thereby supporting the concomitance of NSSI and suicidality. It is also
possible that these more severe contexts further exacerbate one’s negative attributions and replete one’s affective regulation strategies, thereby contributing to combined self-harm. However, it is important to keep in mind that while this model was statistically significant, it resulted in only a small improvement in classification accuracy beyond chance (15% - 19% across the original and imputed data sets).

Influence of Gender

When comparing the four study groups, women were found to exhibit a similar pattern as the original results. That is, a five-variable profile was found to be significant, with a classification accuracy of 41%. Among men, a three-variable vulnerability profile consisting of emotional reactivity, strategies, and negative attribution style was able to distinguish between the four groups with a classification accuracy of 56.14%, although this result needs to be interpreted with caution as only 8 men were in the NSSI-only group. As found in the original analysis, much of the accurate differentiation centered on separating those with and without a self-harm history, for both men and women.

When examining the separation of a collated self-harm group and a no self-harm group, comparable levels of classification accuracy were found for women (75.29%) and men (81.33%), although different variables were found to be significantly contributive. Among women, all five variables were important in differentiating between self-harm and the absence of self-harm, while among men, only strategies, emotional reactivity and negative attribution style were distinguishing, and not self-compassion and negative urgency. In light of theories that men who adhere to traditional masculine norms of prioritizing the self are more likely to be self-compassionate (Neff, 2003a), one possible explanation is that men generally have higher self-compassion that shows greater independence of pathology, thereby exhibiting smaller variation
alongside the presence or absence of self-harm. Self-compassion may be less stable in women, thereby exhibiting greater potential for variation. In the present sample, this hypothesis finds some support in the finding that men exhibited significantly greater self-compassion than women. In terms of negative urgency, its lack of significance in the model does not invariably mean that it does not have a relationship with self-harm among men. Indeed, past research has shown similar patterns of relationships between all UPPS subscales and risk outcomes, regardless of gender (Cyders, 2013). Rather, the present results suggest that negative urgency becomes less salient when considered in conjunction with other vulnerabilities. It may be that other facets of impulsivity carry greater weight in contributing to self-harm for men, such as sensation seeking, which has been found to be stronger in men than women (Cyders, 2013).

When comparing just the three self-harm groups, no significant discriminant functions were found for women, suggesting that female self-harming groups evidenced uniform vulnerability, regardless of self-harm manifestation. Among men, the self-harming groups were distinguishable on self-compassion, with a classification accuracy of 41%, but like women, were undifferentiated on strategies, emotional reactivity, negative attribution style, and urgency. Once again, this finding needs to be interpreted with caution as only 8 men were in the NSSI-only group. While this small sample size allows the analysis to be conducted (Meyers, Gamst, & Guarino, 2013b), it is not generally recommended, and only permits the uncovering of potential preliminary patterns that may serve as springboards for future research.

In summary, a five-factor vulnerability profile could distinguish women who self-harm from women who do not, while a three-factor vulnerability profile consisting of strategies, emotional reactivity and cognitive biases could distinguish self-harming from non-self-harming men. The respective vulnerability profiles were similarly accurate in identifying self-harm
among both men and women. A positive influence of gender is consistent with past research finding the relationship between vulnerabilities and other mental health indices to vary by gender. For instance, Gladstone, Kaslow, Seeley, and Lewinsohn (1997) found the relationship between negative attributional style and depression to be stronger for women than men. Other studies have also shown a gender moderation effect for the interaction between cognitive vulnerabilities and stress in the prediction of depression (e.g., Abela, 2001; Hankin et al., 2001).

With respect to self-harm specifically, very few studies have analyzed the influence of gender. Klonsky and May (2010) found the relationship between urgency and suicide ideation and attempts to be consistent for men and women. This appears in contrast to the present findings, but may simply be an artifact of different statistical techniques with different emphases on statistical versus clinical significance. Indeed, when using the same statistical technique as Klonsky and May—namely, an ANOVA—the same results were found. Nonetheless, the present results highlight the fact that men and women share similar, but unique, pathways to self-harm, whereby all variables increase vulnerability to self-harm in women, and only strategies, emotional reactivity and negative attribution style increase vulnerability to self-harm in men. As such, analyzing vulnerability without a consideration of gender may mask important conclusions regarding the development of self-harm.

Moreover, the vulnerability profile was equally shared across the self-harm groups among women, while for men, some of the vulnerabilities were shared across self-harm manifestations (i.e., strategies, emotional reactivity, negative attribution style and urgency), while other variables (i.e., self-compassion) differed in degree across self-harm manifestations. Contrary to expectations, self-compassion was found to increase across increasing levels of self-harm severity. That is, men in the ‘both’ group reported the highest mean self-compassion, while
men in the NSSI-only group reported the lowest. Not only is this in contrast to the pattern found in the present sample of women, it appears theoretically defiant. If self-compassion is an orientation toward self-care and kindness, more self-destructive forms of self-harm might be expected to coincide with reductions in self-compassion. Additionally, if studies have found negative life events to be greater among those with a suicide history than those with an NSSI history (Baetens et al., 2011), and if self-compassion has been found to provide a buffer against negative life events (Leary et al., 2007; Neff, Kirkpatrick, & Rude, 2007), one might expect that the group suspected to have greater negative life events (i.e., the suicidality groups) would also be the group with the lowest buffer against negative life events (i.e., self-compassion).

Alternatively, perhaps among men, self-harm is viewed as ultimately self-caring in its conceptualization as a means of relieving one from suffering. As a result, men with multiple forms of self-harm may view themselves as more self-compassionate. However, with only 8 men in the NSSI-only group, results may have been different with greater sample sizes, and therefore need to be further examined in larger samples.

**Support for the Third Variable Theory**

These results do provide some support for the Third Variable Theory, suggesting that different manifestations of self-harm generally share what are likely to be long-term vulnerability characteristics. Specifically, this suggests that the vulnerability profile, or variations of it, appears to represent an aggregated third variable that may account for the overlap between NSSI and suicidality. If an individual is high on the vulnerability profile, this may serve as a diathesis that increases an individual’s lifetime risk for either NSSI, suicidality or both. Providing further support for the notion of shared vulnerability is the discovery of more limited differentiation of the self-harm groups on the basis of the vulnerability profile variables (all 5 variables for women
and all 5 variables except self-compassion for men). It is this shared vulnerability that may help to explain the remarkable consistency with which NSSI and suicidality tend to overlap—both concurrently (Andover & Gibb, 2010; Klonsky & Olin, 2008) and over the lifespan (Favazza, 1996; see Hamza, Stewart, & Willoughby, 2012 for a review) in both inpatient (Nock et al.) and community samples (Muehlenkamp & Gutierrez, 2007). The results are also consistent with previous findings that NSSI and suicidality share other long-term risk factors, including childhood abuse, interpersonal or family conflict, lowered parental support, generalized impulsivity, borderline personality disorder characteristics, and lowered self-esteem (Brausch & Gutierrez, 2010; Jacobson et al., 2008; Muehlenkamp & Gutierrez, 2007; Nock et al., 2006; Whitlock & Knox, 2007). There is also some compatibility with studies finding a host of variables to distinguish those with and without a history of self-harm, with very few factors distinguishing NSSI and suicidal behavior (Larson & Sund, 2008). However, this was the first known study to attempt to extract a single vulnerability profile comprised of an aggregate of theoretically- and empirically-driven characteristics, in spite of this being suggested as an important research goal (Evans, Hawton, & Rodham, 2004). It thereby provides unique information regarding the extent to which self-harm manifestations are unique and an added boost to the identification of those at risk for self-harm. Additionally, this is the first known study to use discriminant function analysis in order to determine not only the statistical significance of the relationships between vulnerability factors and self-harm, but also to provide a measure of clinical significance in the form of classification accuracy.

However, evidence also emerged that would contradict the Third Variable Theory in its purest form (see Figure 10). Specifically, a mediational analysis found NSSI to maintain a relationship with suicide attempts above and beyond the vulnerability profile, whereas the Third
Variable Theory argues that any relationship between NSSI and suicide would be negated by the removal of the vulnerability profile. A partial mediation effect does, however, fit with alternative theories—namely, the Gateway Theory and Joiner’s Theory of Acquired Capability—that have been proposed to account for the overlap between NSSI and suicidality. Both of these theories centre on findings suggesting that NSSI, itself, confers a unique additional risk for suicide in self-injuring individuals.

Firstly, the Gateway Theory proposes that NSSI acts as a behaviour of entry on a self-harm continuum, paving the way for more extreme self-harm in the form of suicidal behaviours (Hamza, Stewart, & Willoughby, 2012; see Figure 11). Just as marijuana use may lead to usage of more extreme substances, NSSI may escalate to suicidality because they are simply the same behaviour at different ends of a continuum (Hamza et al., 2012). This theory is supported by the developmental trajectory of co-occurring NSSI and suicidality, whereby the age of onset of NSSI typically precedes that of suicidality (Muehlenkamp & Gutierrez, 2007; Nock et al., 2008), although the extent to which this has been confirmed longitudinally is limited (Hamza et al., 2012). In further support of this theory, and consistent with this study’s findings, NSSI has been found to uniquely predict suicidality (e.g., Asarnow et al., 2011; Whitlock & Knox, 2008), even after other suicidality risk factors are controlled for (e.g., Andover & Gibb, 2010; Whitlock et al., 2012), including prior suicide attempts (Asarnow et al., 2011; Wilkinson et al., 2011).

In opposition to the Gateway hypothesis that NSSI, alone, is a sufficient predictor of suicidality, Joiner’s Interpersonal Theory of Suicide (2005; see Figure 12) contends that NSSI leads to suicidality by way of a mediating mechanism. Specifically, Joiner (2005) posits that participation in self-injury leads to the development of an ‘acquired capability for suicide.’ That is, NSSI enables one to overcome and/or habituate to the fears and pain sensitivity that act as
deterrents against suicide, thereby facilitating more lethal acts of self-harm. NSSI represents one of many desensitizing avenues to suicide, existing alongside substance abuse or exposure to violence (Hamza et al., 2012), and as such, does not present as a necessary condition for suicide. Additionally, this theory states that the acquired capability ‘afforded’ by NSSI only leads to suicide when coupled with perceived burdensomeness and thwarted belongingness (Joiner, 2005). Support for this theory can be found in findings that increases in the frequency of NSSI predict increases in the lethality of suicide attempts (Andover & Gibb, 2010), and that the number of attempts can be predicted by increases in the number of methods and years associated with NSSI engagement (Nock et al., 2006). Testing Joiner’s theory directly, Franklin, Hessel and Prinstein (2011) did, indeed, find that NSSI individuals reported significantly greater levels of acquired capability and demonstrated significantly greater pain tolerance on a cold compressor task than those who did not engage in NSSI (Franklin et al., 2011). Whether this translated into increased suicide risk was not, however, tested in this study, although another study by Van Orden et al. (2008) did find that those reporting less pain sensitivity were at increased risk for attempts cross-sectionally.

When considering this study’s findings in conjunction with past research, it appears that the accuracy of each theory cannot be stated in absolute terms. Rather, evidence appears to exist for all three theories, and as such, it is more likely that these theories, or aspects of them, coexist. Additionally, these theories need to be tested using a longitudinal design in order to ascertain their theoretical elements and tease apart their relationships. For instance, it is possible that acquired capability is a pre-existing third variable predisposing one to both NSSI and suicide (Franklin et al., 2011). Longitudinal studies will provide the strongest evidence for the degree to which these theories are accurate, co-exist, or make unique explanatory contributions. A
Theoretically proposed model for the collaboration of these theories is presented in the overall discussion below.

**How Does the Vulnerability Profile Increase the Risk of Self-Harm?**

The present results fit with the various conceptualizations of NSSI and suicide that, when combined, suggest that self-harm represents a maladaptive coping strategy used to decrease aversive internal states in the absence of more healthier emotion regulation strategies (Linehan, 1993; Zlotnick, Donaldson, Spirito, & Pearlstein, 1997) and, for women, in the presence of supportive behavioural conditions. More specifically, it is possible that people with aversive internal states in the form of painful cognitive biases and strong emotional reactivity have the internal conditions that set the stage for self-harm. When coupled with a lack of affective regulation strategies, and for women, behavioural styles that support the use of self-harm as a coping strategy (i.e., low compassion for the self and high affectively-cued impulsivity), the risk for NSSI or suicide to reduce or escape from internal aversions transpires. Emotional reactivity, itself, may also have a direct impact on the availability of affective regulation strategies due to an imposition of greater regulatory demands (Flett, Blankstein, & Obertynski, 1996; Klonsky, 2009), while cognitive biases might also direct the use of self-harm as a coping strategy due to possible impact of beliefs relating to self-effectiveness and hopelessness on the perceived utility of more widely-used and adaptive forms of coping.

The present findings thereby provide support for several models of NSSI. One such model is the Experiential Avoidance Model of NSSI (EAM; Chapman, Gratz, & Brown, 2006), which posits that NSSI is an experientially avoidant behaviour whose function is to provide an avoidance or escape means of relieving “unwanted internal experiences or the external conditions that elicit them” (Chapman et al., p. 374). Similarly, the results share consistencies
with models of NSSI as it relates to Borderline Personality Disorder. Linehan’s Biosocial Theory of Borderline Personality Disorder (Crowell, Beauchaine, & Linehan, 2009; Linehan, 1993), of which NSSI is a potential symptom, suggests that NSSI and other extreme coping behaviours are the result of having a tendency to respond to stress with dysregulation as a result of intrapersonal or interpersonal vulnerabilities. Lastly, according to Selby and Joiner’s (2009) Emotional Cascade Model, NSSI arises from and is reinforced by the temporary alleviation of affect-intensifying rumination, which fits with the concomitant significance of negative attribution style and emotional reactivity in the profile. This model highlights a role for cognitive and affective vulnerabilities in the emergence of NSSI, suggesting that individuals with a negative attribution style and high emotional reactivity may be more prone to experiencing the more immediate cognitive and emotional precipitants from which NSSI may emerge in real time.

The vulnerability profile may also increase risk of self-harm indirectly. Because each of the variables has been found to correlate with a wide spectrum of clinical psychopathology, it may be that the vulnerability profile increases risk for symptoms of clinical disorders, which in turn increases risk for self-harm. However, not all individuals with self-harm have a history of a diagnosable disorder. Additionally, the vulnerability profile was able to identify self-harm groups who also consisted of individuals who had a past history of self-harm. If the profile was merely related to self-harm insofar as it was related to psychopathological symptoms, and if these symptoms are expected to show a more variable course over time, the profile would only be able to accurately distinguish between a presence and absence of self-harm if that self-harm had occurred in the present or recent past. In other words, the relationship between the vulnerability profile and self-harm would vary alongside the varying relationship between clinical symptoms and self-harm. This, of course, would not apply to Borderline Personality
Disorder whose symptoms, by definition, are expected to follow a less variable, lifetime course. Nonetheless, it would be interesting for future research to examine whether there is, at the very least, a partial mediation effect for psychopathological symptoms.

With respect to suicide, Linehan’s model of suicide (1993) suggests that suicide is the result of the failure or insufficiency of “emotional regulation mechanisms” (Joiner, 2005, p. 41) in allowing an individual to endure and manage negative emotions that may result from an interplay between biological and social factors, such as trauma exposure. This then results in emotional dysregulation, which leads to suicidality when coupled with learned “self-invalidation,” or the ways in which an individual cognitively or behaviourally undermines the self (e.g., negative self-judgments, self-blame, self-punishment). Similar to the vulnerability profile, this model suggests that the way in which one experiences emotions, the fund and quality of emotion regulation strategies one has, and the cognitions one makes pertaining to the self, are all critical factors in suicide. A lack of self-compassion can be considered as either a manifestation of self-invalidation due to its emphasis on treating oneself in invalidating ways, or as a product of self-invalidating processes that communicate and reinforce a sense of an undeserving self. Indeed, studies have found a relationship between self-compassion and invalidation in the form of self-hatred, self-criticism, and negative self-judgments regarding personal worth and adequacy (e.g., Brausch & Guttierrez, 2010; Chapman & Dixon-Gordon, 2007; Glassman, Weierich, Hooley, Deliberto, & Nock, 2007). The potential links between the vulnerability profile and Joiner’s interpersonal-psychological theory of suicidal behaviour (2005) are less immediately apparent, but existent nonetheless. This theory states that suicide emanates from two necessary prerequisites: The desire to die by suicide and the acquired capability to do so. This desire emanates from perceived burdensomeness, or the perception that one’s life is a
burden to friends, family, and/or society, and a sense of low belongingness to a valued group. It is possible that individuals who are vulnerable to living in highly negative and unmanageable emotional contexts, who also make negative attributions about the self, may be vulnerable to perceiving an estranging divide between themselves and others. They may perceive their lives to be vastly different and more negative than the lives of those surrounding them, thus creating perceptions of burdensomeness and alienation. With respect to acquired capability, Joiner’s (2005) second necessary factor in suicide, this is said to arise from habituation to self-injury due to repeated experiences with painful and fearful stimuli, such as NSSI, physical abuse, or substance abuse. It is possible that individuals high on the vulnerability profile may be more likely to engage in risky behaviours that defy the preservation instinct, therefore increasing the likelihood of developing acquired capability. For instance, emotional reactivity has been found to increase risk for early substance abuse (Blackson et al., 1994). Anestis et al. (2014) also proposed that impulsivity may increase the likelihood that one will encounter desensitizing experiences. Indeed, Anestis et al. (2012) found that positive associations between urgency and acquired capability and number of suicide attempts were mediated by an individual’s number of painful and provocative encounters.

**Clinical Significance of Results**

By identifying a profile, rather than variables in isolation, the present results may contribute to increases in the practicality, efficiency, coherence and parsimony of assessment practices in determining risk for self-harm, in addition to delivering organized and diverse clinical targets in therapy that encompass emotional, cognitive and behavioural factors. Additionally, investigating beyond the symptoms of diagnostic syndromes to identify psychological processes can aid in continuing to move the field away from the conceptualization
of NSSI and suicide as mere symptoms of a disorder, towards an appreciation of self-harm as a clinical entity in its own right. Lastly, imminent risk for self-harm is likely to fluctuate over time, rendering a one-time screening vulnerable to false negatives (Hawton, Saunders & O’Connor, 2012). Engaging in NSSI or evidencing high suicidal ideation also does not always prompt the seeking of necessary treatment (Hawton et al., 2012). The vulnerability cluster could therefore be used in conjunction with other vulnerability indices, such as childhood sexual abuse (Muehlenkamp, Kerr, Bradley, & Larson, 2010), in order to identify those who may benefit from a more proactive approach to self-harm prevention, irrespective of current risk.

Although there are no known treatments developed for NSSI specifically, several developed therapies may contain elements that are useful when clinically addressing self-harm vulnerability. Firstly, dialectical behavior therapy (DBT) contains emotion regulation and distress tolerance models that can teach clients a variety of ways to endure intense, lasting and negative emotions and develop more effective regulation skills (Linehan, 1987). In order to support a client’s use of such strategies, the management of affect-related impulsivity may be necessary. Distress tolerance and emotion regulation strategies may, themselves, have an indirect effect on reducing impulsivity by providing them with ways to manage emotions instead of acting on them impulsively. The skill of mindfulness, which is also taught in DBT, may help individuals remain more aware of their actions and the present moment in order to help them make more thoughtful and less impulsive decisions. CBT may also be useful for reducing affective impulsivity by helping clients to become aware of and manage the contingencies of impulsive behavior (e.g., removing or avoiding antecedents by making it more difficult to act on impulsivity in typical ways; anticipating and planning for consequences of distressing events), as well as to develop more adaptive problem-solving strategies. Secondly, CBT could be further
used to address cognitions and schemas that are central to the individual and predispose them to self-harm. Finally, self-compassion can be specifically targeted in women to reduce the likelihood that one would associate self-harm with the self. A newly proposed intervention named Mindful Self-Compassion (MSC) contains several potentially helpful strategies. Loving-kindness meditation involves the client repeating phrases such as “May I be safe” or “May be I kind to myself” during a formal meditation, or informally throughout one’s day (Germer & Neff, 2013). One study found this meditation to increase the daily experience of positive emotions. This, in turn, increased what the authors termed ‘personal resources’ (e.g., mindfulness; social support), which was then able to predict increases in life satisfaction and reductions in depressive symptoms (Frederickson, Cohn, Coffey, Pek, & Finkel, 2008). Another technique aimed at increasing self-compassion is compassionate letter writing in which a therapist helps a client write a letter to themselves from the perspective of the most compassionate version of themselves. The letter conveys empathy, support and acceptance for the client’s distress, and is thought to help them discover a perspective and self-treatment that is incompatible with harsh, cold and unhelpful self-criticism. Although one study found this exercise to help students cope with negative life events (Leary et al., 2007), research on the utility of this technique is limited. When used in alongside CBT techniques to challenge cognitions defying self-compassion, self-compassion strategies may be most effective.

Effectiveness of the Vulnerability Profile

Sensitivity refers to the proportion of ‘true positives’ (i.e., individuals with self-harm) accurately identified as such, while specificity refers to the proportion of ‘true negatives’ (i.e., individuals without self-harm) accurately identified as such. Sensitivity rates across analyses and across genders ranged from 86.5% to 91.04%. Specificity rates ranged from 80% to 94.3%.
Thus, approximately 5.9% to 13.4% of self-harming individuals were missed using the vulnerability profile, while 5.7% to 20% (the majority was above 13%) of non-self-harming individuals were inaccurately identified as having a history of self-harm.

Although most studies aimed at identifying risk factors did not use measures of clinical significance, there do exist some points of comparison to contextualize the present results in the area of suicide, but not NSSI. A study by Delgado-Gomez et al. (2011) discriminated suicide attempters from non-attempters using multiple personality measures separately. A measure of impulsivity (BIS-11; Patton et al., 1995) had a sensitivity rate of 54.56% and specificity rate of 82.38%, while a measure of personality disorders (IPDE-SQ; Loranger et al., 1999b) had a sensitivity rate of 69.29% and specificity rate of 82.37%. Another study by Blasco-Fontecilla et al. (2012) found rates of 80.8% sensitivity and 86.4% specificity using a combination of impulsivity, the presence of personality disorder symptoms, negative life events, and a history of aggression. Therefore, it appears that the present results represent an improvement from some of the past efforts at discrimination in the area of sensitivity.

However, with false positive rates ranging from 5.7% to 20.0%, the vulnerability profile may not only accurately identify those with a history of self-harm, it may over-identify as well. On the one hand, over-identification could lead to unnecessary treatment. On the other hand, these individuals are being over-identified because they presented with a similar vulnerability profile to those with a history of self-harm. It is thus possible that they are, in fact, at risk for a self-harm that has yet to manifest, or that they are high on other protective variables not assessed in the profile that are containing the translation of vulnerability to maladaptive outcome. At the very least, they evidence vulnerabilities that may place them at risk for psychological harm, and thus warrant identification. Additionally, the costs of failing to identify at-risk individuals (i.e.,
suicide attempts and possible death) very clearly outweigh the costs of over-identification.

Nonetheless, classification was imperfect; As such, it may be that the vulnerability profile would improve in clinical utility if used in conjunction with other variables. Although attempts were made to span the various realms of psychological functioning from affective to behavioural to cognitive, comprehensively incorporating interpersonal and biological factors may result in improved specificity. Interpersonally, individuals with self-harm have been found to evidence impairments in social problem-solving and communication (Nock & Mendes, 2008). This may increase the frequency of negative emotions, as well as one’s reliance on maladaptive coping, due to a potential downward impact on the availability and quality of one’s social support. In the biological realm, nascent research has begun to implicate serotonin system dysfunction in both suicide (Lin & Tsai, 2004) and NSSI (Sher & Stanley, 2007). There is also some evidence that serotonin selective reuptake inhibitors can reduce self-harming behaviours (Antochi et al., 2003).

**Distinguishing Current NSSI+Suicidality from NSSI-Only**

The first part of this dissertation provided one explanation as to why NSSI and suicidality tend to co-occur over the lifespan, in addition to isolating a manner in which they are similar. The second part of this dissertation aimed to identify proximal risk factors that may separate those with current NSSI-only and those with concurrent NSSI and suicidality. As such, this may provide an explanation as to why some, but not all, individuals with NSSI evidence concurrent suicidality, in addition to elucidating what makes these behaviours different.

It was hypothesized that psychache and survival and coping beliefs would each be able to distinguish self-injuring individuals with and without a recent suicide attempt in the past six months and/or current suicide ideation. Specifically, those currently evidencing both forms of
self-harm were expected to report greater levels of psychache and lower survival and coping beliefs than those with NSSI-only.

**Psychache**

Results revealed that psychache was able to significantly distinguish between current self-injurers with and without suicidality. Approximately 78% of those with both types of self-harm were correctly classified, leaving 22.2% under-identified. Classification accuracy was less strong for the current NSSI-only group, with 60.6% being accurately classified and 39.4% being over-identified as having suicidality when they did not. In sum, psychache was able to identify suicidality in those with NSSI with good levels of accuracy, but sometimes over-classified exclusively self-injuring individuals as having concomitant suicidality.

These results help to explain why NSSI and suicide both do and do not co-occur in an overlapping time period, suggesting that this may be partly determined by their standing on psychological stressors, such as psychache. If an individual with NSSI does not have high levels of psychache, they are less likely to proceed towards comorbid suicidality. Conversely, a self-injuring individual with high levels of psychache may have a level of psychological distress that is so severe, that NSSI can no longer effectively manage their distress (Whitlock & Knox, 2007), thereby leading to escalation to more lethal forms of self-harm. In this way, psychache may serve as an important signal for suicidality in high-risk individuals that should be routinely assessed among self-injurers. This is critical, as those with a history of NSSI may also be more likely to die from a suicide attempt than those without an NSSI history, because they may underestimate the lethality of their attempts (Stanley, Gameroff, Michalsen, & Mann, 2001) or because the act of NSSI may habituate them to more lethal self-injury (Van Orden, Merrill, & Joiner, 2005). In addition, as clinicians often have to contend with motivations to conceal suicidality in efforts to
avoid unwanted intervention, psychache offers a constructive assessment alternative whose relationship to suicidality would be less explicit and obvious to patients.

These results buttress the empirical goal of continuing to identify imminent indicators of risk that may mark the shift from NSSI to suicidality. These findings also add to a body of research supporting the distinctiveness of the two forms of self-harm on the basis of greater levels of impairment. In addition to psychache, such impairment may also take the form of higher levels of depression, anxiety, hopelessness, suicidal ideation (Stanley et al., 2001), dysthymia, or anger (Guertin et al., 2001). This study is relatively novel, however, in the following ways:

i. It compares groups with current self-harm on their standing on more immediate psychological stressors, as opposed to comparing groups comprised of those with either current or past self-harm on immediate psychological stressors. The former may be more effective in predicting imminent suicidal risk.

ii. It uses discriminant function analysis to provide a measure of clinical, in addition to statistical, significance.

iii. It identifies a previously untested relationship between psychache, NSSI and NSSI+suicidality (as well as the untested relationship between survival and coping beliefs, NSSI and suicidality, which will be discussed below).

**Clinical significance of results**

For the purposes of identifying suicidality among self-injurers, the sensitivity (i.e., self-injurers with suicidality correctly identified as such) and specificity rates (i.e., self-injurers without suicidality correctly identified as such) of the Psychache Scale (Holden, Mehta, Cunningham, & McLeod, 2001) were 77.8% and 60.6%, respectively. The Psychache Scale
(Holden et al.) thus greatly outperformed the sensitivity and specificity rates found in some studies assessing several widely-used risk assessment tools, namely the SAD PERSONS (Patterson, Dohn, Patterson & Patterson, 1983) and the MSPS (Hockberger & Rothstein, 1988), whose sensitivity rates were 19.6% and 40%, respectively (Bolton, Spiwak, & Sareen, 2012). Additionally, the Psychache Scale (Holden et al.) was comparable to other investigated measures. Pokorny (1983) found a discriminant function comprised of suicide attempt history, diagnosis of psychiatric disorder, relationship status of single, windowed or divorced, and previous identification of “suicidal” at any veteran affairs hospital, to have a sensitivity rate of 55.5% and specificity rate of 74.0% in predicting suicide. In more recent years, Hendin et al. (2010) found the Affective States Questionnaire (Hendin et al., 2004), a measure of the intensity of 9 different affects, had a sensitivity of 60% and specificity of 74% in predicting suicidal behaviour. The Psychache Scale (Holden et al.) was also comparable to other well-known indices of suicide risk. Compared to the Beck Hopelessness Scale (BHS; 80% sensitivity and 42% specificity; McMillan, Gilbody, Beresford & Neilly, 2007), the Psychache Scale had similar sensitivity, but was more successful with respect to specificity. Compared to the Scale for Suicidal Ideation (SSI; 75% sensitivity and 88.9% specificity; Holi et al., 2005), the Psychache Scale had similar sensitivity, but lower specificity. It is important to highlight that the current rates of sensitivity and specificity for the Psychache Scale are based on the identification of suicidality among self-injurers, specifically, and are therefore not perfectly comparable. Nonetheless, the Psychache Scale performed similarly or better than measures investigated in previous studies, and importantly, was able to distinguish between two groups that share many similarities, and may therefore be more difficult to distinguish.
As in the first part of the study, the classification errors associated with the Psychache Scale (Holden et al.) revealed a greater emphasis on sensitivity than specificity, which, as evidenced above, appears to be a typical pattern for well-established suicide risk indices (Cochrane-Brink, Lofchy, & Sakinofsky, 2000). Judgments of the utility of a predictive test depend on the relative seriousness of false positives or false negatives (Youden, 1950). When dealing with a behaviour, which when missed, may result in the devastating and irreversible ceasing of life, a cautious approach that favours sensitivity over specificity is generally recommended (O’Connor, Platt, & Gordon, 2011). Of course, yielding a high rate of false negatives does not come without a price, as it may reduce the efficiency and availability of treatment resources in an atmosphere of limited supply and fiscal moderation (Youden, 1950). It is thus imperative that clinical decisions regarding suicide risk are not made on the basis of a single measure, but rather, a battery of measures of which the Psychache Scale may be a part. Psychache can be used alongside other recommended targets that should be routinely monitored among self-injurers, including the severity and duration of NSSI, increasing reductions in the perceived effectiveness of NSSI in regulating emotions, deteriorating mental health, expression of suicidal ideation, and loss of social supports. Additionally, the Psychache Scale is a particularly attractive inclusion in a comprehensive risk assessment as it contains only 13 questions and takes no more than a few minutes to complete, yet results in a 62% improvement in suicidality identification in severely at-risk individuals.

Of course, this begs the question as to why the direct enquiring of one’s suicidal intent or level of suicidal ideation is simply not enough. Although suicidal ideation is something that should be continuously monitored in clients engaging in NSSI, it is not an error-free method. Firstly, while suicidal ideation is highly predictive of subsequent suicide attempts (e.g., Brown et
al., 2000), not all attempts are preceded by self-reported ideation (Waern, Beskow, Runeson, & Skoog, 1999). Secondly, as stated previously, measures that explicitly ask about suicidality may be more susceptible to underreporting. Thirdly, the aim of the second part of this study was not merely to identify which self-injurers have concomitant suicidality. The intent of this study was also to help to clarify why some individuals with NSSI have suicidality, while others do not. The construct of psychache submits a previously untested variable which suggests that painful and unbearable psychological pain may lie, in part, at the root of the transition from NSSI to co-occurring suicidality.

**The relation of current findings to theories of suicide**

The findings regarding psychache are compatible with several theories of suicide. Baumeister’s (1990) escape theory of suicide posits six central steps in suicide: Extreme experiences or circumstances that fall outside one’s standards; internal attributions for those experiences involving self-blame; painful self-awareness of how the self proves inadequate and incompetent relative to one’s standards; resultant acute negative affect; unsuccessful attempts to escape from such painful affect via ‘cognitive deconstruction’ (or, the avoidance of meaningful, abstract, future- or past-oriented thought); and finally, subsequent disinhibition allowing for more extreme means of escape in the form of suicide. Similarly, Joiner’s interpersonal theory (2005), described previously, conceptualizes suicide as the result of acquired capability, perceived burdensomeness and deficient belongingness. In efforts to establish a linkage with Baumeister’s (1990) theory, Joiner (2005) stated that the latter two components can stem from internally attributed and self-discrepant experiences that give rise to severe negative affect prompting suicidality. Finally, Marsha Linehan’s (1993) emotional dysregulation theory of suicidal behaviour suggests that suicide essentially results from being unable to effectively
regulate and thus, escape from aversive emotions. Taken together, each of these theories centralizes painful, intolerable psychological experiences—whether that manifest as extreme negative affect or aversive self-awareness—in the onset of suicidal behaviour. Psychache is put forth as a construct that may capture the pain and severity of such internal encounters, and as the present results would suggest, potentially mark the transition to more severe self-harming behaviours.

**The treatment of suicidality through psychache**

With respect to clinical intervention, findings suggest that reduction of psychache is a worthwhile treatment goal. Although efforts to target the variables in the vulnerability profile may have a downward impact on psychache, should psychache levels continue to rise to the point of elevating one’s risk for suicidality, specific treatment of psychache may be clinically indicated. Shneidman (1993) has argued that psychache is caused by thwarted or unfulfilled psychological needs to which an individual assigns importance. These may include, but are not limited to, needs for affiliation, achievement, control and predictability. Therefore, it is presumed that helping the client to fulfill these needs should yield reductions in psychache, and in turn, suicidality (Shneidman, 1993). In fact, this may also be a worthwhile goal in non-suicidal self-injurers who are troubled by unmet needs, as this may proactively remove support for one potential risk factor for escalation into suicidality. This goal can readily be accommodated in therapeutic approaches that dominate current clinical practice. Most patently, solution-focused therapy (DeJong & Berg, 2008) is, by definition, a goal-oriented approach that targets the construction of one’s future. The therapist might help to identify, refine and clarify the client’s current needs or goals, break these goals into gradated components, identify the skills the client already has to implement these goals, and develop a plan for achieving each nested goal and
mitigating any obstacles along the way (DeJong & Berg, 2008). Cognitive-behaviour therapy (CBT), which addresses dysfunctional cognitions, behaviours and, in turn, emotions, may address a client’s cognitions and assumptions associated with goal-related experiences. Beliefs about the futility of need-striving may be targeted, in addition to the cognitive distortions that may underlie or exacerbate one’s perception of frustrated needs. Interpersonal psychotherapy (IPT), whose goals include managing mood by improving interpersonal functioning, may be particularly well-suited should a client’s needs be of the affiliative type. This is particularly likely given that the most commonly endorsed reasons for attempting suicide in the present sample were disputes with a spouse/lover, family or friends. IPT may help the individual to understand why their interpersonal needs are being thwarted, and subsequently, help them to build interpersonal skills (e.g., communication skills or conflict-resolution skills) that can increase the meeting of one’s interpersonal needs. With respect to treating intolerable psychache directly, dialectical behavior therapy (Linehan, 1991), in its emphasis on emotion regulation and distress tolerance, may be useful in this regard.

**Survival and Coping Beliefs**

Survival and Coping Beliefs (SCB) was not able to significantly separate the two groups when examining men and women together. An examination of women exclusively, however, revealed that survival and coping beliefs was, in fact, able to significantly differentiate between women with current NSSI-only and women with current NSSI+suicidality, with an overall classification accuracy of 51.93%. There were not enough men in the current NSSI-only group (n = 2) to examine men separately, but the fact that survival and coping beliefs was no longer significant when men were included in the analysis may potentially suggest that survival and coping beliefs is not similarly distinguishing for men as it is in women.
Not only have other studies found survival and coping beliefs to be a stronger deterrent to suicide in women than in men (Dobrov & Thorell, 2004), studies have also found gender differences in other types of buffers against suicidal behaviour, including other aspects of reasons for living. For instance, Khan and Farooq (2003) found that while responsibility towards family was an equally strong protective factor across men and women, fear of social disapproval was more salient for women than men, although this has not always found support (e.g., Ellis & Range, 1991; Rich, Kirkpatrick-Smith, Bonner, & Jans, 1992). Other studies have also shown that relative to men, women have higher fear of suicide and moral objections (Linehan, Goodstein, Nielsen, & Chiles, 1983; Ellis & Range, 1991), higher responsibility to family and child concerns (Ellis & Range), and higher responsibility to family and friends (Westefeld et al., 1996).

The hypothesis that SCB would accurately identify self-injurers with and without suicidality was thus supported for women. If intent to die is a fundamental difference between NSSI and suicidality, then beliefs about one’s future, one’s survival capabilities, and the value of living can be expected to accurately distinguish between self-injurers who do and do not wish to die. Moreover, if NSSI can be conceptualized as a behaviour intended to regulate emotion (Nock & Prinstein, 2004), the mere presence of NSSI in the absence of suicidality may signal the presence of a motivation to cope that is buttressed or enabled by more positive beliefs about survival and coping. Once such beliefs decline, the motivation to cope may become truncated, allowing for concomitant suicidality to set in.

When considering both women and men, however, the present hypothesis regarding SCB was not supported. One potential explanation is that perhaps especially for men, SCB is salient to both forms of self-harm, rendering them less differentiated on this basis. In other words, SCB
may also be low in those with NSSI–only, and witness a decline before the onset of any form of self-harm. People who resort to NSSI may be in such distress, that they already have come to doubt their ability to survive, and question the utility of life and positive aspects of their future. Indeed, in the present sample, both of these groups had considerably lower SCB relative to ‘healthy’ individuals. An alternative explanation is that the salience assigned to various reasons for living, including SCB, is highly individualized and variable, resulting in smaller subsections of people for whom SCB is significantly protective. For instance, SCB may be most able to accurately identify suicidality among self-injurers who are at the most imminent and severe levels of suicide risk (i.e., the short period directly preceding a suicide attempt). In support of this hypothesis, Linehan and Goodstein (1983) found other forms of severity to be a salient dimension along which subsections of a suicidality group can be demarcated. Specifically, SCB presented at significantly higher levels among those with a history of serious suicidal ideation, as opposed to those with a history of brief suicidal ideation. In the present study, as the majority of the NSSI+suicidality group contained individuals with a recent attempt in the past 6 months, the group may have contained individuals for whom current or future imminent risk has resolved. Thus, perhaps longitudinal studies would uncover a growing distinguishability between the NSSI-only and NSSI+suicidality group on the basis of SCB, as one approaches, rather than departs from, the most severe levels of suicide.

CHAPTER 6—GENERAL DISCUSSION

General Conclusions

1. **NSSI and suicidality are both overlapping and distinct behaviours**

   Research attempting to answer the question as to whether NSSI and suicide are distinct behaviours evidences support for both similarities and differences—sometimes leaving more
questions than answers. Examining such literature, however, revealed a lack of separation between factors that are likely to be long-standing (i.e., personality traits), and factors that are likely to function more similarly as a state. Although such a distinction can only be verified by future research examining the long-term stability of these ‘traits’ and ‘states’, theoretically, the vulnerability profile consists of trait-like characteristics, while psychache is more likely to widely oscillate over time, akin to a state. To begin to decipher literature findings of both similarities and distinctions, it was hypothesized that shared vulnerabilities or diatheses may underlie their overlap, while distinct state-like ‘triggers’ are at the root of their distinctiveness. Although it cannot be argued that these behaviours are exempt from having distinct vulnerabilities and shared immediate risk factors (and indeed, there is some evidence for the former based on the current study), it was hoped that this hypothesis would help to clarify some of the conflicting findings regarding the relationship between NSSI and suicide.

The first part of this dissertation suggests that NSSI and suicidality share similar vulnerabilities that separate them from individuals without a self-harm history, and that vary only minimally amongst each other. These shared vulnerabilities comprise a single vulnerability profile consisting of all or some of emotional reactivity, negative attribution style, deficient emotion regulation strategies, impulsive urgency, and low self-compassion. The second part of this dissertation showed that NSSI and suicidality can be distinguished on the basis of immediate psychological stressors, specifically, psychache. Levels of survival and coping beliefs was also a significant distinguishing factor among women who self-harm. Taken together, this is the first study to reconcile some of the conflicting findings in the field of self-harm research by suggesting that a diathesis-stress perspective is one avenue along which the simultaneous overlap and distinctiveness of NSSI and suicidality can be explained.
It thus appears that the more appropriate question is not whether NSSI and suicidality are distinct or similar, but in what ways, and to what extent, they are both. Importantly, support for their singularity suggests that collating NSSI and suicidality into a single concept of ‘deliberate self-harm’ (DSH), which refers to any intentional self-injury, irrespective of suicidal intent (e.g., Hawton et al., 2007), may yield inaccurate categorizations and an accompanying loss or obscuring of important information. Utilizing the distinct terms of NSSI, suicidality, and self-harm, while abandoning inaccurately conflating terms like DSH that ignore the multidimensional relationship between NSSI and suicidality, will help to ensure that study results in the field of self-harm research continue to move the field forward in an unambiguous and well-understood manner.

Is There a Continuum of Self-Harm? Yes and No.

A fundamental question in the field has been whether NSSI and suicidality exist along a graded continuum of self-harm, starting with NSSI, followed by suicidality-only, and ending with both NSSI and suicidality, and death by suicide (e.g., Linehan, 1983; O’Carroll et al., 1996). Evidence for a self-harm continuum would come from three sources: (1) NSSI and suicidality tend to co-occur (2) NSSI and suicidality share vulnerability and/or risk factors that provide separation from the absence of self-harm and (3) NSSI and suicidality have shared characteristics that show quantitative increases across the various levels of self-harm. In the present sample, a high rate of co-occurrence was indeed found, with nearly 60% of individuals analyzed reporting histories of both forms of self-harm. The remaining 40% were distributed relatively evenly across the NSSI-only and Suicidality-only groups. With respect to the second criterion, self-harm groups were found to be distinguished from individuals without self-harm on the basis of a vulnerability profile. Considering the third criterion, partial support was found. On
the one hand, the five-variable vulnerability profile appeared to be largely shared by the various self-harm groups, especially for women. While the NSSI-only group had the lowest group mean on the profile, followed by the suicidality-only group then the NSS+suicidality group, there appeared to be little differentiation or meaningful quantitative increases across increasing levels of self-harm severity, especially for women. On the other hand, examining just the three self-harm groups did, in fact, reveal a truncated vulnerability profile containing negative attribution style and strategies. This profile was able to separate those with both forms of self-harm from those with NSSI- or Suicidality-only, but with relatively small accuracy (i.e., approximately 15% better than chance). This abbreviated profile did not appear to accurately separate NSSI from suicidality. Upon considering the results of part II of this dissertation, further support for criterion 3 can be found in the finding that psychache was able to accurately distinguish between those with both forms of self-harm and those with NSSI-only, with an accuracy rate of 62%.

Taken together, long-term vulnerability factors may play a larger role in initial placement on the continuum of self-harm, and to a lesser extent, the location of placement. Immediate stressors, such as psychache, may play a more central role in determining where along the continuum vulnerable individuals fall.

However, it is important to note that even within a continuum of self-harm, there may be several factors resulting in discontinuity. For instance, a small minority of individuals who attempt or die by suicide, do not report and/or experience preceding suicidal ideation. Additionally, the distinction between NSSI and suicidality can be blurred, with NSSI involving some degree of suicidal or ambiguous intent. Similarly, behaviours resulting in suicide may not have been intentionally suicidal, thus representing a lethal instance of NSSI. Lastly, it is possible
that progression across the continuum may not always occur in a forward linear fashion; rather, individuals may oscillate back and forth between various points.

3. Support for the Third Variable Theory is Mixed.

The hypothesis that NSSI and Suicidality co-occur because of shared third variables is partially supported. For one, they tend to co-occur, as evidenced by the composition of the present sample. They were also found to largely share long-term vulnerabilities, which would thus constitute a third variable. Lastly, NSSI engagement was found to cross-sectionally predict suicide attempts, as found in past research (e.g., Whitlock et al., 2013). However, a mediational analysis revealed that NSSI continued to predict suicide attempts when the effects of the vulnerability profile were removed. The third variable theory, on the other hand, would predict that the relationship between NSSI and suicide would be wholly dependent on the presence of the vulnerability profile. Thus, it appears that there is something unique about NSSI that leads to suicidality, either directly (as suggested in the Gateway Hypothesis) or indirectly (as suggested in Joiner’s theory of acquired capability).

Existing research does not provide overwhelming support for one theory to the exclusion of the other theories. Rather, it may be that all three theories help to elucidate the relationship between NSSI and suicidality. Specifically, one possible theoretical model is that the vulnerability profile increases risk for both NSSI and suicidality. This risk may initially manifest as the less extreme NSSI, rendering NSSI an entry behavior of self-harm. The transition from NSSI to more extreme self-harm may happen directly through the direct impact of NSSI on suicide (i.e., the Gateway Hypothesis), through the development of acquired capability (i.e., Joiner’s Theory of Acquired Capability), and/or, as the present study suggests, when accompanied by immediate risk factors like psychache (see Figure 13).
4. Distinction between Trait and State

A premise underlying the hypotheses of this study is the existence of a distinction between traits (or vulnerabilities) and states (or imminent risk factors). It was expected that self-harm vulnerability would be present over time, and thus able to isolate individuals with self-harm histories, regardless of whether they were in the past or present. States, however, were expected to only reflect a current individual’s functioning, thus having identification value with respect to current, but not past, self-harm.

The issue is that traits and states are not always clearly demarcated, potentially representing an arbitrary or meaningless distinction. Additionally, there may exist grey areas where a construct shares features of both traits and states. Although each of the characteristics in the vulnerability profile are intended to describe long-standing personality tendencies, they are not entirely devoid of state-like features. It is plausible that each vulnerability variable can be influenced by temporary factors such as mood, symptoms of psychiatric episodes, or even fatigue. For example, negative attribution style is a well-known vulnerability factor for depression that accounts for recurrences of depression (Alloy, Lipman, & Abramson, 1992). At the same time, negative attribution style can also be influenced or exacerbated by depressive symptoms (Ball, McGuffin, & Farmer, 2008). Another example can be found in the relationship between emotional reactivity and episodes of depression. Once again, it is both logical and empirically supported to presume that individuals who are sensitive to emotions and experience them strongly are more vulnerable to the affective milieu characteristic of depression (Bylsma, Morris, & Rottenberg, 2008). However, a review by Bylsma et al. (2008) found that Major Depressive Disorder can also alter and influence emotional reactivity, thereby suggesting the ability of a trait to adopt state-like features. Similarly, the ‘states’ in this study (namely,
psychache and survival and coping beliefs) may also possess trait-like qualities. If distressing circumstances were to remain stagnant, providing an individual with little opportunity for meaningful reprieve, high levels of psychache and low survival and coping beliefs could remain indefinitely.

Nonetheless, there is evidence to support the trait or state status of the presently investigated vulnerability and risk factors, respectively. For one, each variable was theoretically designed to capture characteristic ways of thinking, self-treatment, or experiencing and responding to emotions. Secondly, the vulnerability variables have been found to be associated with personality disorders (e.g., Fossati, Gratz, Maffei, & Borroni, 2014; Sansone & Sansone, 2010) which, by definition, are enduring across situations and time. Thirdly, stability over time is central to the common definitions of states and traits offered by Allport and Odbert (1936). Although long-term longitudinal data on the vulnerability profiles is sorely lacking, a lack of emotion regulation strategies was the subscale on the DERS (Gratz & Roemer, 2004) to demonstrate the highest test-retest reliability (.89), although this was only tested over a brief, two-month period. Conversely, psychache—which is defined by Shneidman as an acute state—was found on one measure to evidence insignificant test-retest reliability (0.26) over a 28-day period (Leenaars & Lester, 2004). The measure of psychache used in this study has previously demonstrated a test-retest reliability of .57 over a two-year period (Troister, 2014). The above pattern of temporal reliability mirrors that of other sets of scales or subscales with well-established demarcations between state and trait. For example, the State-Trait Anxiety Inventory (Spielberger et al., 1983) found over various time periods, test-retest figures of 0.73 to 0.86 for trait scores and 0.16 to 0.54 for state scores (Spielberger et al.). Fourthly, perhaps the most convincing evidence for the distinction between traits and states in this study emanates from this
study’s findings. For one, the vulnerability profile was able to distinguish between groups who were not just comprised of individuals with recent or current self-harm, but a past history of self-harm as well. Similarly, psychache was able to distinguish between current NSSI groups, but was not found to significantly discriminate between those with past NSSI-only and those with past NSSI+suicidality. The debate between traits and states notwithstanding, these results at the very least reiterate the importance of considering the theorized temporal bounds of predictor variables when developing and testing hypotheses.

**Limitations**

Although the present work makes unique contributions to the literature, the findings need to be interpreted in light of several limitations. The first limitations relate to the possibility of alternative explanations for this study’s findings. Potentially confounding variables that were not assessed, such as depressive symptoms, could have contributed to the identification of groups. However, the selection of confounds would have required a priori knowledge on the external variables that legitimately compose the current study groups, which has not yet been sufficiently established by previous research. Additionally, although non-significant findings occurred in what is considered to be a sufficient sample size in DFA, and were also consistent with this study’s hypotheses, it is nonetheless possible that such null findings were due to a potential lack of power to detect group differences.

Secondly, all data were based on self-reporting that relies on both accurate self-insight and recall (Horesh, 2001). With respect to the vulnerability variables, it may have been difficult for participants to comment on vulnerability tendencies that were not called upon or exercised in the moment of completing the questionnaires. For instance, one may have struggled with the insight and self-evaluation necessary to report on one’s characteristic emotional reactivity when
they were not directly within an emotion-eliciting situation during participation. With respect to self-harm data, there is also the possibility of a retrospective bias. For one, an individual’s recall of self-harm patterns and the time frame in which they occurred may have been vague. Additionally, an individual’s recall or perception of the intent that separates concepts of NSSI and suicide may have changed over time, potentially muddling their distinction with inconsistency and bias. Such difficulties with accurate recall may be increasingly likely with increasing temporal distance between one’s most recent self-harm and the online assessment. To therefore minimize any impact on accuracy, multiple scales were used to validate reports, particularly with regard to the presence and timing of past self-harm.

Given that participants were fully informed of the nature and purpose of the study through both the recruitment and informed consent procedures, an additional limitation is that individuals may have played the role of ‘good participant.’ That is, they may have guessed at the study’s hypotheses and answered the questionnaires in such a way as to confirm those hypotheses. There was also the potential for a sample selection bias entailing systematic differences between those who agreed and refused to participate. This may be especially likely in an online sample where the proportion of those who did and did not participate in response to the study advertisement may be particularly large. Perhaps self-harming individuals who elected to participate were more motivated to share their experiences—a motivation that may have also extended to treatment-seeking behavior, or that may have arisen from having embarked on a growth-enhancing recovery. In turn, they may have represented a less severe population. The opposite may have been true as well. Perhaps individuals with more severe self-harm histories identified more with self-harm, and were therefore more attracted to participating in studies on self-harm. Selection bias may have also existed in our ‘healthy’ sample. Non-self-harming
individuals who agreed to participate may have been interested in the topic of self-harm because of their own realized consideration of self-harm at some point in their lives, or because they may have other psychological difficulties, such as depression, that were not assessed in this study. This would have the potential to obscure or minimize any differences between the self-harm and non-self-harm groups. The potential for selection bias is unavoidable in research studies, as rarely do researchers achieve 100% participation. It is therefore critical that the current results are interpreted with the demographic and self-harm characteristics of the sample in mind.

An additional limitation relates to the generalizability of this study’s findings. Firstly, the current sample was comprised of participants who mostly identified as Caucasian, so the extent to which the present findings would extend to other ethnic groups is unknown. Secondly, the online nature of the study may have limited generalizability in its requirements for participants to be relatively computer-savvy with internet access. Additionally, many of the current self-harm participants were individuals who sought information or support through online communities, and it is unclear whether they differ from individuals who do not access such communities. A third limitation to generalizability is due to the amount of missing data in this study, which ranged from rates of approximately 18-21%. Individuals with no more than 10% missing data on each of the analyzed scales were found to be older and more educated than those with more than 10% missing data on at least one of the scales. No differences were found on several indices of NSSI and suicidality. However, there is bias in these findings as well, as not all non-completers provided such data and were able to be included in the completer analysis. Nonetheless, there were significant demographic differences in age and education between completers and non-completers. Although the age range of the completer sample perfectly overlapped with that of the non-completer sample, the generalizability of the present results to younger, less educated youth
is unclear. One possible explanation for the amount of missing data may have been the amount of sub-questionnaires participants were asked to complete (a maximum of 16). It may have been more difficult for younger participants to sustain the effort and attention necessary to complete the questionnaires. Additionally, participants were required to complete the study in one sitting, which may have increased the impact of boredom and/or fatigue on the potential for non-completion. This was deemed an important methodological strategy, however, as it likely minimized the volume of missing data that was predicted to accrue as a result of participants failing to return to the survey after exiting. To minimize the potential for missing data patterns to be found relating to particular measures, it may have been useful to counterbalance the order of questionnaires. The amount of missing data may have also been due to the exclusively online nature of the study. Other studies have also found online data collection to have issues with missing data, with rates ranging from 25.71 to 42.11% for a given scale (Cantrell & Lupinacci, 2007; Mongrain, Chin, & Shapira, 2011). Participants may have felt less obliged or motivated to provide complete data using an impersonal interface that did not allow for face-to-face contact with the principal investigators. On the other hand, it is this very interface that may have given individuals the distance and anonymity they may have required in order to answer honestly in a manner unbiased by the examiner or research setting. In addition, online methodology has several other highly compelling features. Its most obvious advantage is the minimization of sampling error that results from assessing samples of convenience. Online data collection permits the assessment of individuals who can be challenging to study due to their inaccessibility and low numbers, and therefore enables researchers to study constructs as they exist in the general population in a wide variety of geographical locations, as opposed to more easily accessible populations.
A final limitation was the use of an either-or approach to defining self-harm. Self-harming participants were classified into groups based on their responses to self-harm questions that required them to make a clear distinction between behaviours that did and did not involve a desire or intent to die. However, previous research has shown that one’s perception of such intent is not always clear and well-defined (Kreitman & Phillips, 1969), with a single attempt sometimes embodying ambivalent intent. In this way, simple ‘yes’ or ‘no’ responses may have forced a dichotomous system of categorization onto what may be a continuous process. Therefore, some individuals who were classified as having suicidality or NSSI may have been classified on the basis of a self-harm behavior that was not clearly suicide or NSSI.

**Future Research**

The present study presents exciting findings that suggest a number of avenues for future research. The first step is for future research to replicate the current models and relationships in other community samples, such as university samples, as well as in samples recruited and tested offline. Replication can also center on additional at-risk samples, such as pre- and early-teenagers and specific cultural and/or ethnic groups, such as Aboriginal adolescents.

Although it is important to assess the relationship between NSSI and suicidality in community samples, clinically-based studies are equally imperative. Self-harm has been evident in a wide range of clinical disorders, including Major Depressive Disorder (e.g., Nock et al., 2006), Dysthymic Disorder (Jacobson, Muehlenkamp, Miller, & Turner, 2008), anxiety disorders (Jacobson & Gould, 2007; Nock & Mendes, 2008), eating disorders (Claes, Vandereycken, & Vertommen, 2001), Borderline Personality Disorder (Zanarini, Frankenburg, Hennen, & Silk, 2005), and impulse control disorders (Nock & Mendes). By assessing the present hypotheses in diagnostically restricted samples, we can determine whether the processes underlying the
relationship between NSSI and suicide are similar across different diagnostic entities, or whether they operate in diverse ways. It would also be interesting to determine whether the vulnerability profile confers risk for both self-harm and the above-identified clinical disorders, thereby representing a generalized profile for clinical distress or psychopathology. This would suggest that self-harm is not merely a symptom of a clinical disorder, but a co-occurring entity due to shared vulnerabilities. A related future research goal is to determine whether other behaviours with self-injurious qualities, such as substance use, have a similar vulnerability profile to which their relationship with self-harm can be attributed (e.g., Jacobson & Gould, 2007). It may also be worthwhile to assess the vulnerability profile in behaviours involving other-directed injury, such as physical aggression, to ascertain whether they are simply different manifestations of an underlying propensity for causing injury, or whether they are behaviours with different underlying processes.

Another suggestion for future research is to examine variations of the vulnerability profile that include other variables. This may help to potentially uncover the most optimal combination of vulnerability factors. Although efforts were made to create a profile that spanned a wide range of domains, some may argue that social factors also warrant inclusion. For instance, research suggests that it might be important to include a history of childhood sexual abuse (Martin, Bergen, Richardson, Roeger, & Allison, 2004) and emotional abuse (Glassman, Weierich, Hooley, Deliberto, & Nock, 2007), as both have been associated with an increased risk for NSSI, suicide ideation, and attempts. However, many individuals with self-harm histories have no corresponding childhood abuse history, and theoretically, the vulnerability profile should be shared by the largest number of self-harming individuals. One social factor that may show greater consistency across self-harming individuals is a history of negative life events,
which has also been found to predict both NSSI and suicidality (Garrison et al., 1993). On the other hand, it may be that social factors, such as childhood abuse, are one set of experiences from which affective, cognitive and behavioural vulnerabilities emerge, thereby serving as a potential causal mechanism for vulnerability, as opposed to a more direct vulnerability for self-harm. Only by examining the utility of including social factors in the profile can we begin to answer such questions.

As stated previously, the present results are cross-sectional. Only longitudinal designs can uncover the truly long-standing nature of the vulnerability profile, as well as allow us to make definitive conclusions about causality, or specifically, the relationships between changes in vulnerabilities and risk factors and changes in self-harm status. An ideal longitudinal design would involve prospectively assessing the vulnerability variables in at-risk early teenagers, and following them over time from self-harm initiation and maintenance, to ceasing and relapse. Longitudinal studies can also provide insight on how the vulnerability profile and more immediate variables, like psychache, work together over time in contributing to the onset of self-harm. For instance, one could test how the vulnerability profile may interact with different types of immediate life stressors (e.g., social, financial, dependent or independent) to predict self-harm. One potential hypothesis is that the vulnerability profile predicts the generation of dependent life stressors (i.e., life stressors generated by characteristics or behaviours of the individual), which in turn, predict self-harm, as well as predicts which individuals will respond to independent life stressors with self-harming responses. If individuals with both NSSI and suicidality report more severe life stressors than NSSI-only, another plausible hypothesis is that the vulnerability profile will interact with a high number or severity of current life stressors in predicting the transition from NSSI-only to NSSI+suicidality.
An additional avenue for future research is to buttress the current results with studies using performance-based laboratory assessments of several vulnerability variables. For example, previous research has used such methods to find elevated impulsivity among suicide attempters (Dougherty et al., 2004b; Horesh, 2001). Individuals could be asked to complete a laboratory measure of impulsivity while in a calm state. At a later time, they could be asked to return to the lab, during which they would experience a frustration- or anger-inducing encounter with a confederate, thus allowing for an assessment of various elements of emotional reactivity. They could then be asked to complete another performance measure of impulsivity in order to assess the impact of emotions on impulsivity, and thus, their degree of impulsive urgency. Future studies could also use Ecological Momentary Assessments (EMA; Muehlenkamp et al., 2010) to assess vulnerability variables as they are called upon in daily living using electronic devices provided to participants. For instance, individuals could report on, in real time, the number, type and quality of strategies they use in response to negative emotions, thereby providing an ecological measure of affective regulation strategies.

Additionally, variations to the variables themselves could also be tested. The present study examined emotional reactivity, impulsive urgency and lack of affective regulation strategies in a global sense, without reference to any one particular emotion. These variables may operate differently for different types of emotion, such as anger, anxiety or sadness, and may be differentially related to types of self-harm for different emotions.

Lastly, it would be interesting to re-examine this study’s hypotheses using alternative statistical approaches. Cluster analysis, which delineates groups empirically on the basis of a set of predictors, could be used to either uncover new groups, or confirm the groups established a prior in this study. Additionally, a receiver operating characteristic (ROC) curve, which plots the
true positive rate of a test in function of the false positive rate for various prediction score thresholds, could allow for the identification of cut-off scores that can be used to predict self-harm risk on the basis of the vulnerability profile, psychache and SCB. This, in turn, may facilitate the translation of this study’s results to guiding clinical decision making.

CHAPTER 7

MAJOR CONCLUSIONS

The following major conclusions can be drawn from the present research, which represent important contributions to the field of self-harm research:

1. One reason that NSSI and suicidality may tend to co-occur over the lifespan is that they may share common long-term diatheses that place them at risk of both forms of self-harm over time. One such diathesis is the proposed vulnerability profile, consisting of impulsive urgency, emotional reactivity, negative attribution style, low emotion regulation strategies and low self-compassion. If an individual is high on the vulnerability profile, this may serve as a diathesis that increases an individual’s lifetime risk of either NSSI, suicidality or both.

   a. The vulnerability profile can help to determine whether or not an individual has engaged in self-harm, but is not effective in determining the type of self-harm history involved (i.e., NSSI-only, Suicidality-only, or NSSI+suicidality).

   b. Self-compassion on its own may be particularly salient as a vulnerability factor for engaging in NSSI-only.

   c. For both men and women, NSSI and suicidality may share common aggregated vulnerabilities. However, the types of vulnerabilities involved may differ across gender, at least for some variables. It is important to note that only eight men
were in the NSSI-only group; Therefore, these result patterns need to be clarified in future research.

i. For women, the complete five-factor vulnerability profile was able to distinguish between those with self-harm and those without self-harm. It was not able to distinguish between the three self-harm groups.

ii. For males, a three-variable vulnerability profile consisting of emotional reactivity, low strategies, and negative attribution style was able to distinguish between those with and without histories of self-harm. Only self-compassion, but not the remaining vulnerability variables, was able to distinguish between the three self-harm groups.

2. Although NSSI and suicidality may have overlapping long-term vulnerabilities, they may have different proximal risk factors.

   a. Specifically, psychache is one psychological risk factor that may be particularly salient for suicide. In this study, psychache was able to distinguish between those with current NSSI-only and those with concurrent NSSI and suicidality. In addition to contributing to an understanding of how NSSI and suicidality are distinct behaviours, this may also help to explain why some, but not all individuals with NSSI have concurrent suicidality. Thus, psychache may serve as an important signal for suicidality in high-risk, self-injuring individuals.

   i. Psychache continued to be distinguishing among the two current self-harm groups when examining women exclusively. Only two men were in the current NSSI-only group, so an analysis of men could not be completed.
b. Survival and coping beliefs may also distinguish between women with current NSSI-only and women with current NSSI+suicidality. It is unclear whether the same finding holds for men, so further research is needed with greater samples of men who engage in NSSI-only.

3. NSSI and suicidality are both overlapping and distinct behaviours. The more appropriate question is not whether NSSI and suicidality are distinct or similar, but in what ways, and to what extent, they are both.
REFERENCES


Appendix A

Materials
Letter of Information

The Relationship between Self-Injury and Suicidality

Study Purpose

This research is being conducted by Jacqueline Chin under the supervision of Dr. Ronald R. Holden, in the Department of Psychology at Queen’s University in Kingston, Ontario.

This research investigates the relationship between self-injury and suicidality in young adults aged 18-24. Previous research has shown that some people may be more likely than others to hurt themselves, have suicidal thoughts/make suicide attempts, or both. We would like to explore how various factors may be linked to the presence or absence of self-injury, suicidality, or both. We hope that what we learn from this study may lead to a better understanding of these behaviours and may be used to inform the treatment of these behaviours.

Study Procedures

Participation will involve the completion of a battery of measures online. You will be asked questions about self-injury and suicide, as well as questions about various psychological factors, including (but not limited to) how you experience and deal with negative emotions, how you view yourself, and your attitudes towards living. You are not required to answer any questions that you find distressing or that make you feel uncomfortable. You may complete these measures using your own computer, and on your own time, although the survey cannot be returned to once closed. Participation should take around 50-60 minutes. You will then be compensated with $10 [or $3.50 for Mechanical Turk participants] for your time. Additionally, all participants will be entered into a draw for a $150 gift certificate to an online store of their choice that provides gift certificates.

Possible Benefits of Participation
Although we cannot guarantee or promise that you will personally benefit from your participation in this research, your participation may potentially result in benefits for the field of clinical psychology. These include helping the field to learn more about self-injury and suicide, why they occur and what makes them distinct. This, in turn, may be used to identify ways of reducing and/or preventing these behaviours.

Possible Risks of Participation

There is minimal risk involved in participating in this study, and it is not expected that you will find participation in this study to be demanding or stressful. Some of the questions will ask you to think about and report on potentially sensitive information about self-injury, suicide, and distressing thoughts and emotions. This may bring about negative emotions or cause feelings of discomfort. You are under no obligation to complete any questions that you do not feel comfortable answering. Should you feel the urge to self-harm when completing the questionnaires, on every page will be a link to www.squidoo.com in order to immediately turn your attention to something else.

If you experience any distress and would like to talk to someone, we urge you to speak to someone you trust, contact your health professional, or contact one of the resources listed at the end of this page. These resources will also be available at the end of the study and at the bottom of any email I may send you about the study.

Ethical Aspects of Participation

Your participation at all times is voluntary. While it would be greatly appreciated if you would answer all questions, you are under no obligation to answer any questions that you find objectionable or that make you feel uncomfortable. You may also withdraw from the study at any time. Withdrawing in the middle of completing the online questionnaires may be
accomplished by simply closing the web browser. If you have already completed the
questionnaires but would later like to be withdrawn from the study, you may inform Jacqueline
Chin at [psycstudy2500@gmail.com]. Your data will then be deleted immediately.
All of your responses to the questionnaires will be kept confidential. For the purposes of
compensation and entry into the study draw, you will be asked to provide your email address.
This can be an email address account opened specifically for this study. In order to ensure
confidentiality, your email address will be kept apart from your data, will be stored in a separate
password protected file, and will only be available to the researcher in charge of contacting you
(Jacqueline Chin). For online assessments, data will be password-protected.
At the end of the questionnaires, you will be asked to indicate your preferred method of
compensation. This may be through either paypal or cheque. If you would like to be
compensated via a paypal account that only reveals your email address, we will not require your
name and address. If you prefer to be compensated via cheque, we will require your name and
address. This information will be kept separate from your responses to the questionnaires, will be
stored in a password-protected file, and will only be accessible by Jacqueline Chin.
All information gathered will be used for research purposes only. Any journal publications or
presentations at scientific conferences that proceed from this study will be of general findings,
and will not reveal personally identifying information. Once publications from this study have
been completed, all data and participant information will be destroyed.
Further Information
Any questions about study participation may be directed to Jacqueline Chin at 613-533-2346 or
[psycstudy2500@gmail.com], or Dr. Ronald R. Holden at 613-533-2879 or
[holdenr@queensu.ca]. Any ethical concerns about the study may be directed to the Chair of the
General Research Ethics Board at chair.GREB@queensu.ca or 613-533-6081. This study has been granted clearance according to the recommended principles of Canadian ethics guidelines, and Queen’s policies.

We thank you for your willingness in participating in our research.

Sincerely,

Jacqueline Chin

Resources

We are not in any way affiliated with these websites or organizations. We encourage you to access these resources, as others have found them to be informative and helpful.

- http://www.thesite.org/healthandwellbeing/mentalhealth/selfharm
- http://www.crpsib.com/resources.asp
- http://www.selfinjury.com
- http://www.teensuicideprevention.org/
- 1-800-DON’T-CUT
- 1-800-273-TALK (a 24-hour crisis hotline)
- 1-800-SUICIDE (a hotline for people considering suicide)
- 1-800-334-HELP (a 24-hour crisis line from the Self Injury Foundation)
Consent Form

1. I have read the Letter of Information and have had any questions answered to my satisfaction.

2. I understand that I will be participating in the study called The Relationship Between Self-Injury and Suicide, and that the purpose of the study is to further understanding about why individuals engage in self-injury, have suicidal thoughts, or make suicide attempts. I understand that this means that I will be asked to complete a battery of questionnaires online.

3. I understand that I may feel uncomfortable with some of the questions asked. I understand that my participation in this study is completely voluntary and that I may withdraw at any time. Withdrawing in the middle of completing the online questionnaires may be accomplished by simply closing the web browser. If you have already completed the questionnaires but would later like to be withdrawn from the study, you may inform Jacqueline Chin at [psycstudy2500@gmail.com]. Your data will immediately be deleted.

4. I understand that every effort will be made to protect my right to confidentiality, and that only the principal investigators will have access to the data. The data may also be published in scientific journals or presented at scientific conferences, which will be of general findings and will never reveal any personally identifying information.

5. I am aware that any questions about study participation may be directed to Jacqueline Chin at 613-533-2346 or [psycstudy2500@gmail.com], or Dr. Ronald R. Holden at 613-533-2879 [or holdenr@queensu.ca]. Any ethical concerns about the study may be directed to the Chair of the General Research Ethics Board at chair.GREB@queensu.ca or 613-533-6081.

6. I am aware that this study has been granted clearance according to the recommended principles of Canadian ethics guidelines, and Queen’s policies.

I have read the above statements and freely consent to participate in this research.

☐ Yes
☐ No
Copyrighted

Material
Questionnaire 1

Self-Injurious Thoughts and Behaviors Interview - Adapted Version

These questions ask about your thoughts and feelings of suicide and self-injurious behaviors.

Suicidal Ideation

1) Have you ever had thoughts of killing yourself? (Yes; No)
2) How old were you the first time you had thoughts of killing yourself? (age)
3) How old were you the last time? (age)
4) During how many separate times in your life have you had thoughts of killing yourself? (Please give your best estimate.)
5) How many separate times in the past year?
6) How many separate times in the past month?
7) How many separate times in the past week?
8) When was the last time?

Here is a scale we will use for a number of the upcoming questions.

0-Low  1  2  3  4- Severe

9) On this scale of 0 to 4, at the worst point how intense were your thoughts of killing yourself?
10) On average, how intense were these thoughts?
11) When you’ve had a thought, what method did you think of using?

1) Own prescription drugs
2) Illicit drugs (not rx)
3) Over-counter drugs
4) Poison
5) Firearms
6) Immolation
7) Hanging
8) Sharp object
9) Auto exhaust
10) Other gases
11) Train/car
12) Jump from height
13) Drowning
14) Suffocation
15) Other’s rx drugs
16) Other
17) Multiple

12) When you have thoughts of killing yourself, how long do they usually last?
13) On the scale of 0 to 4, what is the likelihood that you will have thoughts of killing yourself in the future? (0 – Low; 4 – Very Much)

**Suicide Plan**
14) Have you ever actually made a plan to kill yourself? (Yes; No)

We will refer to this as a suicide plan.

15) How old were you the first time you made such a plan? (age)
16) How old were you the last time? (age)
17) During how many separate times in your life have you made a plan?
18) How many separate times in the past year?
19) How many separate times in the past month?
20) How many separate times in the past week?
21) On the scale of 0 to 4, at the worst point, how seriously did you consider acting on the plan?
22) On average, how seriously have you considered acting on them?
23) When you’ve had a plan, what method did you think of using?

1) Own prescription drugs
2) Illicit drugs (not rx)
3) Over-counter drugs
4) Poison
5) Firearms
6) Immolation
7) Hanging
8) Sharp object
9) Auto exhaust
10) Other gases
11) Train/car
12) Jump from height
13) Drowning
14) Suffocation
15) Other’s rx drugs
16) Other

24) When you’ve had a plan, how long have you thought about it before either moving onto something else or acting on the plan?

0) 0 seconds 5) 1-2 days
25) On the scale of 0 to 4, what do you think the likelihood is that you will make a plan to kill yourself in the future?

Suicide Attempt

26) Have you ever made an actual attempt to kill yourself in which you had at least some intent to die? (Yes; No)

We will refer to this as a suicide attempt.

27) How old were you the first time you made a suicide attempt? (age)
28) When was the most recent attempt?
29) How many suicide attempts have you made in your lifetime?
30) How many have you made in the past year?
31) How many have you made in the past month?
32) How many have you made in the past week?
33) What method did you use for your most recent attempt?
34) What was the first most important circumstance contributing to your most recent suicide attempt?
   1) job loss/ job stress/ academic failure
   2) dispute with family or friends
   3) dispute with spouse/lover
   4) financial problems
   5) eviction
   6) health problems
   7) death of another person
   8) psychiatric symptoms
   9) humiliating event
   10) other:
   99) unknown

35) What was the second most important circumstance contributing to your most recent suicide attempt?
36) What was the third most important circumstance contributing to your most recent suicide attempt?
37) What kind of injuries did you have as a result of this attempt?
38) Regarding the most lethal attempt: When did it occur?
39) What kind of injuries did you have as a result of this attempt?
40) How long have you usually thought about suicide before making an attempt? 0) 0 seconds

   1) 1-60 seconds
   2) 2-15 minutes
   3) 16-60 minutes
   4) less than one day
   5) 1-2 days
   6) more than 2 days
   7) wide range (spans > 2 responses)
   8) not applicable
   99) unknown
41) On a scale of 0 to 4, what do you think the likelihood is that you will make a suicide attempt in the future?

Non-Suicidal Self-Injury

42) Have you ever actually engaged in NSSI? (Yes; No)
43) How old were you the first time?
44) When was the last time you engaged in NSSI? Please write the month and year
45) How many times in your life have you engaged in NSSI?
46) How many times in the past year?
47) How many times in the past month?
48) How many times in the past week?
49) Which of the following things have you done to harm yourself? Please check all that apply.

1) cut or carved 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 to the point of drawing blood
12) other (specify): ______________________

99) unknown

50) Have you ever received medical treatment for harm caused by NSSI? (Yes; No; Unknown)

51) On average, for how long have you thought about NSSI before engaging in it?

0) 0 seconds
1) 1-60 seconds
2) 2-15 minutes
3) 16-60 minutes
4) less than one day
5) 1-2 days
6) more than 2 days
7) wide range (i.e., it varies)
8) not applicable
9) unknown

52) On the scale of 0 to 4, what do you think the likelihood is that you will engage in NSSI in the future?
Questionnaire 2

Inventory of Statements about Self-Injury (ISAS)

This questionnaire asks about a variety of self-harm behaviors. Please only endorse a behavior if you have done it intentionally (i.e., on purpose) and without suicidal intent (i.e., not for suicidal reasons).

1. Please estimate the number of times in your life you have intentionally (i.e., on purpose) performed each type of non-suicidal self-harm (e.g., 0, 10, 100, 500):

Cutting ____ Severe Scratching ____
Biting ____ Banging or Hitting Self ____
Burning ____ Interfering w/ Wound Healing ____ (e.g., picking scabs)
Carving ____ Rubbing Skin Against Rough Surface ____
Pinching ____ Sticking Self w/ Needles ____
Pulling Hair ____ Swallowing Dangerous Substances ____
Other _______________

******************************************************************************

Important: If you have performed one or more of the behaviors listed above, please complete the final part of this questionnaire. If you have not performed any of the behaviors listed above, you are done with this particular questionnaire and should continue to the next.

2. If you feel that you have a main form of self-harm, please check the behavior(s) that you consider to be your main form of self-harm.

Cutting ____ Severe Scratching ____
Biting ____ Banging or Hitting Self ____
Burning ____ Interfering w/ Wound Healing ____ (e.g., picking scabs)
Carving ____ Rubbing Skin Against Rough Surface ____
Pinching ____ Sticking Self w/ Needles ____
Pulling Hair ____ Swallowing Dangerous Substances ____
Other _______________

3. At what age did you first harm yourself?
4. At what age did you most recently harm yourself?
5. When was the last time you intentionally harmed yourself with no intent to die? Please write the approximate month and year.
6. Do you experience physical pain during self-harm? (Yes; Sometimes; No)
7. When you self-harm, are you alone? (Yes; Sometimes; No)
8. Typically, how much time elapses from the time you have the urge to self-harm until you act on the urge?
< 1 hour 1 - 3 hours 3 - 6 hours
6 - 12 hours 12 - 24 hours > 1 day
9. Do/did you want to stop self-harming? (Yes; No)

This inventory was written to help us better understand the experience of non-suicidal self-harm. Below is a list of statements that may or may not be relevant to your experience of self-harm. Please identify the statements that are most relevant for you:

“When I self-harm, I am… (0 - not relevant for me at all; 1 - Somewhat relevant for me; 2 - Very relevant for me)

1. …calming myself down
2. …creating a boundary between myself and others
3. …punishing myself
4. …giving myself a way to care for myself (by attending to the wound)
5. …causing pain so I will stop feeling numb
6. …avoiding the impulse to attempt suicide
7. …doing something to generate excitement or exhilaration
8. …bonding with peers
9. …letting others know the extent of my emotional pain
10. ….seeing if I can stand the pain
11. ….creating a physical sign that I feel awful
12. ….getting back at someone
13. ….ensuring that I am self-sufficient
14. ….releasing emotional pressure that has built up inside of me
15. ….demonstrating that I am separate from other people
16. ….expressing anger towards myself for being worthless or stupid
17. ….creating a physical injury that is easier to care for than my emotional distress
18. ….trying to feel something (as opposed to nothing) even if it is physical pain
19. ….responding to suicidal thoughts without actually attempting suicide
20. ….entertaining myself or others by doing something extreme
21. ….fitting in with others
22. ….seeking care or help from others
23. ….demonstrating I am tough or strong
24. ….proving to myself that my emotional pain is real
25. ….getting revenge against others
26. ….demonstrating that I do not need to rely on others for help
27. ….reducing anxiety, frustration, anger or other overwhelming emotions
28. ….establishing a barrier between myself and others
29. ….reacting to feeling unhappy with myself or disgusted with myself
30. ….allowing myself to focus on treating the injury, which can be gratifying or satisfying
31. ….making sure I am still alive when I don’t feel real
32. ….putting a stop to suicidal thoughts
33. ….pushing my limits in a manner akin to skydiving or other extreme activities
34. ….creating a sign of friendship or kinship with friends or loved ones
35. ….keeping a loved one from leaving or abandoning me
36. ….proving I can take physical pain
37. …signifying the emotional distress I’m experiencing
38. …trying to hurt someone close to me
39. …establishing that I am autonomous/independent

40. In the space below, please list any statements that you feel would be more accurate for you than the ones listed above:

41. In the space below, please list any statements you feel should be added to the above list, even if they do not necessarily apply to you
Questionnaire 3

Functional Assessment of Self-Mutilation (FASM)

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

2. In the past year, how many times have you engaged in the following behaviors to deliberately harm yourself (check all that apply)?
   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

3. In the past year, have you gotten medical treatment for behaviours to deliberately harm yourself?

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

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

6. How long did you think about doing the above act(s) before actually doing it?
7. Did you perform any of the above behaviors while you were taking drugs or alcohol?

8. Did you experience pain during this self-harm?

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

10. Did you harm yourself for any of the reasons listed below? (check all reasons that apply):

1. To avoid school, work or other activities
2. To relieve feeling “numb” or empty
3. To get attention
4. To feel something, even if it was pain
5. To avoid having to do something unpleasant you don’t want to do
6. To get control of a situation
7. To try to get a reaction from someone, even if it’s a negative reaction
8. To receive more attention from your parents or friends
9. To avoid being with people
10. To punish yourself
11. To get other people to act differently or change
12. To be like someone you respect
13. To avoid punishment or paying the consequences
14. To stop bad feelings
15. To let others know how desperate you were
16. To feel more a part of a group
17. To get your parents to understand or notice you
18. To give yourself something to do when alone
19. To give yourself something to do when with others
20. To get help
21. To make others angry
22. To feel relaxed
23. Other
Questionnaire 4

Beck Scale for Suicide Ideation

Please carefully read the following 19 statements and, for each, check the most appropriate response for you.

1. How strong is your wish to live?
   o Moderate to strong.
   o Weak.
   o None.

2. Do you have any wish to die?
   o None.
   o Some weak desire.
   o Moderate to strong desire.

3. In considering your reasons for living and dying:
   o the reasons for living outweigh the reasons for dying.
   o the reasons for living equal the reasons for dying.
   o the reasons for dying outweigh the reasons for living.

4. Do you have any desire to attempt to end your life?
   o None.
   o I have some weak desire.
   o I have at least moderate desire.

5. If for any reason your life was endangered and you were in a position to intervene, would you:
   o take the necessary action to save your life?
   o leave the final result of life and death to chance?
   o avoid any steps which could be taken to save your life?

6. For what duration have you had thoughts of taking your own life?
   o If at all, they have been at the most brief, passing thoughts.
   o They have persisted longer than the occasional passing thought.
   o They are continuously on my mind.

7. How frequently have you thought of taking your own life?
   o If at all, only on rare occasions.
   o Fairly frequently.
   o Quite often, almost all the time.

8. How do you feel about any thoughts of ending your life you might have?
   o I reject them.
   o I am unsure about them.
9. Do you feel you can control any thoughts of ending your life you might have?
   o I feel they are under my control.
   o I am unsure that I control them.
   o I have no sense of control over these wishes.
10. Do you feel deterred from taking action to end your life by certain inhibiting factors (e.g., family, religious beliefs) within it?
    o I would not attempt to end my life because of deterrents.
    o I am moderately inhibited from ending my life by deterrents.
    o I am unconcerned about any deterrent.
11. What reasons could you have for attempting to end your own life?
    o Only to get attention or revenge.
    o To get attention and to escape my problems.
    o To escape from my problems and solve them.
12. Have you ever contemplated ending your own life to the extent of making a plan or choosing a method with which to do so?
    o No, I have not considered it.
    o Yes, but not to the extent of working out the details.
    o Yes, I have considered and worked out a plan to do so.
13. What opportunity would you have to end your own life?
    o Very little, there is no available method or opportunity.
    o Some, but getting an opportunity and acquiring a means to do so would take some effort.
    o Considerable, an opportunity and means to do so are readily available.
    o Considerable, although opportunity and means are not currently available, they would be in the future.
14. How capable could you feel in carrying out an attempt to end your life?
    o I would be too afraid, hesitant or incompetent.
    o I would be unsure of my courage and competence.
    o I would be quite sure of my courage and competence.
15. Do you anticipate that you will ever make an actual attempt to end your life?
    o No.
    o I don’t know; I am not quite sure.
    o Yes
16. Have you ever made any preparation for any attempt to end your life?
    o No, none whatsoever.
    o Some, but not complete preparation.
    o Yes, complete preparation for an attempt.
17. Have you ever formulated a suicide note for yourself?
   o No.
   o I thought about one but only started composing or writing it.
   o Yes, I completed one.

18. Have you ever taken any actions (e.g., insurance, will) in anticipation of attempting to end your own life?
   o None at all.
   o Some, I have thought about such action and made preliminary arrangements.
   o Considerable, I have made a definite plan or completed such arrangements.

19. To what degree have you openly revealed any thoughts you might have of ending your life?
   o I have revealed any ideas openly.
   o I have held back on revealing any thoughts of this nature.
   o I have kept them to myself or taken measures to conceal their knowledge from others.
Questionnaire 5

UPPS-P (Urgency Subscale)

Below are a number of statements that describe ways in which people act and think. For each statement, please indicate how much you agree or disagree with the statement. If you **Agree Strongly** check 1, if you **Agree Somewhat** check 2, if you **Disagree somewhat** check 3, and if you **Disagree Strongly** check 4.

1. I have trouble controlling my impulses.
2. I have trouble resisting my cravings (for food, cigarettes, etc.).
3. I often get involved in things I later wish I could get out of.
4. When I feel bad, I will often do things I later regret in order to make myself feel better now.
5. Sometimes when I feel bad, I can’t seem to stop what I am doing even though it is making me feel worse.
6. When I am upset I often act without thinking.
7. When I feel rejected, I will often say things that I later regret.
8. It is hard for me to resist acting on my feelings.
9. I often make matters worse because I act without thinking when I am upset.
10. In the heat of an argument, I will often say things that I later regret.
11. I always keep my feelings under control.
12. Sometimes I do impulsive things that I later regret.
Questionnaire 6

Emotional Reactivity Scale

This questionnaire asks different questions about how you experience emotions on a regular basis (for example, each day). When you are asked about being “emotional,” this may refer to being angry, sad, excited, or some other emotion.

0 – Not at all like me
1 – A little like me
2 – Somewhat like me
3 – A lot like me
4 – Completely like me

1. When something happens that upsets me, it’s all I can think about it for a long time.
2. My feelings get hurt easily.
3. When I experience emotions, I feel them very strongly/intensely.
4. When I’m emotionally upset, my whole body gets physically upset as well.
5. I tend to get very emotional very easily.
6. I experience emotions very strongly.
7. I often feel extremely anxious.
8. When I feel emotional, it’s hard for me to imagine feeling any other way.
9. Even the littlest things make me emotional.
10. If I have a disagreement with someone, it takes a long time for me to get over it.
11. When I am angry/upset, it takes me much longer than most people to calm down.
12. I get angry at people very easily.
13. I am often bothered by things that other people don’t react to.
15. My emotions go from neutral to extreme in an instant.
16. When something bad happens, my mood changes very quickly. People tell me I have a very short fuse.
17. People tell me that my emotions are often too intense for the situation.
18. I am a very sensitive person.
19. My moods are very strong and powerful.
20. I often get so upset it’s hard for me to think straight.
21. Other people tell me I’m overreacting.

22. Please write other relevant questions/comments
Questionnaire 7

Difficulties in Emotion Regulation Scale (DERS) – Strategies Subscale

Please indicate how often the following 36 statements apply to you by writing the appropriate number from the scale above (1 – 5) in the box alongside each item.

1- Almost never (0-10%)
2- Sometimes (11-35%)
3- About half the time (36-65%)
4- Most of the time (66 – 90%)
5- Almost always (91-100%)

1. When I'm upset, I believe that I will remain that way for a long time.
2. When I'm upset, I believe that I'll end up feeling very depressed.
3. When I'm upset, I know that I can find a way to eventually feel better.
4. When I'm upset, I believe there is nothing I can do to make myself feel better.
5. When I'm upset, I start to feel very bad about myself.
6. When I'm upset, I believe that wallowing in it is all I can do.
7. When I'm upset, it takes me a long time to feel better.
8. When I'm upset, my emotions feel overwhelming.
Questionnaire 8
Depressive Attributions Questionnaire

Please select the appropriate number to indicate how much you agree with each statement.

0 – Not at all
1 –
2 –
3 –
4 – Very strongly

1. When bad things happen, I think it is my fault.
2. I feel helpless when bad things happen.
3. When things do not go well, I get easily discouraged
4. When things go well, I think it is just due to good luck
5. When something I do goes wrong, I think it is because I am incapable
6. When something good happens, I think it will not last long.
7. When something bad happens, I think there is little I can do to make things better.
8. When something good happens to me, I think this was because of other people or the circumstances rather than me.
9. Bad things always happen to me.
10. When bad things happen, I rely on other people to sort things out.
11. When bad things happen to me, I am sure it will happen again.
12. When bad things happen to me, I think my life will never get better.
13. When something bad happens, I think of the problems this will cause in all areas of my life.
14. Bad things happen in all areas of my life.
15. When bad things happen to me, I can’t see anything positive in my life.
16. When bad things happen, nothing seems to be in place any more.
**Questionnaire 9**

**Self-Compassion Scale**

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

- Almost Never
- Occasionally
- About Half Of The Time
- Fairly Often
- Almost Always

1. When I'm feeling down I tend to obsess and fixate on everything that's wrong.
2. When things are going badly for me, I see the difficulties as part of life that everyone goes through.
3. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.
4. I try to be loving towards myself when I'm feeling emotional pain.
5. When I fail at something important to me I become consumed by feelings of inadequacy.
6. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.
7. When times are really difficult, I tend to be tough on myself.
8. When something upsets me I try to keep my emotions in balance.
9. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
10. I'm intolerant and impatient towards those aspects of my personality I don't like.

11. When I'm going through a very hard time, I give myself the caring and tenderness I need.

12. When I'm feeling down, I tend to feel like most other people are probably happier than I am.

13. When something painful happens I try to take a balanced view of the situation.

14. I try to see my failings as part of the human condition.

15. When I see aspects of myself that I don't like, I get down on myself.

16. When I fail at something important to me I try to keep things in perspective.

17. When I'm really struggling, I tend to feel like other people must be having an easier time of it.

18. I'm kind to myself when I'm experiencing suffering.

19. When something upsets me I get carried away with my feelings.

20. I can be a bit cold-hearted towards myself when I'm experiencing suffering.

21. When I'm feeling down I try to approach my feelings with curiosity and openness.

22. I'm tolerant of my own flaws and inadequacies.

23. When something painful happens I tend to blow the incident out of proportion.

24. When I fail at something that's important to me, I tend to feel alone in my failure.

25. I try to be understanding and patient towards those aspects of my personality I don't like.
Questionnaire 10

The Psychache Scale

The following statements refer to your psychological pain, NOT your physical pain. By checking the appropriate statement, please indicate how frequently each of the following occurs.

1. I feel psychological pain
   - Never   - Sometimes   - Often   - Very Often   - Always

2. I seem to ache inside
   - Never   - Sometimes   - Often   - Very Often   - Always

3. My psychological pain seems worse than any physical pain.
   - Never   - Sometimes   - Often   - Very Often   - Always

4. My pain makes me want to scream.
   - Never   - Sometimes   - Often   - Very Often   - Always

5. My pain makes my life seem very dark.
   - Never   - Sometimes   - Often   - Very Often   - Always

6. I can't understand why I suffer.
   - Never   - Sometimes   - Often   - Very Often   - Always

7. Psychologically, I feel terrible.
   - Never   - Sometimes   - Often   - Very Often   - Always

8. I hurt because I feel empty.
   - Never   - Sometimes   - Often   - Very Often   - Always

9. My soul aches
   - Never   - Sometimes   - Often   - Very Often   - Always

Please continue this inventory using the following scale:
10. I can't take my pain any more
   o Strongly Disagree   o Disagree   o Unsure   o Agree   o Strongly Agree
11. Because of my pain, my situation is impossible
   o Strongly Disagree   o Disagree   o Unsure   o Agree   o Strongly Agree
12. My pain is making me fall apart.
   o Strongly Disagree   o Disagree   o Unsure   o Agree   o Strongly Agree
   o Strongly Disagree   o Disagree   o Unsure   o Agree   o Strongly Agree
**Questionnaire 11**

**Reasons for Living Inventory - Survival and Coping Beliefs Subscale**

Many people have thought of suicide at least once. Others have never considered it. Whether you have considered it or not, we are interested in the reasons you would have for NOT committing suicide if the thought were to occur to you or if someone were to suggest it to you.

The following statements are reasons people sometimes give for NOT committing suicide. We would like to know how important each of these possible reasons would be to you at this time in your life as a reason to not kill yourself.

Each reason can be rated from 1 (Not At All Important) to 6 (Extremely Important). If a reason does not apply to you or if you do not believe the statement is true, then it is not likely important and you should put a 1. Please use the whole range of choices so as not to rate only at the middle (2, 3, 4, 5) or only at the extremes (1, 6).

Please indicate the importance to you of each reason for NOT killing yourself.

Even if you never have or firmly believe you never would seriously consider killing yourself, it is still important that you rate each reason. In this case, rate on the basis of WHY KILLING YOURSELF IS OR WOULD NEVER BE AN ALTERNATIVE FOR YOU.

1. Not at all important
2. Quite unimportant
3. Somewhat unimportant
4. Somewhat important
5. Quite important
6. Extremely important

1. I care enough about myself to live.
2. I believe I can find other solutions to my problems.
3. I still have many things left to do.
4. I have hope that things will improve and the future will be happier.
5. I have the courage to face life.
6. I want to experience all that life has to offer and there are many experiences I haven’t had yet which I want to have.
7. I believe in everything has a way of working out for the best.
8. I believe I can find a purpose in life, a reason to live.
9. I have a love of life.
10. No matter how badly I feel, I know that it will not last.
11. Life is too beautiful and precious to end it.
12. I am happy and content with my life.
13. I am curious about what will happen in the future.
14. I see no reason to hurry death along.
15. I believe I can learn to adjust or cope with my problems.
16. I believe killing myself would not really accomplish or solve anything.
17. I have a desire to live.
18. I am too stable to kill myself.
19. I have future plans I am looking forward to carrying out.
20. I do not believe that things get miserable or hopeless enough that I would rather be dead.
21. I do not want to die.
22. Life is all we have and is better than nothing.
23. I believe I have control over my life and destiny.
Appendix B

Figures
Figure 1

*Calculation of Kappa Statistic*

\[
\text{Kappa} = \frac{\text{Po} - \text{Pc}}{1 - \text{Pc}}
\]

where

\( \text{Po} \) = the sum of the observed proportion of agreement = \( \frac{\text{Sum of the matrix diagonal elements}}{\text{Sum of all elements}} \)

\( \text{Pc} \) = the sum of the chance expected proportion of agreement

a. Row proportions = \( \frac{\text{Sum of columns for each row}}{\text{Sum of all elements}} \)

b. Column proportions = \( \frac{\text{Sum of rows for each column}}{\text{Sum of all elements}} \)

c. \( \text{Pc} \) = Sum of (row proportion X column proportion)
Figure 2

*Flowchart of Missing Data*

Initial Sample  
\(n = 476\)

Duplicates and individuals not meeting age criteria  
\(n = 102\)

Individuals available for analyses  
\(n = 347\)

**Analyses Part 1**

- Outliers  
  \(n = 16\)
  - Missing data on categorization variable  
    \(n = 28\)
  - Missing total score on \(\geq 1\) vulnerability variable  
    \(n = 41\)

\(N = 262\)

**Analyses Part 2**

- Outliers  
  \(n = 14\)
  - Missing data on categorization variable  
    \(n = 30\)
  - Missing total score on Psychache  
    \(n = 31\)
  - Missing total score on SCB  
    \(n = 40\)

\(N = 232\)
Does the Vulnerability Profile Distinguish Among those with a History of NSSI-Only, Suicidality-Only, NSSI+Suicidality, and No History of Self-Harm?
Figure 4

Does the Vulnerability Profile Distinguish Among NSSI-Only, Suicidality-Only and NSSI+Suicidality?
Model Testing Hypothesis that Vulnerability Mediates the Relationship Between NSSI and Suicidality

\[ * * p < .01, \text{two-tailed} \]
Figure 6

Does the Vulnerability Profile Distinguish Among those with a History of
NSSI-only, Suicidality-only, NSSI+Suicidality, and No History of Self-Harm: Women.
Figure 7

Does the Vulnerability Profile Distinguish Among those with a History of NSSI-only, Suicidality-only, NSSI+Suicidality, and No History of Self-Harm: Men

![Canonical Discriminant Functions](image-url)
Figure 8

Does the Vulnerability Profile Distinguish Among NSSI-Only, Suicidality-Only and NSSI+Suicidality: Women
Figure 9

Does the Vulnerability Profile Distinguish Among NSSI-Only, Suicidality-Only and NSSI+Suicidality: Men
Figure 10

*The Third Variable Theory*

Vulnerability profile $\rightarrow$ NSSI $\rightarrow$ Suicidality

Figure 11

*The Gateway Theory*

NSSI $\rightarrow$ Suicidality

Figure 12

*Theory of Acquired Capability*

NSSI $\rightarrow$ Acquired capability $\rightarrow$ Suicidality
Figure 13

*Figure 13*

*A visual representation of how theories may combine*