UNDERSTANDING NON-SUICIDAL SELF-INJURY IN COLLEGE POPULATIONS

by

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Certificate of Approval

This is to certify that the accompanying thesis by Serenita Shannon Kumar has been accepted in partial fulfillment of the requirements for graduation with Honors in Psychology.

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Abstract

Non-suicidal self-injury is the direct and deliberate destruction of one's own body tissue without suicidal intent. The present study: (1) compares non self-injurious coping strategy use between participants who self-injure and those who do not; (2) extends the Four Function Model (Nock & Prinstein, 2004) to a nonclinical sample of college students; and (3) tests the validity of the Four Function Model, which describes and categorizes 22 possible reasons for self-injuring. Participants included 272 undergraduate students of which 66 self-injured. Participants took an online survey; questions were from the "How I Deal with Stress" inventory (Heath & Ross, 2007) and the "Functional Assessment of Self-Mutilation" (Lloyd-Richardson, Kelly, & Hope, 1997). The study found that self-injurers use coping strategies associated with impulsivity and that they self-injure in order to stop bad feeling and punish themselves. The study also found the Four Function Model requires a different construct when describing why college students self-injure.

List of Illustrations

Understanding Non-Suicidal Self-Injury in College Populations

Millions of teenagers engage in self-injurious behaviors every year (Hewitt, 1997; Nock, 2009). In fact, engaging in harmful and self-destructive behaviors is becoming more mainstream and socially acceptable (Hewitt, 1997; Whitlock, Power, & Eckenrode, 2006). Escalating levels of engagement in self-injurious behaviors indicate the importance of developing effective prevention and intervention treatments. But in order to develop effective treatment plans, it is first necessary to understand why individuals self-injure.

The act of self-injury is one of the most perplexing problems facing psychologists today (Nock, Prinstein & Sterba, 2009). Many explanations and models describing why people self-injure exist (Nock, 2009; Suyemoto & MacDonald, 1995), making it difficult for researchers to agree on why people self-injure (Lloyd-Richardson, 2008). As Suyemoto (1998) states, "one of the most difficult tasks in attempting to understand any pathological behavior is discerning why this *particular* behavior, at this *particular* time, serves this *particular* function, for this *particular* patient" (Suyemoto, 1998, p. 537). In other words, individuals may have many different reasons for engaging in self-injury and these reasons may vary over time and situation.

Through numerous studies, researchers have theorized about why individuals choose self-injury; they have formed predictions about the age of onset of self-injury and have created models on how self-injury helps individuals. However, the majority of this research has focused primarily on clinical adolescent populations; less research has focused on nonclinical samples of college students, even though self-injury is prevalent among college students. About 4% of individuals from large nonclinical populations self-

injure (Klonsky, 2007); even higher percentages of individuals from college populations self-injure (Favazza & Conterio, 1989; Gratz, 2001; Whitlock, Eckenrode, & Silverman, 2006). In this context, a nonclinical sample refers to a sample of participants that is selected from outside a clinical setting such as a hospital, mental health institution, or outpatient treatment center. Perhaps through increased efforts to understand self-injury in college students, researchers can take a step toward developing more effective prevention and intervention treatments for self-injurers.

History of Self-Injury

For longer than 65 years, researchers have been gathering information about self-injurious behaviors (Suyemoto, 1998). However, researchers had not reached a consensus on what the definition of self-injury should include until recently. Previously, definitions of self-injury included various levels of severity. For example, some studies have included only moderately self-injurious nonsuicidal self-cutting; other studies have included other acts such as self-burning, interfering with wound healing, self-hitting, and self-biting, in addition to self-cutting; some studies have even included the more severe acts of self-inflicted injury such as eye enucleation, self-castration, or suicidal attempts and gestures (Suyemoto, 1998).

Researchers also did not previously differentiate between nonsuicidal self-injurious behaviors and suicidal behaviors because they did not have ample evidence that individuals may engage in self-injurious behaviors with different intentions (Jacobson & Gould, 2007). Now, researchers are not only well aware that numerous forms of self-injury exist, but also that each form potentially serves different functions (Muehlenkamp, 2005; Nock, 2009; Prinstein, 2008). Thus, self-injurious behaviors in general are

classified into two categories based on intention: (1) suicidal self-injurious gestures and behaviors; and (2) nonsuicidal self-injurious behaviors.

Even after researchers began distinguishing between suicidal and nonsuicidal self-injurious behaviors, there was still no consensus on what behaviors self-injury should encompass or what terminology should be used to describe self-injury. Numerous seemingly synonymous terms exist for describing self-injury, such as self-harm (Favazza & Conterio, 1988), harmful behaviors (Deliberto & Nock, 2008), self-mutilation (Lloyd-Richardson et al., 2006), and deliberate self-harm (Gratz, 2003). Similarly, a lack of consensus on the definition of self-injury as well as what behaviors self-injury should describe complicates the results of research studies (Suyemoto, 1998). If a clear definition of self-injury does not exist, then the decision to include or exclude self-injurious behaviors is solely up to the discretion of individual researchers. This variability means that study results may not be comparable to other studies due to very different interpretations of self-injury. Researchers may also be unable to form a unified theory on self-injury and thus may have difficulty developing treatment plans. However, researchers have recently become more aware of the consequences of ill-defined terms and so have made attempts to come to a consensus on which behaviors the term "self-injury" should include. Now, there is a definition that differentiates between suicidal and nonsuicidal behaviors and exists as a category of a specific type of self-injury.

Non-Suicidal Self-Injury

Nonsuicidal self-injury (NSSI) is a specific type of self-injury that is stigmatized in society and thus differs from socially acceptable forms of self-injury such as ear piercing. Current consensus on the definition of NSSI is that it is the "direct and

deliberate destruction of one's own body tissue in the absence of suicidal intent" (Nock & Favazza, 2009, p. 9). The term "direct" in the definition implies that self-injury occurs as a direct outcome of the action, without intervening steps. For example, cutting one's skin with a blade is direct self-injury, whereas drinking and driving or smoking can lead to negative outcomes through indirectly occurring processes and are not considered as NSSI (Nock & Favazza, 2009). The term "deliberate" in the definition implies that the action was intended by the individual, and that it was not the result of an accident (Nock & Favazza, 2009). By this definition, actual destruction of one's own body tissue is required, although it is understood that the severity of physical injury caused by NSSI can vary significantly. The final component of the definition of NSSI is that the purpose of engaging in NSSI must not be as a suicidal gesture or behavior. Unless otherwise stated, all references to "self-injury" throughout the present study will refer to the non-suicidal self-injury (NSSI) definition.

Over the course of 65 years, researchers have categorized self-injurious behaviors by severity. Lloyd-Richardson and her colleagues (2006) studied NSSI in nonclinical adolescent populations by subdividing self-injurious behaviors into two categories: moderate and severe NSSI, and minor NSSI (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2006). Moderate and severe NSSI included cutting/carving on skin, burning skin, giving self a tattoo, scraping skin, and erasing skin; minor NSSI included hitting self on purpose, pulling hair out, inserting objects under nails or skin, biting self, and picking at areas of body to draw blood. By categorizing behaviors as moderate and severe NSSI or minor NSSI, Lloyd-Richardson and colleagues were able to focus on understanding those self-injurious behaviors that are most harmful to the body, such as cutting and burning.

Many researchers continue to define NSSI as including moderate, severe, and minor self-injurious behaviors (Klonsky, 2007; Nock, 2009; Whitlock et al., 2006) A new debate is emerging on whether these behaviors should be approached differently and studied separately based on severity (Lloyd-Richardson et al., 2006). Since no decision on this debate has been reached, the present study will only focus on the two most common and moderately severe self-injurious behaviors: cutting and burning.

Possible Risk Factors for Future Engagement in NSSI

Researchers are not certain of what factors contribute to future engagement in NSSI (Gratz, 2003; Heath, Toste, Nedecheva, Charlebois, 2008). This doubt is primarily because of two reasons: (1) not enough research on risk factors for NSSI exists; and (2) the research that does exist provides researchers with inconsistent results on which factors can be considered as risk factors for NSSI. Research on risk factors for NSSI is important because by understanding what factors may contribute to future engagement in NSSI, researchers and clinicians can develop prevention plans that target people with these risk factors.

Researchers have currently divided potential risk factors for NSSI into two categories: 1) such environmental risk factors as childhood maltreatment; and 2) such individual risk factors as difficulties with emotion expression and intensity. The majority of research that has focused on environmental risk factors has consistently found a link between childhood sexual and physical abuse and later engagement in self-injurious behaviors (Heath et al., 2008). Early attachment difficulties or disruptions, such as childhood separation, childhood loss, childhood neglect, or poor quality of parent-child relationship, may also be environmental risk factors for NSSI (Gratz, 2003). Research has

shown that these environmental risk factors could increase the likelihood that people may develop individual risk factors such as problems with expressing emotions (Heath et al., 2008). Research also consistently suggests that individuals who engage in self-injury often exhibit poor problem-solving skills (Evans, Williams, O'Louglin, & Howells, 1992; Nock & Mendes, 2008) and have rigid thinking styles (Kernberg, 1994).

Very few of these findings have been drawn from nonclinical samples. According to Heath and colleagues (2008), only Gratz and colleagues (2002, 2006) have attempted to simultaneously study both environmental and individual risk factors in a nonclinical sample of young adults who engage in NSSI. Thus, despite previous research findings, research on risk factors for NSSI is still preliminary and has only been supported in a few studies.

Existing Intervention Strategies

Research on intervention strategies is limited by the knowledge base on self-injury; effective treatments are particularly insufficient when compared to the numerous treatments existing for other behavioral problems such as depressive and anxiety disorders (Nock, Teper, & Hollander, 2007). Of the researched therapies for self-injury, behavior therapies have received the most attention as evidence-based treatments for reducing self-injury. Researchers cite behavior therapy approaches to yield an 80% reduction in self-injury over the course of the interventions (Kahng, Iwata, & Lewin, 2002; Klonsky & Muehlenkamp, 2007; Muehlenkamp, 2006; Nock et al., 2007). The most widely used behavior therapy is dialectical behavior therapy (DBT). The second most prominent and empirically supported intervention therapy for nonsuicidal self-injury is problem solving therapy (PST).

Dialectical behavior therapy (DBT) was developed by Linehan (1993) to treat individuals engaging in suicidal and nonsuicidal self-injury (Nock et al., 2007). The core principle of DBT is based on encouraging the client to simultaneously change and accept his or herself (Muehlenkamp, 2006). Clinicians attempt to achieve this balance of change and acceptance by helping clients develop new coping skill sets, addressing motivational obstacles during treatment, and promoting skill generalization outside the therapy setting (Ivanhoff, Linehan, & Brown, 2001). Clinicians use a hierarchical stage model that provides a guiding structure for the therapy including through individual therapy, group skills training, phone coaching, and supervision/consultation for the client with the therapist (Muehlenkamp, 2006).

Dialectical behavior therapy was initially examined and shown to be effective for borderline personality disorder, of which NSSI is the most prominent symptom (Muehlenkamp, 2006). However, more recent studies comparing the effectiveness of DBT and a comparison condition, such as therapy by experts for suicidal behaviors and borderline personality disorder, have generally failed to find differences regarding the effectiveness in decreasing self-injurious behaviors (Klonsky & Muehlenkamp, 2007; Linehan, Comtois, Murray, Brown, Gallop, & Heard., et al, 2006; Muehlenkamp, 2006; Nock & Hollander, 2007). Thus, there is much controversy among researchers regarding the effectiveness of DBT therapy.

Problem solving therapy (PST) is a type of cognitive-behavioral therapy similar to dialectical behavior therapy in that it focuses on immediately targeting NSSI and remedying skill deficits (Muehlenkamp, 2006). The assumption underlying the use of PST is that dysfunctional coping behaviors result from a cognitive or behavioral

breakdown in the problem-solving process (D'Zurilla & Nezu, 2001). The goals of PST are to help clients identify and resolve the problems they encounter in their lives and to teach clients general coping and problem-solving skills that they can utilize in the future to deal with the problems they encounter more effectively (Muehlenkamp, 2006). Therapists help clients accomplish these goals by teaching them the different steps in problem solving; these steps include: problem identification and goal setting via the use of a behavioral analysis of the problem, brainstorming and assessing potential solutions, selecting and implementing a solution, and evaluating the success of the chosen solution (D'Zurilla & Nezu, 2001; Muehlenkamp, 2006).

As with dialectical behavior therapy, studies on the efficacy of PST in reducing self-injurious behaviors have found mixed support. Early researchers have cited short-term effects on reducing NSSI; recently, researchers have stated PST reduces self-injurious behaviors in the long run, whereas other studies report inconclusive results (Muehlenkamp, 2006). Thus, even the most prominent interventions for self-injury are not consistently successful in reducing the use of self-injurious behaviors.

Discrepancies in Previous Research

Prevalence. The greatest inconsistency among previous research is in reports of lifetime incidence rates of NSSI in nonclinical samples of adolescents and young adults. Some studies report incidence rates between 10% and 20% (Muehlenkamp & Gutierrez, 2007; Ross & Heath, 2002; Whitlock et al., 2006). Other studies report much higher incidence rates that range between 37% and 40% (Gratz, 2006; Gratz 2007; Lloyd-Richardson et al., 2007; Lloyd-Richardson, 2008). Research done exclusively on young

adults samples found prevalence rates ranging between 12% and 38% (Favazza & Conterio, 1989; Whitlock et al., 2006).

Some of the discrepancy between the researchers who reported much higher incidence rates and those who reported lower incidence rates has to do with the inclusion or omission of certain behaviors. Researchers who presented checklists of all possible self-injurious behaviors to their participants and asked their participants to indicate all the behaviors used reported significantly higher rates of prevalence. Heath and colleagues (2008) speculate that when the definition of NSSI includes behaviors such as pulling hair, scraping skin, or picking at a scab because they can be considered as damaging tissue, participants who normally would not consider themselves self-injurers report themselves as such (Heath, 2008). Heath and colleagues think that this may be because participants' understanding of behaviors may be different than researchers' conceptualization of self-injurious behaviors. Although participants may report engaging in behaviors that fall under the definition of NSSI, they may have had different intentions than those the researchers are interested in. For example, an individual may report engaging in NSSI because he picked at a scab. He may have deliberately and intentionally picked at the scab because it was irritating and about to fall off. However, researchers would not consider this behavior as a nonsuicidal self-injurious behavior. Researchers are interested in individuals who may pick at a scab by reopening the wound, increasing the size of the wound, or perhaps even infecting it. This simple misunderstanding is the basis for why the present study will only look at moderately severe behaviors such as cutting and burning, rather than the more ambiguous acts.

Age of Onset. The second biggest inconsistency in previous research on NSSI is about the age of onset. Since the beginning of research on NSSI, researchers have been focusing almost exclusively on the adolescent population, particularly the adolescent clinical population. Approximately 20 years ago, it was generally accepted that individuals began self-injuring during adolescence (Favazza & Conterio, 1988). Findings across clinical and nonclinical samples reported that the typical age of onset of NSSI was between the ages of 12 and 14 (Muehlenkamp & Gutierrez, 2004; Muehlenkamp & Gutierrez, 2007; Nock & Prinstein, 2004; Ross & Heath, 2003).

More recently, however, researchers are finding that the age of onset of NSSI may not be limited to adolescence. Whitlock and colleagues (2006) found substantial numbers of individuals engaging in NSSI for the first time after the age of 17; of the 2875 undergraduate and graduate students who engaged in NSSI, 46% reported initially engaging after the age of 17 (Whitlock, Power, & Eckenrode, 2006). According to Heath and colleagues (2008), this finding indicates that a significant portion of those who self-injure will begin to do so during their college years. Clearly, researchers studying the age of onset of NSSI have not yet found solidarity on this aspect of NSSI. Hence, research on the age of onset of NSSI is warranted for all populations engaging in NSSI including college-aged and young adult populations.

Gender. The third major area of inconsistency is on gender differences among those who self-injure. Research studies, especially from the 1980s, often report finding gender differences; these studies have shown that women are more likely to engage in NSSI than are men (Ross & Heath, 2003; Simpson & Porter, 1981). However, this finding of gender differences has recently been contested. Researchers are now finding

no gender differences between men and women; recent studies show that men and women engage in NSSI at more similar rates than previously believed (Lloyd-Richardson et al., 2007; Muehlenkamp & Gutierrez, 2004).

This discrepancy between past and current research studies on gender differences has caused researchers to begin theorizing on why recent research studies often do not report gender differences, whereas past research studies often reported gender differences (Jacobson & Gould, 2007; Whitlock et al., 2009). Researchers believe that it may not be that women are more likely than men to self-injure, but that women may be more prone to seek help than men, particularly when distressed (Whitlock et al., 2009). Thus, since more women may be present in clinical settings than men, Heath and colleagues (2008) speculate that this may lead to a gender difference when examining clinical samples rather than nonclinical samples. Some researchers also predict that women may also more readily admit self-injuring, whether in counseling or in research studies (Whitlock et al., 2009). If women are more open about their engagement in NSSI than men are, this may skew data on gender differences. Whitlock and colleagues (2009) believe this gender difference may arise from the difficulties of studying gender differences when a disproportionate number of participants are female. Furthermore, they claim that findings related to who is treated for NSSI suggest that college health and residence life staff may overlook males at risk for NSSI (Whitlock et al., 2009). Thus, according to some researchers, including Whitlock and colleagues, the data are inconclusive in determining whether gender differences actually exist (Jacobson & Gould, 2007).

The assertion that gender differences do not exist in nonclinical samples may have some merit (Nock, 2009). Heath and colleagues (2008) found that within nonclinical

samples, it appears that gender differences exist depending on the inclusion of indirect nonsuicidal self-injurious behaviors, such as nonsuicidal overdosing and ingesting harmful substances (Heath et al., 2008). Additionally, Heath and colleagues claim that most researchers who have limited their definitions to direct self-injurious behaviors did not find gender differences. Nevertheless, some researchers still believe gender differences exist in nonclinical populations (Nock, 2009). Consequently, researchers have not yet come to an agreement regarding the existence of gender differences, particularly in the context of nonclinical or clinical populations.

Understanding NSSI through the Four Function Model

In order to provide a better understanding of why individuals engage in NSSI, Nock and Prinstein (2004, 2005) developed a model called the Four Function Model of non-suicidal self-injury. The Four Function Model is based on twenty-two potential reasons individual may have for engaging in self-injury. Research on the Four Function Model refers to these reasons as "reinforcements" because they describe possible reasons why self-injurious behaviors are reinforced. These reinforcements are grouped into two dichotomous dimensions: (1) positive or negative reinforcements and (2) automatic or social reinforcements. The reinforcements are categorized into what Nock and Prinstein refer to as a "function," hence the name, the Four Function Model. The automatic function refers to reasons that are internally reinforced; the social function refers to reasons that are externally reinforced. The Four Function Model is presented schematically in Figure 1.

In Figure 1, the first function proposed in the Four Function Model is the automatic positive reinforcement (APR) in which NSSI is performed to generate feeling.

In this function, individuals who self-injure may experience periods of dissociation or depersonalization; engaging in NSSI may bring them back from their dissociative or depersonalized state (Klonsky, 2007). For example, individuals may engage in NSSI because they initially feel emotionless, such as numbness or anhedonia; afterwards, they report feeling alive or real again (Nock, 2009).

The second proposed function is automatic negative reinforcement (ANR) in which NSSI is performed to remove or escape from currently existing emotions, such as a negative affective or cognitive state. The ANR function of NSSI is framed around the idea that self-injury is an expression of anger or derogation toward oneself (Klonsky, 2007). For example, individuals may self-injure as a way to punish or deprecate themselves (Nock, 2009). The ANR function of NSSI is the most commonly endorsed reason among researchers in the field of nonsuicidal self-injury for explaining why individuals self-injure (Nock & Prinstein, 2005).

The third proposed function of NSSI is social positive reinforcement (SPR) in which NSSI is performed to get attention or access to environmental resources. The SPR function of NSSI characterizes individuals who self-injure as publically seeking help by allowing others to notice injuries and scars or as attempting to avoid abandonment by manipulating other people or their environments (Klonsky, 2007). For example, an individual may self-injure in order to elicit affectionate responses from a romantic partner or loved one; individuals may also self-injure in order to elicit reinforcing responses from peers at school.

The fourth proposed function of NSSI in the Four Function Model is social negative reinforcement (SNR) in which NSSI is performed to remove some interpersonal

demand. This function portrays NSSI as a way in which individuals can assert their boundaries of the "self" (Lloyd-Richardson, 2008; Nock, & Prinstein, 2004). By marking their skin through self-injurious acts, individuals can separate themselves from other people and their environment and become more individualized (Klonsky, 2007). In doing so, individuals can assert their identity or autonomy (Nock, 2009). For example, individuals may self-injure in order to get out of going to school, to make their parents stop fighting, or to make other people leave them alone (Lloyd-Richardson, 2008).

Researchers who have used The Four Function Model of NSSI have only looked at clinical and adolescent populations; this model has not yet been applied to nonclinical populations of college students. In clinical populations, researchers found that adolescents typically self-injured for at least one of the four functions of the Four Function Model (Nock & Prinstein, 2004). Nock and Prinstein (2004) found that adolescents engaged in NSSI for positive and negative automatic reinforcements more than for positive and negative social reinforcements; they also found that adolescents engaged in NSSI more for automatic negative reinforcements than for automatic positive reinforcements. The present study attempts to understand why individuals in college populations self-injure by determining whether they engage in NSSI for any of the functions described by this model.

Concerns Regarding the Four Function Model

The Four Function Model is currently the only existing model that attempts to describe why individuals may choose to engage in NSSI by categorizing potential reinforcing reasons for engaging in self-injury. The present study uses this model because of its objective to understand self-injury in college populations and because of its goal to

provide research for the development of effective prevention and intervention plans. By examining whether some reinforcements or categories are used more than others, researchers can develop effective plans that target those specific reinforcing reasons individuals may have for choosing to self-injure.

The present study adheres to the categorization of reinforcements denoted by Nock and Prinstein (2004, 2005) and Lloyd-Richardson, Kelly, and Hope (1997). See Table 1 for their categorization of reinforcements in the Four Function Model. Their categorization was based on the results of their factor analyses[1]. Although Lloyd-Richardson et al. noted that the results of the factor analyses in their research were clear, it is important to be aware that these factor analyses were only conducted on clinical and adolescent samples. Thus, extending the Four Function Model to a different population may be problematic since its validity in a nonclinical population of college students has not yet been established.

However, for the purposes of the present study, this issue of the lack of validity of the model in a nonclinical sample of college students is neither crucial nor detrimental. As previously stated, the primary purpose of the present study is not to determine whether the model is valid in a different population, but whether the reasons individuals in a nonclinical population of college students engage in self-injury are similar to the reasons individuals in other populations engage in self-injury. Since the Four Function Model describes why individuals in clinical and adolescent populations self-injure, it follows that the most logical way to study the same behavior in a different population would be to begin by using the same tool. Through this extension of the model, it would then be possible to determine whether similar types of reinforcements are used

consistently across different populations. By comparing and contrasting the reasons individuals from different populations self-injure, future research can formulate effective prevention and intervention plans for individuals in different populations that can combat the specific reasons those individuals may have for self-injuring. The most optimal way to compare and contrast 22 different behaviors is to use the existing categorization of the model to determine whether some functions in the Four Function Model are used more than others.

However, despite using the model, the present study will not limit itself to the constraints of the model, namely the categorization denoted by previous researchers. Thus, the present study will attempt to examine the validity of the Four Function Model in a nonclinical sample of college students, a previously untested population, as an exploratory component. If the categorization of reinforcements is the same in all populations, the findings of this exploratory component of the present study can potentially further validate the Four Function Model. However, if the findings are different than that of previous research, the results are inconclusive as this implies that a different construction of the model may be necessary for a different population. In order to maintain the exploratory nature of this component of the present study, there are no hypotheses on the extension of the Four Function Model to a nonclinical population of college students in the present study.

Additionally, the Four Function Model does not differentiate between an individual's decision to self-injure and an individual's decision to continue self-injuring. The model simply categorizes possible reasons an individual may have for engaging in NSSI, regardless of whether the individual self-injured for the first time or the tenth time.

Nevertheless, this limitation of the model does not affect the goal of the present study to use the model as a tool to examine which reinforcements are most commonly used.

The Present Study

Nonsuicidal self-injury is still a relatively new field of research. Previous research in this area has primarily focused on clinical populations and almost exclusively on the adolescent age range. Although there have been a few studies on college populations, most of these studies have looked at self-injurious behaviors in combination with alcohol and drug use, or have examined the co-morbidity of NSSI with eating disorders, borderline personality disorder, bipolar disorder, or with mentally unstable or retarded populations. The present study attempts to address a gap in the current research on NSSI by focusing solely on self-injurious behaviors in a nonclinical sample of college students: a less researched but still very important population since self-injury often exists in college populations. The present study will also use the previously established definition of nonsuicidal self-injury as the "direct and deliberate destruction of one's own body tissue in the absence of suicidal intent" (Nock, 2009) and focus on the two most common and moderately severe self-injurious behaviors: cutting and burning.

The present study also attempts to examine the differences in coping mechanisms chosen by individuals who do and do not self-injure. By comparing these two groups, the present study may shed some light on the process of deciding to engage in NSSI. Previous research that has looked at non self-injurious coping mechanisms has only done so with a purpose of using it as a screening measure; by embedding a question about the use of self-injury as a coping strategy among many others, and advertising the survey study as one on coping strategies, previous researchers were able to screen for self-

injurers without participants' knowledge. This reduced the self-selection bias that occurs when participants know the topic of the study. However, because of the complication of using deception while obtaining consent, the present study will be advertised as a study on self-injury. The present study intends to use the same coping strategy screening measure, except it will use it to compare the use of non self-injurious coping strategies between individuals who self-injure and those who do not.

The goals of the present study are: (1) to compare non self-injurious coping strategy use between individuals who self-injure and those who do not; (2) to extend the Four Function Model of NSSI (Nock, 2009) to a nonclinical sample of college students; and (3) to test the validity of the Four Function Model. Previous research has not looked at coping strategies and has not attempted to find support for the Four Function Model of NSSI in a nonclinical sample. Therefore, the hypotheses for the first two goals of the present study are preliminary. There are no hypotheses regarding the third goal as it is an exploratory component of the present study.

Hypothesis 1: There will be a difference between the number of non self-injurious coping strategies used by individuals who engage in NSSI and individuals who do not engage in NSSI.

Hypothesis 2: There will be a difference between the number of times individuals who engage in NSSI use a non self-injurious coping strategy and the number of times individuals who do not engage in NSSI use a non self-injurious coping strategy.

Previous research on the Four Function Model indicates that more adolescents engage in NSSI for the positive and negative automatic reinforcements, engaging in NSSI more for the automatic negative reinforcement than the automatic positive reinforcement

(Lloyd-Richardson et al., 2007; Nock & Prinstein, 2004). Since the Four Function Model has not previously been extended to nonclinical college populations, these hypotheses are based on research from clinical populations.

Hypothesis 3: A greater proportion of college students will engage in NSSI for automatic reinforcements than social reinforcements.

Hypothesis 4: A greater proportion of college students will engage in NSSI for automatic negative reinforcements than automatic positive reinforcements.

Additionally, the relationships between variables such as high school, college, class year, race and ethnicity, gender, age of onset of NSSI, prevalence of NSSI within the sample for this study, as well as the four reinforcements from the Four Function Model will be examined.

The categorization of reinforcements into the Four Function Model is based on factor analyses only conducted on samples of clinical and adolescent populations. Thus, as an exploratory component of my thesis, the present study will attempt to determine whether the current categorization of reinforcements applies to a nonclinical sample of college students.

Method

Participants

Two hundred and seventy-two participants from two private liberal arts colleges along the U.S. West Coast participated in this study. The two colleges were Whitman College (Washington) and Whittier College (California). One hundred and eighty-seven (70%) were from Whitman College and eighty (30%) were from Whittier College. Table 2 describes participants by their age, class year, race/ethnicity, and the type of high

school they attended. Participants ranged from 18 to 23 years old. Twenty-six percent (69) of the participants were male and seventy-four percent (195) of the participants were female.

Measures

The How I Deal With Stress Inventory (HIDS). Heath and Ross (2002) designed and reported this inventory. Researchers have since used this inventory as a screening measure to differentiate between the participants who engage in NSSI and those who do not. However, researchers have only used the responses of participants who self-injured; they discarded the responses from participants who did not self-injure. The HIDS measure consists of 29 coping strategies in which "use of self-injury" is embedded into the questionnaire as one of the possible coping strategies. Participants indicate how often they use each coping strategy on a 4-point Likert scale (1 = *never* and 4 = *frequently*).

The present study uses the HIDS inventory to screen for participants who do engage in NSSI as well as to compare the use of coping strategies between participants who do and do not engage in NSSI. Participants who specify that, when feeling stressed, have "hurt themselves on purpose", "done risky things" or "talked to someone" are asked to provide more details about their use of the coping strategy. Participants who indicate they have hurt themselves on purpose are automatically transferred to an additional component of the survey assessing their use of self-injurious behaviors.

In a large-scale study of college students, the HIDS inventory was examined through a multidimensional scaling analysis which supported the construct validity of the measure (Ross, Heath, & Toste, 2009), even though no formal studies assessing the

validity and reliability of this instrument exist. In the present study, the HIDS inventory had an internal consistency of α = .74. See Appendix A for the HIDS inventory.

The Functional Assessment of Self-Mutilation (FASM). Lloyd-Richardson, Kelly, and Hope (1997) designed and created this measure in order to measure the frequency, methods, and functions of self-mutilation. The FASM consists of 11 nonsuicidal self-injurious behaviors and 22 possible reasons for engaging in self-injurious behaviors. The possible reasons for engaging in NSSI are categorized into the Four Function Model. Participants describe their use of each of the 22 reinforcements (see Table 1) on a 4-point Likert scale (1 = *never* and 4 = *often*). The internal consistency of the original scale ranged from α = .65 to .66.

In the present study, the scale was reformatted to only consist of two nonsuicidal self-injurious behaviors: self-cutting and self-burning; the other nine behaviors that described less severe self-injurious behaviors such as scraping oneself, pulling out one's hair, and biting one's mouth or lip were not examined. Several multiple choice questions were also added to the FASM scale such as "if you stopped injuring yourself, why did you stop"; "why did you stop injuring yourself at that moment"; "how long have you been self-injuring"; as well as "yes" or "no" questions such as "have you ever seen a counselor or therapist for issues related to your self-injury." The internal consistency of the reformatted scale in the present study is α = .72. See Appendix B for the modified FASM questionnaire.

Demographic information was also collected. See Appendix C for the demographic questions. The internal consistency for the entire survey including the HIDS inventory and the FASM questionnaire is α = .72.

Procedure

I first received approval from the Whitman College Institutional Review Board (IRB) and then the Whittier College IRB. I then emailed my survey link via school wide mailing lists. At the beginning of the online survey, a consent form appeared that provided participants with a little information about the study and a reminder of their rights as a research participant. Only if participants checked the box that indicated they are over the age of 18 and that they voluntarily give their consent to participate in the study would the online survey move forward.

Before analyzing the data, I deleted the participants who did not properly complete the survey, resulting in 272 out of an initial 347 total responses.

Analyses

In order to compare the frequency and use of coping strategies for individuals who engaged in NSSI and individuals who did not engage in NSSI, t tests for independent samples were used. In order to analyze the data for the four categories of reinforcements in the Four Function Model, t tests for dependent samples were used by comparing the automatic function to the social function and the automatic negative function to the automatic positive function. Additionally, cross-tabs, one-way ANOVA's, and t tests for independent samples were used to assess significances among demographics. Finally, descriptive analyses were used to look at all other data.

Factor analyses were conducted on the current categorization of the 22 reinforcements in the Four Function Model in order to determine whether the current categorization is valid for a nonclinical sample of college students. This was done using an Unweighted Least Squares (ULS) extraction of four factors with a Promax rotation

($\kappa = 4$). The internal consistency of each of the four factors was then evaluated with Cronbach's alpha coefficients. The internal consistency for the first and second factors were high and ranged from $\alpha = .80 – .92$. The internal consistency for the third and fourth factors were modest but acceptable given that the scale is very short; the coefficients were $\alpha = .59 – .65$.

Results

Hypotheses

The first hypothesis of the present study examined whether there is a difference between the number of non self-injurious coping strategies used by individuals who engage in non-suicidal self-injury (NSSI) and individuals who do not. Only the 254 participants who fully completed the coping strategies survey measure were included in the analysis for this hypothesis. Of the 254 participants in this analysis, 61 engaged in self-injury. The data did not fully support this hypothesis, $t(252) = -1.84$, $p = .086$; however, it did indicate that a trend may exist. Participants who engage in NSSI may use a greater number of non self-injurious coping strategies ($M = 18.28$, $SD = 3.16$) than participants who do not engage in NSSI ($M = 17.38$, $SD = 3.39$). See Table 3.

The second hypothesis looked at whether there is a difference between the number of times individuals who engage in NSSI use a non self-injurious coping strategy and the number of times individuals who do not engage in NSSI use a non self-injurious coping strategy. All 268 participants were included in this analysis, even though not all participants completed all the questions in this survey measure. This hypothesis was partially supported by the data. See Table 3 for a list of coping strategies that indicated significant results and trends. Participants who engage in NSSI use the coping strategy

"say to myself it doesn't matter" (M = 3.01, SD = 0.84) more frequently than participants who do not engage in self-injury (M = 2.66, SD = 1.02), $t(265) = -2.57$, $p < .05$. Participants who engage in self-injury also "stop eating" (M = 2.28, SD = 1.13) more often than participants who do not engage in self-injury (M = 1.61, SD = 0.94), $t(266) = -4.80$, $p < .001$. Participants who self-injure also "cry" (M = 3.15, SD = 0.88) more than those who do not self-injure (M = 2.78, SD = 1.00), $t(264) = -2.71$, $p < .05$. Additionally, participants who self-injure "engage in risky behaviors" (M = 1.66, SD = 0.95) more frequently than participants who do not engage in NSSI (M = 1.38, SD = 0.78), $t(264) = -2.37$, $p < .05$. Participants who do not self-injure play sports (M = 2.58, SD = 1.18) more frequently than participants who do self-injure (M = 2.14, SD = 1.16), $t(264) = 2.63$, $p < .05$. A trend emerged such that participants who engage in NSSI may be more likely to "spend time alone" (M = 3.60, SD = 0.58) than participants who do not engage in NSSI (M = 3.42, SD = 0.76), $t(266) = -1.78$, $p = 0.08$. Another trend indicated that participants who engage in NSSI may "drink alcohol" more frequently (M = 2.10, SD = 1.06) than participants who do not engage in NSSI (M = 1.83, SD = 0.99), $t(266) = -1.96$, $p = 0.05$. Additionally, a trend suggested that participants who do not self-injure may be more likely to participate in "interactive online gaming" (M = 1.33, SD = 0.81) than participants who do self-injure (M = 1.15, SD = 0.53), $t(265) = 1.71$, $p = 0.09$. All non-significant data for the other coping strategies are listed in Appendix D.

The third and fourth hypotheses extended the Four Function Model of NSSI to a nonclinical population. Only the 62 participants who indicated engaging in self-injury for non-suicidal reasons and who completely filled out the Functional Assessment of Self-

Mutilation survey measure were included in these analyses. The third hypothesis was supported. A greater proportion of college students in this sample engage in NSSI for reinforcements categorized in the automatic function (M = 2.37, SD = 0.73) than the social function (M = 1.36, SD = 0.40), $t(61) = 10.19$, $p < .001$ (see Table 4). The fourth hypothesis was also supported. A greater proportion of college students in this sample engage in NSSI for reinforcements categorized in the automatic negative (M = 2.48, SD = 0.90) than the automatic positive function (M = 2.29, SD = 2.29), $t(61) = 2.15$, $p < .05$ (see Table 4).

Demographic Comparisons

Of the 264 participants who indicated their sex, 11 out of a total of 69 men and 56 out of a total 195 women indicated they engaged in NSSI (see Table 2). A two-tailed independent samples t test indicated that there are gender differences among those who engage in NSSI; women are more likely to engage in NSSI than men, $t(262) = -2.11$, $p < .05$ (see Table 5). A one-way between groups Analysis of Variance did not indicate any significance between the means of participants who engage in NSSI and those who do not based on their age, year in college, type of high school attended, and race and ethnicity in the present study. An independent samples t test did not indicate any significance between the means of participants who engage in NSSI and those who do not based on the college they attend. See Appendix E for non-significant demographic analyses.

Analyses on All Participants

All 265 participants who answered the question, “How stressed have you felt over the past two weeks” were included in the following data report. The median score

reflecting college students stress levels was six on a scale of 1 = "*no stress*" and 10 = "*most stressed*" (see Table 6). The median score of six remained the same even when only self-injurers were analyzed, only non self-injurers were analyzed, and all participants were analyzed. A t test for independent samples indicated no significant difference between the reported stress levels of participants who engage in NSSI and those who do not (see Appendix F). A t test for independent samples indicated no significant difference between the reported stress levels of participants from Whitman College and Whittier College (see Appendix G). This analysis was conducted as an attempt to assess underlying differences between the two colleges that may compromise the rigor of the present study.

Additional Data on All Participants

The following results are based on the entire sample of 268 participants. The present study examined the most commonly used coping strategies by self-injurers and non self-injurers separately. The most common coping strategies people who self-injured used, beginning with the most commonly used include: "spending time alone" (M = 3.60, SD = 0.58), "listening to music" (M = 3.58, SD = 0.76), and "trying to solve the problem" (M = 3.52, SD = 0.70). Table 7 describes the means and standard deviations for coping strategies used by self-injurers. The most common coping strategies people who did not self-injure used, beginning with the most commonly used include: "trying to solve the problem" (M = 3.64, SD = 0.57), "listening to music" (M = 3.56, SD = 0.74), and "spending time alone" (M = 3.42, SD = 0.76). Table 8 describes the means and standard deviations for coping strategies used by non self-injurers.

Two hundred and fifty-eight participants (96%) endorsed using the non self-injurious coping strategy to "talk" when stressed (see Table 9). The most common group of people participants indicated they talk to when stressed was their friends; 241 college students (89%) indicated talking to their friends when stressed. Table 9 describes whom college students reported talking to when stressed. After talking about their stress, 176 students (65%) reported feeling calm. Table 9 also describes how college students reported feeling after they had talked about their stress.

Seventy college students (26.30%) indicated that they engage in risky behaviors when stressed (see Table 10). The most common risky behaviors college students reported engaging in were risky use of alcohol, risky sex, and risky driving; 31 college students (12%) engaged in risky alcohol consumption, 30 (11%) engaged in risky sex, and 28 (10%) engaged in risky driving (see Table 10). The most common feelings college students reported feeling after engaging in risky behaviors were the following: 30 (11%) felt excited, 29 (11%) felt confident, 29 (11%) energetic and 27 (10%) guilty (see Table 10).

Analysis on all Participants who Engage in NSSI

Although the hypotheses for this study did not focus on the social reinforcement category, a t test for dependent samples was conducted in order to determine whether there was a difference between the means of the proportion of students who indicated engaging in self-injury for social positive reinforcements and social negative reinforcements. Only the 62 participants who indicated engaging in self-injury for non-suicidal reasons and who completely filled out the Functional Assessment of Self-Mutilation survey measure were included in this analysis. The analysis indicated that

there is a trend that a greater proportion of students may be more likely to self-injure for reasons categorized as social positive reinforcements (M = 1.39, SD = 0.45) than social negative reinforcements (M = 1.26, SD = 0.50), $t(62) = -1.99$, $p = 0.05$ (see Table 4).

Further analyses on all participants who self-injure indicate that those who have also done drugs are more likely to have seen a therapist regarding issues related to their self-injury (M = 1.92, SD = 1.14) than those who have not also done drugs (M = 1.26, SD = 0.60), $t(62) = 3.02$, $p < .05$. Table 11 describes significant results and trends about coping strategies and seeing a therapist. Participants who self-injure and pray or engage in religious or spiritual activities are less likely to see a therapist regarding issues related to their self-injury (M = 2.43, SD = 1.20) than those who do not engage in religious or spiritual activities (M = 1.79, SD = 0.93), $t(62) = -2.22$, $p < .05$. Analyses also indicated a trend such that those who stop eating as a coping mechanism, in addition to self-injuring, may be more likely to see a therapist (M = 2.58, SD = 1.10) than those who do not stop eating (M = 2.10, SD = 1.13), $t(62) = 1.68$, $p = .09$. Another trend indicates that those who engage in risky behaviors may also be more likely to see a therapist (M = 1.92, SD = 1.10) than those who do not engage in risky behaviors (M = 1.45, SD = 0.78), $t(62) = 1.98$, $p = .05$. Additionally, participants who talk when stressed may be more likely to see a therapist (M = 3.50, SD = 0.51) than participants who do not talk when stressed (M = 3.18, SD = 0.84), $t(62) = 1.71$, $p = .09$. See Appendix H for a list of non-significant data about using coping strategies and seeing a therapist.

Additional Data from all Participants who Engage in NSSI

Of the 265 participants included in this study, 66 indicated that they had engaged in NSSI; 53 indicated they self-cut, three indicated they self-burn, and 10 indicated they

self-cut and self-burn (see Table 12). Of the sixty-six, 31 indicated engaging in NSSI within the past year; 26 indicated they self-cut, three indicated they self-burn, and two indicated they self-cut and self-burn (see Table 12). Of the 66 who indicated engaging in NSSI, 11 indicated they self-injured "once," 44 indicated they have self-injured a "few times," and 11 self-injure "frequently" (see Table 13). When asked where those who engage in self-injury typically hurt themselves, 89% (59) of self-injurers indicated they self-injure on their arms. Table 13 describes all the areas participants indicated they self-injure.

Five participants indicated engaging in self-injury for suicidal reasons; these participants were not included in any analyses as the present study focuses only on participants who engage in self-injury for non-suicidal reasons (see Table 12).

Of the 66 participants who indicated engaging in self-injury, 18 (27%) indicated they self-injured between 2-4 times; 17 (26%) indicated they self-injured between 5-10 times, and 18 indicated between 11-50 times. See Table 13 for a breakdown of total times participants indicated they self-injured.

Of the sixty-six participants, only three self-injured to the extent which their injury required medical attention. Of the three, only two indicated they sought medical attention for an injury that required it. Eight (12%) of the sixty-six participants indicated they engaged in self-injury while on drugs.

Of the 66 participants who indicated they engage in self-injury for non-suicidal reasons, 24 (37%) indicated they had seen a therapist or counselor for issues regarding their self-injury; 41 (63%) indicated they had not.

Thirty-one (48%) of the 66 participants thought about self-injuring for a few minutes or less before actually engaging in self-injury. See Table 14 for a breakdown of how long participants who engage in self-injury typically think about self-injuring before doing so. Twenty-nine (46%) of the 66 participants engaged in self-injury for less than six months; 23 (36%) have engaged in self-injury for longer than two years. See Table 14 for a breakdown of how long participants indicated they engaged in self-injury. Five participants indicated self-injuring within the past month. Table 14 describes when the last time participants indicated they hurt themselves.

Of the 66 participants who indicated engaging in self-injury, 60 (92%) indicated they experienced little or moderate pain when they engaged in self-injurious behaviors. Table 13 describes participants report of pain experienced when engaging in self-injury.

When asked how participants felt before engaging in self-injury, 52 (79%) indicated feeling overwhelmed, 43 (65%) indicated feeling sad, 39 (59%) felt angry, 34 (52%) felt tense, and 32 (18%) felt anxious. See Table 15 for breakdown of emotions participants indicated they experienced before engaging in self-injury. When asked how participants felt after engaging in self-injury, 31 (47%) indicated feeling calm, 30 (45%) indicated feeling ashamed, 28 (42%) felt sad, and 25 (38%) felt guilty. See Table 15 for a breakdown of emotions experienced after self-injuring.

Those who engaged in self-injury for non-suicidal reasons were asked to describe their reasons for no longer engaging in self-injury. The most common reason, which 33 (50%) participants endorsed, was that they felt there was no longer a need to engage in self-injury. Other common reasons include because they felt ashamed, felt bad, or they found a different coping mechanism. See Table 16 for a list of reasons why participants

stopped engaging in self-injury. Participants were also asked to describe their reasons for deciding to stop engaging in their self-injurious behavior at that moment when they were self-injuring. The most common reason, which 35 (53%) participants endorsed, was that they stopped engaging in self-injury at that moment because they felt better. See Table 16 for a list of reasons why participants decided to stop engaging in self-injury at that moment when they were engaging in their self-injurious behavior.

When asked when participants recall first engaging in self-injury, most participants reported first self-injuring between the ages of 12 and 16. The youngest age reported was nine; the oldest was 22. See Table 17 for a breakdown of the age participants reported first engaging in self-injury.

Data Pertaining to the Four Function Model

The Functional Assessment of Self-Mutilation (FASM) survey measure looked at the various reinforcements behind self-injury. See Table 1 for description of the categorization of reinforcements in the Four Function Model. All 63 participants who engaged in self-injury for non-suicidal reasons and fully completed the FASM are included in the following data report. There are only two reinforcements categorized in the automatic negative function of which the most commonly endorsed was "to stop bad feelings" (M = 2.48, SD = 1.16). There are only three reinforcements categorized in the automatic positive function of which "to punish yourself" (M = 2.48, SD = 1.13) was the most commonly endorsed. The most endorsed reinforcements in the social positive function include: to "get attention" (M = 1.54, SD = 0.90), to "try to get a reaction from someone, even if it's negative" (M = 1.49, SD = 0.84), and "to let others know how desperate you were" (M = 1.57, SD = 0.91). The most endorsed reinforcements in the

social negative function include: “to avoid having to do something unpleasant you don’t want to do” (*M* = 1.37, *SD* = 0.74) and “to avoid being with people” (*M* = 1.32, *SD* = .67).

Participants indicated that the most common reinforcements which explained why they engaged in self-injury were: to punish yourself (*M* = 2.48, *SD* = 1.27), to stop bad feelings (*M* = 2.48, *SD* = 1.16), and to relieve feeling numb or empty (*M* = 2.46, *SD* = 1.11). Other commonly endorsed reinforcements include: to get control of a situation (*M* = 2.29, *SD* = 1.11), to feel something even if it was pain (*M* = 2.27, *SD* = 1.13), and to feel relaxed (*M* = 2.10, *SD* = 1.13). See Table 18 for a list of all reinforcements and their means and standard deviations in order of most commonly endorsed.

Exploratory Analysis of the Four Function Model of NSSI

In the present study, a Principal Components Analysis of the 22 items in the Functional Assessment of Self-Mutilation Questionnaire suggested that two to four factors might account for approximately half of the variance. A visual representation of the suggested factors is depicted in Appendix H. After looking at 2 to 5 factor extractions with orthogonal and oblique rotations, an Unweighted Least Squares (ULS) extraction of four factors with a Promax rotation ($\kappa = 4$) appeared as the cleanest solution (See Table 19). This solution explained 54% of the variance (respectively 20%, 13%, 11%, and 10% for Factors 1 – 4). Table 20 describes the variances explained by each of the four factors. The six items that defined Factor 1 (loadings ranging from .62 – .94) described the social positive function. Four of the five items that loaded on Factor 2 described the social negative function, the remaining item described the social positive function; the loadings

ranged from .56 – .81. The four items loading on Factor 3 (with loadings ranging from .48 – .80) did not describe any of the functions from the Four Function Model; these items appear to describe an "inclusiveness" function. The five items loading on Factor 4 describe an automatic function (with loadings ranging from .38 – .70); the items in this factor include reinforcements categorized in the automatic positive function and the automatic negative function. Two of the 22 items did not load sufficiently as only those items with loadings greater than .35 loaded. These items include: "to get other people to act differently or change" and "to punish oneself."

Discussion

Hypotheses

The first hypothesis, which looked at whether there was a difference between the total number of coping strategies used by self-injurers and non self-injurers, indicated that individuals who engage in NSSI (non-suicidal self-injury) may use more non self-injurious coping strategies than those who do not self-injure. This hypothesis was supported by a trend: Individuals who self-injured used an average of 18 strategies, whereas individuals who did not self-injure used an average of 17 strategies. This trend, that people who self-injure may be more likely to use more coping strategies than those who do not self-injure, may have some interesting implications. Perhaps this trend indicates that the coping strategies people who self-injure use are not as effective in helping them deal with their problems as they are for people who do not self-injure, and thus the people who self-injure need to use more coping strategies. Alternatively, the people who self-injure could have more stressful problems than the people who do not self-injure, thus requiring those who self-injure to use more coping strategies to deal with

their problem. It is interesting that the top three most commonly used strategies for these two groups are identically reversed (see Table 7 & 8). In this sample, self-injurers coped with stress by first "spending time alone" and third by "trying to solve the problem," whereas non self-injurers coped with stress by first "trying to solve the problem" and fourth by "spending time alone." Since "trying to solve the problem" appears more effective than "spending time alone" this could support the idea that the coping strategies people who self-injure use may be less effective than the strategies non self-injurers use. Of course, this comparison alone cannot suggest that self-injurers use less effective coping mechanisms than non self-injurers because the top three strategies are the same for both groups.

The second hypothesis examined whether there were differences between the number of times self-injurers and non self-injurers used a particular coping strategy. This hypothesis was partially supported: The present study found that self-injurers appeared to use coping strategies associated with solitary activities such as "saying the problem didn't matter," "stopping eating," "crying," and "engaging in risky behaviors." Non self-injurers appeared to use coping strategies associated with social activities such as "playing sports." A trend also emerged such that self-injurers had a tendency to "spend time alone" and "drink alcohol" more than those who did not self-injure. The data also suggests that non self-injurers had a tendency to "play interactive online games" more than self-injurers.

However, this classification of activities as solitary or social is debatable because several of these coping strategies can be interpreted as both solitary and social, depending on the context and way they are used. An individual can sit in her room alone and drink

alcohol or she can go out and drink alcohol with her friends; in both situations drinking alcohol can be a coping strategy. Similarly, an individual can sit in his room alone and play computer games, or he can play computer games with several of his friends at the same time, communicating through headsets. Since this classification of coping strategies has a variety of interpretations, it may not accurately describe the nature of the differences between the coping strategies self-injurers use and those non self-injurers use.

It seems that a more important factor in how individuals decide to deal with a problem may be impulsivity; instead of dealing with a problem or planning a way to find relief from their stress, people who self-injure may be more inclined to use reactionary behaviors in order to seek immediate gratification. This finding is also reflected in research by Herpertz, Sass, and Favazza (1997) who looked at impulsivity as a personality trait in self-mutilators. Herpertz and colleagues (1997) found that self-mutilators engage in various types of impulsive behaviors, including substance abuse and promiscuity. The present study found that individuals who engaged in risky behaviors typically engaged in reckless driving, uncontrolled alcohol abuse, and promiscuous or unprotected sex (see Table 10). After engaging in such behaviors participants reported feeling excited, energetic, and confident (see Table 10); these emotions reflect immediate gratification. Additionally, Herpertz and colleagues (1997) found that the participants in their study who engaged in self-mutilative behaviors had a deficit in future-oriented problem solving (Herpertz et al., 1997), which researchers also consider a risk factor for NSSI (Evans, et al., 2005). Engaging in risky behaviors typically requires little forethought and does not solve the problem.

Playing sports, on the other hand, is an example of a way to release stress that is neither immediate nor impulsive. Playing sports requires at least a little forethought and planning. Even if an individual is very upset and wants to play sports immediately, he or she still needs to gather the appropriate equipment (such as a basketball or soccer ball) or put on the necessary sports attire (such as running shoes or a swimsuit). Although playing sports does not solve a problem, it is neither impulsive nor typically risky.

Crying is another example of an impulsive coping strategy that does not solve the problem but can quickly emotionally pacify an individual. Coping strategies such as crying and saying the problem doesn't matter reflect poor problem solving skills. Similarly, stopping eating is a poor way to solve any problem.

Additionally, these coping strategies that self-injurers use seem similar to self-injury. Self-injury is a maladaptive coping strategy that is reactionary to high emotional states or stress levels (Haines, et al., 1995). The act of self-injury requires little planning or forethought; it is an impulsive behavior (Herpertz, et al., 1997). In fact, the present study found that 48% of participants who self-injure thought about self-injuring for only few minutes or less (see Table 14). Researchers Nock and Prinstein (2004) found similar results; in their sample of self-injuring adolescents, their participants thought about self-injuring for five minutes or less (Nock & Prinstein, 2004).

Furthermore, some clinicians even diagnose patients who engage in repetitive self-mutilation under an "impulse-control disorder-not otherwise specified" (Herpertz, et al., 1997). There is much existing research that discusses whether self-injurious behaviors should be classified as a separate syndrome (Favazza & Conterio, 1988; Herpertz, et al., 1997; Muehlenkamp, 2005); however the purpose of referencing this finding, that some

clinicians provide a diagnosis for those who engage in self-mutilative acts, is to emphasize the connection between self-injury and impulsivity—the connection between self-mutilation and impulsivity appears strong enough that self-injurious acts are considered a component of the diagnosis for an impulse control disorder. Although self-mutilative acts differ from non-suicidal self-injurious acts in that they encompass a slightly broader range of behaviors, it is still worth considering that an impulsivity component may exist in relation to NSSI.

It is also interesting to note that some of the coping strategies individuals who self-injure use are behaviors often associated with clinical disorders. Nock and colleagues (2007) state that the majority of adolescents who engage in self-injury meet the criteria for a mental disorder including major clinical disorders on Axis I and personality disorders on Axis II. Additionally, many clinical disorders such as bipolar disorder and borderline personality disorder include self-injurious acts as a precursor or factor for diagnosis (Whitlock, et al., 2006; Whitlock, et al., 2009). This relates to the present study because the severe use of any one coping strategy such as "drinking alcohol" or "stopping eating," can feasibly spiral into a clinical disorder, such as alcoholism or anorexia. This does not mean that all self-injurers will develop clinical disorders or that all self-injurers have a clinical disorder. The present study merely suggests that there may be a connection between a finding of the present study, that self-injurers engage or may engage in coping strategies that can lead to clinical disorders if abused, and findings from previous research, which suggests that self-injurious behaviors are often co-morbid with a clinical disorder (Nock et al., 2007; Whitlock, et al., 2006; Whitlock, et al., 2009).

The third and fourth hypotheses of the present study focus only on self-injurers and which reinforcements are used in order to determine whether individuals self-injured more for some reasons than others. The present study attempted to determine this by comparing the categories of the Four Function Model. The third hypothesis looked at whether individuals engaged in NSSI more for reinforcements categorized in the automatic function than the social function; the present study found support for this hypothesis. Individuals are more likely to engage in NSSI for reinforcements such as "to stop bad feelings," "to feel something, even it was pain," "to relieve feeling numb or empty," or "to feel relaxed" (see Table 1 for the categorization of reinforcements into the Four Function Model). Thus, individuals in this study may have engaged in self-injury most often for reasons related to creating a desirable emotional state or removing an undesirable state.

The fourth hypothesis focused more specifically on the automatic reinforcements; it looked at whether reinforcements categorized in the automatic negative function were used more than those in the automatic positive function. The results of the present study provided support for this hypothesis suggesting that individuals in this sample engaged in NSSI to alleviate an existing emotional state more than to create a desired emotional state. This is a crucial finding because this implies that nonclinical populations of college students, in addition to adolescent and clinical populations, self-injure for primarily the same reasons: to "stop feeling bad" and to "relieve feeling numb or empty."

Further analyses on the categories of the Four Function Model indicate a trend such that individuals may be more likely to self-injure for reinforcements categorized in the social positive function than the social negative function. Although a trend may exist

indicating that social positive reinforcements are used more than social negative reinforcements, closer examination of the means reveals that both of these types of strategies were hardly used. However, this trend may exist in the few instances when these strategies are used. Since the present study as well as previous research have found that most individuals who self-injure tend to do so for reinforcements categorized in the automatic function, particularly in the automatic negative function, this trend does not illuminate much about why people choose to self-injure.

Implications Regarding Participants who have Engaged in Self-Injury

The present study found that 25% of the entire sample of participants engaged in NSSI (see Table 12). The present study's finding of a 25% prevalence rate is slightly higher than the 15-20% prevalence rates some researchers have found while studying college populations (Gratz et al., 2002; Heath et al., 2008; Muehlenkamp & Gutierrez, 2007; Whitlock et al., 2006), whereas it is much lower than the 38-40% other researchers have found (Gratz, 2006; Gratz 2007; Lloyd-Richardson et al., 2007; Lloyd-Richardson, 2008). Since the field of self-injury is a newly developing field, most researchers have looked at populations either that are slightly different because of the specific behaviors they included or because of the specific populations they examined. Thus, it is difficult to say whether self-injurious behaviors are increasing in prevalence.

Twelve percent of the entire sample, almost half (47%) of all self-injurers, indicated engaging in self-injury within the past year (see Table 12). This finding suggests that self-injury continues during the college years. Additionally, fourteen percent of participants who self-injured in the present study reported that they began self-injuring between ages 18 and 22 (see Table 17). This indicates that individuals also begin

self-injuring during college. This is an important finding because prevention plans that target nonclinical populations of college students do not appear to currently exist.[2] Additionally, most research on intervention strategies for self-injurers focus on adolescent populations (Kahng, et al., 2002; Klonsky & Muehlenkamp, 2007; Muehlenkamp, 2006; Nock et al., 2007). Thus, the present study has found reason to suggest that intervention strategies should also target college populations in addition to adolescent populations.

This finding, that self-injury can begin during the college years, is somewhat comparable to the findings of Whitlock and colleagues (2006) which looked at a variety of self-mutilative behaviors in college populations; they reported an age of onset range between 10 and 20 years old. The later ages Whitlock and colleagues report include the age range when students are typically 17-20 years old or, in other words, beginning college. Similarly, Heath and colleagues (2008), who looked at all behaviors classified as NSSI, reported an age of onset range between 17 and 24 years old; these years also overlap the typical age range of college students. Responses in the present study indicate that the typical age of onset of NSSI may occur between 12 and 16 years (see Table 17). Although there appears to be little consensus on when individuals typically first begin to self-injure, these findings do indicate that self-injury can begin throughout the college years.

The present study found that participants appear to engage in self-injury as a short-term or a long-term coping strategy. Forty-six percent of participants who self-injured did so for six months or less and 36% of participants who self-injured did so for two to four years or more years (see Table 14). Perhaps this indicates that self-injury may

be used as a coping mechanism for different types of time sensitive needs. Research on trauma survivors suggests that self-injurious behaviors can serve different functions at different times (Connors, 1996; Heath, et al., 2008). Although the present study did not look at participants' experience with trauma, perhaps this same idea—that self-injury can serve different purposes at different times—can be applied to the participants in the present study. The participants in this study could be separated into groups based on how long they have used self-injury as a coping mechanism such as short-term self-injurers and long-term self-injurers. Alternatively, participants could be separated into groups based on what type of stressors they have had to cope with such as temporary stressors or permanents stressors. These speculations are only based on the results of the present study because few studies examine the functions of self-injury over time. Since research in the area of non-suicidal self-injury is newly emerging, few longitudinal studies exist.

In the present study, 53% of participants indicated they engaged in self-injury between two and ten times (see Table 13). This is somewhat comparable to the findings reported by Whitlock and colleagues (2006) in which 48% of their sample self-injured between two and 10 times. However, this finding is surprising given that Whitlock and colleagues examined self-mutilative behaviors, which encompass a far greater range of behaviors than the specific non-suicidal self-injurious behaviors the present study examined. Thus, since the frequency of engagement in self-injury is greater than previous research findings for a broader range of behaviors, perhaps this indicates that the specific self-injurious behaviors of self-cutting and self-burning are more persistent.

When participants were asked whether they experienced any pain while self-injuring, 92% of participants said they only experienced little or moderate pain (see Table

13). Numerous researchers have reported similar findings across a variety of populations (Gratz et al., 2002; Heath et al., 2008; Muehlenkamp & Gutierrez, 2007; Whitlock et al., 2006). Self-injurers do, however, eventually experience the pain; typically, this occurs minutes, hours, or sometimes days after inflicting the injury (Haines, Williams, Brain, & Wilson, 1995).

The most common feeling participants indicated they experienced before self-injuring was overwhelmed (see Table 15); the most common feeling participants indicated experiencing after self-injuring was calm (see Table 15). When participants in the present study were asked why they stopped self-injuring at that moment, 53% of participants said they felt better (see Table 16). This process of escalating negative emotions, self-injuring, and then feeling calm again is like a "stereotyped cycle" (Haines et al., 1995, p.472). Haines and colleagues (1995) explain that individuals may choose to stop self-injuring only after they see blood; the sight of blood appears to create a sense of relief. Research on the neurochemical changes that occur during self-injury suggests that endorphins are released as the skin is cut and blood is visible, which elevates the mood and provides a calming effect (Haines et al., 1995; Zellars, Meurs, Perrewe, Kacmar, & Rossi, 2009). In fact, researchers explain that some individuals will continue self-injuring until there is enough blood to facilitate a change in mood (Haines et al., 1995).

The present study found that 50% of participants who self-injured stopped self-injuring when they felt they no longer had need of it (see Table 16). Participants also stopped for other reasons such as because they felt bad, ashamed, or because they found a different coping mechanism for their stress. This finding is promising in that individuals who self-injure may have a 50% chance of stopping when their stress diminishes.

Only 37% of participants in the present study had seen a therapist regarding issues related to their self-injury. Since both college campuses involved in the present study offer free counseling services, this statistic suggests that despite free available help, college students are still engaging in such harmful behaviors.

Of the participants who self-injured, 12% indicated doing so while taking drugs or alcohol. Research on alcohol and self-injury is limited and the literature that does exist reports varied findings. Gollust and colleagues (2008) reported no significant relationship between self-injury and drinking (Gollust, Eisenberg, Golberstein, 2008). However, other studies report that self-injurious acts can occur hours after alcohol consumption (Hawton & Harriss, 2007). Additionally, a study on adolescents suggested that alcohol abuse and drug abuse were risk factors for self-injury (Deliberto & Nock, 2008). Research also indicates that self-injury is common in clinical samples of substance-dependent persons (Evren & Evren, 2005; Oyefeso, Brown, Chiang, & Clancy, 2008). A growing body of research has begun examining the links between alcohol/drug use and self-injury; however, the associations between these links are still unclear.

In the present study, only three of participants had self-injured to the extent which they needed medical attention; however, only two participants sought medical help. Since there was only one participant who did not seek medical attention when it was needed, and the present study is based on participant self-report, speculations may not be appropriate. Whitlock and colleagues (2006) reported that more than 9.4% of their sample of 490 self-injurers had hurt themselves severely more than expected, whereas only 6.5% of their sample had sought medical help. Perhaps this suggests that individuals

may desire to maintain the secrecy of their self-injury, even when the injury is severe enough to put them in danger.

It is less common for non-suicidal self-injurious acts to get so out of control, since acts of NSSI are very different from suicidal acts (Nock, 2009). However, it is important to note that some people do engage in self-injurious behaviors with suicidal intentions. In the present study, five out of the seventy-one participants who indicated engaging in self-injurious behaviors did so with a suicidal intention (see Table 12). The present study only focused on non-suicidal self-injury; hence, the five participants who indicated "yes" to the question "have you ever self-injured with a suicidal intention" were removed from all analyses.

Implications Regarding All Participants of the Present Study

Both self-injurers and non self-injurers had a median stress level of six on a scale of one = *no stress* and ten = *most stressed*. Since the survey was only emailed to the college campuses during the semester, this moderately increased stress level may be reflective of the academic demands of private liberal arts colleges. There is no research to compare these findings to because Ross and Heath (2002), the researchers who developed the 'How I Deal with Stress' inventory, only used the measure to filter responses for participants who self-injure. Similarly, other researchers who have used this inventory were also only interested in using this measure as a screening tool for self-injuring participants (Heath, et al., 2008). Thus no reports on the stress levels or commonly used coping strategies in previous research exist.

The present study also detected gender differences such that women self-injure more than men. Recent research on self-injury often reports no gender differences and

suggests that when differences do emerge they are most likely because women are more present in the samples or more open about their self-injurious behaviors than men (Heath et al., 2008; Jacobson & Gould, 2007; Whitlock, et al., 2009). Perhaps these reasons could also explain the finding of gender differences in the present study; there are more females than males on both Whitman College campus and Whittier College campus and more women than men filled out the survey on self-injury. Alternatively, perhaps there really are differences between men and women's engagement in self-injury on college campuses such that more women self-injure than men.

Exploratory Analysis of the Four Function Model of NSSI

The results of the factor analysis extraction indicated that there are four factors; this means that there are four separate and distinct functions that attempt to describe why individuals self-injure. However, upon close examination of these four factors, the categorization of reinforcement items, based on the loadings of the 23 items into the four factors, differ considerably from the categorization of reinforcements in the Four Function Model. The reinforcement items that loaded into the first and second factors which correspond respectively to the social positive and social negative function in the Model, are the only items that are categorized the same as those in the Four Function Model.

The third factor based on the factor analysis extraction is a combination of the two automatic functions; all of the items previously categorized in the automatic positive and automatic negative loaded into this factor. Since the components of this factor are from the automatic function, it seems appropriate to title it an "emotion regulation" function, which is in essence what the automatic function describes. Additionally, the item "to get

control of a situation," an item previously categorized as a social positive reinforcement, had a loading of .40 into this new category. This additional item actually could fit into this category of emotion regulation if the interpretation of "get control" is less a desire to "get" control of or be in charge of what is happening in the situation, and more a desire to resume "control" of the emotions surrounding whatever is happening in the situation.

The components of the fourth factor are all items previous categorized as automatic positive reinforcements. However, these four items grouped together describe self-injurious behaviors as an inclusive act. These four items include: "to feel more a part of a group," "to be like someone you respect," "to give yourself something to do when with others," and "to make others angry." All four items somewhat contain an "others" component; this aspect of "others" appears to separate those who self-injure from those who do not. If self-injuring allows someone to feel more a part of a group, the assumption is that the people in the group also self-injure. By self-injuring, individuals can imitate the person they respect and feel more like part of the rest of the group that self-injures. Similarly, if individuals self-injure so that they can be more like someone they respect and share their self-injury with someone else, the assumption again is that the person they respect and the person they want to share their self-injury with also self-injures. By self-injuring, the person behaves more like others who self-injure. The item "to make others angry" could also fit into this theme of "fitting in with others who self-injure" because if a person who self-injures is trying to make someone else angry by self-injuring, the person they are trying to make angry is probably not going to engage in or endorse engaging in self-injury. Through these ways, self-injury could become an access to inclusivity—only people who self-injure can be part of the inclusive group.

Implications and Future Research Suggestions Regarding the Exploratory Analysis

Since the item loadings into the four factors differ from the items loadings denoted by Nock and Prinstein in the Four Factor Model, this may indicate that the Four Function Model is not robust enough to account for the responses of participants in the present study's population. If the Four Function Model cannot explain why nonclinical populations of college students self-injure, researchers might consider developing a new model that does explain these behaviors. Alternatively, researchers could also consider revising the Four Function Model, perhaps with the categories the present study suggests. However, the factor analysis conducted in the present study is only exploratory and thus these interpretations on how to categorize these items are merely speculations. Future researchers should conduct additional exploratory analyses on college populations to decide whether the results from the present study are replicable; based on those conclusions, researchers should then conduct confirmatory analyses before deciding whether a new model should be developed for college populations or how the Four Function Model could be revised and applied to a nonclinical population of college students.

Although this factor analysis is not equivalent to previous studies, the results of the present study are inconclusive regarding the validity of the Four Function Model. The present study found a different categorization of items in a different sample; it is not surprising that a model intended to describe why individuals in clinical adolescent populations self-injure has a different construct in a different population. This lack of generalizability, however, has some interesting implications.

First, if the same model cannot describe reasons two different populations may have for self-injuring, perhaps this indicates that college students in nonclinical populations self-injure for different reasons than adolescents in clinical populations. Second, since both populations do not appear to share reasons for self-injuring, this may indicate that the same prevention and intervention strategies cannot be applied to both populations; researchers may need to develop different strategies for the different populations. Third, since these differences regarding the reasons for self-injuring are between populations of clinical adolescents and nonclinical college students, either the differences are due to age (adolescents versus college students) or mental health classification (clinical versus nonclinical). However, there is also the possibility that these differences are due to something completely different. Future researchers should aim to understand where these differences are coming from because this affects how self-injury is understood. If self-injury is a coping strategy that fulfills various purposes over the span of many years, researchers need to develop different intervention strategies that target the many possible reasons for self-injuring as well as the various age groups that engage in self-injury. Although the findings of the present study are inconclusive regarding the validity of the model, they do suggest that different populations may self-injure for different reasons.

The final implication the present study would like to focus on regarding this exploratory factor analysis is how remarkable it is that the item loadings indicate that the social positive, social negative, and automatic function do exist as reasons individuals in a nonclinical population of college students self-injure. This implication means that people in this population self-injure for at least some of the same reasons as people in

clinical adolescent populations. This is important because it emphasizes that there may be fundamental reasons why individuals across different age groups engage in self-injury. If future research continues to find similar results, researchers can begin developing prevention and intervention strategies by beginning to target these universal reasons. So, although there are many differences between these two different populations, if researchers begin developing strategies by focusing on the similarities and then adopt them to target the differences between the populations, perhaps future prevention and intervention plans will be effective enough to decrease the prevalence of self-injury.

Additional Future Research Suggestions

Future researchers could attempt to better understand the choice and use of coping strategies in populations that self-injure. The present study is only a small step toward determining which coping strategies self-injurers use; the present study also suggests some reasons how the behaviors self-injurers use are related and how these behaviors can seem appealing for self-injurers to use. Although the present study bases its speculations on previous research examining risk factors for self-injury, the connection between these risk factors and how they affect the choice and use of coping strategies is unclear. A better understanding of what function these coping strategies serve for self-injurers can positively influence the development of prevention plans.

The development of prevention plans is another area future research could look into. Currently few studies exist on prevention plans for self-injury, despite all the research that describes prevalence rates of up to 48% in nonclinical samples. The single prevention plan targeting non-suicidal self-harm was an intervention plan that attempted to prevent future self-injurious acts; thus, it was more of an intervention strategy and less

of a prevention plan. In the study, the researchers examined adolescent self-injurers who had previously been hospitalized in psychiatric institutions; the researchers provided the self-injurers with the phone numbers for a psychiatrist or counselor who they could contact at anytime when they needed help (Morgan, Jones, & Owen, 1993). Although the researchers found this strategy effective, based on the data from the present study, that only 37% of self-injurers accessed free counseling services, future research needs to look at whether this strategy is effective for a population outside of an adolescent clinical sample.

Furthermore, the literature on non-suicidal self-injury is rapidly expanding and many studies that assess the prevalence or attempt to understand the basic motivations behind self-injury already exist. Future researchers could begin to develop additional prevention strategies based on this growing body of research that describes reasons why individuals self-injure.

Additionally, research cites only two existing intervention strategies, dialectical behavior therapy and problem-solving therapy, as somewhat effective in reducing self-injurious behaviors. However, even studies on these strategies report mixed results. One possible direction would be to assess the existing intervention strategies to determine their effectiveness. Another possible direction would be to examine research describing intervention strategies for other maladaptive coping strategies, such as alcohol or drug abuse, to determine whether they can be applicable to self-injury.

Future researchers might also consider looking at the role of self-injury in regards to other behaviors such as drugs and alcohol. The present study discusses the findings of drug/alcohol use with self-injury as well as the findings of many other studies that have

reported mixed findings. Future research that attempts to better understand these behaviors in relation to each other may be able to report clearer results; this is important because several research studies indicate that these behaviors commonly co-occur during the college years.

Finally, the present study also found that the most commonly endorsed reasons individuals in this sample had for self-injuring were to "stop bad feelings" and to "relieve feeling numb or empty." This means that the biggest reason why individuals in this sample self-injured was as attempt to escape from existing emotions. Perhaps future researchers could attempt to look at what sorts of specific events or circumstances lead individuals to choose self-injury instead of a non self-injurious coping strategy, or even another maladaptive coping strategy such as smoking or substance abuse.

Limitations of the Present Study

There has been very little research on non-suicidal self-injury in nonclinical populations of college students, partially because this is a very specific sample. For this reason, it is somewhat difficult to connect the findings of the present study to previous research on nonclinical populations. It then follows that the implications of the present study may only be applicable to the participants of the present study. In other words, the generalizability of the present study's results may be limited. However, the results of the present study can be compared to previous research that follows a similar procedural pattern, for example Nock and Prinstein's (2004, 2005) work and Lloyd-Richardson, Kelly, and Hope's (1997) work with the Four Function Model. This imitation of procedure, and extension to a different population, is necessary in order to explore other areas in this newly emerging field studying self-injury. Thus, since efforts were made to

uphold the scientific rigor of the present study, the inevitable lack of generalizability appears to be less of a weakness and more a consequence of being the first step in a new direction.

Additionally, the strength of the results, particularly the factor analysis component of the present study, is typically dependent on sample size. Since the present study had only 66 participants who self-injured, the results based on this small sample size might not be representative of the general population of self-injurers.

Also, due to the number of t tests for independent samples conducted for hypothesis two, there is an increased chance for type I errors. The present study may have suggested there is a difference between self-injurers and non self-injurers use of a particular coping strategy when, in fact, there is no difference.

Another limitation of the present study is that participants were not screened for risk factors for NSSI. There was no measure assessing whether participants had experienced environmental risk factors such as childhood maltreatment or whether participants possessed individual risk factors such as difficulty with emotion expression and intensity. There was also no measure assessing personality constructs or whether participants had a diagnosed disorder. This lack of information clouds the data because there is no assurance that the participants in this nonclinical sample are different from participants in a clinical sample. Participants in the present study could have mental disorders that are co-morbid with self-injury or personality traits that make it more likely for them to engage in self-destructive or maladaptive coping strategies. Nevertheless, the present study was conducted acknowledging these constraints; it would not have been

feasible to incorporate all of these factors into the online survey for fear that the survey would be so long that most participants would fail to complete it.

The use of the Four Function Model in a population in which the model has not yet been validated is another potential limitation of the present study. Although, as explained earlier, the use of the model does not interfere with the goals of the study, it is still important to acknowledge that the present study might have stronger implications if the Four Function Model was already validated in a nonclinical population of college students. Based on the results of the exploratory factor analysis, the current categorization of reinforcements into the Four Function Model is not entirely applicable to a nonclinical population of college students.

Finally, the biggest limitation of the present study is the self-selection bias of participants. The present study was advertised via standardized emails as a study on self-injury. Since the survey was only administered to participants who chose to take the study by clicking on the survey link, the self-selection bias occurs as a participant chooses or chooses not to take the survey based on the topic. There was no way to control for this without using deception in the advertisement of the study, which is what previous researchers have done in order to avoid the self-selection bias. The occurrence of this bias implies that the participants who took the survey may have been individuals who were more interested in self-injury than those individuals who chose not to take the survey. This does not necessarily imply that greater or fewer numbers of self-injurers took the survey. For example, perhaps some people who have self-injured do not want to be reminded of or discuss their past behaviors even through an anonymous format, whereas other who have self-injured do want to discuss it. Hence it is not possible to determine

whether the self-selection bias in the present study increased or decreased the prevalence rates of this sample. Thus, this limitation must be kept in mind when considering that 25% of this sample has engaged in self-injury.

Strengths of the Present Study

The biggest strength of the present study is its uniqueness and exploratory aspect. The many exploratory components and preliminary hypotheses of the present study can be considered strengths because of what they may contribute to this newly emerging field of research on non-suicidal self-injury. The present study may also be the first step in a new direction of research within this area of clinical psychology. Previous research has not looked at the relationship between coping strategy choice and use between self-injurers and non self-injurers; previous research has also not extended the only existing model that attempts to describe reasons why people self-injure to a college population. Thus, the present study takes an important first step in examining these relationships by exploring several new areas and uncovering many interesting implications. Since the present study is strongly rooted in research, these findings may lead to many new directions for future researchers to discover.

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Footnotes

[1] "The categorization of reinforcements in the Four Function Model is based on factor analyses"—this information was obtained through email correspondence with Dr. Lloyd-Richardson, who is the author of the Functional Assessment of Self-Mutilation. This survey measure classifies reinforcements into the Four Function Model.

[2] Based on several variations of "self-injur prevention" searches through "PsychInfo" and "Google Scholar," only a few research articles that focus on prevention emerge. The few studies that do exist focus on "deliberate self-harm," self-mutilative behaviors, or a combination of suicidal and non suicidal behaviors. These few studies also focused solely on clinical populations. Studies focusing on prevention of self-injury in nonclinical populations of college students did not appear to exist.

Appendix A: The 'How I Deal with Stress' Inventory (HIDS)
(© Heath & Ross, 2007)

Coping strategies	***Never***	***Once***	***Few times***	***Frequently***
1. Try not to think about it	0	1	2	3
2. Spend time alone	0	1	2	3
3. Go out	0	1	2	3
4. **Talk to someone**	0	1	2	3
5. Try to solve the problem	0	1	2	3
6. Do something to keep myself busy	0	1	2	3
7. Say to myself it doesn't matter	0	1	2	3
8. Listen to music	0	1	2	3
9. Exercise	0	1	2	3
10. Play sports	0	1	2	3
11. Read	0	1	2	3
Coping strategies	***Never***	***Once***	***Few times***	***Frequently***
12. Go shopping	0	1	2	3
13. Eat	0	1	2	3
14. Stop eating	0	1	2	3
15. Drink alcohol	0	1	2	3
16. Hit someone	0	1	2	3
17. Get into an argument with someone	0	1	2	3
18. Do drugs	0	1	2	3
19. Smoke	0	1	2	3
20. **Do risky things**	0	1	2	3
21. **Physically hurt myself on purpose**	0	1	2	3
22. Cry	0	1	2	3
23. Sleep	0	1	2	3
24. Pray or engage in religious activities	0	1	2	3
25. Interactive online gaming (e.g., WoW)	0	1	2	3
26. Video games (e.g., PlayStation, Xbox)	0	1	2	3
27. Chat online (e.g., MSN)	0	1	2	3
28. General computer/internet use	0	1	2	3
29. Watch television	0	1	2	3
30. Other: _____	0	1	2	3

On a scale of 1 to 10, where 1 is no stress at all and 10 is the most stressed you have ever felt, **how stressed have you been over the past two weeks?** (circle one)

1 2 3 4 5 6 7 8 9 10

If you indicated you talk to someone, who do you talk to? (check all that apply)

- ☐ Parents
- ☐ Other family members
- ☐ Friends
- ☐ Romantic partner
- ☐ Teachers
- ☐ Other (specify):_____

When you talked to someone to deal with stress, how did this make you feel? (check all that apply)

- ☐ Calm
- ☐ Nervous
- ☐ Ashamed
- ☐ Tense
- ☐ Overwhelmed
- ☐ Energetic
- ☐ Angry
- ☐ Anxious
- ☐ Confident
- ☐ Sad
- ☐ Excited
- ☐ Guilty
- ☐ Happy
- ☐ Scared
- ☐ Other (specify):_____

If you indicated you engage in risky activities, what kind of risky activities have you engaged in? (check all that apply)

- ☐ Reckless driving
- ☐ Uncontrolled drug abuse
- ☐ Uncontrolled alcohol abuse
- ☐ Theft
- ☐ Vandalism
- ☐ Promiscuous/unprotected sex
- ☐ Excessive gambling
- ☐ Other (specify): _____

When you engaged in risky activities, how did you feel? (check all that apply)

- ☐ Calm
- ☐ Nervous
- ☐ Ashamed
- ☐ Tense
- ☐ Overwhelmed
- ☐ Energetic
- ☐ Angry
- ☐ Anxious
- ☐ Confident
- ☐ Sad
- ☐ Excited
- ☐ Guilty
- ☐ Happy
- ☐ Scared
- ☐ Other (specify): _____

If you indicated you have hurt yourself on purpose, please circle any way that you have intentionally hurt yourself <u>without suicidal intent</u>:

- ☐ Cut your wrists, arms, or other areas of your body
- ☐ Burned yourself

What parts of your body have you hurt? (check all that apply)

- ☐ Arms
- ☐ Legs
- ☐ Stomach
- ☐ Thighs
- ☐ Chest
- ☐ Face
- ☐ Genitals
- ☐ Other (specify): _____

When you hurt yourself on purpose without suicidal intent, how did you feel BEFORE you hurt yourself on purpose? (check all that apply)

☐ Calm	☐ Nervous	☐ Ashamed
☐ Tense	☐ Overwhelmed	☐ Energetic
☐ Angry	☐ Anxious	☐ Confident
☐ Sad	☐ Excited	☐ Guilty
☐ Happy	☐ Scared	☐ Other (specify): _____

When you hurt yourself on purpose without suicidal intent, how did you feel AFTER you hurt yourself on purpose? (check all that apply)

☐ Calm	☐ Nervous	☐ Ashamed
☐ Tense	☐ Overwhelmed	☐ Energetic
☐ Angry	☐ Anxious	☐ Confident
☐ Sad	☐ Excited	☐ Guilty
☐ Happy	☐ Scared	☐ Other (specify): _____

When was the last time you hurt yourself on purpose? (check one box)

☐past week	☐past month	☐past six months
☐past year	☐within the past two years	☐more than two years ago

Has this ever resulted in hospitalization or injury severe enough to require medical treatment even if you did receive medical treatment? ❑ Yes ❑ No

Have you ever hurt yourself with the intent to die/kill yourself?

❑ Yes ❑ No

How many times have you hurt yourself on purpose throughout your life? (check one box)

☐One time	☐2 to 4 times	☐5 to 10 times
☐11 to 50 times	☐51 to 100 times	☐More than 100 times

Appendix B: The 'Function Assessment of Self-Mutilation' (FASM)
(Lloyd-Richardson, Kelly, Hope, 1997)

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

	No	**Yes**	**Approx. how many times?**	**Should you have gotten medical treatment (even if you didn't)?**
cut or carved on your skin				
burned your skin (i.e. with a cigarette, match or other hot object)				

B. If not in the past year, have you EVER engaged in the following behaviors to <u>deliberately harm yourself</u> (check all that apply):

	No	**Yes**	**Approx. how many times?**	**Should you have gotten medical treatment (even if you didn't)?**
cut or carved on your skin				
burned your skin (i.e., with a cigarette, match or other hot object)				

<u>If yes to any of the above behaviors</u>, please complete the questions (C-H) below:

C. While doing any of the above acts, were you trying to kill yourself?
_____ Yes _____ No

D. How long did you think about doing the above act(s) before actually doing it?
_____ none
_____ "a few minutes"
_____ less than 60 minutes
_____ greater than 1 hour but less than 24 hours
_____ greater than 1 day but less than a week
_____ greater than a week

E. Did you perform any of the above behaviors while you were taking drugs or alcohol? _____ Yes _____ No

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

_____ severe pain
_____ moderate pain
_____ little pain
_____ no pain

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

H. If you have completely stopped harming yourself, why did you stop? (check all that apply)

___In order to stop unwanted attention
___I didn't like the scars
___I felt ashamed
___I felt like I didn't need to anymore
___I began talking to someone (a parent, friend, therapist)
___I began using another coping mechanism that worked better
___Self-injury is unhealthy
___Other, please specify _____

I. How many years have you been doing this? (If you are no longer doing this, how long did you do this before you stopped?)

___less than one month
___longer than one month but less than six months
___longer than six months but less than a year
___longer than one year but less than two years
___longer than two years but less than four years
___longer than four years

J. When you self harmed, why did you stop at that moment? (check all that apply)

___I was distracted by something (i.e. someone knocked on my door, the phone rang, etc)
___I had to do something/go somewhere (i.e. go to class, get back to work, etc)
___I was in pain
___I was scared
___I felt better
___I felt worse
___I felt tired
___Other, please specify _____

K. Have you ever been to a therapist or counselor for issues related to your self-harm? _____ Yes _____ No

Appendix C: Demographics

Age: _____

Sex: □ Male □ Female

Race/Ethnicity:
□ White/ Caucasian
□ Hispanic or Latino/Latina
□ Black or African-American
□ Asian or Asian-American
□ American Indian or Alaskan Native
□ Native Hawaiian or Pacific Islander
□ Other (please specify) _____

Year in School:
□ Freshman
□ Sophomore
□ Junior
□ Senior

Which private liberal arts college do you currently attend?
□ Whitman College
□ Whittier College

Which type of high school did you attend?
□ Private High School
□ Public High School
□ Home Schooled
□ Boarding School
□ High School Education Abroad (studied outside of U.S.)
Please specify where _____

Appendix D

Means and t tests for Number of Times Coping Strategies Used: Non-Significant Results

Coping Strategy	Engaged in NSSI	Mean	SD	N	df	*t*
Try not to think about it	No	3.04	0.96	199	264	-0.372
	Yes	3.09	0.88	67		
Go out	No	2.90	0.95	200	265	-0.685
	Yes	2.99	0.88	67		
Try to solve the problem	No	3.64	0.57	201	266	1.342
	Yes	3.52	0.70	67		
Do something to keep myself busy	No	3.34	0.83	199	264	-0.666
	Yes	3.42	0.74	67		
Listen to music	No	3.56	0.74	199	264	-0.230
	Yes	3.58	0.76	67		
Exercise	No	3.15	0.93	201	265	0.878
	Yes	3.03	1.04	66		
Read	No	2.80	1.04	200	265	-0.340
	Yes	2.85	1.10	67		
Go shopping	No	2.03	1.01	200	264	0.068
	Yes	2.02	1.05	66		
Eat	No	3.01	1.03	199	263	-0.035
	Yes	3.02	0.97	66		
Hit others	No	1.21	0.56	200	265	0.329
	Yes	1.18	0.55	67		
Get into an argument with someone else	No	2.08	0.95	200	264	-0.338
	Yes	2.12	1.02	66		
Do drugs	No	1.37	0.82	199	263	-1.373
	Yes	1.53	0.90	66		
Smoke	No	1.30	0.79	200	265	-1.195
	Yes	1.43	0.78	67		
Sleep	No	3.24	0.81	199	264	-0.502
	Yes	3.30	0.78	67		

Means and t tests for Number of Times Coping Strategies Used: Non-Significant Results

Coping Strategy	Engaged in NSSI	Mean	SD	N	df	*t*
Pray or engage in religious/ spiritual activities	No Yes	2.14 2.19	1.21 1.13	201 67	266	-0.33
Video games	No Yes	1.72 1.61	1.02 1.04	201 66	265	0.76
Chat online	No Yes	2.10 1.95	1.18 1.16	201 66	265	0.90
General computer/ internet use	No Yes	3.30 3.30	0.96 0.95	201 67	266	0.00
Watch TV	No Yes	2.89 2.94	1.01 .97	201 67	266	-0.35
Talk	No Yes	3.45 3.28	0.77 0.76	199 67	266	1.51

Appendix E

One-way ANOVA of Demographics: Non-Significant Results

Demographic	Sum of Squares	df	Mean Square	*F*
Age				
Between Groups	1.78	5	0.36	1.93*
Within Groups	48.47	262	0.19	
Race				
Between Groups	0.60	4	0.15	0.80**
Within Groups	49.02	261	0.19	
Type of high school				
Between Groups	0.81	5	0.16	0.86***
Within Groups	49.44	262	0.19	

*p = .09 **p = .526 ***p = .512

Means and t test for Demographics: Non-Significant Results

College Attended	Mean	SD	N	df	*t*
No	0.26	0.44	185	261	0.49*
Yes	0.23	0.42	78		

Note: The means and standard deviations for engagement in self-injury are based on 1= *no* and 1 = *yes*
**p* = .626

Appendix F

Means and t test for Stress Levels

Stress Levels	Mean	SD	N	df	*t*
Self-injured					
No	5.43	1.99	199	264	-1.16*
Yes	5.76	2.07	67		
College attended					
Whitman	5.55	1.88	185	261	0.71*
Whittier	5.36	2.32	78		

Note: Stress levels are measured on a scale of 1= *no stress* and 10 = *most stressed*.
* $p = .48$

Appendix G

Means and t tests for those who Self-Injure and 'Have Seen a Therapist': Non-Significant Results

Coping Strategy	Engaged in NSSI	Mean	SD	N	df	*t*
Try not to think about it	Yes	3.04	0.96	24	62	-0.49
	No	3.15	0.80	40		
Spend time alone	Yes	3.67	0.57	24	62	0.77
	Yes	3.55	0.60	40		
Go out	Yes	2.96	0.96	24	62	-0.42
	No	3.05	0.78	40		
Try to solve the problem	Yes	3.63	0.60	24	62	0.13
	No	3.50	0.71	40		
Do something to keep myself busy	Yes	3.25	0.84	24	62	-0.28
	No	3.53	0.70	40		
Say to myself it doesn't matter	Yes	2.79	0.88	24	62	-0.33
	No	3.13	0.82	40		
Listen to music	Yes	3.50	0.98	24	62	-0.15
	No	3.65	0.62	40		
Exercise	Yes	3.08	1.06	24	62	0.06
	No	3.03	1.05	40		
Play sports	Yes	2.17	1.20	24	61	-0.01
	No	2.15	1.16	39		
Read	Yes	2.88	1.04	24	62	0.03
	No	2.85	1.14	40		
Go shopping	Yes	1.79	0.93	24	62	-0.36
	No	2.15	1.10	40		
Eat	Yes	2.92	1.06	24	61	-0.24
	No	3.15	0.81	39		
Drink alcohol	Yes	2.38	1.06	24	62	0.43
	No	1.95	1.06	40		
Hit others	Yes	1.13	0.45	24	62	-0.69
	No	1.23	0.62	40		

Means and t tests for those who Self-Injure and 'Have Seen a Therapist': Non-Significant Results

Coping Strategy	Engaged in NSSI	Mean	SD	N	df	*t*
Get into an argument with someone else	Yes	2.33	1.05	24	61	1.17
	No	2.03	0.99	39		
Smoke	Yes	1.58	0.93	24	62	1.57
	No	1.28	0.64	40		
Cry	Yes	3.04	1.04	24	62	-0.69
	No	3.20	0.79	40		
Sleep	Yes	3.13	0.95	24	62	-1.36
	No	3.40	0.67	40		
Interactive online gaming	Yes	1.13	0.45	24	61	-0.38
	No	1.18	0.60	39		
Video games	Yes	1.63	1.14	24	61	-0.06
	No	1.64	1.01	39		
Chat online	Yes	1.79	1.02	24	61	-1.02
	No	2.10	1.25	39		
General computer/ internet use	Yes	3.29	0.86	24	62	-0.34
	No	3.38	0.98	40		
Watch TV	Yes	2.71	1.04	24	62	-1.71
	No	3.13	.88	40		

Appendix H

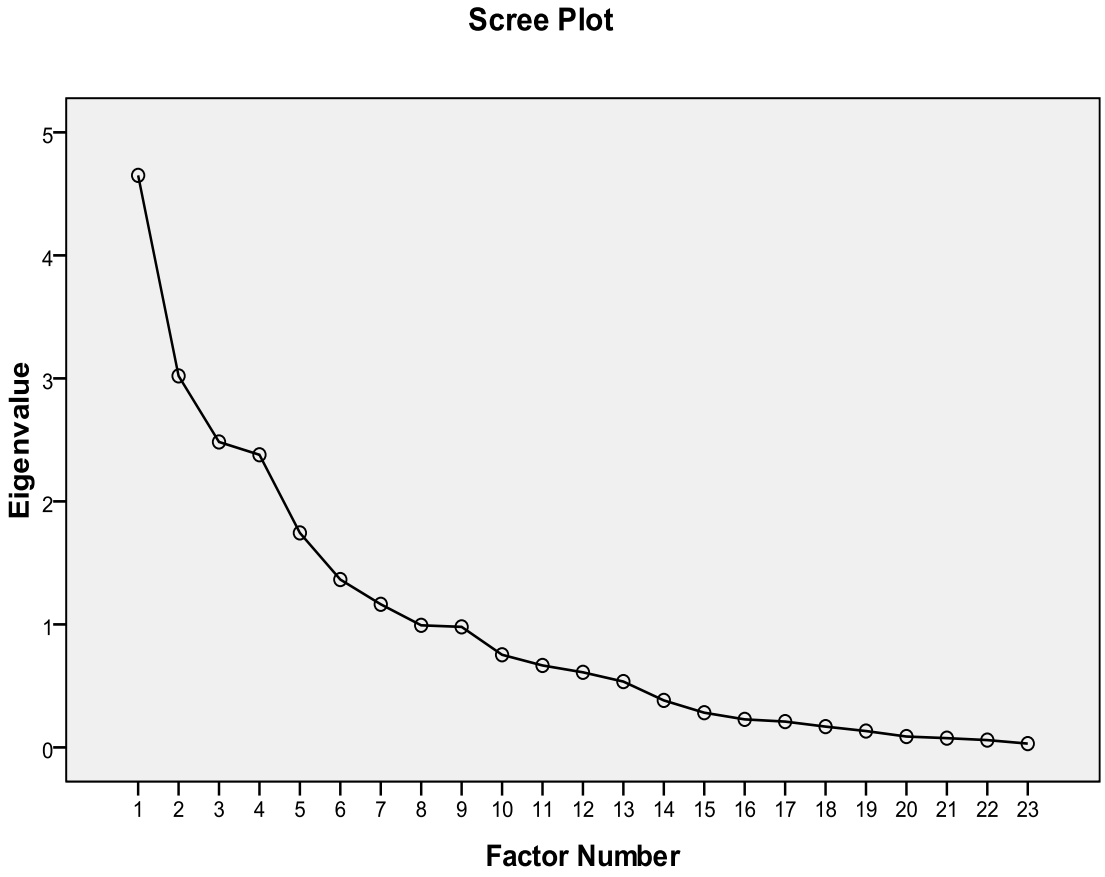
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Table 1

Categorization of Reinforcements in the Four Function Model according to Previous Researchers

Reinforcements
Automatic Negative Reinforcements
14. To stop bad feelings
2. To relieve feeling "numb" or empty
Automatic Positive Reinforcements
4. To feel something, even if it was pain
10. To punish yourself
22. To feel relaxed
Social Negative Reinforcements
1. To avoid school, work, or other activities
5. To avoid having to do something unpleasant you don't want to do
9. To avoid being with people
13. To avoid punishment or paying the consequences
Social Positive Reinforcements
3. To get attention
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
16. To feel more a part of a group
17. To get your parents to understand or notice you
6. To get control of a situation
11. To get other people to act differently or change
12. To be like someone you respect
15. To let others know how desperate you were
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

Note: Numbers in front of reinforcement indicate question number in the FASM survey scale measure.

Table 2
Demographic Descriptions of Participants

Demographic	# of participants	% of participants
Sex		
Men	69	26
Self-injured		
Yes	11	16
No	58	84
Women	195	74
Self-injured		
Yes	56	29
No	139	71
Age		
18	52	19
19	80	29
20	42	15
21	57	21
22	27	10
23+	11	4
Class Year		
Freshman	90	33
Sophomore	57	21
Junior	43	16
Senior	77	28
Race/Ethnicity		
White/Caucasian	180	67
Hispanic or Latino/Latina	24	8
Black or African-American	6	2
Asian or Asian American	24	8
Type of High School Attended		
Private	57	21
Public	190	71
Home Schooled	4	1
Boarding	4	1
Abroad	9	3

Table 3

Means and t tests for Non Self-Injurious Coping Strategies

Coping Strategies	Mean	SD	N	df	*t*
Total Number Used					
Self-injured					
No	17.38	3.39	193	252	-1.84*
Yes	18.28	3.16	61		
Say to myself it doesn't matter					
Self-injured					
No	2.66	1.02	200	265	2.57**
Yes	3.01	0.84	67		
Stop eating					
Self-injured					
No	1.61	0.94	201	266	-4.80***
Yes	2.28	1.13	67		
Cry					
Self-injured					
No	2.78	1.00	199	264	-2.71**
Yes	3.15	0.88	67		
Engage in risky behaviors					
Self-injured					
No	1.38	0.78	199	264	-2.37**
Yes	1.66	0.95	67		
Play sports					
Self-injured					
No	2.58	1.18	200	264	2.63**
Yes	2.14	1.16	66		
Spend time alone					
Self-injured					
No	3.42	0.76	201	266	-1.80*
Yes	3.60	0.58	67		
Drink alcohol					
Self-injured					
No	1.83	0.99	201	266	-1.96*
Yes	2.10	1.06	67		
Interactive online gaming					
Self-injured					
No	1.33	0.81	201	265	1.71*
Yes	1.15	0.53	66		

*Indicates trend ($.05 \leq p < .10$). **$p < .05$. ***$p < .001$.

Table 4

Means and t tests for Reinforcements

Reinforcements	Mean	SD	N	df	*t*
Automatic	2.37	0.73	62	61	10.19**
Social	1.36	0.40			
Automatic Negative	2.48	0.90	62	61	2.15**
Automatic Positive	2.29	0.75			
Social Positive	1.39	0.45	62	61	-1.994*
Social Negative	1.26	0.50			

*Indicates trends ($.05 \leq p < .10$). **$p < .05$. ***$p < .001$.

Table 5

Mean and t test for Sex and Self-Injury

Sex	Mean (n = 264)	SD	N	df	*t*
Male	0.16	0.37	69	262	-2.11**
Female	0.29	0.45	195		

Note: The mean values are scaled such that 1 = *no* and 2 = *yes*.
**$p < .05$

Table 6

Frequencies of Stress Levels over Two Weeks

Stress Levels	# of participants (n = 265)		% of participants	
	Self-Injured (n = 66)	Did Not Self-Injure (n = 199)	Self-Injured (n = 66)	Did Not Self-Injure (n = 199)
No Stress	2	1	3	1
2	0	14	0	7
3	9	33	14	17
4	8	18	12	9
5	6	24	9	36
6	16	40	24	20
7	12	40	18	20
8	7	22	11	11
9	4	5	6	3
Most Stressed	2	2	3	1

Note: Percentages are rounded to nearest whole number.

Table 7

Mean values for Non Self-injurious Coping Strategies Used by Self-Injurers

Reinforcement	Mean (n = 269)	SD
Spend time alone	3.60	0.58
Listen to music	3.58	0.76
Try to solve the problem	3.52	0.70
Do something to keep myself busy	3.42	0.74
Sleep	3.30	0.78
General computer/internet use	3.30	0.96
Talk	3.28	0.76
Cry	3.15	0.88
Try not to think about it	3.09	0.88
Exercise	3.03	1.04
Eat	3.02	0.97
Say to myself it doesn't matter	3.01	0.84
Go out	2.99	0.88
Watch TV	2.90	0.97
Read	2.85	1.10
Stop eating	2.28	1.13
Pray or engage in religious/spiritual activities	2.19	1.13
Play sports	2.14	1.16
Get into an argument with someone else	2.12	1.02
Drink alcohol	2.10	1.06
Go shopping	2.02	1.05
Chat online	1.95	1.16
Engage in risky behaviors	1.66	0.95

Note: Mean values are measured on a 4-point Likert scale (1 = *never* and 4 = *frequently*)

Table 7 continued

Mean values for Non Self-injurious Coping Strategies Used by Self-Injurers

Reinforcement	Mean (n = 269)	SD
Video games	1.61	1.04
Do drugs	1.53	0.90
Smoke	1.43	0.79
Hit others	1.18	0.55
Interactive online gaming	1.15	0.53

Note: Mean values are measured on a 4-point Likert scale (1 = *never* and 4 = *frequently*)

Table 8

Mean values for Non Self-injurious Coping Strategies Used by Non Self-Injurers

Reinforcement	Mean (n = 269)	SD
Try to solve the problem	3.64	0.57
Listen to music	3.56	0.74
Talk	3.45	0.77
Spend time alone	3.42	0.76
Do something to keep myself busy	3.34	0.83
General computer/internet use	3.30	0.96
Sleep	3.24	0.81
Exercise	3.15	0.93
Try not to think about it	3.04	0.96
Eat	3.01	1.03
Go out	2.90	0.95
Watch TV	2.89	1.01
Read	2.80	1.04
Cry	2.78	1.00
Say to myself it doesn't matter	2.66	1.02
Play sports	2.58	1.18
Pray or engage in religious/spiritual activities	2.14	1.21
Chat online	2.10	1.18
Get into an argument with someone else	2.08	0.95
Go shopping	2.03	1.01
Drink alcohol	1.83	0.99
Video games	1.72	1.02
Stop eating	1.61	0.94

Note: Mean values are measured on a 4-point Likert scale (1 = *never* and 4 = *frequently*)

Table 8 continued

Mean values for Non Self-injurious Coping Strategies Used by Non Self-Injurers

Reinforcement	Mean (n = 269)	SD
Engage in risky behaviors	1.38	0.78
Do drugs	1.37	0.82
Interactive online gaming	1.33	0.81
Smoke	1.30	0.79
Hit others	1.21	0.56

Note: Mean values are measured on a 4-point Likert scale (1 = *never* and 4 = *frequently*)

Table 9

Frequencies for Talking

Talking	# of participants (n = 268)	% of participants
Frequency		
Never	10	4
Once	16	6
Few times	97	36
Frequently	145	54
With whom		
Parents	153	57
Romantic partners	133	49
Family members	94	35
Teachers	33	12
Friends	241	89
Feelings after		
Calm	176	65
Tense	52	19
Angry	20	7
Sad	66	24
Happy	53	20
Nervous	54	20
Overwhelmed	93	34
Anxious	79	29
Excited	19	7
Scared	24	9
Ashamed	42	16
Energetic	15	6
Confident	77	29
Guilty	36	13

Table 10
Frequencies for Risky Behaviors

Risky behaviors	# of participants (n = 266)	% of participants
Frequency		
Never	196	73
Once	28	10
Few times	34	13
Frequently	8	3
Type		
Reckless driving	28	10
Theft	12	4
Excessive gambling	0	0
Uncontrolled drug abuse	9	3
Vandalism	9	3
Uncontrolled alcohol abuse	31	12
Promiscuous/unprotected sex	30	11
Feelings after		
Calm	9	3
Tense	18	7
Angry	11	4
Sad	7	3
Happy	21	8
Nervous	18	7
Overwhelmed	13	5
Anxious	16	6
Excited	30	11
Scared	13	5
Ashamed	24	9
Energetic	29	11
Confident	29	11
Guilty	27	10

Table 11

Means and t tests for those who Self-Injure and Have Seen a Therapist

Coping Strategy	Engaged in NSSI	Mean	SD	N	df	*t*
Pray or engage in religious/ spiritual activities	Yes	1.79	0.93	24	62	-2.219**
	No	2.43	1.20	40		
Do drugs	Yes	1.92	1.13	24	61	3.022**
	No	1.26	0.60	39		
Stop eating	Yes	2.58	1.10	24	62	1.675*
	No	2.10	1.13	40		
Engage in risky behaviors	Yes	1.92	1.10	24	62	1.979*
	No	1.45	0.78	40		
Talk	Yes	3.50	0.51	24	62	1.705*
	No	3.18	0.84	40		

*Indicates trends ($.05 \leq p < .10$). **$p < .05$.

Table 12

Frequencies of Self-Injury

Self-Injurious Behavior	# of participants	% of participants (n = 66)	% of total participants (n = 265)
Ever self-injured			
Self-cut	53	80	20
Self-burn	3	5	1
Both	10	15	4
Self-injured in past year			
Self-cut	26	39	10
Self-burn	3	5	1
Both	2	3	1
Suicidal intention			
Yes	5[1]	7[2]	
No	66	93[2]	

Note: Percentages are rounded to the nearest whole number.
[1]Since these participants indicated they had self-injured with a suicidal intention, their responses were deleted and were not considered in any analyses.
[2]These percentages are calculated before removing the responses of those who self-injured for suicidal reasons (n = 71).

Table 13

Frequencies of Self-Injurious Acts

Self-injurious act	# of participants (n = 265)	% of participants
Frequency		
Never	199	74
Once	11	4
Few times	44	16
Frequently	11	4
Location		
Arms	59	22
Legs	24	9
Hands	17	6
Feet	0	0
Stomach	9	3
Thighs	15	6
Chest	2	< 1
Face	2	< 1
Genitals	1	< 1
Number of times		
2-4 times	18	27
5-10 times	17	26
11-50 times	18	27
51-100 times	6	9
100+ times	1	2
Pain experienced		
Severe	1	2
Moderate	29	45
Little	31	48
No pain	4	6

Table 14

Frequencies of Time regarding Self-Injury

Time	# of participants (n = 66)	% of participants
Time thought before		
Didn't think about it at all	10	16
Few min	21	33
< 30 min	6	9
< 1 hour	8	13
1 hr < x < 24 hr	2	3
1 day < x < 1 wk	8	13
> 1 wk	9	14
Total time		
< one month	15	24
One month < x < 6 months	14	22
6 months < x < 1 year	5	8
1 year < x < 2 years	6	9
2 years < x < 4 years	12	19
> 4 years	11	18
Last time		
Past week	3	5
Past month	2	3
Past 6 months	12	18
Past one year	11	17
Within two years	9	14
Longer than two year	29	44

Note: Percentages are rounded to nearest whole number.

Table 15

Frequencies of Feelings regarding Self-Injury

Emotions	# of participants	% of total participants (n = 66)
Calm		
Before	3	5
After	31	47
Tense		
Before	34	52
After	3	5
Angry		
Before	39	59
After	8	12
Sad		
Before	43	65
After	28	42
Happy		
Before	1	2
After	1	2
Nervous		
Before	1	2
After	7	11
Overwhelmed		
Before	52	79
After	15	23
Anxious		
Before	32	48
After	6	9
Excited		
Before	2	3
After	2	3
Scared		
Before	18	27
After	9	14
Ashamed		
Before	19	29
After	30	45
Energetic		
Before	0	0
After	0	0
Confident		
Before	0	0
After	1	2
Guilty		
Before	19	29
After	25	38

Note: Percentages are rounded to nearest whole number.

Table 16

Frequencies for Reasons for Stopping Self-Injuring

Reasons	# of participants (n = 66)	% of total participants
Stopping completely		
I still self-injure	4	6
In order to stop unwanted attention	9	14
I didn't like the scars	15	23
I felt ashamed	20	30
I felt like I didn't need to anymore	33	50
I began talking to someone (i.e. a parent, friend, therapist)	13	20
I began using another coping mechanism that worked better	21	32
Self-Injury is unhealthy	26	39
Stopping at that moment		
I was distracted by something	14	21
I had to do something/ go somewhere (i.e. class, get back to work, etc)	14	21
I was in pain	12	18
I was scared	15	23
I felt better	35	53
I felt worse	8	12
I was tired	5	8

Note: Percentages are rounded to nearest whole number.

Table 17

Frequencies for Age of First Self-Injury

Age	# of participants (n = 66)	% of total participants
Nine	2	3
Ten	1	2
Eleven	4	6
Twelve	11	17
Thirteen	18	27
Fourteen	12	18
Fifteen	10	15
Sixteen	15	23
Seventeen	6	9
Eighteen	4	6
Nineteen	0	0
Twenty	2	3
Twenty-one	2	3
Twenty-two	1	2

Note: Percentages are rounded to nearest whole number.

Table 18

Mean values for Reinforcements

Reinforcement	Mean (n = 63)	SD
To stop bad feelings	2.48	1.16
To punish yourself	2.48	1.27
To relieve feeling “numb” or empty	2.46	1.11
To get control of a situation	2.29	1.11
To feel something, even if it was pain	2.27	1.13
To feel relaxed	2.10	1.13
To let others know how desperate you were	1.57	0.91
To get attention	1.54	0.90
To try to get a reaction from someone, even if it’s a negative reaction	1.49	0.84
To get help	1.41	0.82
To avoid having to do something unpleasant you don’t want to do	1.37	0.75
To receive more attention from your parents or friends	1.37	0.79
To avoid being with people	1.32	0.67
To get your parents to understand or notice you	1.32	0.82
To get other people to act differently or change	1.29	0.73
To be like someone you respect	1.21	0.57
To avoid school, work, or other activities	1.21	0.60
To give yourself something to do when alone	1.17	0.56
To make others angry	1.17	0.56
To avoid punishment or paying the consequences	1.13	0.38
To feel more a part of a group	1.11	0.36
To give yourself something to do when with others	1.05	0.28

Note: Mean values are measured on a 4-point Likert scale (1 = *never* and 4 = *frequently*)

Table 19

Exploratory Factor Analysis, Unweighted Least Squares extraction of four factors, Promax rotation ($\kappa = 4$)

Items	Factor 1 (SPR)	Factor 2 (SNR)	Factor 3 (inclusiveness)	Factor 4 (emotion regulation)
To try to get a reaction from someone**	.94			
To receive more attention**	.85			
To get attention**	.84			
To get help**	.68			
To get your parents to understand or notice you**	.67			
To let others know how desperate you were**	.62			
To avoid punishment or paying the consequences**		.81		
To avoid having to do something unpleasant**		.67		
To give yourself something to do when alone		.64		
To avoid school, work, or other activities**		.63		
To avoid being with people**		.56		
To feel more a part of a group			.80	
To be like someone you respect			.77	
To give yourself something to do when with others			.69	
To make others angry			.48	
To stop bad feelings				.70
To relieve feeling "numb" or empty				.56
To feel relaxed				.53
To feel something, even if it was pain				.50
To get control of a situation				.39
*To punish yourself				
*To get other people to act differently or change				
*Other				

Note: Some item names were shorted.
*These items cross-loaded and had loadings below .35
**These items loaded such that they are consistent with the categorization of items in the Four Function Model.

Table 20

Total Variance Explained by the Extracted Four Factors

Factor	% of Variance	Cumulative %
1	20.22	20.20
2	13.13	33.35
3	10.80	44.15
4	10.34	54.49

Figure 1

Four Function Model

	Positive Reinforcement (PR)	Negative Reinforcement (NR)
Automatic (A)	**APR**	**ANR**
Social (S)	**SPR**	**SNR**