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Non-Suicidal Self-Injury: Prevalence and Correlates

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Sarah Wood

Eastern Illinois University
To Dan Schimerowski

I love you and I miss you every day.
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Abstract

Non-Suicidal Self-Injury (NSSI) is a behavior done with the intent of harming oneself without the intent to commit suicide. NSSI includes many different behaviors including cutting, hitting, and burning oneself. NSSI has been associated with anxiety, depression, and emotion focused coping styles. This study aimed to learn more about the prevalence of NSSI among adults and to learn more about the relationship between NSSI, locus of control, anxiety, depression, and coping styles. Results found that lifetime prevalence of NSSI was high (54.8%). This is significantly larger than previous studies have found. Possible reasons for this discrepancy include: an increase in lifetime prevalence, using different definitions of NSSI, and methodological differences. Those who reported engaging in NSSI had higher anxiety and depression scores as well as a more external locus of control. Those who reported engaging in NSSI were more likely to endorse having an avoidance coping style. Measurement of engagement in NSSI is difficult and this makes it challenging to examine results. A clear definition of NSSI is needed to proceed further with research and a better measurement tool based on that definition is needed to accurately collect data. Future research would also benefit from separating those who have a lifetime engagement of NSSI from those who are currently engaging in NSSI.
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Non-suicidal self-injury (NSSI) is one behavior on a spectrum of behaviors meant to inflict harm on oneself up to and including death (Skegg, 2005). These behaviors, referred to collectively as self-harm behaviors, vary in severity and lethality. Other examples include disordered eating, substance misuse, reckless behavior, and suicide attempts. Similarly, NSSI behaviors range in terms of severity and lethality with some behaviors, such as cutting oneself, having the potential to cause severe harm, with others such as punching oneself, having a very low potential of causing severe harm.

Many different terms have been used to describe these self-injurious behaviors including attempted suicide, deliberate self-harm, parasuicide, self-injury, self-poisoning (specifically used when ingesting dangerous substances), and self-mutilation (Skegg, 2005). Non-suicidal self-injury (NSSI) is the most updated and accurate of these terms and it will be used throughout this paper to refer to behaviors such as cutting, burning, biting, pinching oneself, banging or hitting self, and swallowing dangerous substances.

There is controversy over what specifically qualifies as NSSI. At its most basic, NSSI is defined as "direct, deliberate destruction of one's own body tissue in the absence of intent to die" (Guerreiro, Cruz, Frasquilho, Santos, Figueria, Sampaio, 2013). Although it is vague, this definition appears to include all NSSI behaviors and it encapsulates the two important facets of these behaviors: they are deliberately done to harm oneself and they are done in the absence of suicidal intent.

Although the definition of NSSI clearly excludes suicide attempts, the distinction between the two is often not clear. Suicidal intent can be difficult to qualify due to the transient nature of suicidal ideation. Many people who engage in NSSI have endorsed having suicidal ideation at some point in time but not always while they are engaging in
their self-injurious behavior (Turner, Layden, Butler, & Chapman, 2013). The key factor is that the specific behavior must not be done with the intention of killing oneself to qualify as NSSI.

*The Diagnostic and Statistical Manual 5th Edition* (DSM-5) recently added a definition of NSSI as a part of the condition for further study non-suicidal self-injury disorder. The DSM-5 defines NSSI as “Intentional self-inflicted damage to the surface of his or her body of a sort likely to induce bleeding, bruising, or pain...with the expectation that the injury will lead to only minor or moderate physical harm” (APA, 2013). This definition would include commonly endorsed behaviors such as cutting, burning, and punching oneself but it leaves out behaviors that target internal systems of the body such as swallowing substances or disordered eating.

Finding a conceptualization that includes all relevant behaviors but excludes behaviors that may be culturally normative, such as self-tattooing, self-piercing, or non-problematic substance use can be difficult. Almost all conceptualizations include behaviors that cause damage to surface body tissue; controversy tends to stem from the decision to include behaviors that may be harmful in the long term rather than immediately damaging and behaviors that causes internal harm rather than surface tissue damage. Some behaviors that target internal body systems are conceptualized as symptoms of other mental illnesses. For example, restricting food intake to dangerously low levels is often categorized as a symptom of an eating disorder rather than being a behavior designed solely to harm oneself, and swallowing dangerous substances may be categorized as a suicide attempt due to the high potential for lethality or as a substance use disorder.
Disordered eating is conceptualized as part of the larger self-harm spectrum and eating disorders are common among those who engage in NSSI (Taliaferro & Muehlenkamp, 2015; Yiu, Turner, Layden, Chapman, & Zaitsoff, 2015). However, disordered eating may not be done with the intention of causing harm to oneself and depending on the severity of the behavior it may not lead to any harm at all. Those who engage in disordered eating may be attempting to lose or gain weight or may have a mental disorder such as anorexia rather than purposefully attempting to harm themselves. However, swallowing dangerous substances could not be done for any purpose other than to harm oneself. Bearing in mind that swallowing dangerous chemicals is different than misusing substances such as cannabis and alcohol, swallowing dangerous substances is not done to achieve a “high” or altered state of consciousness.

For the purposes of this paper, we will use the DSM-5 definition with the addition that damage due to these behaviors may also be internal. This definition includes the behavior of swallowing dangerous chemicals/substances. Research shows that this behavior is an important aspect of NSSI as it has been found that those who engage in this behavior are very similar to those who engage in other forms of NSSI. Those who deliberately swallow substances or take overdoses in the absence of suicidal intent have been found to have comparable levels of depression and anxiety to those who cut themselves. They have also been found to be facing similar interpersonal issues, have similar levels of self-esteem, and similar coping behaviors (Hawton, Harriss, & Rodham, 2010). This data demonstrates that the only apparent differences between those who swallow substances and those who cut themselves may be the method of NSSI.
Prevalence

It is difficult to ascertain accurate prevalence rates of NSSI. Many studies on prevalence are contradictory or unclear although general themes do still emerge. Adolescents appear to be at the greatest risk of engaging in NSSI. Researchers estimate lifetime prevalence rates range from 12.1-41.6% (Brunner et al., 2014; Doyle, Treacy, & Sheridan, 2015; Zetterqvist, Lundh, Dahlström, & Svedin, 2013).

The lower end of this range (12.1%) was assessed using a qualitative measure that had participants answer ‘yes’ or ‘no’ to a statement asking if they had ever self-harmed. Researchers did not provide a definition of self-harm nor any examples of self-harm behaviors. If the participant indicated that they had self-harmed, they then had to describe their most recent incident. This description was then coded as self-harm or not based on previously researched protocols (Doyle, Treacy, & Sheridan, 2015). This type of question is considered a ‘gateway question’ as it asks the participants an initial broad question and if they meet certain criteria they are then asked follow up questions.

In contrast, the highest reported lifetime prevalence (41.6%) was found using the Functional Assessment of Self-Mutilation (FASM) and the Self-Injurious Thoughts and Behaviors Interview Short Form-Self-Report (SITBI-SF-SR). Researchers found that when they asked a general question as part of the SITBI-SF-SR (“Have you ever actually engaged in non-suicidal self-injury?”) with a definition of NSSI (“That is, purposefully hurt yourself without wanting to die, for example by cutting or burning”) only 17.2% of adolescents responded yes (Zetterqvist, Lundh, Dahlström, & Svedin, 2013). However, when completing the FASM which asks about eleven specific self-harm behaviors in the past year the number of affirmative responses increased to 35.6%. It is clear that there
were major differences between the measures used to assess self-injury and this indicates that the prevalence estimate is not accurate. Especially considering its extremeness in comparison to other rates (Zetterqvist, Lundh, Dahlström, & Svedin, 2013).

Similar to adolescents, college students have a wide range of reported prevalence rates. On the lower end of the spectrum, one study found a prevalence rate of 3% among college students as measured by one question (“Have you ever intentionally cut, burned, bruised, or otherwise injured yourself?”). This measure may have found a low prevalence rate due to the fact that it is not standardized (Taliaferro & Muehlenkamp, 2015).

Klonsky and Olino (2008) found a prevalence rate of 25% using the Inventory of Statements about Self-Injury (ISAS), a measure which they found to be both valid and reliable in their study. Using that same measure, Batejan, Swensen, Jarvi, & Muehlenkamp (2015) found that 56% of their college student sample endorsed engaging in NSSI at least once in their lifetime. Two other studies found rates of 38 and 40% while also using the ISAS on college students (Bracken-Minor, McDevitt-Murphy, & Parra, 2012; Hamza & Willoughby, 2014). It appears that even when the same measure is used on comparable samples, prevalence rates vary considerably.

Lifetime prevalence rates are estimated to be much lower in adults. One study done with adults in Germany (average age of 48.8 years old) found a lifetime prevalence rate of three percent (Plener, Allroggen, Kapusta, Brahler, Fegert, & Groschwitz, 2016). Another study done on American adults found a lifetime prevalence rate of five percent with a 12-month prevalence rate of less than one percent (Klonsky, 2011). The discrepancy between adolescent and adult rates of reporting may be due to underreporting
among adults or a recent increase in lifetime prevalence. If the discrepancy is due to an increase in lifetime prevalence, adult rates will rise over time.

A meta-analysis was conducted by Swannell, Martin, Page, Hasking, & St. John (2014) that sought to clarify prevalence. They analyzed 119 studies with 128 prevalence estimates that ranged from 1.5-54.8%. After controlling for methodological errors, they estimated the following for lifetime prevalence: 17.2% among adolescents, 13.4% among young adults, and 5.5% among adults. The study found that using a checklist was favorable to using a single yes/no question as a checklist was more likely to get accurate results. They also found that studies done on college students may not be generalizable to young adults as a whole, as they found a large discrepancy between college and community prevalence rates (20.2% vs. 11.5% respectively). Assuring anonymity was associated with higher prevalence rates as well and this may be due to the sensitive nature of NSSI. Lastly, these researchers stated that it is not likely that there has been a true increase in lifetime prevalence of NSSI. Rather, they claim that methodological errors have contributed to the false appearance of an increase.

**Co-Occurring Disorders**

NSSI was originally conceptualized as a symptom of Borderline Personality Disorder (BPD). Although NSSI has gained traction as a clinically distinct behavior, it is still highly associated with BPD. In an inpatient psychiatric unit for adolescents, 63.5% of those who engaged in NSSI met criteria for BPD and all of the sample met criteria for at least one personality disorder (Ferrara, Arianna Terrinoni, & Williams, 2012). It is important to note that this sample was obtained from an inpatient psychiatric unit and the data may be skewed toward more severe cases of NSSI. It is also important to note that
this sample is of adolescents and, although they met criteria for BPD, they cannot be diagnosed with a personality disorder. In order to be diagnosed with BPD a person must be over the age of 18 with a history of symptoms for at least one year (APA, 2013). It would be inappropriate to draw conclusions about those who engage in NSSI based solely on this study.

Another study found that 46% of undergraduates who reported engaging in NSSI screened positively for BPD, demonstrating a high level of comorbidity. This study also found that those with BPD who engaged in NSSI had more difficulty in emotional regulation and endorsed using NSSI as a tool for coping with dissociation (depersonalization/derealization), reducing suicidal ideation, and for self-punishment (Bracken-Minor & McDevitt-Murphy, 2014). This research suggests that those with BPD may be using it to cope with symptoms of their disorder.

Mood disorders are also commonly associated with NSSI. Major Depressive Disorder is the most commonly found disorder among those who engage in NSSI with rates ranging from 42-60% in adult and undergraduate college student samples (Csorba, Dinya, Plener, Nagy, & Pali, 2008; Selby, Bender, Gordon, Nock, & Joiner Jr, 2012). Another study found that 29% of their sample who engaged in NSSI were experiencing current depressive symptoms and 39% were experiencing hopelessness. Both of these traits were found significantly more often in those who self-harm compared to those that had no history of self-harm (Taliaferro & Muehlenkamp, 2015). Dysthymia/Persistent Depressive Disorder and Bipolar Disorder are also diagnosed in those who engage in NSSI at higher rates than in those who have never self-injured (Csorba, Dinya, Plener, Nagy, & Pali, 2008; Taliaferro & Muehlenkamp, 2015).
Even though it is done in the absence of suicidal ideation, NSSI has been shown to be a significant risk factor for suicide attempts. Specifically, those who engage in multiple NSSI behaviors (i.e. both cutting and burning) are at a higher risk for making a subsequent suicide attempt (Turner, Layden, Butler, & Chapman, 2013). This trend is in line with Joiner and colleague’s Interpersonal Psychological Theory of Suicidal Behavior (2012) which suggests that a person must have both a desire to end their life as well as the capability to do so in order to attempt suicide. Joiner suggested that NSSI behaviors increase a person’s capability to end their life as they become desensitized to the act of harming themselves.

Anxiety disorders have been found in high rates among those who self-injure as well. Rates of any anxiety disorder range from 17-26.6%. One study found that 44% of those who endorsed NSSI experienced anxiety symptoms, but did not necessarily meet criteria for an anxiety disorder (Csorba, Dinya, Plener, Nagy, & Pali, 2008; Selby, Bender, Gordon, Nock, & Joiner Jr, 2012; Taliaferro & Muehlenkamp, 2015).

Disordered eating and eating disorders are very common among those who self-injure. This co-morbidity is unsurprising because, as previously discussed, disordered eating can be conceptualized as its own form of self-harm. In one community sample, 78% of adults with a history of NSSI endorsed weekly engagement in binge eating or compensatory weight control behaviors (i.e. vomiting, laxative/diuretic misuse, excessive exercise). Those who reported engaging in disordered eating habits tended to endorse cutting, burning, scratching until bleeding, and self-hitting as their most common forms of self-injury (Yiu, Turner, Layden, Chapman, & Zaitsoff, 2015). Among college students, one study found that 38% of their sample that self-injured had been diagnosed
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with anorexia or bulimia in the past 12 months or they had used laxatives, vomiting, or diet pills to lose weight in the past 30 days (Taliaferro & Muehlenkamp, 2015).

Substance use disorders have a nuanced relationship with NSSI. As with disordered eating, substance misuse can be conceptualized as self-harm when it has a reasonable chance to cause harm to oneself. Consequently, it would stand to reason that it would be comorbid with NSSI. Among emergency department patients who presented with self-inflicted injury, 60.7% had a substance abuse diagnosis (Chartrand, Bhaskaran, Sareen, Katz, & Bolton, 2015). Another study found those who self-injured were more likely to use tobacco (66%), marijuana (42%), non-prescribed prescription drugs (42%), and other illegal drugs (18%) when compared to those who did not endorse a history of NSSI (Taliaferro & Muehlenkamp, 2015). This relationship, however, is not linear. Bracken-Minor, McDevitt-Murphy, & Parra (2012) found that those who endorsed NSSI were only more likely to consume alcohol if they also had symptoms of anxiety. This highlights the heterogeneity of the population that engages in NSSI.

The previously discussed disorders, with the exception of substance use, are considered internalizing disorders in which a person internalizes their emotions. Externalizing disorders are characterized by behaviors that are directed at one’s environment and include attention deficit/hyperactivity disorder, oppositional defiance disorder, and conduct disorder. These disorders are not as common as others when it comes to comorbidity but they are still found at a significantly higher rate among those who engage in NSSI compared to those who do not. One study found that 25% of those who endorsed a history of NSSI were diagnosed with any externalizing disorder compared to 3% of those who did not have a history of NSSI (Taliaferro &
Muehlenkamp, 2015). NSSI has also been associated with conduct disorder with one study on adolescents finding 13.3% of those who endorsed NSSI meet criteria (Csorba, Dinya, Plener, Nagy, & Prali, 2008).

**Risk Factors**

Generally, those who self-injure are more likely to have experienced an acute stressor which may be responsible for triggering use of NSSI (Chartrand et al., 2015; Nock, 2009). There are many other known risk factors for engagement in and maintenance of NSSI behaviors including demographic, environmental, and psychological.

In terms of demographics, those who self-injure are more likely to be white than non-white. They are also more likely to be of a non-heterosexual orientation (Taliaferro & Muehlenkamp, 2015). Research is mixed as to whether females or males are more likely to self-injure. Many studies have found higher rates of NSSI in females, but others have found comparable rates (Chartrand et al., 2015; Selby, Bender, Gordon, Nock, & Joiner Jr, 2012; Taliaferro & Muehlenkamp, 2015; Victor, Styer, & Washburn, 2015). At this point, it is unclear if there is a true sex difference.

Those who self-injure are more likely to have experienced childhood sexual or physical abuse (Chartrand et al., 2015; Nock, 2009). They are also more likely to have been the victim of sexual assault, physical assault, and/or emotional abuse within an intimate relationship (Taliaferro & Muehlenkamp, 2015).

Mental illness is a significant risk factor for NSSI. As previously discussed, NSSI behaviors are highly comorbid with a variety of mental illnesses. Outside of specific mental illnesses, NSSI is associated with broad psychological traits such as impulsivity
and aggression. One study found that 68.1% of their participants who reported a history of NSSI scored significantly higher on an impulsivity and aggression measure than those who had no history of NSSI. This data must be interpreted with caution though, as the participants were emergency room patients, so this finding may not be generalizable outside of this setting (Chartrand et al., 2015).

In terms of impulsivity, negative urgency (the tendency to act impulsively when experiencing negative emotions) predicts initial engagement in NSSI, while lack of perseverance (the tendency to fail to maintain focus on tasks that are found to be boring or hard) predicts the maintenance of NSSI behaviors (Riley, Combs, Jordan, & Smith, 2015).

**Functions of NSSI**

People report engaging in NSSI for many different reasons. A study on adolescents who self-injure found that 99.5% of participants engaged in NSSI with the expectation that there would be some consequence or response for their behavior (Zetterqvist, Lundh, Dahlström, & Svedin, 2013). These functions can be categorized into three groups: automatic, social influence, and nonconformist peer identification (Dalhström, Zetterqvist, & Lundh, 2015).

Automatic functions refer to physical and/or emotional sensations that are caused by NSSI. Commonly endorsed automatic functions include: relieving or reducing negative emotions, trying to feel anything even if it is pain, and trying to relieve feelings of emptiness or numbness. The previously mentioned study of adolescents also found that 98.5% of participants reported experiencing a negative feeling or thought before engaging in NSSI (Zetterqvist, Lundh, Dahlström, & Svedin, 2013). This finding lends
credence to the idea that people may engage in this behavior for the purpose of relieving these negative thoughts and emotions. In a review of empirical literature, relieving negative emotions was found to be the most commonly endorsed reason for NSSI behavior (Zetterqvist, 2015).

Social functions refer to the impact that NSSI behaviors have on one’s circumstances or the people in them. Examples include: to resolve an interpersonal conflict, to get help, to get attention, and to influence another person’s behavior. These factors may be conceptualized as help-seeking or as a means to increase social support (Dalhström, Zetterqvist, & Lundh, 2015). This function was found to be more common in adult and adolescent inpatient units than in adult community samples (Zetterqvist, 2015).

Nonconformist peer identification refers to using NSSI as a means to affiliate with a group. Those who engage in NSSI for this purpose may be attempting to be more like people that they like and/or respect, to be in a group, to make other people angry, or to avoid responsibilities or people (Dalhström, Zetterqvist, & Lundh, 2015). Less research has been done on this group of functions as they were previously conceptualized as social functions. Due to these functions being more deviant, they have been found to fit better as a distinct group.

**Sub-Groups of NSSI**

Although those who engage in NSSI are a heterogeneous group, studies have used factor analysis to identify four distinct subgroups of injurers: experimental, mild, multiple functions/anxious, and automatic functions/suicidal (Klonsky & Olino, 2008; Bracken-Minor et al., 2012).
The *experimental type* is characterized by those who occasionally engage in NSSI and have less severe psychopathology. Members of this group tend to harm themselves less often and their methods tend to vary. This type is common as Klonsky and Olino (2008) found that 61% of their college student sample belonged to this group.

The *mild type* typically includes members who began self-injuring at an early age. Members of this group tend to engage in less severe behaviors such as biting and pinching as opposed to cutting or burning. Although this group is denoted as mild, that does not mean that their behaviors are not harmful. This group tends to engage in these behaviors chronically (Klonsky & Olino, 2008).

The *multiple functions/anxious type* tend to have more severe mental health diagnoses. Members of this group endorse many different reasons for engaging in NSSI including both automatic and social functions. This group specifically demonstrates more symptoms of anxiety than any of the other groups and they may use NSSI as a way to cope with that anxiety (Klonsky & Olino, 2008).

The *automatic functions/suicidal type* is almost exclusively made up of those who cut themselves for automatic responses. As opposed to the other groups, cutting is generally the sole injurious behavior of the members. This group demonstrates the highest levels of psychopathology including depression, anxiety, and borderline personality disorder symptoms. This group is also at the highest risk for suicide attempts (Klonsky & Olino, 2008).

**Theoretical Conceptualizations**

A leading theory on the development and maintenance of NSSI has been posited by Nock (2009). This theory integrates information about known risk factors and
functions of NSSI into one model. This model identifies distal, interpersonal, and intrapersonal risk factors. Nock proposes that distal factors are potential causes of interpersonal and intrapersonal vulnerabilities that lead to the onset of NSSI.

Distal risk factors that Nock identified include childhood abuse, family hostility and criticism, and a genetic predisposition for high emotional/cognitive reactivity. Interpersonal vulnerability factors include poor communication and problem-solving skills. Intrapersonal vulnerability factors include high aversive emotions, high aversive cognitions, and poor distress tolerance (Nock, 2009). It could be argued that the previously discussed risk factors fit into this model as potential distal factors or as interpersonal vulnerabilities in the case of traits such as impulsivity or aggression.

The second aspect of Nock's model (2009) is a triggering or stressful event. The type of stressor is theorized to depend on the function of NSSI. If a person uses NSSI to increase a sense of belonging in a peer group, then their stressor will look different than for a person who uses it to reduce their negative emotions.

The third part of Nock's model (2009) includes hypotheses related to initial engagement and maintenance of NSSI behaviors. A person chooses to engage in NSSI after a triggering event although the exact mechanism of this choice is unknown. Finally, after the person engages in NSSI the behavior is reinforced if it serves its function. This reinforcement makes the person more likely to engage in NSSI again when faced with another stressor (Nock, 2009).

Many different hypotheses have been tested with regard to the potential cause of onset and maintenance of NSSI behaviors. These hypotheses often refer back to the different functions of NSSI (automatic, social, nonconformist peer identification) (Nock,
Due to the multitude of reasons people engage in NSSI, it is not likely that one single hypothesis will be able to fully explain the behavior. Rather, it is more likely that each hypothesis may apply to a small group of those who self-injure.

The *Social Learning Hypothesis* proposes that NSSI behavior is learned from observing others engage in it in person or via media. A literature review found that those who engage in NSSI are likely to have a friend who also engages in the behavior. This trend was found in both inpatient and community settings and across all ages (Jarvi, Jackson, Swenson, & Crawford, 2013). It is possible that those who engage in NSSI seek out friends who also engage in the behavior or that people learn to self-injure from their friends.

The *Self-Punishment Hypothesis* suggests that NSSI behaviors are used as punishment that was learned through abuse or criticism by others. Studies have shown that there are individuals who report engaging in NSSI behaviors as a form of self-punishment; however, the learning mechanism for this form of punishment is unknown (Batejan, Swenson, Jarvi, & Muehlemkamp, 2015; Zetterqvist, Lundh, Dahlström, & Svedin, 2013). Self-punishment would be considered an automatic function as it may be done to relieve a negative emotion or generate a positive emotion.

The *Social Signaling Hypothesis* suggests that NSSI behaviors serve as a means of communication when more common means are unsuccessful. Individuals have reported that they engage in NSSI behaviors to influence others, get help, and to feel in control of a situation (Batejan, Swenson, Jarvi, & Muehlemkamp, 2015; Dalhström, Zetterqvist, & Lundh, 2015; Zetterqvist, Lundh, Dahlström, & Svedin, 2013). NSSI could be interpreted as a form of communication when it is committed for these specific
reasons; however, there is no evidence suggest that those who engage in NSSI have a communication skill deficit. This hypothesis fits with the social functions of NSSI as it refers to using it as a tool for social influence.

The *Pain Analgesia/Opiate Hypothesis* states that people may engage in this behavior because they have a dispositional pain analgesia or they developed pain analgesia from habituation through NSSI and/or childhood abuse. Laboratory studies confirm that those who engage in NSSI do tend to have a higher pain threshold and tolerance. It is unknown if these differences are present before the onset of NSSI or if it is an effect of repeated NSSI behaviors (Hooley, Ho, Slater, & Lockshin, 2010).

The *Implicit Identification Hypothesis* suggests that those who frequently engage in NSSI behaviors do so because they identify with the behavior. Dalhström, Zetterqvist, & Lundh (2015) found that among other endorsed social functions of NSSI, some individuals indicated that they self-harmed to feel more like part of a group or to be like someone they respect. While this may overlap with the social learning hypothesis, it appears that those who chronically engage in NSSI may do so due to identifying as a self-injurer. This relates to the nonconformist peer identification functions of NSSI as it is done to increase a sense of belonging with a group.

The *Pragmatic Hypothesis* provides a general answer for why people engage in NSSI behaviors. NSSI is fast, easily accomplished, and it serves some general function for the person engaging in the behavior. This hypothesis, while accurate, is too vague to be beneficial in regard to clinical work or research.
Coping Styles

Maladaptive coping styles may also be a risk factor for NSSI. Although people use a variety of coping skills when faced with stressful situations, they tend to use similar types of skills. These coping skills often fall under one of two categories: emotion focused and problem focused (Frydenberg, 2008).

Emotion-focused coping includes coping behaviors that focus on reducing distress and associated emotions. Examples include distancing, escape, and avoidance. The goal of these behaviors is not to cope with the situation itself but rather the emotional consequence of the situation. Problem-focused coping addresses the situation rather than the distress or emotions. Examples include problem-solving and confrontation (Lazarus, 1993). While neither style is considered right or wrong they do have differing impacts on mental health and NSSI.

Emotion-focused coping has been associated with NSSI. A review of eighteen studies with adolescents found that NSSI was associated with specific emotion-focused coping strategies including avoiding the problem, using drugs and alcohol, getting angry, ruminating, self-blame, and helplessness. The same study found that use of problem focused coping such as requesting help, confrontation and problem solving, and positive reappraisal resulted in less likelihood for engagement in NSSI (Guerreiro, Cruz, Frasquilho, Santos, Figueria, Sampaio, 2013). Another study of adolescents found that emotion-oriented coping was associated with overall poorer mental health as well as greater severity of self-harm (McMahon, Corcoran, McAuliffe, Keeley, Perry, & Arensman, 2013).
Avoidance/helplessness can also be conceptualized as a coping style (Lyne & Roger, 2000). Avoidance/helplessness coping skills (avoiding the problem, giving up) have previously been seen as part of emotion focused coping, but they appear to be their own separate type of skill and they will be measured separately in this study.

One study of adolescents confirmed that those who engaged in NSSI were more likely to use emotion focused coping such as self-blame, tension reduction, and generally nonproductive coping. Those who did not have a history of NSSI were more likely to use productive coping, focus on the positive, and seek social support (Guerreiro, Figueria, Cruz, & Sampaio, 2014). These results have been replicated in college students although coping styles themselves were not found to be a significant independent predictor of self-harm (Borrill, Fox, Flynn, & Roger, 2009). Less information is known about the relationship between coping style and NSSI in adults.

**Locus of Control**

Locus of control refers to a person’s beliefs about their ability to impact their environment. Julian Rotter (1996) proposed that rewards for behavior are only effective if a person believes that the reward is a result of his or her own behavior. Rotter classified people as having either an internal or external locus of control.

A person with an internal locus of control believes that they have control over events or outcomes in their life. A person with an external locus of control believes that outside forces, luck, chance, or powerful others control events or outcomes (Rotter, 1966). For example, if a person with an internal locus of control gets a good grade on a paper they believe that they controlled this outcome. They may believe that they got the good grade due to their studying or due to the fact that they are smart. A person with an
external locus of control who also gets a good grade does not believe this was caused by something they did. They may believe that they got the grade due to teacher error, the teacher being a lenient grader, or due to random chance.

Having an external locus of control has been positively correlated with broad aspects of psychopathology including depression, dysphoria, anxiety, and low self-esteem as well as high overall levels of psychological distress (Hale & Cochran, 2001; Papadopoulos, Paralikas, Barouti, & Chronopoulou, 2014). It has also been positively correlated with both anxiety and depressive disorders. Gallagher, Bentley, & Barlow (2014) conducted a meta-analysis on available research and found that individuals with lower levels of perceived control (i.e. an external locus of control) tended to have more severe symptoms of anxiety. This effect was found to be strongest with Generalized Anxiety Disorder. In regard to depressive disorders, those with an external locus of control tended to report higher levels of symptoms (Presson & Benassi, 1996).

It does not appear that any studies have been done that explore the relationship between locus of control and NSSI. It is expected that an external locus of control is associated with NSSI due to the fact that it is often associated with similar self-harm behaviors such as substance use and mood disorders.

**Hypotheses**

Hypothesis One: Lifetime prevalence of NSSI engagement in adults will be higher than found in previous studies. This is expected due to the higher prevalence rates that have been found in both adolescents and young adults.

Hypothesis Two: Those who report engagement in NSSI will have a more external locus of control than those who do not report engagement. This has not been
previously studied, however, locus of control has been associated with disorders such as
depression and anxiety which tend to be found in those who engage in NSSI.

Hypothesis Three: Those who report engagement in NSSI will be identified as
having an avoidance/helplessness coping style more than those who do not report
engagement. This would be consistent with previous literature on coping styles of
adolescents who engage in NSSI.

Hypothesis Four: Those who report engagement in NSSI will have higher rates of
anxiety and depression than those who do not report engagement in NSSI. Many studies
have found that those who engage in NSSI are more likely to have anxiety and/or
depression,

Hypothesis Five: Frequency of engagement in NSSI will have a significant
relationship to the above factors. It is expected that if a person is engaging in this
behavior often, they will have more psychopathology.

Methods

Participants

Participants were recruited from Amazon Mechanical Turk; an online
crowdsourcing marketplace where people are given the option to perform various tasks,
including survey completion, for monetary compensation. All participants were
American to prevent any cross cultural or language barriers. Participants were
compensated .10 cents for their participation. In total, 151 people completed the survey.
Of these participants, 146 completed all measures in an appropriate manner. Four
participants were excluded due to unusually short response times (less than three
minutes) and one was excluded due to missing data.
The final sample was 67.1% women, 32.2% men, and 0.7% transgender. The majority (82.9%) of the sample identified as heterosexual, 12.3% identified as bisexual, 4.1% as homosexual, and 0.7% asexual. In regard to race, 69.2% of participants identified as White, 11.0% as Asian, 7.5% as Hispanic, 6.8% as African-American, 4.1% as Multi-Ethnic, 0.7% as Pacific Islander, and 0.7% as ‘other’.

The majority of participants had a four-year college degree (32.9%), followed by some college (25.3%), a professional degree (15.8%), a two-year college degree (15.8%), a high school diploma (7.5%), a doctorate degree (2.1%), and one participant who did not answer this question. Participants ages were 18-25 (19.9%), 26-35 (38.4%), 36-45 (24.0%), 46-55 (8.9%), 56-65 (3.4%), and 66 and older (5.5%).

**Measures**

**Inventory of statements about self-injury (ISAS).** The ISAS was used to measure frequency, method, and function of NSSI behaviors. The ISAS assesses the lifetime frequency of 12 NSSI behaviors: cutting, severe scratching, biting, banging or hitting self, burning, interfering with wound healing, carving, rubbing skin against rough surface, pinching, sticking self with needles, pulling hair, and swallowing dangerous substances. The measure asks participants to estimate the amount of times they have intentionally done the behavior without suicidal intent. NSSI behaviors are then added to get a total number of times an individual has engaged in NSSI throughout their lifetime. This scale has been found to have good internal consistency ($\alpha = .84$) and test-retest reliability ($r = .85$) in college students (Klonsky & Olino, 2008).

**Rotter's locus of control scale.** Rotter’s Locus of Control Scale was used to measure the degree to which participants believe that they have control over what
happens in their lives. This scale consists of 29 items in which participants indicate which of two statements they agree with the most (“a. No matter how hard you try some people just don't like you. b. People who can't get others to like them don't understand how to get along with others.”). One point was given for every external locus of control choice made. A high score indicates a more external locus of control while a low score indicates a more internal locus of control. This scale was found to have acceptable internal consistency and test-retest reliability (Rotter, 1966).

**COPE questionnaire.** The COPE Questionnaire was used to assess the coping styles of participants. The original COPE is a 52-item questionnaire where participants indicate how often they use a coping behavior on a four point Likert scale ranging from “I usually don’t do this at all” to “I usually do this a lot” (Carver, Scheier, & Weintraub, 1989). Responses on the original version of the COPE lead to 15 individual subscale scores.

Lyne and Roger (2000) proposed a simplification of the 15 subscale scores. Using factor analysis, Lyne and Roger identified a three-factor structure for the COPE: active/rational coping, emotion coping, and avoidance/helplessness coping. These three scales were found to have internal consistency ranging from acceptable to good. Fifteen individual items were removed due to an unacceptable fit, leaving the measure with 37 items. A high score on an individual subscale indicates that an individual often uses that coping style.

**Hospital anxiety and depression scale (HADS).** The HADS was used to measure levels of anxiety and depression. The HADS has been found to be a valid measure for screening for symptoms of Major Depressive Disorder and anxiety disorders.
in healthy populations (Bocéréan & Dupret, 2014; Kjærgaard, Arfwedson Wang, Waterloo, & Jorde, 2014). Participants indicated how much they agreed with a statement (i.e. "I get sudden feelings of panic") on a scale of 0-3. Scores were then added to get two totals for a depression subscale and an anxiety subscale. Scores ranging from 0-7 are considered normal, 8-10 are considered borderline abnormal, and 11-21 are considered abnormal.

**Procedure**

Participants completed an online survey via Qualtrics. As NSSI is the main focus of this study, the ISAS was administered first and the rest of the measures were counterbalanced to prevent any one measure from effecting performance on another. Participants received their compensation after they had finished their survey.

**Results**

**Prevalence**

Of the 146 participants, 87 (59.6%) reported engaging in an act of NSSI at least once in their lifetime. Those who reported interfering with wound healing as their only form of NSSI were excluded from the final sample. Interfering with wound healing includes behaviors such as picking scabs which may not be clinical significant as it could be considered culturally normative and may not be done with the intention of harming oneself. The adjusted number of participants who endorsed NSSI was 80 (54.8%).

Of those who reported NSSI, 77.5% used two or more methods. The mean frequency of engagement reported was 121 times, the median frequency of engagement in NSSI was 30, and the mode was one. The minimum amount of engagement was one
and maximum amount reported was 1,560. Of the participants, 28.1% reported hitting themselves, 25.3% cutting, 21.9% pulling their hair, 17.8% severely scratching, 17.1% pinching, 11.6% biting, 9.6% rubbing their skin against rough surfaces, 9.6% swallowing dangerous substances, 8.2% burning, 6.2% sticking themselves with needles, 4.8% carving, and 4.8% 'other' as a form of NSSI.

Demographic Comparisons

A one-way ANOVA was conducted to examine differences between demographic groups. A significant difference was found in age groups $F(5, 140) = 3.34, p < .01$ (Table 1). A post hoc Tukey HSD test found that those in the age group 18-25 were significantly more likely to report NSSI than those in the 66 and older group, $p < .05$. Those in the 26-35 age group were also more likely to report NSSI than the 66 and older age group, $p < .05$. A second one-way ANOVA found a significant difference based on sexual orientation, $F(2, 142) = 7.29, p = .001$ (Table 2). A post-hoc Tukey’s test found that those who identified as bisexual were more likely to report NSSI than those who identified as heterosexual, $p = .001$. All other demographic comparisons were not significant.

Those who endorsed cutting themselves were compared to those who had reported no NSSI. This was done to clarify any relationships between variables that may otherwise not have been found due to the high prevalence rate of NSSI found in this study. A t-test found that those who identified as female were more likely to report cutting themselves than those who identified as male, $t(99) = -2.38, p = .02$. A one-way ANOVA found that found that sexual orientation was significant, $F(2, 99) = 15.72, p <$
.001. Post-hoc Tukey's HSD tests found that those who identified as bisexual were more likely to report engagement in cutting themselves than those who identified as heterosexual, \( p < .001 \). A second one-way ANOVA found a significant difference based on age, \( F(5, 96) = 3.35, p = .008 \). Post-Hoc Tukey's HSD tests found that those aged 26-35 were significantly more likely to report engaging in cutting themselves than those aged 36-45, \( p = .03 \). There were no significant differences found for ethnicity or education level.

**Locus of Control**

A t test for independent means was conducted comparing those who reported engaging in NSSI and those who did not. Results indicated that those who engaged in NSSI (\( M = 12.16, SD = 4.18 \)) were significantly more likely to have an external locus of control than those who did not (\( M = 9.68, SD = 4.07 \), \( t(146) = -3.40, p = .001, d = 0.60 \)).

Those who reported engaging in cutting specifically (\( M = 13.39, SD = 4.16 \)) were found to have significantly higher scores than those who did not endorse any NSSI (\( M = 9.68, SD = 4.64 \), \( t(100) = -4.00, p < .001 \)).

**Anxiety**

Those who engaged in NSSI (\( M = 10.79, SD = 4.33 \)) had higher scores on the HADS anxiety scale than those who did not (\( M = 6.92, SD = 4.07 \), \( t(146) = -5.51, p < .001, d = 0.92 \)). A correlation was run to test if frequency of NSSI was correlated with levels of anxiety. A positive correlation was found, \( r(78) = .29, p = .005 \) (one-tailed). The NSSI group had a mean score that fell in between the categories of borderline abnormal and abnormal levels of anxiety. Those who did not endorse NSSI had a mean score that indicated normal levels of anxiety.
Those who reported cutting themselves \((M = 10.79, SD = 4.33)\) had higher scores on the HADS anxiety scale than those who did not report cutting \((M = 6.92, SD = 4.07)\), \(t(146) = -5.51, p < .001, d = 0.92\). Anxiety scores and times engaged in NSSI were positively correlated, \(r(78) = .29, p = .005\) (one-tailed). The cutting group had a mean score that fell in between the categories of borderline abnormal and abnormal. Those who did not endorse NSSI had a mean score that indicated normal levels of anxiety.

**Depression**

On the depression subscale of the HADS, those who reported NSSI \((M = 7.05, SD = 4.07)\) had significantly higher scores than those who did not report NSSI \((M = 4.02, SD = 3.31)\), \(t(146) = -4.88, p < .001, d = .82\). The cutting group had a mean score that was in between the normal and borderline abnormal category for scoring while the non-NSSI group fell into the normal category.

Those who reported cutting as a form of NSSI \((M = 10.61, SD = 4.54)\) had significantly higher depression scores than those who did not report any NSSI \((M = 6.92, SD = 4.07)\), \(t(100) = -4.19, p < .001\). The cutting group had a mean score that was in between the borderline abnormal and abnormal category for scoring while the non-NSSI group fell into the normal category.

**Coping Styles**

In regard to coping style, those who engaged in NSSI \((M = 23.53, SD = 6.67)\) were more likely to use the avoidance/helplessness coping style than the no NSSI group \((M = 20.27, SD = 6.62)\), \(t(146) = -2.94, p = .004, d = 0.49\). As number of times engaging in NSSI increased, so did scores on the avoidance/helplessness cope style \(r(78) = .20, p =

The emotion focused and action focused coping style subscales were not found to have a significant relationship with NSSI engagement.

Those who did not endorse any NSSI ($M = 47.95, SD = 11.14$) were more likely to use an action focused coping style than those who reporting cutting themselves ($M = 42.58, SD = 9.76$), $t(100) = 2.43, p = .02$. The avoidance coping and emotion focused coping styles were not found to have a significant relationship with engagement in cutting as a form of NSSI.

**Comparisons among those who engage in NSSI**

Those who endorsed NSSI were split into three groups based on amount of engagement in NSSI. Participants were rank ordered and three groups were created. The first group included those who engaged in NSSI fewer than 10 times ($N = 29, 36.3\%$), the second group included those who reported engagement in NSSI more than 10 times but fewer than 85 times ($N = 24, 30.0\%$), and the third group included those who engaged in NSSI 86 or more times ($N = 27, 33.8\%$). No demographic comparisons were found to be significant among these three groups.

There were no significant differences among these three groups on locus of control, anxiety, or depression scores. A one-way ANOVA found a significant difference between groups on scores on the avoidance subscale of the COPE, $F(2, 77) = 3.55, p = .03$. Post-hoc Tukey’s HSD tests found that those who engaged in NSSI more than 86 times had higher scores on the avoidance subscale than those who engaged in NSSI fewer than 10 times. A second one-way ANOVA found a significant difference between groups on the emotion focused coping style subscale, $F(2, 77) = 3.89, p = .03$. Post-Hoc Tukey’s HSD tests found that those who engaged in NSSI fewer than 10 times were less likely to
use an emotion focused coping style than those who engaged in NSSI more than 10 times but fewer than 85 times, $p = .02$.

**Correlations**

Engagement in NSSI was found to be significantly correlated with anxiety scores ($r = .29, p < .01$). This correlation had a medium effect size. Engagement in NSSI was also found to be correlated with use of the Avoidance COPE style ($r = .20, p < .05$), this effect size was small. Engagement in NSSI was not correlated with the remaining variables, however, there were significant correlations between the other variables. Table 1 presents all of the correlation data.

Table 1.

*One Tailed Correlations Among Those Who Engage in NSSI (N = 80)*

<table>
<thead>
<tr>
<th>Variables</th>
<th>NSSI</th>
<th>Locus of Control</th>
<th>Anxiety</th>
<th>Depression</th>
<th>Avoidance COPE</th>
<th>Emotion COPE</th>
<th>Action COPE</th>
</tr>
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<tbody>
<tr>
<td>NSSI</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Locus of Control</td>
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<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>.29**</td>
<td>.21*</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>.12</td>
<td>.29**</td>
<td></td>
<td>.44***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidance COPE</td>
<td>.20*</td>
<td>.19*</td>
<td>.44***</td>
<td>.32*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotion COPE</td>
<td>.16</td>
<td>-.07</td>
<td>.22*</td>
<td>-.10</td>
<td>.32**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action COPE</td>
<td>.10</td>
<td>-.26*</td>
<td>-.05</td>
<td>-.34***</td>
<td>.34***</td>
<td>.34***</td>
<td>--</td>
</tr>
</tbody>
</table>

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

**Discussion**
Prevalence

The prevalence rate of NSSI was found to be significantly higher (54.7%) in this study than comparable studies of adults which reported rates of three to six percent (Klonsky, 2011; Plener, Allroggen, Kapusta, Brahler, Fegert, & Groschwitz, 2016). There are many possible reasons for this discrepancy. Research focusing on rates of NSSI in adults is less common than studies of adolescents and college students. It is possible that there has not been enough research done to be able to make valid comparisons between studies. The current study found that the majority of people who endorsed NSSI were in the 18-25 and 26-35 age groups which indicates high prevalence rates in both early and middle adulthood.

Another possible reason for this large difference is methodological differences. The ISAS is a self-report inventory with a list of 12 different behaviors. Many previous studies have relied on single item questions or gateway questions which have both been shown to reduce reported prevalence rates (Swannell, Martin, Page, Hasking, & St. John, 2014). For the purposes of this paper, NSSI was defined as self-inflicted behaviors done with the intention of harming oneself, without suicidal intent, that cause either internal or external tissue damage. Even with a clear cut definition of what NSSI is, categorizing behaviors can be difficult. Interfering with wound healing was initially included as NSSI, but due to the high amount of reported engagement it appears that this behavior could be considered normative. All other included behaviors (cutting, severe scratching, biting, banging or hitting self, burning, carving, rubbing skin against rough surfaces, pinching, sticking self with needles, pulling hair, and swallowing dangerous substances) meet the definition of NSSI as they are done with the intention of harming oneself, they are likely
to cause pain, bleeding, or bruising, and they cause tissue damage whether it be internal or external.

Though it is possible that other studies that report lower prevalence rates incorrectly exclude NSSI behaviors, it is also possible that the ISAS is too sensitive a measure. Using this measure, researchers found prevalence rates from 25-56% among college students (Batejan, Swensen, Jarvi, & Muehlenkamp, 2015; Klonsky and Olino, 2008). These rates are similar to rates found in this study. This is the most commonly used measure in college students, so it is difficult to judge its sensitivity by comparing it with alternative measures. One other study found a much lower rate (three percent), but they relied on single item question which has been shown to erroneously reduce reported prevalence rates (Swannell, Martin, Page, Hasking, & St. John, 2014; Taliaferro & Muehlenkamp, 2015). The ISAS begins by asking participants to estimate the amount of times they have intentionally done a behavior without suicidal intent. It is possible that participants may include times that they have engaged in a behavior without an intent to harm themselves (i.e. picking scabs with the intention to heal them faster, pinching oneself to stay awake). It is a mistake to include those who do not intend to harm themselves with those who intentionally engage in NSSI. This was one other rationale for excluding those who only endorsed interfering with wound healing as their form as NSSI from the NSSI positive group. Including those who do not intend to harm themselves may explain why psychopathology is not consistently found to be associated with NSSI. The ISAS is a self-report which raises additional concerns about acquiescence influencing responses. However, there is no alternative to self-report at this point in time.
Previous studies have indicated that when adults do report a past history of NSSI they tend to deny current engagement (Klonsky, 2011). This suggests the possibility that adults are less likely to report NSSI due to forgetting previous engagement. This is especially likely if previous engagement in NSSI was minimal. There is also a possibility that the stigma surrounding NSSI has influenced previously reported rates. A last possibility, is that prevalence of NSSI is increasing. Swannell, Martin, Page, Hasking, & St. John (2014) stated that this was not likely in their meta-analysis, but current findings may indicate otherwise.

Although there are concerns about the measure used for NSSI in this study, there is still clear evidence indicating that adult rates are higher than previously found. Specifically, rates were found to be much higher than was expected for cutting behaviors alone. Cutting is considered NSSI by all definitions and it is a behavior that is unlikely to be reported unless it was done to harm oneself. The prevalence rate of cutting found in this study (28.1%) was significantly higher than previous adult rates.

It appears that regardless of the measure used, history of NSSI among adults is much higher than previously thought. This indicates that people of all ages are potentially in need of interventions to prevent and reduce NSSI behaviors. This is especially concerning considering the negative outcomes that are associated with NSSI engagement.

Demographic Comparisons

When comparing those aged 18-25 and 26-35 against those who were 66 and older, the younger participants were more likely to report engaging in NSSI. This is consistent with previous findings that those who are younger report higher rates of NSSI (Brunner et al., 2014; Doyle, Treacy, & Sheridan, 2015; Klonsky, 2011; Plener,
Allroggen, Kapusta, Braehler, Fegert, & Groschwitz, 2016; Zetterqvist, Lundh, Dahlström, & Svedin, 2013). As previously discussed, it is difficult to draw conclusions about prevalence. However, this study does not contradict previous studies that indicate initial engagement in NSSI tends to begin in adolescence.

In regard to gender, there was no significant difference based on gender, as men and women were found to have similar reported rates of overall NSSI. However, women were significantly more likely to cut themselves than men. Only one participant identified themselves as transgender, therefore no conclusions can be drawn for this group. Those who identified themselves as bisexual reported significantly higher levels of NSSI compared to those who identified as heterosexual. However, the differences between those who identified as gay and those who identified as bisexual or heterosexual were not significant. This confirms previous findings that found only an increased risk in those who identified as bisexual but not in other members of the LGBT* community. It is unclear why those who identify as bisexual are more likely to engage in NSSI than those who are heterosexual while those who identify as gay are not. One study found that those who identify as bisexual experience internalized self-stigma as well as perceived bigotry from both heterosexual and gay individuals. This study also found that self-stigma and perceived bigotry were correlated with depression, a known risk factor of NSSI (Lambe, Cerezo, & O'Shaughnessy, 2017).

**Anxiety and Depression**

Those who engaged in NSSI reported higher levels of anxiety than those who did not report NSSI. Based on scale norms, the NSSI group was considered between ‘borderline abnormal’ and ‘abnormal’ indicating that an anxiety disorder may be present.
In regard to depression scores, those who reported NSSI were significantly more likely to have higher scores on the depression scale; however, the mean score was in between the ‘normal’ and ‘borderline abnormal’ categories. This indicates that while there was a significant difference in scores, those who engaged in NSSI were not more likely to have a depressive disorder based on scale cut offs. It was also found that higher scores on the anxiety and depression subscales were not significantly correlated with engagement in NSSI, meaning that those who were engaging in NSSI more frequently were no more likely to be more anxious or depressed. These results highlight the controversy over the relationship between mental health and NSSI. Previous research has found a relationship between engagement in NSSI and depression and anxiety (Csorba, Dinya, Plener, Nagy, & Pali, 2008; Selby, Bender, Gordon, Nock, & Joiner Jr, 2012; Taliaferro & Muehlenkamp, 2015). However, other studies found that there are people who engage in NSSI who do not appear to have any mental health diagnosis. Another possible reason for the lack of psychopathology in the NSSI group is that this study was measuring lifetime NSSI engagement, but only current levels of anxiety and depression. It is possible that some participants with a history of NSSI do not meet criteria for a mental illness now, but did at the time of their engagement in NSSI. This lack of a clear relationship makes it difficult to understand the motivation behind engagement in NSSI. If a person does not have a mental disorder, but is engaging in NSSI it becomes difficult for clinicians to treat the behavior. There are no empirically supported treatments for NSSI behaviors alone and it appears that it is not enough to rely on treatments for anxiety and depression as individuals may not be experiencing those symptoms. It is generally considered that any behavior that causes harm to oneself is maladaptive, however if there is no mental health
disorder to treat along with the behavior it is difficult to label it as such. The inclusion of Non-Suicidal Self-Injury Disorder (NSSID) in the DSM-5 as a condition for further study may close this gap and lead to more accessible treatment for those that self-injure.

Locus of Control

As hypothesized, having a more external locus of control was associated with engaging in NSSI. However, there was not a significant correlation between scores on locus of control and frequency of NSSI. This suggests that while those who have any history of NSSI tended to have higher locus of control scores, higher scores did not indicate increased frequency of NSSI.

It is possible that an external locus of control may be associated with NSSI due to the co-morbidity of anxiety and depressive disorders. It was found in these study that those who engaged in NSSI were more likely to have high levels of anxiety and depression, this is consistent with previous literature as well (Csorba, Dinya, Plener, Nagy, & Pali, 2008; Selby, Bender, Gordon, Nock, & Joiner Jr, 2012; Taliaferro & Muehlenkamp, 2015). An external of locus of control may also be conceptualized as helplessness due to the fact that those with a more external locus of control may believe that they are not in control of their lives. The use of NSSI as a possible way to gain control over one’s life has not been previously explored, but it may be an avenue for future research.

Coping Styles

Those who reported engaging in NSSI were significantly more likely to have an avoidance/helplessness coping style. They were not more likely to engage in emotion focused coping or action focused coping. This relationship may be partially explained by
hypothesized functions of NSSI, such as reducing negative feelings. It was also found that as the reported number of times people engaged in NSSI increased, so did the use of avoidance/helplessness coping styles.

It is possible that NSSI could be considered a coping skill that falls under the category of the avoidance/helplessness coping style. This is a potential new hypothesis to explore in further research. NSSI may also be conceptualized as an avoidance coping skill as it does not target the true cause of the negative emotion.

Frequency and Severity

Due to the wide range of frequencies of NSSI reported (Min: 1, Max: 1,560), the decision was made to split participants into three groups. There were few differences between these three groups. Those who reported NSSI the most (86+ times) were more likely to use an avoidance coping style than those who reported NSSI less than ten times. This supports the speculation that those who frequently engage in NSSI may use it as a part of their avoidance coping style. Those who were in the middle group which was characterized by moderate engagement in NSSI (11-85 times) were significantly more likely to use an emotion focused coping style than those who were in the least frequent NSSI group. Emotion focused coping styles have been associated with negative outcomes such as poorer mental health and increased severity of NSSI (McMahon, Corcoran, McAuliffe, Keeley, Perry, & Arensman, 2013). This indicates that those with moderate engagement in NSSI may be at a higher risk for those specific negative outcomes.

There were no significant differences between frequency groups on anxiety or depression subscales which suggests that even those who engage in high levels of NSSI are not more likely to experience higher levels of anxiety or depression when compared
to those who reported engaging in NSSI less than ten times. It appears that frequency of engagement in NSSI is not a crucial factor in determining severity of NSSI behaviors.

Conclusions

The goal of this study was to gain clarity on the prevalence, purpose, and correlates of NSSI. It is clear that the prevalence rate of NSSI is not easily determined and rather than providing clarification this study further obfuscated rates. This is due to the lack of a clear, consistent definition of NSSI. Although this study used an empirically supported definition, it is still different than others that have been used.

This study also focused on lifetime engagement rather than current engagement. An individual who engages in NSSI when they are an adolescent is going to have different survey results if they respond when they are middle aged than they would if they responded when they were an adolescent. Differentiating between previous engagement, current engagement, and no history of NSSI would make these relationships clearer.

This study did not account for severity of NSSI as there is not a measure that can objectively measure this. Frequency of engagement cannot be substituted for severity as the range of NSSI behaviors is so extreme. Cutting behaviors could be conceptualized as a more severe form of NSSI, however this is not always the case. Those who endorsed cutting behaviors were less likely to use action focused coping skills, but other comparisons were found to be similar when including all forms of NSSI.

This study did confirm previous research that anxiety and depression are associated with NSSI. This study also confirmed that different coping styles are associated with NSSI in adults. This is helpful as this result was previously only found in
adolescents. Avoidance was the specific coping style associated with NSSI. This may indicate that NSSI could be a type of coping skill that fits into the avoidance style.

The relationship between locus of control and NSSI was previously unstudied. These results indicate that those who engage in NSSI are more likely to have a more external locus of control. This may indicate that individuals who do not feel in control of their life are more likely to engage in NSSI. More research needs to be done to confirm this hypothesis.

Limitations and Future Directions

This study was conducted with participants from Amazon Turk. This is not an ideal subject pool as participants were recruited online. A study by Paolacci, Chandler, & Ipeirotis (2010) found that participants recruited from Amazon Turk were less likely to report dishonestly than certain other groups, but they were more likely to leave responses blank and more likely to report low motivation. This study also relied entirely on self-report measures which increases the possibility of inaccurate results. The measuring process is ambiguous as it stands, and more needs to be done to clarify how to best measure NSSI. This begins by having a clear and consistent definition of NSSI. To get an appropriate definition it is necessary to distinguish between nonproblematic behavior and psychopathology. The DSM-5 has begun this process by creating non-suicidal self-injury disorder but more research is needed to confirm the utility of this definition. With a consistent definition, a more reliable and valid measure could be created that can adequately measure the prevalence rate.

This study did not distinguish between previous and current engagement in NSSI. It would be beneficial to compare those who have a history of NSSI engagement with
those who currently engage in NSSI as well as with those who have never engaged in
NSSI to get a clearer picture of correlates and risk factors. It appears that more people are
affected by NSSI than previously thought and more research needs to be done to address
this dangerous behavior.
References


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Hawton, K., Harriss, L., & Rodham, K. (2010). How adolescents who cut themselves...


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Appendix A

Inventory of Statements about Self-Injury

INVENTORY OF STATEMENTS ABOUT SELF-INJURY (ISAS) – SECTION I. BEHAVIORS

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

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutting</td>
<td></td>
</tr>
<tr>
<td>Biting</td>
<td></td>
</tr>
<tr>
<td>Burning</td>
<td></td>
</tr>
<tr>
<td>Carving</td>
<td></td>
</tr>
<tr>
<td>Pinching</td>
<td></td>
</tr>
<tr>
<td>Pulling Hair</td>
<td></td>
</tr>
<tr>
<td>Severe Scratching</td>
<td></td>
</tr>
<tr>
<td>Banging or Hitting Self</td>
<td></td>
</tr>
<tr>
<td>Interfering w/ Wound Healing</td>
<td></td>
</tr>
<tr>
<td>Rubbing Skin Against Rough Surface</td>
<td></td>
</tr>
<tr>
<td>Sticking Self w/ Needles</td>
<td></td>
</tr>
<tr>
<td>Swallowing Dangerous Substances</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B
Rotter's Locus of Control Scale

For each question select the statement that you agree with the most

1. a. Children get into trouble because their parents punish them too much.
   b. The trouble with most children nowadays is that their parents are too easy with them.

2. a. Many of the unhappy things in people's lives are partly due to bad luck.
   b. People's misfortunes result from the mistakes they make.

3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.
   b. There will always be wars, no matter how hard people try to prevent them.

4. a. In the long run people get the respect they deserve in this world
   b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries

5. a. The idea that teachers are unfair to students is nonsense.
   b. Most students don't realize the extent to which their grades are influenced by accidental happenings.

6. a. Without the right breaks one cannot be an effective leader.
   b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. a. No matter how hard you try some people just don't like you.
   b. People who can't get others to like them don't understand how to get along with others.
8. a. Heredity plays the major role in determining one's personality
   b. It is one's experiences in life which determine what they're like.

9. a. I have often found that what is going to happen will happen.
   b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10. a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
    b. Many times exam questions tend to be so unrelated to course work that studying in really useless.

11. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
    b. Getting a good job depends mainly on being in the right place at the right time.

12. a. The average citizen can have an influence in government decisions.
    b. This world is run by the few people in power, and there is not much the little guy can do about it.

13. a. When I make plans, I am almost certain that I can make them work.
    b. It is not always wise to plan too far ahead because many things turn out to- be a matter of good or bad fortune anyhow.

14. a. There are certain people who are just no good.
    b. There is some good in everybody.

15. a. In my case getting what I want has little or nothing to do with luck.
    b. Many times we might just as well decide what to do by flipping a coin.
16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.

b. Getting people to do the right thing depends upon ability. Luck has little or nothing to do with it.

17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.

b. By taking an active part in political and social affairs the people can control world events.

18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.

b. There really is no such thing as "luck."

19. a. One should always be willing to admit mistakes.

b. It is usually best to cover up one's mistakes.

20. a. It is hard to know whether or not a person really likes you.

b. How many friends you have depends upon how nice a person you are.

21. a. In the long run the bad things that happen to us are balanced by the good ones.

b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22. a. With enough effort we can wipe out political corruption.

b. It is difficult for people to have much control over the things politicians do in office.

23. a. Sometimes I can't understand how teachers arrive at the grades they give.
b. There is a direct connection between how hard I study and the grades I get.

24. a. A good leader expects people to decide for themselves what they should do.
   b. A good leader makes it clear to everybody what their jobs are.

25. a. Many times I feel that I have little influence over the things that happen to me.
   b. It is impossible for me to believe that chance or luck plays an important role in my life.

26. a. People are lonely because they don't try to be friendly.
   b. There's not much use in trying too hard to please people, if they like you, they like you.

27. a. There is too much emphasis on athletics in high school.
   b. Team sports are an excellent way to build character.

28. a. What happens to me is my own doing.
   b. Sometimes I feel that I don't have enough control over the direction my life is taking.

29. a. Most of the time I can't understand why politicians behave the way they do.
   b. In the long run the people are responsible for bad government on a national as well as on a local level.

**Score one point for each of the following:**

2. a, 3.b, 4.b, 5.b, 6.a, 7.a, 9.a, 10.b, 11.b, 12.b, 13.b, 15.b, 16.a, 17.a, 18.a, 20.a,
21. a, 22.b, 23.a, 25.a, 26.b, 28.b, 29.a.
Appendix C

Hospital Anxiety and Depression Scale

Hospital Anxiety and Depression Scale (HADS)

Tick the box beside the reply that is closest to how you have been feeling in the past week.  
Don’t take too long over your replies: your immediate is best.

<table>
<thead>
<tr>
<th>D</th>
<th>A</th>
<th>D</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel tense or ‘wound up’:</td>
<td>I feel as if I am slowed down:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Most of the time</td>
<td>3</td>
<td>Nearly all the time</td>
</tr>
<tr>
<td>2</td>
<td>A lot of the time</td>
<td>2</td>
<td>Very often</td>
</tr>
<tr>
<td>1</td>
<td>I ran out of time, occasionally</td>
<td>1</td>
<td>Sometimes</td>
</tr>
<tr>
<td>0</td>
<td>Not at all</td>
<td>0</td>
<td>Not at all</td>
</tr>
</tbody>
</table>

| I still enjoy the things I used to enjoy: | I get a sort of frightened feeling like ‘butterflies’ in the stomach: |
| 0 | Definitely as much | 0 | Not at all |
| 1 | Not quite so much | 1 | Occasionally |
| 2 | Only a little | 2 | Quite often |
| 3 | Hardly at all | 3 | Very often |

| I get a sort of frightened feeling as if something awful is about to happen: | I have lost interest in my appearance: |
| 3 | Very definitely and quite badly | 3 | Definitely |
| 2 | Yes, but not too badly | 2 | I don’t take as much care as I should |
| 1 | A little, but it doesn’t worry me | 1 | I may not take quite as much care |
| 0 | Not at all | 0 | I take just as much care as ever |

| I can laugh and see the funny side of things: | I feel restless as I have to be on the move: |
| 0 | As much as I always could | 3 | Very much indeed |
| 1 | Not quite so much now | 2 | Quite a lot |
| 2 | Definitely not so much now | 1 | Not very much |
| 3 | Not at all | 0 | Not at all |

| Worrying thoughts go through my mind: | I look forward with enjoyment to things: |
| 3 | A great deal of the time | 0 | As much as I ever did |
| 2 | A lot of the time | 1 | Rather less than I used to |
| 1 | From time to time, but not too often | 2 | Definitely less than I used to |
| 0 | Only occasionally | 3 | Hardly at all |

| I feel cheerful: | I get sudden feelings of panic: |
| 3 | Not at all | 3 | Very often indeed |
| 2 | Not often | 2 | Quite often |
| 1 | Sometimes | 1 | Not very often |
| 0 | Most of the time | 0 | Not at all |

| I can sit at ease and feel relaxed: | I can enjoy a good book or radio or TV program: |
| 0 | Definitely | 0 | Often |
| 1 | Usually | 1 | Sometimes |
| 2 | Not Often | 2 | Not often |
| 3 | Not at all | 3 | Very seldom |

Please check you have answered all the questions.

Scoring:

Total score: Depression (D)_________ Anxiety (A)_________

0-7 = Normal
8-10 = Borderline abnormal (borderline case)
11-21 = Abnormal (case)
Appendix D

COPE Questionnaire

We are interested in how people respond when they confront difficult or stressful events in their lives. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you generally do and feel, when you experience stressful events. Obviously, different events bring out somewhat different responses, but think about what you usually do when you are under a lot of stress.

Then respond to each of the following items by blackening one number on your answer sheet for each, using the response choices listed just below. Please try to respond to each item separately in your mind from each other item. Choose your answers thoughtfully, and make your answers as true FOR YOU as you can. Please answer every item. There are no "right" or "wrong" answers, so choose the most accurate answer for YOU--not what you think "most people" would say or do. Indicate what YOU usually do when YOU experience a stressful event.

1 = I usually don’t do this at all
2 = I usually do this a little bit
3 = I usually do this a medium amount
4 = I usually do this a lot

1) I try to grow as a person as a result of the experience.
2) I get upset and let my emotions out.
3) I try to get advice from someone about what to do.
4) I concentrate my efforts on doing something about it.
5) I say to myself “this isn’t real”.

6) I admit to myself that I can’t deal with it, and quit trying.

7) I restrain myself from doing anything too quickly.

8) I discuss my feelings with someone.

9) I get used to the idea that it happened.

10) I daydream about things other than this.

11) I get upset, and am really aware of it.

12) I make a plan of action.

13) I hold off doing anything about it until the situation permits.

14) I try to get emotional support from friends or relatives.

15) I just give up trying to reach my goal.

16) I take additional action to try to get rid of the problem.

17) I refuse to believe that it happened.

18) I let my feelings out.

19) I try to see it in a different light, to make it seem more positive.

20) I sleep more than usual.

21) I try to come up with a strategy about what to do.

22) I focus on dealing with this problem, and if necessary let other things slide a little.

23) I get sympathy and understanding from someone.

24) I give up the attempt to get what I want.

25) I look for something good in what is happening.

26) I think about how I might best handle the problem.
27) I make sure not to make matters worse by acting too soon.

28) I try hard to prevent other things from interfering with my efforts at dealing with this.

29) I accept the reality of the fact that it happened.

30) I feel a lot of emotional distress and I find myself expressing those feelings a lot.

31) I take direct action to get around the problem.

32) I reduce the amount of effort I'm putting into solving the problem.

33) I learn to live with it.

34) I think hard about what steps to take.

35) I act as though it hasn't even happened.

36) I do what has to be done, one step at a time.

37) I learn something from the experience.

Scales (sum items listed, with no reversals of coding):

Active/Rational Coping: 1, 4, 7, 9, 12, 16, 19, 21, 22, 25, 26, 28, 29, 31, 34, 36, 37

Emotion Coping: 2, 3, 8, 11, 14, 18, 23, 30

Avoidance: 5, 6, 10, 13, 15, 17, 20, 24, 32, 33, 35