Examining the Relationship between the Function of Nonsuicidal Self-Injury (NSSI) and Motivation to Stop NSSI in Emerging Adulthood

by

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Abstract

Nonsuicidal self-injury (NSSI) is defined as an intentional or deliberate self-inflicted act resulting in tissue damage without suicidal intent and that is not socially sanctioned. NSSI can have disastrous consequences and lifelong impacts on an individual. While research in the field of NSSI is growing, there remains little research on factors associated with the discontinuation of NSSI. This study utilized a sample of college students (n = 103) to investigate individuals' motivations to engage in NSSI and how these motivations relate to reasons individuals gave for stopping NSSI. Logistic regression was used to determine if different motivation styles were predictive of whether or not an individual would have been NSSI for 12 months or more. Linear regression was used to determine if different motivation styles were significant predictors of Vulnerability or Resiliency-related reasons for stopping NSSI. Results suggested that *automatic-positive reinforcement* as motivation for NSSI may be predictive of higher scores for Vulnerability-related reasons for stopping NSSI. However, functions of NSSI failed to produce predictive ability for distinction between Continued or Discontinued NSSI, or Resiliency-related reasons for stopping NSSI.

Keywords: nonsuicidal self-injury, NSSI, discontinuation, motivation, self-injury

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CHAPTER ONE

Examining the Relationship between the Function of Nonsuicidal Self-Injury (NSSI) and Motivation to Stop NSSI in Emerging Adulthood

Although the language used may vary slightly throughout the literature, nonsuicidal self-injury (NSSI) is defined as an intentional or deliberate self-inflicted act resulting in tissue damage without suicidal intent, and that is not socially sanctioned (Glenn & Klonsky, 2013; Muehlenkamp, Hoff, Licht, Azure, & Hasenzahl, 2008; Nock & Prinstein, 2004; Walsh, 2006; Whitlock & Rodham, 2013; You, Lin, Fu, & Leung, 2013). Common behaviors that may be considered NSSI include cutting, burning, stabbing, hitting, excessive rubbing, biting, scratching skin, or banging the head against the wall (American Psychiatric Association [APA], 2013; Nock & Prinstein, 2004; Whitlock & Rodham, 2013; You et al., 2013). While many of the intentional or deliberate self-inflicted harm categorized as NSSI were once viewed as attempts on one's life (Angelotta, 2015), literature supports that NSSI is specifically distinct from suicidal self-injury or suicide attempts (Walsh, 2012), and in response to the activity, individuals may experience increased feelings of guilt or shame, scarring and disfigurement, infection and spread of disease, and in some cases accidental death (Mayo Clinic Staff, 2017). NSSI has emotional costs (Briere & Gil, 1998), physical costs (Mayo Clinic Staff, 2017), and financial costs (National Collaborating Centre for Mental Health, 2012), thus understanding the factors that contribute to the initiation and discontinuation of this behavior may result in saved lives, decreased psychological distress, and retained financial resources.

Function of NSSI

The methods and frequency of engagement in NSSI may continue into adulthood for a subset of individuals; however, it has been suggested that the function of engagement in such

behavior may be distinctively different in adolescent versus adult populations. Whitlock and Selekman (2014) suggested that engagement in NSSI behaviors in adolescence may be the result of attempts to reach emotional equilibrium in response to developmental changes occurring during this time. However, this does not adequately explain continuation of NSSI behaviors beyond periods of developmental changes and further into adulthood, highlighting the possibility of differing functions of NSSI for different individuals.

While NSSI is not a direct threat to the life of the person, such as is the case with suicide, it is not clear what purpose or role NSSI plays for the individual who engages in the behavior. A number of theories have been developed to help explain why people engage in NSSI; however, many of the proposed models have received criticism, only explain NSSI for some individuals, and many lack empirical support. See Messer and Fremouw (2008) for a review of models of NSSI.

One model that shows promise for understanding the function of NSSI, and thus, potentially explaining why people stop engaging in NSSI, is the functional model of NSSI developed by Nock and Prinstein (2004). Nock and Prinstein (2004) asked participants how often they engaged in "nonsuicidal self-mutilation" for specific reasons. Nock and Prinstein's analyses evaluated four primary functions of self-mutilation behaviors, which involved whether functions were automatic (intrapersonal) or social (interpersonal), as well as positive or negative. The researchers' resulting four functions were a) *automatic-negative reinforcement* (e.g., to stop bad feelings), b) *automatic-positive reinforcement* (e.g., to feel something, even if it was pain), c) *social-negative reinforcement* (e.g., to avoid something unpleasant one doesn't want to do), and d) *social-positive reinforcement* (e.g., to let others know how desperate one was). These four functions, called the Four Function Model (FFM), were associated with reductions in tension or

other negative affective states, creating a desirable physiological state, escaping from interpersonal tasks, and gaining attention from others or access to materials, respectively (Nock & Prinstein, 2004).

To understand the FFM of NSSI, it is important to describe each of these functions in detail; the following sections will do as such.

Automatic-negative reinforcement. The function of NSSI that is most frequently endorsed by those engaging in these behaviors *is automatic-negative reinforcement* (Nock & Cha, 2009). This function of NSSI has also been referred to in the literature as intrapersonal negative reinforcement (Nock & Cha, 2009). Individuals engage in NSSI in order to remove or escape from an aversive affective or cognitive state (Nock & Cha, 2009). In other words, those who engage are attempting to reduce unwanted or intolerable feelings, and NSSI is effective in doing so by shifting the individuals' affective or cognitive state.

Automatic-positive reinforcement. In *automatic-positive reinforcement*, also cited as intrapersonal positive reinforcement (Nock & Cha, 2009), NSSI aims to create some sort of feeling in the absence of emotion. Individuals who reported engaging in NSSI for this reason often reported engaging in NSSI to elicit a feeling because they felt numb.

Social-negative reinforcement. Literature on the function of NSSI also cites *social,* or interpersonal reasons (Nock, 2009), for individuals to engage in NSSI. *Social-negative reinforcement* functions of NSSI intend to remove some interpersonal demand (Nock & Cha, 2009) or to escape from undesired social situations (Nock, 2009).

Social-positive reinforcement. NSSI can also be performed with the goal of communicating to others. *Social-positive reinforcement,* or interpersonal positive reinforcement

(Nock & Cha, 2009), facilitates help-seeking. In other words, this function of NSSI serves to get the attention of others or to access resources in the environment (Nock & Cha, 2009).

Discontinuation of NSSI

Whitlock, Eckenrode, and Silverman (2006) investigated the course of NSSI in those who reported not having engaged in such behavior for 12 months, and who did not plan to engage in NSSI again in their lives. The researchers reported that the majority (79.8%) of individuals who met this criterion had stopped NSSI within 5 years of starting and that 40% had stopped within the first year of initiating NSSI.

In an attempt to better understand what motivates individuals to stop engaging in NSSI, Turner, Chapman, and Gratz (2014) investigated reasons individuals reported for why they decided to refrain from NSSI. Turner and colleagues (2014) determined two higher-order factors of reasons to stop NSSI: Vulnerability-related and Resiliency-related reasons. Turner and colleagues (2014) suggested that those who reported Vulnerability-related reasons for refraining from NSSI may be more likely to display a poorer prognosis, including more chronic or severe forms of NSSI and a higher chance of continued NSSI over time. Conversely, those who reported Resiliency-related reasons for refraining from NSSI may predict a more favorable prognosis, including less severe forms of NSSI and less frequency or chance of continued NSSI later in life.

Research Questions

Given what is known to date about NSSI, as well as the remaining gaps in the literature, the following research questions are proposed:

RQ1: Which of the four functions of NSSI, a) *automatic-negative reinforcement*, b) *automatic-positive reinforcement*, c) *social-negative reinforcement*, and d) *social-positive*

reinforcement, is the strongest predictor that an individual will have Discontinued NSSI later in life?

RQ2: Which of the four functions of NSSI is the strongest predictor of Vulnerability-related reasons for Discontinued NSSI?

RQ3: Which of the four functions of NSSI is the strongest predictor of Resiliency-related reasons for Discontinued NSSI?

Method

Participants

Participants were recruited online from a mid-size, liberal arts and sciences public university with a student population around 10,000 in the Mid-Atlantic region of the United States. Based on the analyses utilized in the current study, as well as the power and the alpha levels suggesting a medium effect size determined a priori, a minimum sample size of 95 was determined to be sufficient for the current study using G*Power Data Analysis software (G*Power 3.0.10).

Inclusion and exclusion criteria. Those participants who reported prior suicide attempts were directed to the end of the survey in order to retain a sample of participants who engaged in NSSI but did not engage in self-injury with the intent of death. A college-age population was chosen for this study given the a) higher prevalence rate of NSSI compared to other age ranges (Rodham & Hawton, 2009) and b) research that documents that students are likely to discontinue NSSI during college age (Whitlock et al., 2006).

Measures

Descriptive item on NSSI. Discontinuation of NSSI was assessed in this study by asking when the last time the participant engaged in NSSI: a) within the last week, b) 1 month, c) 3 months, d) 6 months, or e) 12 months or more.

PHQ-9. The Patient Health Questionnaire-9 is a 9-item self-report measure used to assess for the presence and severity of questions. This measure has shown strong psychometric properties in prior studies (Cameron, Crawford, Lawton, & Reid, 2008).

Functional Assessment of Self-Mutilation. The Functional Assessment of Self-Mutilation (FASM; Lloyd, Kelley, & Hope, 1997) is a 30-item self-report measure of the methods, frequency, and function of self-mutilation behavior. This measure produces scores for each of the four functions of NSSI discussed by Nock and Prinstein (2004) and reviewed by Nock and Cha (2009). In order to assess the method and frequency of NSSI, participants are asked if they have intentionally engaged in 11 forms of self-injury *without* the intention to kill oneself.

In the final portion of the FASM, participants are asked how often they had engaged in self-mutilation for each of 22 reasons. Responses are rated on a 4-point Likert scale ranging from 0 (*never*) to 3 (*often*). The FASM is a well-researched assessment developed to suggest four possible functions of self-mutilation (Nock & Prinstein, 2004) based on answers to these 22 items. The Four Function Model (FFM) proposed by Nock and Prinstein (2004) as measured by the FASM has demonstrated both structural and construct validity (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; Nock & Prinstein, 2005) and includes a) *automatic-negative reinforcement* (e.g., to stop bad feelings), b) *automatic-positive reinforcement* (e.g., to feel

something, even if it was pain), c) *social-negative reinforcement* (e.g., to avoid being with people), and d) *social-positive reinforcement* (e.g., to let others know how desperate you were).

Reasons to Stop Self-Injury Questionnaire. The Reasons to Stop Self-Injury Questionnaire (RSSIQ; Turner, Chapman, & Gratz, 2014) is a 40-item self-report measure that assesses for an individual's motivation to discontinue engagement in NSSI. Responses are rated on a 5-point Likert scale ranging from 1 (*not at all important*) to 5 (*extremely important*) and scores are summed across composite items with higher scores representing higher motivation to discontinue NSSI in a specific domain.

Prior research has suggested that the higher-order scale of Resiliency-related reasons showed excellent internal consistency ($\alpha = .90$). The higher-order scale of Vulnerability-related reasons also showed excellent internal consistency ($\alpha = .86$; Turner et al., 2014).

Results

Demographics

In terms of gender, 70.5% ($n = 72$) of participants identified as female, 28.6% ($n = 30$) identified as male, and 1.0% ($n = 1$) identified as Other. Age of participants ranged from 18 years old to 42 years old, with a mean age of 19.5 ($SD = 3.38$). While there were older individuals who participated in this study, 91.3% ($n = 94$) of the sample were in the traditional college-age range of 18-21. Sixty-seven percent ($n = 69$) of the sample identified as White/Caucasian, 13.6% ($n = 14$) African American, 9.7% ($n = 10$) Multiracial, 5.8% ($n = 6$) Latino/Hispanic, 3.9% ($n = 4$) Other, 0.0% Native American, and 0% Asian/Pacific Islander. Sexual orientation of the utilized sample revealed that 73.8% ($n = 76$) identified as heterosexual, 14.6% ($n = 15$) as Bisexual, 5.8% ($n = 6$) as Other, 4.9% ($n = 5$) as Gay, and 1.0% ($n = 1$) as Lesbian (see Table 1).

[Table 1 Here]

Research Question One

The first regression analyses assessed the likelihood that a participant would have discontinued NSSI in the past 12 months. This equation was significant, X^2 (6, N =1-3) = 15.72, p = .015.

In the second step of this regression model, the four predictor variables in question were added. These variables were derived from the FASM and represent the four different motivational categories for engaging in NSSI. The second step of the model was not found to be significant, X^2 (4, N =1-3) = 1.83, p = .77 (see Table 2).

[Table 2 Here]

Research Question Two

Three separate analyses were conducted to answer this research question, the first looking at the ability of the four functions of NSSI to predict scores on Vulnerability-related reasons to stop NSSI for the entire sample. The second two analyses used the same model to analyze these relationships for those who were considered to be Continued NSSI, and for those who were considered to have Discontinued NSSI independently.

Analysis with the entire sample. When analyzing Vulnerability-related reasons for the entire sample of participants, covariate predictors were entered in the same way as in the analysis performed to answer research question one. Next the predictor variables in question (*automatic-positive reinforcement, automatic-negative reinforcement, social-positive reinforcement,* and *social-negative reinforcement*) were added into the second step of the model.

When the predictor variables in question were added to the model in the second step, the model reached significance, ΔR^2 = .09, F(10, 92) = 2.56, p = .044. Participants' ratings of *automatic-positive reinforcement* as a function of NSSI significantly predicted higher scores for

Vulnerability-related reasons for stopping NSSI (β = .27, p = .005). When examining the entire sample of Continued and Discontinued NSSI groups, the answer to research question two is that *automatic-positive reinforcement* motivations for engaging in NSSI is the strongest predictor of Vulnerability-related reasons for stopping NSSI later in life.

Analysis with continued NSSI sample. When analyzing Vulnerability-related reasons for the portion of the participants who were categorized as continued engagers in NSSI, the same analytical procedures were utilized.

The first step of this model was not found to be significant in prediction of scores for Vulnerability-related reasons for stopping NSSI, R^2 = .15, F(6, 43) = 1.30, p = .278. The second step was also found to be nonsignificant, ΔR^2 =.17, F(4, 39) = 2.50, p = .058.

Analysis with discontinued NSSI sample. When analyzing Vulnerability-related reasons for the portion of the participants who were categorized as Discontinued NSSI, the same procedures were used to add variables into the equation.

The first step on this model for those who were categorized as having Discontinued NSSI was not significant, R^2 =.14, F(6, 46) = 1.28, p = .285. Additionally, for this subset of the entire sample, the second step of the model did not reach significance, ΔR^2 = .09, F(4, 42) = 1.20, p = .326 (see Table 3).

[Table 3 Here]

Research Question Three

Three separate analyses were conducted to answer this research question, the first looking at the ability of the four functions of NSSI to predict scores on Resiliency-related reasons to stop NSSI for the entire sample. The second two analyses used the same model to analyze these

relationships for those who were considered to Continue NSSI, and for those who were considered to have Discontinued NSSI independently.

Analysis with the entire sample. When analyzing Resiliency-related reasons for the entire sample of participants, covariate predictors were entered in the same way as in the analysis performed to answer research questions one and two. Next, the predictor variables in question were added into the second step of the model.

Overall, the first step of this regression model predicting scores for Resiliency-related reasons to stop NSSI was not significant, $R^2 = .09$, $F(6, 96) = 1.58$, $p = .160$. When the predictor variables in question were added to the model in the second step, the model again failed to reached significance, $\Delta R^2 = .05$, $F(4, 92) = 1.39$, $p = .243$.

Analysis with continued NSSI sample. When analyzing Resiliency-factors for the portion of the participants who were categorized as Continued NSSI, covariate predictors were again entered in the same way as in the previous analysis. Next the predictor variables in question were added into the second step of the model.

The first step of this model was not found to be significant in prediction of scores for Resiliency-related reasons for stopping NSSI, $R^2 = .15$, $F(6, 46) = 1.25$, $p = .101$. Again, the four functions of NSSI were entered into the second step of the model, specifically for continued engagers. The second step was also found to be nonsignificant, $\Delta R^2 = .15$, $F(4, 39) = 2.08$, $p = .103$.

Analysis with discontinued NSSI sample. When analyzing Resiliency-related factors for the portion of the participants who were categorized as Discontinued NSSI, covariate predictors were again entered in the same way as in the previous analysis followed by predictor variables in the second step.

The first step on this model for those who were categorized as having Discontinued NSSI was not significant, R^2 =.18, $F(6, 46) = 1.69$, $p = .146$. For this subset of the sample who Discontinued NSSI, the second step of the model did not reach significance, $\Delta R^2 = .03$, $F(4, 42) = .33$, $p = .857$.

Discussion

Interpretation of Results

Research question one. Contrary to the hypothesis, the result of the first analysis did not suggest that the four functions of NSSI could statistically predict whether an individual would have discontinued NSSI. These findings are inconsistent with previous research that suggest that both social (important relationship to others) and intrapersonal (self-awareness, ability to regulate emotion) reasons played important roles in discontinuation on NSSI (Mummè, Mildred, & Knight, 2017; Whitlock, Prussien, & Pietrusza, 2015). How does one make sense of the findings? Three possible explanations may offer insight: a) how FASM measures interpersonal and intrapersonal factors, b) other possible predictors, and c) sample size.

Measurement of interpersonal and intrapersonal factors. The measurement of interpersonal and intrapersonal factors may have played a role in the results found in the current study. Each of the four functions utilized in the current study could be categorized as interpersonal (*social*) or intrapersonal (*automatic*). One possible explanation for the lack of results is that the specific questions used on the FASM in the current study did not accurately capture the specific interpersonal and intrapersonal factors that previous research found to be associated with discontinuation of NSSI. For example, Kiekens and colleagues (2017) found that affective imbalance (positive/rewarding and negative/punishing experiences) was the most commonly cited function of NSSI by those who were considered to have discontinued NSSI. In one study

(Kiekens et al., 2017), affective imbalance involved management of depressive or dissociated emotion states, as well as management of agitating or high energy affective states. Again, affective imbalance could be viewed as a similar construct to *automatic-negative reinforcement,* yet the current study did not find this function to be a significant predictor of Discontinued NSSI. One key difference between the research by Kiekens et al. (2017), which documented affective imbalance as being associated with discontinued NSSI, and the current study is that previous research examined emotional regulation more broadly. The current study differentiated between *positive* and *negative* intrapersonal (*automatic*) functions of NSSI. A possible explanation for why results were not replicated in the current study is that *automatic* or *intrapersonal* functions of NSSI should be looked at as a broad category and not differentiated between *positive* and *negative*.

***Other possible predictors*.** Another additional explanation for the findings in the current study is that other predictors of Discontinued versus Continued NSSI were more influential than the predictors used. While the four factors (*automatic-positive reinforcement, automatic-negative reinforcement, social-positive reinforcement,* and *social-negative reinforcement*) identified by Nock and Prinstein (2004) have empirical support, it is possible that other factors influence NSSI discontinuation. For example, research has indicated that there are other factors associated with discontinuation of NSSI such as life satisfaction, perceived social support, and perceived emotional regulatory capability (Kiekens et al., 2017). It may be that changes in how satisfied individuals are with their lives (Kress, Newgent, Whitlock, & Mease, 2015; Whitlock et al., 2015), increased perceived support from those around them (Muehlenkamp, Brausch, Quigley, & Whitlock, 2013; Whitlock et al., 2015), and/or an increased confidence in their ability to manage their emotions (Whitlock et al., 2015; Wilcox et al., 2012), are more important changes occurring

in individuals' lives that influence them to discontinue NSSI over the specific reasons why they were initially engaging in NSSI. Indeed, Glenn and Klonsky (2011) found that when comparing longitudinal data to cross-sectional studies on predictors of NSSI over time, that function of NSSI was a not significant predictor. It may be that for the sample used in the current study, participants either continued or discontinued NSSI for reasons other than the function that maintained the behavior.

Sample size. While research suggests additional variables associated with discontinuation of NSSI, as noted previously (i.e., social support, perceived emotional regulator capability, etc.), it is possible that the sample size was too small to detect a meaningful difference. Although the Power analysis conducted for this study suggested that the sample size utilized would be adequate enough to find significance, a larger sample size may have helped to clarify if there was predictive ability of the FASM on whether or not individuals would be NSSI free for 12 months or more by lowering the chances of a Type II error. That is, given the strong support in the literature for similar constructs as the FFM used in the current study to show relationships to discontinuation of NSSI, it is possible that a relationship was not found due to error.

Research question two. When examining the model with the entire sample, the predictors of interest were found to be significant in their predictive ability for Vulnerability-related reasons for discontinuing NSSI as expected ($p = .044$). Specifically, *automatic-positive reinforcement* was found to be significantly predictive of higher likelihood of higher scores on Vulnerability-related reasons for Discontinued NSSI. NSSI aims to create some sort of feeling in the absence of emotion in individuals who endorse this function. Individuals who endorsed higher scores on *automatic-positive reinforcement* may feel numb and use NSSI as a way to elicit some sort of feeling. Research has suggested that NSSI could serve to help an individual to

feel excitement, to gain a sense of control, or to stop dissociative experiences (Gratz, 2003; Nixon, Cloutier, & Aggarwal, 2002; Peterson, Freedenthal, Sheldon, & Anderson, 2008). In fact, Calati, Bensassi, and Courtet (2017) found that NSSI was more common among individuals with dissociative disorders and those individuals with higher scores on a measure of dissociative symptoms than in those without a dissociative disorder or who had lower scores on a measure of dissociative symptoms. One possible explanation for the finding that *automatic-positive reinforcement* is predictive of Vulnerability-related reasons for stopping NSSI is that it is experienced by individuals with symptoms of serious and persistent mental illnesses such as Posttraumatic Stress Disorder (PTSD) or Depersonalization/Derealization Disorder. Ford and Gomez (2015) investigated the relationship of psychological trauma and dissociative and posttraumatic stress disorders to NSSI and suicidality. The researchers' findings suggest that "Dissociative disorders and [Posttraumatic Stress Disorder] (PTSD) are consistently associated with increased NSSI" (Ford & Gomez, 2015). Individuals experiencing Dissociative disorders or PTSD often report symptoms such as "I know I have feelings but I don't feel them," or "Difficulty experiencing positive affect" (APA, 2013). While literature on motivations for engaging in NSSI and its predictive ability on reasons for discontinuing NSSI has been sparse, research has begun to examine why individuals in their emerging adulthood stop engaging in NSSI. For example, Mummè and colleagues (2017) found that almost 80% of individuals wanted to stop NSSI and 56.1% of participants cited thoughts that NSSI was "unhealthy" as a motivation for stopping. However, research has not related feelings of numbness or other dissociative symptoms to long-term engagement of NSSI. That is, it is unclear if individuals who report engaging in NSSI for reasons related to numbness or dissociation will experience a poorer prognosis as related to their NSSI as suggested by the current study. The current study may add a

consideration of dissociation and feeling numbness to the understanding of the function and treatment of NSSI.

When analysis of the second research question was conducted for the Continued NSSI group only, the final model did not reach significance and therefore was not interpreted. This model did not approach significance and as such, the Beta weights of the predictor variable of interest were not compared for their predictive ability on scores for Vulnerability-related reasons for stopping NSSI. One might make sense of the findings through three possible explanations: a) lack of variability in Vulnerability-related reasons for stopping NSSI based on Continued/Discontinued NSSI, b) reduced sample size, and c) alternative functional models of NSSI.

Lack of variability in Vulnerability-related reasons for stopping NSSI based on Continued/Discontinued NSSI. One possibility for why the current study found the results presented is that Vulnerability-related reasons for NSSI do not vary as a result of whether or not individuals continue or discontinue NSSI throughout emerging adulthood. Turner and colleagues (2014) suggested in the development of their measure of reasons individuals provided for stopping NSSI (RSSIQ) that certain reasons for stopping NSSI—specifically Vulnerability-related reasons—were more likely to be associated with individuals suffering from more chronic presentations of NSSI throughout the lifespan. In the current study, the variable of Vulnerability-related reasons taken from the RSSIQ was used as a criterion variable to answer research question two. While theoretically and intuitively this notion makes sense, results were not found to be significant in the current study when research question two was analyzed specifically looking at those who were considered to have Continued NSSI, and those who were considered to have Discontinued NSSI. One possible explanation for why is that Vulnerability-related

reasons for stopping NSSI do not truly vary as a function of Continued NSSI into emerging adulthood. This proposed rationale hopes to explain why the FFM of NSSI (Nock & Cha, 2009; Nock & Prinstein, 2004) was found to be a significant predictor of Vulnerability-related reasons for stopping NSSI for the entire sample utilized in the current study, but failed to reach significance for each the Continued NSSI and Discontinued NSSI groups independently.

Reduced sample size. An additional explanation for the lack of findings is the research design of the current study. One aspect of research design that may have resulted in retaining the null hypothesis is that of sample size. This model may have failed to reach significance due to the reduced sample size of analyzing the Discontinued and Continued NSSI groups independently. That is, the a priori power analysis and effect size calculations were based on the entire sample and not divided groups. This Power analysis conducted using G*Power Data Analysis software (G*Power 3.0.10) suggested that analyses utilize a sample of at least 95 participants. Field (2009) has suggested that using a sample size that is too small may result in a decrease in Power to the analyses performed. In turn, the researcher suggested that a decrease in statistical Power may reduce the ability of the analyses to detect and effect when there is one to be detected. The reduced sample size may have impacted the results by having only 50-53 participants' data to analyze once split into Continued versus Discontinued NSSI status.

Alternative functional models of NSSI. Furthermore, there are additional models of NSSI that may be better predictors of NSSI. While the previously mentioned rationale may explain, in part, the lack of significant predictive ability of the FFM model of NSSI on participants' scores for Vulnerability-related reasons for stopping NSSI in Discontinued or Continued groups in the current study, one additional possible reason for this absence of findings is the functional model of NSSI used as predictor variables in the current study. Turner and

colleagues (2014) cited the FFM of NSSI as one of the main functional models of NSSI in current research. However, the researchers also cited the Experiential Avoidance Model (EAM; Chapman, Gratz, & Brown, 2006) as another possible explanation for the functional maintenance of NSSI behaviors in individuals. It could be that the EAM of NSSI, which suggests that NSSI is maintained through avoidance or reduction of unwanted thoughts, emotions, somatic sensations, or other distressing or uncomfortable internal experiences, is a better predictor of scores for Vulnerability-related reasons for stopping NSSI. It is possible that this theoretical model may align more accurately with the factors of the RSSIQ utilized as outcome variables in the current study than functions associated with the FFM of NSSI.

Research question three. This question was examined with the entire sample, and again with Continued NSSI and Discontinued NSSI independently. When the entire sample was analyzed, the final model did not reach significance, contrary to expectation. Therefore, Beta weights of the predictor variables of interest were not interpreted or compared to determine the strongest predictor of Resiliency-related reasons to stop NSSI.

When analysis of the third research question was conducted for the Continued NSSI group only, the final model did not reach significance and therefore was not interpreted, contrary to expectations. The model did not reach significance and therefore the Beta weights of the predictor variables of interest were not interpreted or compared in order to determine the strongest predictor of Resiliency-related reasons to stop NSSI.

When analysis of the third research question was conducted for the Discontinued NSSI group only, the final model did not reach significance and therefore was not interpreted, contrary to expectations. Because the model did not reach significance, Beta weights of the predictor

variables of interest were not interpreted or compared to determine the strongest predictor of Resiliency-related reasons to stop NSSI.

Support for this research question was not found. Two possible explanations may make sense of the absence of findings: a) other possible predictors and b) research design.

Other possible predictors. An additional explanation for the findings in the current study is that other predictors of Discontinued versus Continued NSSI were more influential than the predictors used. As mentioned previously, researchers have indicated that there are factors associated with discontinuation of NSSI such as life satisfaction, perceived social support, and perceived emotional regulatory capability that are outside of the scope of the FFM utilized in the current study (Kiekens et al., 2017). It could also be that the EAM of NSSI (Chapman et al., 2006) could also have better predicted Resiliency-related reasons for NSSI. For participants in this sample who indicated a stronger level of Resiliency-related reasons for discontinuing NSSI, the previously mentioned factors may have had a more significant contributing effect than the function that NSSI served for these individuals when using the FFM of NSSI. It also may be that participants who cited Resiliency-related reasons for stopping NSSI may have been engaging in less severe forms of NSSI, although this was not analyzed in the current study. In their meta-analysis, which did not report specific results of severity, frequency, or number of different methods used in NSSI, Mummè and colleagues (2017) suggested that overall, severity, frequency, and number of different methods were the most stable predictors of continued NSSI. In the current study, severity of NSSI (as measured by receiving medical attention for NSSI) was low. That is, it was uncommon for individuals to report that they received medical attention for NSSI-related wounds. Frequency of engagement in NSSI in the current study varied widely from one occurrence to estimations of 150 engagements in NSSI. One possibility is that the less severe

nature of NSSI reported in the current study impacted the results. It could be that function of NSSI plays a more critical role in the reasons individuals provide for discontinuing NSSI than for individuals who report more severe forms of NSSI.

Research design. An additional plausible explanation for why the overall sample utilized in this study, as well as the Discontinued NSSI sample, failed to demonstrate predictive ability for individuals who scored higher on the measure of Resiliency-related reasons for stopping NSSI is the nature of the research design. Specifically, those who may have reported stronger Resiliency-related reasons for stopping NSSI have been theorized to demonstrate more permanent discontinuation from NSSI once stopped (Tuner et al., 2014). One possible explanation for the reason the current study did not find predictive ability of the FFM of NSSI on Resiliency-related reasons for stopping NSSI is that using long-term retrospective accounts may significantly limit the reliability and validity of observations (Nock, 2012). If participants in the Discontinued NSSI group had not engaged in NSSI for long periods of time, they may have had difficulty recalling specific functions that NSSI served for them when they were engaging. Difficulty recalling specific functions may have limited the reliability and validity of this portion of the current study as suggested by Nock (2012).

Limitations

Three key limitations impact this study: a) categorization of participants, b) generalization, and c) the validity of measures used in the analyses.

Categorization of NSSI. When considering the results and interpretation, it is important to note that in the current study, the Continued NSSI group consisted of those individuals who had engaged in NSSI at some point in the last 12 months. The Discontinued NSSI consisted of those individuals who had not engaged in NSSI in 12 months or more. The cutoff period for

Discontinued versus Continued MSSO was arbitrarily set at 12 months. While arbitrary, other researchers have used 12 months as a cutoff period (Kiekens et al, 2017). While unlikely given the current body of research, which commonly uses 12 months or less in making the distinction between Continued or Discontinued NSSI (Kieken et al., 2017; Muehlenkam, Brausch, & Washburn, 2017; Rodham & Hawton, 2009), it could be that those who reported not having engaged in NSSI for the past 12 months may engage in these behaviors once again in the future. However, there remains a lack of longitudinal research in the field of NSSI. Similarly, it is possible that those who reported engaging in NSSI within the past 12 months may never do so again. One study (Glenn & Klonsky, 2011) evaluated relapse rates for individuals who were considered to have Discontinued NSSI. Research by Glenn and Klonsky (2011) suggested that more individuals in their longitudinal study relapsed after 1 year of NSSI abstinence than individuals with 2 years of abstinence, suggesting that a 2-year cutoff period may be more appropriate than a 1-year cutoff. Glenn and Klonsky (2011) posited that 2 years of abstinence may be a better indicator of "genuine NSSI remission." The 12-month cutoff for Continued versus Discontinued NSSI may serve as a limitation in the current study as it is unclear if participants who were considered to have Discontinued NSSI relapsed at any point after their participation in the study. This relates to the current study as the current study utilized a 12-month cutoff to consider participants as Continued engagers in NSSI or to have Discontinued NSSI.

Generalizability. Caution should be used when generalizing the findings from the current study to the general population. The sample utilized was comprised primarily of heterosexual, Caucasian, college females 18 to 21 years of age. It may be that individuals who fall outside of these demographics experience different motivations for engaging or not engaging

in NSSI. Research suggests that individuals engage in NSSI regardless of race or socioeconomic status (DeAngelis, 2015). However, it has been well documented that those in the LGBTQ+ community are at a significantly higher risk for NSSI (DeAngelis, 2015; Muehlenkamp et al., 2015). Additionally, it is clear that NSSI occurs outside of the college population. For example, studies on community samples have suggested rates of 46.5% (Lloyd-Richardson, Perrine, Dierker, & Kelly, 2007), 24% (Giletta, Scholte, Engels, Ciairano, & Prinstein, 2012), and 35.6% (Zetterqvist, Lundh, Dahlström, & Svedin, 2013). However, it is unclear if individuals in a community sample engage in NSSI for the same reasons as college students or if they have similar reasons for stopping NSSI.

Validity of measures. Perhaps one of the greatest limitations of this study was the lack of available factor loadings for the RSSIQ. Completing a factor analysis of this measure was not part of the initially proposed methods and therefore was not considered when planning for projected sample size. At the time the decision was made to complete a factor analysis, data collection had already ended. The sample size used to complete the factor analysis of the RSSIQ (n = 103) was less than would have been desired if completing a factor analysis was part of the original proposed methodology. Research suggests that for the current study, an $N > 200$ would have been the minimal number of participants to conduct an appropriate factor analysis (Myers, Ahn, & Jin, 2011). The smaller than recommended sample size may have produced factors that were not accurate to the original development of the measure on which the current study was based. The factors taken from the RSSIQ (i.e., Resiliency-related reasons and Vulnerability-related reasons for stopping NSSI) were used as criterion variables in the analyses performed to answer research questions two and three. It is possible that the results for the analyses performed to answer research questions two and three may have varied if the original factor loadings had

been provided. The theoretical basis on which the current study was designed used the information from the findings on the original development of the RSSIQ. If the factors determined in the current study varied from those discussed in the development of the measure, there may be room for error in interpreting results if the measure used in the current study was not accurately assessing what it intended. This may serve as a limitation to the current study because it remains unclear if the factors used in the current study were the same as the original RSSIQ. Without the factor loadings from the original development of the measure, one cannot be certain that the measure was assessing the same constructs. Using factor loadings and categorizing Resiliency- and Vulnerability-related reasons for stopping NSSI, which were researched to a greater extent as in the development publication of the measure, may have been more accurate.

Strengths

Despite the limitations of this study discussed previously, there were strengths to be noted as well. They include a) the sample utilized and b) the novelty of the research. These strengths will be discussed in further detail to follow.

Sample utilized. First, this study was purposeful in selecting the sample used. A college student sample was selected for this investigation because college-age students reported high prevalence rates of NSSI (Rodham & Hawton, 2009). At the same time, Whitlock and colleagues (2006) suggested that the time of emerging adulthood is a period of resolution for NSSI. This was the case in the current study. While prevalence rates were not directly assessed in this study, as all participants had engaged in NSSI, over 100 students reported engaging in NSSI at some point in their lives. This response rate could be interpreted as suggesting a significant number of students at the university surveyed who have engaged in NSSI. Additionally, of those who were

included in this study, approximately half were considered to have Discontinued NSSI. This reflects previous research that suggest that the developmental period that is typical of a college student is a time when individuals may discontinue NSSI (Whitlock et al., 2006).

Novelty. In addition to a purposeful sample, this study demonstrated strength in its novelty. Much of the research in the field of NSSI has focused on correlates and functions of NSSI. More recently, researchers have begun to look into why individuals stop NSSI. To the researcher's knowledge, there have yet to be investigations into how correlates and functions are related to reasons for stopping NSSI. This study aimed to fill this gap in the literature and did so by examining the predictive ability of function of NSSI on discontinuation, as well as Resiliency- and Vulnerability-related reasons for discontinuing NSSI.

Directions for Future Study

It is clear that research on NSSI is still in its formative stages and that more investigations will help the field to better understand this phenomenon. This section will highlight some areas that may be useful to consider to further study based on the literature reviewed and the results of this study. First, longitudinal rather than retrospective research could be invaluable to the field of research on NSSI. As it relates to this study, longitudinal research could have been instrumental in determining a more accurate cutoff point for which participants should have been considered Continued or Discontinued NSSI. Longitudinal research could help determine how long of a period would be most appropriate to consider an individual as having discontinued his/her engagement in NSSI. Longitudinal research could also contribute more accurate accounts of age of onset, frequency, and age of discontinuation of NSSI, which is important for an overall understanding of NSSI.

Second, the sample used in the current study was largely homogeneous. While previous researchers have investigated NSSI in LGBT populations (Muehlenkamp et al., 2015), it is important that research be conducted across genders, ethnicities, and education levels to understand how NSSI may vary. Finally, more research is needed on the investigation of reasons why individuals stop NSSI and measures should be developed and validated to do so. Learning about the reasons why individuals stop NSSI in emerging adulthood could help clinicians have a better understanding of how they may tailor their interventions to increase the likelihood that individuals will discontinue using NSSI to serve whatever function it does for that individual.

While the current study did not demonstrate predictive ability of functions of NSSI on whether or not an individual would have discontinued NSSI, it is important that the link between function and reasons for stopping NSSI continue to be explored. This could be done utilizing different theories of functions of NSSI or using different ways to measure either function of NSSI or reasons to stop NSSI.

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Table 1

Demographic Profiles of Participants

	Continued NSSI		Discontinued NSSI		Total	
Demographic Category	**N**	**%**	**N**	**%**	**N**	**%**
Gender						
Male	15	30.0	15	28.3	30	29.1
Female	34	68.0	38	71.7	72	69.9
Other	1	2.0	0	0.0	1	1.0
Age						
18-21	47	94.0	47	88.7	94	91.3
22-30	3	6.0	4	7.6	7	6.8
31-42	0	0.0	2	3.7	2	1.9
Race/Ethnicity						
White/Caucasian	34	68.0	35	66.0	69	67.0
Black/African American	9	18.0	5	9.4	14	13.6
Hispanic/Latinx	1	2.0	5	9.4	6	5.8
Asian/Pacific Islander	0	0.0	0	0.0	0	0.0
Native American	0	0.0	0	0.0	0	0.0
Other	1	2.0	3	5.7	4	3.9
Multiracial	5	10.0	5	9.4	10	9.7
Sexual Orientation						
Heterosexual	37	74.0	39	73.6	76	73.8
Bisexual	6	12.0	9	17.0	15	14.6
Gay	1	2.0	4	7.5	5	4.9
Lesbian	1	2.0	0	0.0	1	1.0
Other	5	10.0	1	1.9	6	5.8

Table 2

Logistic Regression Models for Research Question One

Step and Variable(s)	Discontinued versus Continued NSSI							
	X^2	*df*	*P*	% Correct	*B*	*SE B*	*β*	*p*
1. Covariates	15.72	6	.015	64.1				
PHQ-9					-.09	.03	.92	.010*
Age					.14	.11	1.15	.214
Counseling					-.69	.58	.50	.236
Medication					<-.01	.59	1.00	.997
Trauma					-.20	.46	.82	.661
Gender					-.46	.50	.63	.351
2. FASM	1.83	4	.767	68.0				
PHQ-9					-.07	.04	.93	.043*
Age					.14	.12	1.15	.230
Counseling					-.78	.62	.46	.208
Medication					.17	.62	1.19	.777
Trauma					-.31	.50	.73	.530
Gender					-.75	.57	.44	.19
ANR					-.39	.32	.68	.224
APR					.09	.35	1.09	.807
SNR					.30	.61	1.34	.629
SPR					-.13	.73	.88	.861

Note. Final model for Research Question One: X^2 (10, N = 103) = 17.551, p = .063
*$p < .05$

Table 3

Hierarchical Multiple Linear Regression Models for Research Question Two

	Total Sample[a]							
Step and Variable(s)	*df*	R^2	ΔR^2	ΔF	*B*	*SE B*	β	*t*
1. Covariates	(6, 96)	.09	.09	1.65				
PHQ-9					.03	.01	.24	2.27*
Age					-.02	.03	-.08	-.78
Counseling					.06	.25	.03	.23
Medication					-.25	.25	-.13	-1.04
Trauma					-.18	.19	-.09	-.92
Gender					.03	.20	.01	.12
2. FASM	(10, 92)	.18	.09	2.56*				
PHQ-9					.02	.01	.19	1.69
Age					-.02	.03	-.06	-.55
Counseling					-.04	.25	.02	-.17
Medication					-.23	.25	-.12	-.95
Trauma					.04	.20	.02	.19
Gender					.11	.22	.06	.51
ANR					-.03	.13	-.03	-.20
APR					.28	.14	.27	2.02*
SNR					.19	.24	.09	.77
SPR					.36	.30	.14	1.21

	Continued NSSI[b]							
Step and Variable(s)	*df*	R^2	ΔR^2	ΔF	*B*	*SE B*	β	*t*
1. Covariates	(6, 43)	.15	.15	1.30				
PHQ-9					.04	.02	.31	2.00
Age					-.06	.12	-.08	-.48
Counseling					-.10	.36	-.05	-.29
Medication					-.33	.34	-.17	-.98
Trauma					.11	.30	.05	.36
Gender					-.39	.35	-.19	-1.31
2. FASM	(4, 39)	.36	.17	2.50				
PHQ-9					.02	.02	.16	1.00
Age					.01	.12	.01	.09
Counseling					-.17	.36	-.09	-.48
Medication					-.51	.33	-.26	-1.52
Trauma					.37	.30	.19	1.23
Gender					-.17	.39	-.08	-.44
ANR					-.11	.22	-.11	-.49
APR					.48	.22	.46	2.17*
SNR					-.10	.38	-.04	-.26
SPR					1.17	.52	.37	2.22*

	Discontinued NSSI[c]							
Step and Variable(s)	*df*	R^2	ΔR^2	ΔF	*B*	*SE B*	β	*t*
1. Covariates	(6, 46)	.14	.14	1.28				
PHQ-9					.03	.02	.21	1.37
Age					-.02	.03	-.08	-.55
Counseling					-.07	.37	-.04	-.19
Medication					.08	.37	.04	.21
Trauma					-.35	.26	-.20	-1.37
Gender					.47	.28	-.08	1.67
2. FASM	(4, 42)	.23	.09	1.20				
PHQ-9					.03	.02	.20	1.30
Age					-.02	.03	-.08	-.51
Counseling					-.13	.39	-.08	-.33
Medication					.12	.39	.07	.31
Trauma					-.22	.28	-.12	-.78
Gender					.41	.30	.22	1.40
ANR					-.07	.17	-.02	-.01
APR					.12	.20	.11	.59
SNR					.53	.32	.29	1.67
SPR					-.04	.38	-.02	-.11

Note. Dependent variable: Vulnerability-related reasons for discontinuing NSSI.
[a] Final model for Research Question Two, Total Sample: $F(4, 92) = 2.56$, $p = .044$
[b] Final model for Research Question Two, Continued NSSI: $F(4, 39) = 2.50$, $p = .058$
[c] Final model for Research Question Two, Discontinued NSSI: $F(4, 42) = 1.20$, $p = .326$
*$p < .05$

Table 4

Hierarchical Multiple Linear Regression Models for Research Question Three

	Total Sample[a]							
Step and Variable(s)	*df*	R^2	ΔR^2	ΔF	*B*	*SE B*	β	*t*
1. Covariates	(6, 96)	.09	.09	1.58				
PHQ-9					.04	.02	.26	2.44*
Age					<.01	.03	.01	.11
Counseling					-.13	.28	-.06	.46
Medication					-.14	.28	-.06	-.49
Trauma					-.08	.22	-.04	-.38
Gender					-.41	.23	-.18	-1.77
2. FASM	(4, 92)	.14	.05	1.39				
PHQ-9					.04	.02	.27	2.38*
Age					.01	.03	.04	.42
Counseling					-.14	.29	-.07	-.47
Medication					-.13	.29	-.06	-.43
Trauma					.07	.23	.03	.31
Gender					-.39	.26	-.17	-1.50
ANR					-.16	.15	-.16	-1.07
APR					.21	.16	.18	1.28
SNR					.03	.28	.01	.11
SPR					.61	.35	.21	1.74

	Continued NSSI[b]							
Step and Variable(s)	*df*	R^2	ΔR^2	ΔF	*B*	*SE B*	β	*t*
1. Covariates	(6, 46)	.15	.15	1.25				
PHQ-9					.04	.02	.31	2.01*
Age					-.09	.13	-.11	-.67
Counseling					-.28	.40	-.13	-.72
Medication					-.08	.37	-.04	-.20
Trauma					.26	.33	.12	.78
Gender					-.55	.38	-.24	-1.43
2. FASM	(4, 42)	.30	.15	2.08				
PHQ-9					.03	.02	.25	1.51
Age					-.02	.13	-.02	-.14
Counseling					-.36	.40	-.16	-.90
Medication					-.26	.37	-.12	-.70
Trauma					.46	.34	.21	1.37
Gender					-.47	.43	-.21	-1.08
ANR					-.31	.25	-.27	-1.25
APR					.42	.25	.36	1.73
SNR					-.08	.43	-.03	-.19
SPR					1.49	.58	.43	2.54*

	Discontinued NSSI[c]							
Step and Variable(s)	*df*	R^2	ΔR^2	ΔF	*B*	*SE B*	*β*	*t*
1. Covariates	(6, 46)	.18	.18	1.69				
PHQ-9					.06	.02	.40	2.69*
Age					<.01	.03	.01	.09
Counseling					-.04	.43	-.02	-.10
Medication					-.13	.45	-.06	-.30
Trauma					-.33	.30	-.16	-1.10
Gender					-.11	.32	-.05	-.33
2. FASM	(4, 42)	.21	.03	.33				
PHQ-9					.07	.03	.41	2.56*
Age					.01	.04	.03	.19
Counseling					<-.01	.47	<-.01	-.01
Medication					-.10	.47	-.05	-.21
Trauma					-.21	.33	-.10	-.62
Gender					-.12	.36	-.05	-.31
ANR					-.08	.20	-.09	-.41
APR					.08	.24	.07	.35
SNR					.16	.38	.08	.41
SPR					.27	.46	.11	.60

Note. Dependent variable: Resiliency-related reasons for discontinuing NSSI.
[a] Final model for Research Question Three, Total Sample: $F(4, 92) = 1.39$, $p = .243$
[b] Final model for Research Question Three, Continued NSSI: $F(6, 43) = 2.08$, $p = .103$
[c] Final model for Research Question Three, Discontinued NSSI: $F(4, 42) = .329$, $p = .857$
*$p < .05$

CHAPTER TWO

REVIEW OF THE LITERATURE

Chapter One provided a brief overview of the current study, including a review of the literature on the prevalence, function, and reason for discontinuation of engagement in nonsuicidal self-injury (NSSI). The goal of Chapter Two is to expand on Chapter One and to provide an in-depth review of the literature to date on self-injury. More specifically, Chapter Two provides a) a brief introduction reviewing consequences of NSSI and why it is an important topic for investigation, b) the terminology used in the literature and history of NSSI, c) support for the differentiation of NSSI from other behaviors (i.e., suicidal gestures or attempts) and diagnoses (i.e. BPD), d) the age of onset and prevalence rates of NSSI throughout different developmental periods, e) findings on frequency and methods used in NSSI, f) risk and protective factors, g) current treatments and treatment considerations for NSSI, h) a discussion of the different functions NSSI may serve, i) motivations associated with the decision to stop engaging in NSSI, and lastly, j) the introduction of research questions and hypotheses for the current study.

Introduction

NSSI is an intentional act resulting in immediate tissue damage without suicidal intent (Walsh, 2006), which may lead to increased feelings of guilt or shame, scarring and disfigurement, infection and spread of disease, and in some cases, accidental death (Mayo Clinic Staff, 2017). There remains a paucity of research on the economic cost of NSSI, but studies conducted in the United Kingdom estimate an average of 220,000 emergency room visits per year associated with self-harm and 19% of total inpatient and outpatient costs being related to deliberate self-harm (National Collaborating Centre for Mental Health, 2012). Therefore,

investigations that provide a clearer picture of patterns of NSSI, reasons why individuals self-injure, as well as why individuals may stop such behaviors could prove invaluable to early intervention and possible avoidance of disastrous consequences associated with NSSI later in life.

Unfortunately, several factors make research focusing on NSSI difficult to conduct in an accurate fashion. Throughout the history of the study of NSSI, several of these themes become apparent and regrettably are only recently being addressed by researchers and clinicians. In order to understand the current state of literature and practice concerning NSSI, including the function it may serve as well as motivations for discontinuing such behavior, it is essential to introduce and briefly discuss the factors that have hampered the progress of research throughout the history of self-injury, including lack of consistency in terminology, difficulty distinguishing NSSI as distinct from other disorders, and inconsistent findings from study to study. These concerns will be addressed in the following sections.

Terminology and History of Self-Injury

Terminology. Before one can begin to understand or contribute to the literature on self-injury, one needs to be well informed about the terminology used, when each term may be used, as well as in which parts of the world different terms may be used. Unfortunately, a lack of consistency in terminology has been an ever-present difficulty in the literature focusing on self-injurious behavior (Angelotta, 2015; Nock, 2010; Rodham & Hawton, 2009). This lack of consistency in terminology and operationalization of terminology used across studies is important to note, as it may contribute to the lack of a clear understanding of NSSI, including prevalence rates and function of nonsuicidal behaviors. Common terms used within the literature include deliberate self-harm (Chapman & Dixon-Gordon, 2007), self-harm (Gilman, 2012; Laye-

Gindhu & Schonert-Reichl, 2005), self-injurious thoughts and behaviors (Nock, Prinstein, & Sterba, 2009), self-mutilatative behavior (Nock & Prinstein, 2004), parasuicidal behavior (Ekman & Söderber, 2012), and nonsuicidal self-injury (In-Albon, 2015). The following section will discuss and define the most commonly used terminology.

Self-harm or self-injury. As Nock (2010) described, the terms self-harm or self-injury represent the broadest category of terminology used within the self-injury literature. Nock (2010) stated, "All behaviors that are performed intentionally and with the knowledge that they can or will result in some degree of physical or psychological injury to oneself could be conceptualized as self-injurious" (p. 341). Each of the terms previously mentioned would fall under the category of self-harm or self-injury. Therefore, research that utilizes these umbrella terms, such as self-injury or self-harm, is likely to produce expectedly higher prevalence rate estimates and be inclusive of a heterogeneous collection of self-harm behaviors. The terms self-injury and self-harm are inclusive of suicidal and nonsuicidal acts, as well as intentional or nonintentional harm (engaging in risky behaviors).

Deliberate self-harm. Whereas self-injury or self-harm mentioned previously may include nonintentional self-injury that results from the conscious choice to engage in risky behavior known to the individual to have the potential to cause harm, the term deliberate self-harm does not. However, the term deliberate self-harm in itself presents some amount of confusion. For example, the definition of deliberate self-harm in the United States specifically excludes suicidal intent, whereas suicidal intent may or may not be present when the term in used in the United Kingdom (Whitlock & Rodham, 2013). Furthermore, operational definitions of deliberate self-harm vary from study to study and terms usually associated with suicidal intent

(parasuicidality) may be used to study self-harm without suicidal intent. Furthermore, other terms are used interchangeably across studies (Laye-Gindu & Schonert-Reichl, 2005).

Therefore, the term deliberate self-harm may include NSSI depending on the country and the individual researcher; however, the term may also include suicide attempts depending on location, which serves a different function for individuals than NSSI. A downfall to using the term deliberate self-harm is the difficulty comparing across studies; however, to completely exclude previous research utilizing this terminology would be neglectful. Therefore, this review will include studies that used the term deliberate self-harm when researchers operationalized their terms as non-inclusive of suicidal intent, and these studies will be specifically pointed out when reviewed.

Nonsuicidal self-injury. NSSI is perhaps the most recent term to be introduced into the nomenclature of self-injury and may be the most specific terminology used. For these reasons, NSSI will be the focus of this study in an attempt to contribute to the literature, findings that are comparable to other research that utilizes the same terminology. Although the wording may vary slightly, NSSI used throughout the literature is defined as an intentional or deliberate self-inflicted act resulting in tissue damage without suicidal intent and that is not socially sanctioned (Glenn, & Klonsky, 2013; Walsh, 2006; Muehlenkamp et al., 2008; You, Lin, Fu, & Leung, 2013; Nock & Prinstein, 2004; Whitlock & Rodham, 2013).

Many of the qualities of this definition can also be found in the DSM 5's Nonsuicidal Self-Injury as a condition for further study (American Psychiatric Association [APA], 2013):

> The 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 (i.e., there is no suicidal intent). (p. 803)

Additionally, Criterion D for this Condition for Further Study states "the behavior is not socially sanctioned (e.g., body piercing, tattooing, part of a religious or cultural ritual)" (APA, 2013, p. 803).

The definition of NSSI in the literature as well as in the DSM-5 (APA, 2013) does not specify limited number of behaviors that might fall into this category. However, common behaviors that may or may not be considered NSSI based on other factors may include cutting, burning, stabbing, hitting, excessive rubbing, biting, scratching skin, banging the head against the wall (APA, 2013; Nock & Prinstein, 2004; Whitlock & Rodham, 2013; You et al., 2013).

History of NSSI. The clinical difference between self-harm with and without suicidal intent has been articulated frequently as early as in the 19th century clinical literature with the first case report of repetitive, nonlethal self-harm in a nonpsychotic individual being published in 1913 by L. E. Emerson (Angelotta, 2015). However, it was not until 100 years later, in 2013, that the first mention of NSSI found its way into the diagnostic nomenclature of mental illness, the DSM-5, as a distinct condition rather than merely a symptom of another disorder.

The patient described by Emerson in 1913 reported she began cutting after an accidental injury and a realization that it relieved a headache and a "queer feeling." Additionally, Emerson's patient reported no desire to kill herself, yet frequently thinking about self-harm before engaging in the act (Angelotta, 2015). The description of this particular patient published in the early 20th century bears a remarkable resemblance to the proposed diagnostic criteria for and definitions of NSSI throughout the literature over a century later.

A few decades later, Karl Menninger, a psychiatrist, introduced the term focal, or partial suicide, to describe self-injury without suicidal intent. He defined focal suicide as self-mutilations, malingering, polysurgery, purposive accident, impotence, and frigidity (Menninger,

1933). He viewed self-harm as a mechanism to preserve life by substituting a partial suicide for actual suicide and saw it as a crude attempt at self-help (Angelotta, 2015). It was during this period that researches began to study suicide and self-harm from an epidemiological standpoint and found that "not all of those who attempt suicide have the same wish to die" (Hendin, 1950 in Angelotta, 2015, p. 78). This sparked the epidemiological study of self-injurious behavior without suicidal intent.

Research conducted in the 1960s and 70s birthed the idea of a *prototypical cutter*, which has been described as a young, attractive, intelligent, and socially adept female (Angelotta, 2015). Additionally, research in this era provided insight into typical episodes of self-injury, which include a triggering event, tension resulting from the triggering event, urge to self-injure, and then self-injurious behaviors that reduced tension. The notion of self-injury without the intent to die was first proposed to be included as a distinct diagnosis in the 1983 version of the *Diagnostic and Statistical Manual of Mental Disorders III* (DSM-III) by Pattison, over 30 years ago. The proposed features of Kahan and Pattison's *deliberate self-harm syndrome* included inability to resist impulse to self-injure, experience of tension prior to the NSSI act, and the experience of release or relief after the NSSI act is completed (Glenn & Klonsky, 2013; Kahan & Pattison, 1984;). However, the diagnostic category was rejected and the third edition of the DSM lacked specific mention of NSSI outside the diagnostic criteria of borderline personality disorder.

Despite the rejection of a category specific to self-injury without suicidal intent in the DSM-III, researchers continued to show support for such behaviors as a distinct phenomenon and again a diagnostic category that described behaviors typically associated with NSSI was proposed for the following edition of the DSM. *Repetitive self-mutilation* was proposed as a disorder of primary concern in 1990 by Favazza and was defined as a syndrome of repetitive

burning or cutting in response to psychological or environmental stress (Angelotta, 2015). Again, the diagnostic classification was not accepted and NSSI remained in the fourth edition of the DSM solely as a symptom of borderline personality disorder.

Again, in preparation for the most recent edition of the DSM, the term *deliberate self-injury syndrome* was proposed in 2005 (Muehlenkamp, 2005), and the term *nonsuicidal self-injury* in 2009 (Shaffer and Jacobson, 2009). However, despite strong empirical support on NSSI as a distinct syndrome, classification as a diagnosable disorder was again eluded. Currently, as previously mentioned, NSSI remains as a Condition for Further Study in the latest version of the DSM (DSM-5).

Although the classification of self-injury without suicidal intent has had a difficult time making its way into the diagnostic classification system as a distinct disorder, one thing is clear, and that is that the topic of self-injury without the intent to die is not a new phenomenon and is anything but unique to modern times (Gilman, 2012; Nock, 2010; Rodham & Hawton, 2009). The topic has been receiving increased attention in recent research and will more than likely again be proposed as a distinct diagnostic classification in the next edition of the DSM or similar diagnostic text. The following section will discuss how NSSI is different from other forms of self-harm and associated diagnoses, further highlighting the support in the literature for NSSI to be considered a unique classification.

Differentiation of Nonsuicidal Self-injury from other Diagnoses and Forms of Self-harm

As discussed previously, the classification of NSSI has been slow to be accepted as a possible distinct diagnostic category over the past four decades. Diagnostically, NSSI has been listed as a symptom of borderline personality disorder (APA, 2013) and fails to be mentioned elsewhere in previous versions of the DSM. Clinically and culturally, NSSI has been slow to be

viewed as a phenomenon that is specifically distinct from suicidal self-injury or suicide attempts, and due to the lack of a distinct diagnostic category, the two may be treated similarly socially and in clinical settings. The following section will introduce empirical support for the differentiation of NSSI from suicidal self-injury and borderline personality disorder.

Nonsuicidal versus suicidal self-injury. At first glance, engagement in behaviors commonly associated with NSSI, such as intentional cutting, could easily be taken as a sign of suicidal behavior, especially when the behavior is severe enough to require medical attention. However, research has demonstrated clinically distinct patterns of one who self-harms with the intent of ending one's own life versus one who engages in self-injurious behavior without the intention of dying – the defining characteristics of NSSI (Walsh, 2012). For example, suicidality and NSSI tend to demonstrate different age of onset with those who reported engaging in NSSI beginning to do so at an earlier age (Cox et al., 2012).

Additionally, investigation into emotional antecedents and consequences of suicide attempts compared to self-injury without the intent to die have shed light on varying emotional experiences associated with the two behaviors. Chapman and colleagues (2007) found that those who reported engaging in deliberate self-harm (*without* suicidal intent) reported positive emotional shifts more commonly from before engaging in self-harm behavior to after than did those who reported a suicide attempt. In this study, the researchers found that relief was the most common emotion experienced after a self-injurious act for those engaging in deliberate self-harm compared to anger, which was experienced by those reporting a suicide attempt. Further evidence of the distinction between suicidal and NSSI has been presented by Nock and colleagues (2009). In a real-time investigation into thoughts of self-injury, they found that NSSI

thoughts were accompanied by thoughts of suicide only 1.0% - 4.2% of the time (Nock et al., 2009).

Butler and Malone (2013) described functional difference between NSSI and suicide. They stated "whereas NSSI represent a maladaptive coping mechanism to regulate overwhelming emotions and to endure life, a suicide attempt reflects a desire to escape and to end one's life" (p. 325).

Furthermore, there are drastically different methods used in suicidal acts than in NSSI. The Centers for Disease Control and Prevention (CDC, 2010) identify death by suicide most commonly occurs by firearm, hanging, pill or poison ingestion, jumping from a height, use of a sharp instrument, and death involving a moving vehicle. Methods frequently used in NSSI are considerably different, and although there is inconsistency in the frequency reported from study to study, most often include cutting, excoriation of wounds, self-hitting, burning, and head banging (Walsh, 2012). Walsh (2012) noted that the most common form of NSSI (cutting) is only associated with under 2% of completed suicides and that when individuals do suicide by cutting, it is usually from cutting in a very different way and includes severing the carotid artery or jugular vein, piercing the heart, or a massive incision to the abdomen (CDC, 2010), all methods extremely uncommon or unheard of in NSSI.

While NSSI is clearly supported as a distinguished category from suicidality, it is important to note that there *is* an association between NSSI and suicide attempt, and that NSSI may be a strong predictor of suicidality (Butler & Malone, 2013; Tuisku et al., 2014; Victor, Styer, & Washburn, 2015). However, it is dangerous to assume that because an individual engages in NSSI, he/she experiences suicidal ideation as well.

Borderline personality disorder and NSSI. As discussed in the review of history of NSSI, self-injury has found its place in the DSM listed as a symptom of borderline personality disorder (BPD). The most recent criteria for BPD reads as follows: "A pervasive pattern of instability of interpersonal relationships, self-image, and affects, and marked impulsivity, beginning by early adulthood and present in a variety of contexts" (APA, 2013, p. 663). The criteria then lists nine additional criteria, five of which need to be met for a diagnosis of BPD. Criterion 5 reads, "Recurrent suicidal behavior, gestures, or threats, or self-mutilating behavior" (APA, 2013, p. 663). Glenn and Klonsky (2013) suggested that this classification of NSSI as a criteria for BPD assumes that NSSI is unlikely to occur without a BPD diagnosis, and that NSSI does not have clinical significance outside the contest of BPD.

A simple comparison of prevalence rates (which will be reviewed in the following section) highlights the dramatic differences in those who meet a criteria for BPD and those who engage in NSSI. Although self-mutilative acts (cutting or burning) are common in those with BPD, it is estimated that the median population prevalence of BPD is 1.6%, although it may be as high as 5.9% (APA, 2013). In 2010, the Substance Abuse and Mental Health Services Administration (SAMHSA) released a report to congress on BPD suggesting a lifetime prevalence rate of 5.9%. Although prevalence rates from NSSI vary greatly from study to study and have been reported as high as 39% in some investigations (Claes, Houben, Vandereycken, Bijttebier, & Muehlenkamp, 2010), most research has reported average prevalence rates above 12% in community samples (Nock, 2010). Even using the highest reported estimate of lifetime prevalence of BPD, reported prevalence rates of NSSI more than double this amount, even using the most conservative of estimates. Therefore, one can infer that there is a significant amount of individuals who report engaging in NSSI yet do not meet criteria for BPD. Nock, Joiner, Gordon,

Lloyd-Richardson, and Prinstein (2006) reported that about half of inpatient self-injurers did not meet diagnostic criteria for BPD.

While NSSI remains a criteria for BPD in the most recent edition of the DSM and has been clinically associated with other mental disorders such as anxiety and depression (Glenn and Klonskly, 2013), it has also been suggested that NSSI occurs outside of mental health diagnoses. Gollust, Eisenberg, and Golberstein (2008) found that around 44% of college students who reported self-harm (although not specified if there was suicidal intent) did not meet criteria for any DSM-IV-TR disorder.

As the research continues to support NSSI as distinct from suicidal injury as well as occurring outside of BPD or other DSM disorders, it is clear that the mindset around self-injury that is not suicidal needs to shift away from previous assumptions NSSI may be on the same continuum as suicidal behaviors or that those who engage in NSSI are exhibiting a symptom of BPD. Continuing to consider NSSI as similar to suicidal self-injury or as a symptom of BPD has the potential to limit its consideration as a distinct disorder. This will be important for further editions of diagnostic classification systems, as well as for clinical case conceptualization and treatment.

The following section will use the terminology discussed as well as evidence of differentiation of NSSI as a distinct phenomenon to introduce what is known about the prevalence, age of onset, and course of engagement in NSSI.

Age of Onset and Prevalence of Nonsuicidal Self-injury

Age of onset. Although estimates about the age of onset for NSSI behaviors vary and are further complicated by a lack of consistency in the definitions used in each investigation as previously discussed, results from several studies suggest individuals tend to first engage in

NSSI early in adolescence. Rodham and Hawton (2009) suggested an average age of onset in engagement of NSSI between 12 and 14. This proposal has been supported by others. For example, Meuhlenkamp and Gutierrez (2004) reported age of onset of NSSI of 13 years old for 15% of their participants and 14 years old for 28.4% of their participants; Nock and Prinstien (2004) reported the majority of the participants in their study first engaged in NSSI in early adolescence (mean age of 12.8). Ross and Heath (2002) reported that 59% of their participants reported age of onset of NSSI at age 12, however they also found a significant percent of participants in this study (24%) reported an age of onset at age 11 or younger. Other reports suggest the most common age for the first onset of deliberate self-harm is 16 (Skegg, 2005). Whitlock and colleagues (2006) suggested that the variation in onset is fairly normally distributed with about 25% beginning NSSI between 10 and 14 years old, 27% between 15 and 16 years old, and 38% between 17 and 24 years old.

Prevalence. Some researchers have reported an increase in individuals who engage in intentional and direct injuring of one's own body tissue without suicidal intent (Nock, 2010; Muehlenkamp et al., 2008; Gratz, 2001; In-Albon, Ruf, & Schmid, 2013; Gilman, 2012). The rise in reported prevalence of nonsuicidal self-injurious behaviors along with the early age of onset is of great concern as NSSI may become a stable maladaptive strategy for individuals to face developmental tasks. This may result in severe negative consequences for adolescents' and young adults' psychosocial development, and potentially predispose one to suicidal behaviors later in life (Guan, Fox, & Prinstein, 2012).

While it has been suggested the prevalence rates for NSSI are increasing worldwide, there remains a lack of research on the trajectory of such behaviors. This includes limited knowledge on what percentages of individuals continue NSSI past adolescence and emerging

adulthood into adulthood. Research continually suggests lower prevalence rates of NSSI in adult populations compared to adolescent and emerging adult populations (Nock, 2010; Prinstein et al., 2010). However, to date, there have not been published longitudinal data on the course of NSSI throughout the lifetime.

The increase in reported NSSI in the last 10-15 years has been observed in both adolescent and adult clinical and community samples (Prinstien et al., 2010) with prevalence rate estimates ranging from 15% - 20% in adolescents and young adults (Heath, Ross, Toste, Charlebois, & Nedecheva, 2009) and as high as 39% in some investigations (Claes et al., 2010). These rates, when compared to rates of NSSI in 2005-2006, which where suggested to be lower than 10%, support the suggestion that rates of NSSI may, in fact, have increased in the past – but more recently, prevalence rates may be leveling off (Muehlenkamp, Claes, Havertape, & Plener, 2012).

Some studies suggest that NSSI is a phenomenon that occurs more commonly in adolescence and is typically extinguished by adulthood (Whitlock & Selekman, 2014). However, for a subset of individuals, it is clear that engagement in NSSI begins before adolescence (Ross & Heath, 2002), and continues into emerging adulthood and beyond (Kharsati & Bhola, 2015; Meulenkamp et al., 2015).

Childhood. As mentioned, typical age of onset for NSSI is during early adolescence; it has been suggested that NSSI rarely occurs in childhood (Rodham & Hawton, 2009). Possibly one of the most considerable gaps in the NSSI literature is research concerning prevalence rates of NSSI in children. However, Whitlock and Selekman (2014) described two studies conducted outside of the United States that investigated the broader classification of self-harm in children below the age of 11. The first of these two studies conducted by Meltzer, Gatward, Goodman,

and Ford (2001) found an overall prevalence rate estimate of 1.3% in children between the ages of 5 and 10 with much higher rates in children diagnoses with a mental illness (6.2% - 7.5%) than those without diagnosis (0.8%). Similarly, the second investigation, which provided percentages of children who called a self-harm hotline, reported 2% of callers reported their age from 5 to 11 years old. Interestingly, and perhaps more relevant to the current investigation, retrospective analyses of older individuals who have engaged in NSSI at some point in their lives suggest a much higher rate of an age of onset before 11 years of age (Whitlock & Selekman, 2014).

While the primary focus of the current investigation is not on age of onset or prevalence rates of NSSI during childhood, it is important to consider such data as the engagement in NSSI behavior earlier in life may be associated with different function or trajectory of continued behavior later in life, such as motivation to discontinue.

Adolescence and emerging adulthood. The developmental periods with the most available research in the field of self-harm and NSSI are adolescence and emerging adulthood. This is likely because individuals who fall into this category are thought to be at the highest risk for engaging in NSSI (Rodham & Hawton, 2009) and report engaging in NSSI at the highest rates (White, Trepal-Wollenzier, & Nolan, 2002; Whitlock & Selekman, 2014). Adolescence is considered the period of development typically between the age of 10 and 19 years (Canadian Paediatric Society, 2003), while emerging adulthood has been proposed as a more recently identified developmental period typically occurring between the age of 18 and 25 years (Arnett, 2007). As mentioned, prevalence rate estimates vary, but research has reported current engagement in NSSI for adolescents and young adults at 6% - 7% (Gollust et al., 2008) and lifetime prevalence ranging from 12% - 38% in undergraduate college students (Rodham &

Hawton, 2009). Whitlock and Selekman (2014) reported that of the youth who reported engaging in NSSI at some point, over three-quarters of those individuals reported doing so on more than one occasion.

Adulthood NSSI. As most of the focus of the NSSI literature is on adolescence and emerging adulthood, not many studies investigate prevalence rates of NSSI in adults. Most of the studies of NSSI in adulthood are of small and specialized samples; however, it has been reported that 6-month prevalence rate estimates are 4% in adult community samples and 21% in adult clinical samples (Briere & Gil, 1998). It has also been suggested that NSSI in adulthood has a stronger relationship with suicidality or suicide attempts and that NSSI in adulthood should be taken very seriously (Rodham & Hawton, 2009). Additionally, Whitlock and Selekman (2014) suggested that those who continue NSSI into adulthood may suffer from emotional and mental imbalances not associated with normal development and that this may complicate treatment.

Demographic differences. Research has also looked at differences in several demographic categories in regard to NSSI. Lloyd-Richardson and colleagues (2007) found no differences in engagement in NSSI by age, gender, socio-economic status (SES), living situation, or regions of the country in their sample of adolescents. However, the researchers reported differences in reported rates and nature of NSSI based on racial identification. Overall, they found that Caucasian individuals were more likely than African American individuals to engage in NSSI. When broken down into minor NSSI and moderate/severe NSSI, Lloyd-Richardson and colleagues (2007) found that those who identified as Caucasian were more likely to engage in moderate/severe methods of NSSI, while African American individuals were more likely to engage in minor methods of NSSI (Lloyd-Richardson et al., 2007).

Other research has suggested that there may, in fact, be differences in gender among those who engage in NSSI. For example, Lay-Gindhu and Schornert-Reichl (2005) found that among adolescents in a community sample, those who identified as female were more likely to report NSSI. Additionally, Zetterqvist and colleagues (2013) reported that functions of NSSI may vary by gender with the largest differences found with females reported higher rates of automatic/intrapersonal functions of NSSI than males.

Research on differences in prevalence rate estimates associated with multiple demographic variables is inconclusive for the most part. However, it is clear that those who identify a sexual minority status report considerably higher prevalence rates than those who identify as heterosexual. It has been suggested that sexual minority individuals are three to five times more likely to engage in NSSI than their heterosexual counterparts (Reisner, Biello, Perry, Gamarel, & Mimiaga, 2014). Meuhlenkamp and colleagues (2015) examined rates of NSSI in sexual minority college students and found that over half (62.8%) reported a lifetime history of engaging in NSSI behavior.

While it has been suggested that there has been a recent increase in the prevalence rates of NSSI (Hawton, Rodham, & Evans, 2006), it is unclear whether this increase is reflective of an actual rise in prevalence of engagement in NSSI, or whether the perceived increase is the product of increased visibility and assessment on NSSI, as well as research conducted on the topic.

With the increased attention in popular culture and media being paid to NSSI in the past decade or so (Heath et al., 2009; Gilman, 2012), it is easy to believe that engagement in intentional, self-directed injury to one's own body is a relatively recent phenomenon that has become commonplace in today's culture. While it has been suggested that prevalence rates of NSSI are increasing (Hawton et al., 2006), the idea of clinically distinct subgroups of those who

engage in self-injury without the intent of dying is not a novelty. Regardless of whether or not there is a rise in rates of individuals engaging in self-harm, prevalence rates reaching as high as 39% and above (Claes et al., 2010), and even rates as low as 6% (Gollust et al., 2008) are higher than the prevalence rates of many DSM disorders and are alarming and cause for concern.

Nature of NSSI

Similar to results presented in the literature on the prevalence rates of NSSI, there exists inconsistencies on the most frequently reported methods of NSSI. However, there are common themes that emerge when existing literature is looked at as a whole. For example, reported rates of individuals engaging in cutting or carving of the skin range from 32.6% (Zetterqvist et al., 2013) to over 86% (Lloyd-Richardson et al., 2007). Much of the research on methods has reported that cutting is the most commonly found method of NSSI (Laye-Gindhu & Schonert-Reichl, 2005; Messer & Fremouw, 2008; Walsh, 2012); however, other investigations have reported other methods of NSSI such as biting or hitting yourself as more frequently occurring method of NSSI (Zetterqvist et al., 2013). Consistent with other difficulties in fully understanding NSSI, contradictions likely exist in the literature on the most common methods of engagement in NSSI due to irregularity in definitions of self-harm and other methodological differences such as whether or not cutting is combined with carving or scratching of the skin or if these methods are reported as distinct categories of NSSI.

One factor that complicates the understanding of the specific methods of NSSI reported by individuals is that the majority of those who engage in NSSI report using more than one method. For example, Whitlock and Rodham (2013) suggested that 70% of those who engage in NSSI reported using multiple methods. Findings on the amount of different methods used vary, but average amount of methods used have been reported to range from 2.35 (Lloyd-Richardson

et al., 2007) to 4.5 (Glenn & Klonsky, 2013). Despite the inconsistencies and factors that contribute to difficulty in formulating a clear understanding of the methods used by individuals who engage in NSSI, Walsh (2012) has suggested across literature that cutting, self-burning, scratching, carving, picking of wounds, self-hitting, self-burning, head banging, and self-inflicted tattoos are the most common methods of NSSI, although the order of reported frequencies may vary by investigation.

Research that has investigated the frequency of reported incidents of NSSI offers a bit more consistency, although variations do exist. A common theme found in the research on NSSI is that individuals who engage in these types of behaviors do so with some amount of regularity. Lloyd-Richardson and colleagues (2013) reported the average number of NSSI incidents in the past 12 months to be 12.8. Other researchers have suggested similar frequencies. For example, Laye-Gindhu and Schonert-Reichl (2005) reported 52% of their sample engaged in NSSI between 2 and 10 times in the last 12 months. Additionally, Zetterqvist and colleagues (2013) reported 41% of their sample engaged in NSSI over 11 times in the past 12 months and Zetterqvist, Lundh, and Svedin (2014) reported 44% of their sample engaged in NSSI over the past 12 months. When participants were asked if they engaged in NSSI more than 20 times in the past 12 months, only 12% reported that they did so this frequently (Laye-Gindhu & Schonert-Reichl, 2005).

Despite the frequency of incidents of engagement in NSSI over the past year, few individuals report receiving medical attention for their behaviors. For instance, Whitlock and colleagues (2006) reported only 6.5% of their participants who engaged in NSSI received medical attention (although more reported they should have), and Lloyd-Richardson and colleagues (2007) reported that only 3% of their sample received medical attention for their injuries.

Risk and Protective Factors

There has been little research done on the risk factors associated with engagement in NSSI, which might identify those who could benefit from early intervention. It could be that some individuals possess intrapersonal or interpersonal vulnerability factors that inhibit the ability to cope with stress (Nock, 2010). Nock (2010) suggested that vulnerabilities or risks might be related to the specific function NSSI serves for a specific individual.

Much of the literature to date on NSSI focuses on co-occurring diagnoses, symptoms, and features of those who engage in NSSI. Findings related to demographic and descriptive features as well as diagnostic covariates with NSSI are useful in that they provide a clearer picture of those who engage in NSSI. For instance, high comorbidity rates of affective disorders such as major depressive disorder, dysthymia, anxiety, and bipolar disorder have been found in college-aged individuals who met the proposed DSM-5 criteria for NSSI (Selby, Bender, Gordon, Nock, & Joiner, 2012).

Furthermore, Laye-Gindhu and Schonert-Reichl (2005) suggested that those who engaged in NSSI reported increased antisocial behavior, emotional distress, anger problems, health risk behaviors, and decreased self-esteem. When considering self-harm that was not limited to NSSI, Skegg (2005) reported that depression, substance abuse, anxiety disorders, and personality disorders each put individuals at higher risk for engagement in these behaviors. Additionally, Skegg (2005) reported that being separated or divorced from a spouse placed individuals at a much higher risk for engagement in self-harm.

Certain childhood experiences and family characteristics may also present risks that have been associated with engagement in both suicidal and nonsuicidal self-injury later in life. For example, several studies have suggested that emotional, physical, and sexual abuse; trauma; and

maltreatment may cause an increased risk for later engagement in NSSI (Glassman, Weierich, Hooley, Deliberto, & Nock, 2007; Nock & Kessler, 2006; Skegg, 2005). Other childhood experiences that have been suggested to increase the risk of later life engagement in NSSI include families in which parents are separated or divorced, families with marital discord (Skegg, 2005), and in families in which a child has formed an insecure attachment to caregivers (Gratz, Conrad, & Roemer, 2002).

Unfortunately, less research has been conducted that assesses for protective factors that may decrease the risk of individuals engaging in NSSI, despite exposure to risk factors. However, Wichstrøm (2009) suggested that social support may play a key factor in both prevention and treatment of NSSI. Skegg (2005) reported that few people who engaged in NSSI reported having well-functioning relationships. It may be that social support, defined as a social relation leading the individual to believe that he/she is cared for, loved, esteemed, and valued, (Christoffersen, Møhl, DePanfilis, & Vammen, 2015), may be the most promising protective factor defending against engagement in NSSI. In fact, Christoffersen and colleagues (2015) reported that in their sample of adolescents and young adults, social support mediated the relationship between traumatic life events and NSSI later in life. This highlights the social and interpersonal function that may be served by NSSI for certain individuals.

Treatment and Treatment Considerations

As awareness of NSSI as a severe clinical and social problem continues to grow, it is important to consider NSSI in the context of psychological treatment. As discussed, early conceptualizations of NSSI, including those listed as diagnostic criteria in the current and previous versions of the *DSM*, considered NSSI as a symptom of borderline personality disorder, or as falling along the same continuum as suicidal self-injury – often associated with major

depressive disorder. More recent research has shown increasing support for NSSI as a distinct phenomenon. However, specific treatments based on a conceptualization of NSSI as a distinct disorder are absent from the literature. When psychological treatment of NSSI is discussed, treatments that are utilized are often similar to those used for treatment of suicidality, major depressive disorder, or borderline personality disorder and lack consideration of the different functional antecedents of engagement of NSSI.

For instance, Cook and Gorraiz (2016) conducted a meta-analytic investigation of the effectiveness of dialectical behavior therapy (DBT; Linehan, 1993) as a treatment modality for both inpatient and outpatient adolescent individuals who engaged in NSSI. DBT is a comprehensive, cognitive-behavioral treatment, comprised of principles from behavioral science, dialectical philosophy, and Zen practice (Lynch, Trost, Salsman, & Linehan, 2007). It was originally developed for chronically suicidal females who met the criteria for BPD (Linehan, Armstrong, Suarez, Allmon, & Heard, 1991). Cook and Gorraiz (2016) reported an overall large, positive effect of DBT's effect on adolescent NSSI, such that DBT was found to effectively reduce engagement in NSSI. While this preliminary investigation suggested promise for DBT as a treatment for NSSI, the treatment used was developed to treat BPD and the overlap between BPD and NSSI may have been responsible for the reported effectiveness. Additionally, this treatment modality continues to conceptualize NSSI as a symptom of BPD and fails to adequately address NSSI as a distinct phenomenon that may benefit from treatment approaches tailored to specific functions of NSSI.

Other approaches to the treatment of NSSI include stepped-care models, which include both suicidal and nonsuicidal self-injury (Walsh, 2012). This model includes interventions of different levels of intensity to be matched with varying levels of intensity of symptoms (New

Zealand Ministry of Health, 2009). Conceptually, this model, which suggests increased intervention intensity for suicidal self-injury compared to NSSI, places NSSI on the same continuum as suicidality. As research has supported, NSSI should not be considered to be a less severe version of the same behavior as suicidal self-injury as there are fundamental differences between the two behaviors (Butler & Malone, 2013; Nock et al., 2009). The stepped-care treatment includes prevention at the lowest level; assessment and contingency management for the next step; skills training, cognitive treatment, family therapy, and possibly pharmacological treatment for the third step (suggested for recurrent, common, and low-lethality NSSI); and body image work, exposure treatment, protective hospitalization, DBT, and/or residential treatment in the highest two stages (suggested for atypical NSSI or recurrent suicidality) (Walsh, 2012).

Function of Nonsuicidal Self-Injury

It has only been recently that researchers have begun to investigate why those who engage in NSSI continue to do so, or make the decision to discontinue such behaviors. The methods and frequency of engagement in NSSI may continue into adulthood for a subset of individuals; however, it has been suggested that the function of engagement in such behavior may be distinctively different in adolescent versus adult populations. Whitlock and colleagues (2014) suggested that engagement in NSSI behaviors in adolescence may be the result of attempts to reach emotional equilibrium in response to developmental changes occurring during this time. However, this does not adequately explain continuation of NSSI behaviors beyond periods of developmental changes and further into adulthood, highlighting the possibility of differing functions of NSSI for different individuals.

Much of the literature on nonsuicidal self-injury explores prevalence rates, age of onset, and less commonly, trajectory of such behaviors. It is also not uncommon for investigations to

explore associated diagnostic factors associated with engagement in NSSI, such as depression, suicidality, anxiety posttraumatic stress, impulsivity, aggression, social isolation, or loneliness, as previously discussed (Nock & Prinstein, 2004). However, the results of such investigations only provide clinicians with information about what characteristics of those at increased risk for engagement in NSSI have in common with one another and do not provide information about the function of such behaviors (Nock & Prinstein, 2004). Information regarding functions served by nonsuicidal self-injurious behaviors may be invaluable in helping researchers and clinicians better help individuals engaging in NSSI explore healthier methods for serving the functions served by said behaviors.

Despite the large focus on diagnostic correlates with NSSI in the literature, there have also been several models proposed to explain the mechanisms behind, and the functions of, NSSI and other forms of self-mutilation. However, many of the proposed models have received criticism and many lack empirical support. Nevertheless, commonly proposed models to explain the function served by NSSI warrant mention here. Messer and Fremouw (2008) reviewed many of these models and provide critiques of the available findings for each. The first of the seven models discussed by this review is the sexual model of self-mutilation. This model, which has received much less attention in the literature in recent years compared to the period in which it was proposed, emphasizes the importance of sexual development and sexuality concerns (Messer & Fremouw, 2008) in considering the function of NSSI, including providing sexual gratification or release, or as an attempt to punish sexual feelings or control sexual development (Suyemoto & Macdonald, 1995). Critiques of support for this model include its heavy reliance on case studies and anecdotal conclusions (Messer & Fremouw, 2008) and empirical research does not provide strong support for this model (Favazza & Conterio, 1989).

As discussed in the review of history on NSSI, there has also been a model of suicide proposed to explain nonsuicidal self-injury. This model suggest NSSI is an attempt to forego or avoid suicide (Menninger, 1933; Messer & Fremouw, 2008), and that NSSI is on the same continuum as suicidal behaviors (Firestone & Seiden, 1990). However, it is worth reiterating that there is very little, if any, support for this model of engagement in NSSI.

The behavior/environmental model of NSSI suggests that these behaviors may be socially reinforced by feedback provided in their environment, including attention received from others, or inclusion in a specific group (Messer & Fremouw, 2008). The environmental and social factors that may explain the function of engagement in NSSI have shown more support than several other models reviewed (Nock & Prinstein, 2004; Nock & Prinstein, 2005), and will be discussed in more detail to follow.

Depersonalization has also been researched as a model to explain why individuals intentionally harm themselves without the intent to die. This model proposes that individuals who experience feelings of numbness or un-realness as a result of dissociation or depersonalization self-mutilate in order to regain a sense of self or re-establish one's identity and to end the experience of depersonalization (Messer & Fremouw, 2008). This model has shown more support as suggested by a survey of mental health professionals working with individuals who engaged in self-cutting (Suyemoto & MacDonald, 1995), longitudinal investigations (Van der Kolk, Perry, & Herman, 1991), and in correlational studies (Brodsky, Cloitre, & Dulit, 1995). While there has been more support for a depersonalization model of NSSI, results are limited in their generalizability due to small and specific samples utilized (Messer & Fremouw, 2008). It has also been suggested that the depersonalization model of understanding the function of NSSI

may fit better into the model of emotional regulation as the depersonalization model suggests individuals are trying to increase too little emotion (Walsh, 2012).

A commonly cited function of NSSI within the literature is emotional regulation. For instance, research suggests that individuals commonly report feelings of tension and anxiety, as well as anger either at oneself or at others prior to engaging in NSSI (Crouch & Wright, 2004). In their investigation to emotional antecedents to NSSI, Chapman and colleagues (2007) found that individuals most commonly reported feeling anger or anxiety before engaging in NSSI. The researchers also reported almost 13% of their sample reported feeling boredom before engaging in NSSI. These findings suggest that the emotional, or affect regulation function of NSSI may explain why individuals engage in these behaviors when they experience too much, or too few uncomfortable emotions. Reports of nearly all (98%) of participants in some investigations have cited affect regulation as a relevant factor in why they engaged in NSSI (Glenn & Klonsky, 2013). However, recent research on the function of NSSI maintenance suggests that, while emotional or affective regulation may be the function served by NSSI for some individuals, it is not always the case. Additionally, research into functions of NSSI suggest that it is a complicated behavior that likely serves many functions. For example, a large study of adolescents in Sweden reported that individuals who engaged in NSSI reported an average of 4.3 out of a list of 22 functions served by the NSSI (Zetterqvist, Lundh, Dahlström, & Svedin, 2013).

Nock and Prinstein (2004) have proposed a model to explain the function of NSSI, which includes many of the models discussed previously. They asked participants how often they engaged in nonsuicidal self-mutilation for specific reasons. Their analyses evaluated four primary functions of self-mutilation behaviors, which involved whether functions were *automatic* or *social*, as well as *positive* or *negative*. Their resulting four functions were as

follows: a) *automatic-negative reinforcement* (e.g., to stop bad feelings); b) *automatic-positive reinforcement* (e.g., to feel something, even if it was pain); c) *social-negative reinforcement* (e.g., to avoid something unpleasant you don't want to do); and d) *social-positive reinforcement* (e.g., to let others know how desperate you were). These functions are associated with reductions in tension or other negative affective states, creating desirable physiological states, escaping from interpersonal tasks, and gaining attention from others or access to materials, respectively (Nock, 2004). This model of NSSI function includes environmental, social, and interpersonal functions of NSSI, as well as intrapersonal reasons such as affect regulations, whether it be to increase affect as in the case with depersonalization or numbness, or to decrease overwhelming amounts of negative emotions such as anger or anxiety and tension.

The four functions served by NSSI mentioned above make up the functional model of Nonsuicidal Self-Injury or the Four-Function Model (FFM) of NSSI (Nock & Prinstien, 2004). This type of approach attempts to classify and treat behaviors according to the processes that produce and maintain them. It is this type of approach, rather than a syndromal approach, that will provide the most useful information for formulations of intervention because it explains *why* individuals engage in NSSI. Nock and Prinstien's (2004) FFM of NSSI has been reportedly replicated in adolescent community and clinical samples as well as in adult clinical samples and has shown internal consistency reliability and construct validity (Nock & Prinstien, 2004).

Research using the four-function model of NSSI has suggested that *automatic* or intrapersonal functions were reported more commonly by adolescents (29.3% - 46.9%) than were *social* functions (5.6% - 28.9%) (Zetterqvist et al., 2013). Other differences have been found between reported *automatic* and *social* functions of NSSI. For example, Zetterqvist et al. (2014) reported that being female, having experienced emotional abuse, prolonged illness, or handicap

during childhood, and symptoms of depression significantly predicted reported *automatic*/intrapersonal functions of NSSI, whereas symptoms of anxiety predicted reported *social* functions of NSSI. Additionally, increased frequency of engagement in NSSI has been associated more with *automatic*/intrapersonal functions than *social* functions (Zetterqvist et al., 2014; Klonsky & Olino, 2008).

While Nock and Prinstein's (2004) investigation into function of engagement in NSSI has been an invaluable contribution to the literature and will be the basis of investigation into function of NSSI in this study, their model accounts only for the psychological function served by NSSI. It has been suggested that within the research on the function of NSSI, psychological function, biological function, and social function are all important aspects of why individuals may engage in NSSI (Whitlock & Selekman, 2014). While not the focus of this study, biological functions of NSSI are important to take into consideration when attempting to understand why individuals continue to engage in NSSI. Biological factors may also help clinicians to more fully understand, and to more effectively intervene, with those who engage in NSSI.

Biological or physiological models of the function of NSSI suggest that the behavior is remedial in nature and is driven by an attempt to balance endogenous opioid, which may have been lowered by a history of abuse, trauma, or neglect (Whitlock & Selekman, 2014). Additionally, serotonergic dysfunction has been suggested as a possible explanation for engagement in NSSI (Simeon et al., 1992); however, research on this explanation is limited and methodology issues preclude a determination that serotonergic dysfunction is specifically related to NSSI (Messer & Fremouw, 2008). Most researchers agreed that NSSI is a complex phenomenon and one that likely fulfills many functions in a variety of areas on an individual's life.

A more complete understanding of why individuals maintain engagement in NSSI can help to inform prevention or intervention. However, as mentioned, researching function of NSSI behaviors is not a simple task and different groups of individuals may engage in very similar looking behaviors for very different reasons. For example, Laye-Gindhu and Schoner-Reichl (2005) reported that boys were more likely than girls to report functions similar to Nock and Prinstein's (2004) *social-positive reinforcement* and *social-negative reinforcement* and that girls were more likely than boys to report the function of their NSSI was similar to Nock and Prinstein's (2004) *automatic-negative reinforcement* and *automatic-positive reinforcement*. A better understanding of the reasons why individuals report NSSI could lead to a better understanding of which methods of intervention could be the most effective for specific functions of NSSI.

Discontinuation of Nonsuicidal Self-Injury

While there has been little research to date on the function of NSSI, even less research has focused on factors associated with discontinuation, or cessation, of NSSI. Like research on functions of NSSI, information gained about why individuals stop engaging in NSSI may have potential to further inform intervention and clinical treatment for those who engage in NSSI.

As previously suggested, engagement in nonsuicidal self-injury is a behavior typically initiated during adolescence (Rodham & Hawton, 2009). However, there is far less consistency in the literature on the course and trajectory of NSSI into emerging adulthood. While it has been suggested that this type of behavior occurs primarily during adolescence (Whitlock & Selekman, 2014), some investigations have reported NSSI continues into adulthood (Kharsati & Bhola, 2015; Meulenkamp et al., 2015). Therefore, further research into motivational factors for discontinuation of nonsuicidal self-injury is needed to form a better understanding of why the

course of NSSI looks different for some individuals and is distinguished by the resolution of adolescence for some but not others.

Whitlock and colleagues (2006) investigated course of NSSI in those who reported not having engaged in such behavior for 12 months and who did not plan to engage in NSSI again in their lives. They reported that the majority (79.8%) of individuals who met this criterion had stopped NSSI within 5 years of starting and that 40% reported stopping within the first year of initiating NSSI. This highlights the importance of being able to accurately assess and identify NSSI and provide early intervention. These findings also suggest that for the majority of individuals to begin engaging in NSSI, even for those whom NSSI served a function for many years, were at some point motivated to discontinue engaging in NSSI. A better understanding of why these individuals decided to do so is crucial for tailoring interventions for those who continue to engage in these dangerous behaviors.

It has only been recently that research has begun to investigate discontinuation in further detail. While this body of literature is still in its infancy, factors affecting NSSI discontinuation are beginning to come to light. Whitlock and colleagues (2015) investigated a large sample of college students who reported past history, or current NSSI. They found that, in a sample with a mean age of 21.3 years, individuals who reported that they had engaged in NSSI in the past 12 months were more likely than those who denied past 12-month NSSI to be female, report higher lifetime frequency, more NSSI forms and functions, identifying themselves as a "self-injurer," and to report current psychological distress (Whitlock et al., 2015). In addition to these findings, Whitlock and colleagues (2015) reported that those who reported past 12-month NSSI were less likely to report that therapy was useful in helping to stop NSSI, that self-injury interfered with their lives, perceived social support, access to emotional regulation strategies, and life

satisfaction than individuals who reported past NSSI, but denied past 12-month engagement. Furthermore, the researchers reported that individuals in their sample qualitatively reported that changes in both social (important relationship to others) and intrapersonal (self-awareness, ability to regulate emotion) reasons played important roles in discontinuation on NSSI.

In another recent investigation into factors associated with NSSI maintenance or discontinuation, Duggan, Heath, and Hu (2015) examined the role body objectification in different forms plays among young adolescents. They found that in their sample of 11 to 13 year olds, those who reported continued NSSI maintenance over a 12-month period showed significantly greater scores on measures of body objectification in the form of appearance monitoring and adopting an outsider's view of the self, greater depressive symptoms, and more difficulty regulating emotions than those who reported discontinuing NSSI over the 12-month period and those who denied any engagement in NSSI.

In an attempt to better understand what motivates individuals to stop engaging in NSSI, Turner and colleagues (2014) investigated reasons individuals reported for why they decided to refrain from nonsuicidal self-injury. In their research, they found that responses given by participants about why they stopped engaging in NSSI suggested nine subscales of reasons individuals had for refraining from NSSI, as well as two higher-order factors. The subscales include Desire for change, Situational and environmental deterrents, Negative emotional consequences, Fear of discovery and stigma, Negative impact on relationships, Addiction to NSSI, Others' expectations, Negative physical consequences, and Body concerns. They determined that these nine subscales fit within two factors: Vulnerability-related reasons to refrain from NSSI and Resiliency-related reasons to refrain from NSSI.

Vulnerability-related reasons for refraining from NSSI include the subscales of Fear of discovery and stigma, Addiction to NSSI, Others' expectations, Negative physical consequences, and Situational and environmental deterrents. Turner and colleagues (2014) suggested those who report Vulnerability-related reasons for refraining from NSSI may be more likely to display chronic or severe course of NSSI over time. Conversely, those who reported Resiliency-related reasons for refraining from NSSI, which includes the subscales of Desire for change and resolution of distress, Concerns about negative emotional consequences, Body concerns, and Concerns about NSSI's negative impact on relationships, may predict less frequency of NSSI later in life.

With the contribution to the literature from Turner and colleagues (2014), researchers and clinicians now have a better understanding about why individuals continue or discontinue engagement in nonsuicidal self-injury. However, there is much that remains to be explored in regard to motivations for individuals to discontinue nonsuicidal self-injury. There have yet to be any connections made between the function individuals report that NSSI is serving during the period of time in which they are engaging in such behaviors and their reported motivations for stopping these behaviors.

Therefore, this investigation aimed to explore retrospective functions of engagement in NSSI during emerging adulthood. Additionally, and perhaps most clinically relevant, this investigation assessed for factors that may contribute to the Continued or Discontinued NSSI later in life. Turner and colleagues (2014) investigated why individuals who have previously engaged in nonsuicidal self-injury chose to discontinue such behaviors. They found a variety of motivations or reasons to stop self-injury. However, little research has investigated factors associated with different motivations to stop NSSI. A better understanding of how functions of

NSSI maintenance relate to factors associated with discontinuation of NSSI has the potential to better inform clinical practice from a strength and protective factors based approach, and to offer more effective methods of intervention matching based on individual assessment of functions of NSSI.

Given what is known to date on the subject of nonsuicidal self-injury, as well as the remaining gaps in the literature, the following three research questions were proposed:

RQ1: Which of the four functions of NSSI is the strongest predictor that an individual will have Discontinued NSSI later in life?

RQ2: Which of the four functions of NSSI is the strongest predictor of Vulnerability-related reasons for discontinuation of NSSI?

RQ3: Which of the four functions of NSSI is the strongest predictor of Resiliency-related reasons for discontinuation of NSSI?

Summary and Conclusion

Chapter Two focused on reviewing the problems with NSSI and NSSI research, the terminology used in the literature and history of NSSI, support for the differentiation of NSSI from other behaviors and diagnoses, the age of onset and prevalence rates of NSSI throughout different developmental periods, the nature of NSSI, risk and protective factors, treatment considerations for NSSI, the different functions NSSI may serve, motivations associated with the decision to stop engaging in NSSI, and lastly, the introduction of research questions for the current study.

As has been pointed out throughout the chapter, there remain many gaps in the literature on the function of engagement in NSSI, along with reasons why individuals discontinue nonsuicidal self-injury. The current research attempted to contribute to the literature and to work

toward closing the current gaps in knowledge on nonsuicidal self-injury by assessing the associations between different functions of NSSI and motivations for discontinuing NSSI later in life.

CHAPTER THREE

METHOD

As previously discussed, the focus of this study was to examine the relationship between the function of NSSI maintenance and individuals' motivations for discontinuing NSSI later in life. The following three research questions were proposed in order to examine this relationship:

RQ1: Which of the four functions of NSSI is the strongest predictor that an individual will have Discontinued NSSI later in life?

RQ2: Which of the four functions of NSSI is the strongest predictor of Vulnerability-related reasons for discontinuation of NSSI?

RQ3: Which of the four functions of NSSI is the strongest predictor of Resiliency-related reasons for discontinuation of NSSI?

This chapter will present information about the participants involved in this study, the measures used to assess the variables in question, and the statistical techniques used to answer the proposed research questions.

Participants

This section describes and provides rationale for the participants recruited for this study as well as criteria for data that was included or excluded from analyses.

College age students. In the original proposal of the current study, a minimum sample size of 159 was thought to be necessary based on the power analysis conducted. However, after discussing with the colleagues the analyses utilized in this study as well as the power and the alpha levels determined a priori, a minimum sample size of 95 was determined to be sufficient for the current study using G*Power Data Analysis software (G*Power 3.0.10). This analysis was conducted to suggest a medium effect size. Committee members approved this change.

More specifically, parameters were set to have a medium effect size of $f^2 = 0.15$, an $\alpha = 0.05$, and an estimated power ($1 - \beta$ error probability) = 0.85 with an actual power = 0.851. In order to ensure the minimum sample size was reached after exclusionary criteria are applied, approximately 360 students were recruited for participation in this investigation. Participants were recruited from the student body of a public university in the Mid-Atlantic region of the United States using online recruitment software (SONA). The university sampled in this study was a mid-size, liberal arts and sciences public university with a student population around 10,000. The college population chosen for this study was due to the higher prevalence rate estimates of NSSI compared to other age ranges (Rodham & Hawton, 2009). Additionally, college-age individuals were an ideal population for this study as research suggests this is a developmental period when resolution of NSSI is likely to occur (Whitlock et al., 2006). It was expected that this population would adequately include both individuals who report they were currently engaging in NSSI, as well as individuals who may have engaged in NSSI in the past but have since discontinued this behavior.

Eligibility. Eligibility criteria was that participants were at least 18 years of age and have, at some point in their lives, engaged in direct and intentional self-injury of one's own body tissue *without* the intent of dying as a result of said self-injurious act (NSSI). Additionally, because this investigation was specifically interested in NSSI and not suicidal behaviors, and because it is possible for NSSI to overlap with suicidal self-injury, it was necessary for participants to deny previous suicide attempts. Research discussed previously (Walsh, 2012) has supported the conclusion that NSSI and suicidal behaviors are, in fact, distinct constructs and do not necessarily fall on the same continuum as once thought. Therefore, the criteria of denying

suicidal behaviors was included in order to obtain the clearest picture of the distinct construct of NSSI as possible.

Exclusion. Exclusionary criteria have been established a priori. Participants who reported previous suicide attempts were redirected away from the survey to a page providing information about local and national mental health resources and thanked for their time.

Measures

This section will provide a detailed description of the measures that were used to assess the variables being examined. Descriptions will provide an introduction to the constructs being assessed by each measure, how each measure has been used in previous research, the psychometric properties of each measure, as well as information on whether each measure has been used in other studies similar to this study when available. The measures that will be described in detail include the Functional Assessment of Self-Mutilation (FASM; Lloyd, Kelley, & Hope, 1997) and the Reasons to Stop Self-Injury Questionnaire (RSSIQ; Turner, Chapman, & Gratz, 2014). Demographic, descriptive, and status of discontinuation items will also be discussed.

Demographics. Demographic information was collected including age, gender, race/ethnicity, and sexual orientation. This information was used as covariates to control for differences in these factors.

Descriptive items. As described below, the FASM collects certain descriptive information about an individual's engagement in NSSI. In addition to the descriptive information assessed by the FASM, participants were asked about any history of trauma, receiving mental health counseling, or being prescribed medication for a mental health concern. These items were

also used as additional control items in the primary analyses used to answer the proposed research questions.

Discontinuation of NSSI. A categorical variable using month-long intervals assessed the length of time from last episode of NSSI. Results from this item were used to determine whether an individual was considered to have Discontinued NSSI. Individuals who denied engagement for at least 12 months were considered to have Discontinued NSSI. Results from these items helped to answer the first research question examining which functions of NSSI were associated with continuation or discontinuation of NSSI.

PHQ-9. The Patient Health Questionnaire-9 is a 9-item self-report measure used to assess for the presence and severity of questions. This measure has shown strong psychometric properties in prior studies (Cameron, Crawford, Lawton, & Reid, 2008). In the current study, this measure displayed strong internal consistency ($\alpha = .92$).

Functional Assessment of Self-Mutilation. The FASM (Lloyd et al., 1997) is 30-item self-report measure of the methods, frequency, and function of self-mutilation behavior, which includes two main portions measuring different constructs: method and frequency of NSSI, and function of NSSI. In order to assess the method and frequency of NSSI, participants were asked if they have intentionally engaged in 11 forms of self-injury *without* the intention to kill oneself within the past year with an additional option for "other," giving the participant the opportunity to report methods of NSSI not listed in the FASM. For methods of NSSI that were endorsed by participants, they were then asked approximately how many times they had engaged in that specific behavior with the intent to self-harm, and if they had received medical treatment for the endorsed method of NSSI at any point in their lives. The question pertaining to medical treatment has been used as a proxy for severity of NSSI behavior. This first portion of the FASM

yields two factors: moderate/severe NSSI (cutting/carving, burning, self-tattooing, scraping, and erasing or rubbing one's skin to the point of burning/bleeding), and minor NSSI (hitting self, pulling hair, biting self, inserting objects under nails or skin, picking at a wound, and picking areas to draw blood) (Lloyd et al., 1997). While not specifically a focus of this study, it is worth mentioning that previous research has categorized NSSI this way and is important when interpreting the frequencies and descriptive results of this investigation.

In the final portion of the FASM, participants were asked how often they had engaged in self-mutilation for each of 22 reasons. Responses are rated on a 4-point Likert scale ranging from 0 (*never*) to 3 (*often*). The FASM is a well-researched assessment developed to suggest four possible functions of self-mutilation (Nock & Prinstein, 2004) based on answers to these 22 items. The four factor model proposed by Nock and Prinstein (2004) has demonstrated both structural and construct validity (Lloyd-Richardson et al., 2007; Nock & Prinstein, 2005) and includes a) *automatic-negative reinforcement* (e.g., to stop bad feelings; to relieve feeling numb or empty); b) *automatic-positive reinforcement* (e.g., to feel something, even if it was pain; to feel relaxed); c) *social-negative reinforcement* (e.g., to avoid being with people; to avoid doing something unpleasant you don't want to do), and d) *social-positive reinforcement* (e.g., to let others know how desperate you were; to get your parent to understand or notice you). Internal consistency for the FASM subscales in the current study is as follows: *automatic-negative reinforcemen*t ($\alpha = .78$), *automatic-positive reinforcement* ($\alpha = .58$), *social-negative reinforcement* ($\alpha = .51$), and *social-positive reinforcement* ($\alpha = .78$). These four functions were used as predictor variables discussed further in the analyses section of this chapter.

Reasons to Stop Self-Injury Questionnaire. The RSSIQ (Turner et al., 2014) is a 40-item, self-report measure that assesses for an individual's reason or motivation to discontinue

engagement in NSSI. Responses are rated on a 5-point Likert scale ranging from 1 (*not at all important*) to 5 (*extremely important*) and scores are summed across composite items with higher scores representing higher motivation to discontinue NSSI in a specific domain.

The RSSIQ is a recently developed measure of reasons to refrain from NSSI. Because this measure is a fairly new assessment, few studies have had the opportunity to utilize the RSSIQ to date. However, Turner and colleagues (2014) in their development of the RSSIQ conducted several studies exploring factor structure, reliability, and convergent validity of the measure, as well as confirmatory factor analyses of their findings and incremental predictive validity.

In their development of the RSSIQ, Turner and colleagues (2014) set out to initially conduct an exploratory factor analysis (EFA) of 115 reasons to stop self-injury collected from those who self-injury from online forums, community mental health clinics, a university, as well as reasons provided by researchers and clinicians. An initial EFA of the responses yielded 77 items that included nine factors: Desire for change and resolution of distress, Situational and environmental deterrents, Negative emotional consequences, Fear of discovery and stigma, Negative impact on relationships, Addiction to NSSI, Others' expectations, Negative physical consequences, and Body concerns. The initial subscales demonstrated acceptable to excellent internal consistence (α = .74 - .94) as well as convergent and divergent validity with predicted constructs including reasons for living and suicide risk, hopefulness, coping strategies, and attachment and social support (Turner et al., 2014).

In a second study of the RSSIQ, Turner and colleagues (2014) attempted to confirm the nine factors previously identified, increase the clinical utility of the measure by further reducing the number of items in each subscale, and test two competing hierarchical models of the

interrelations between the nine subscales. After setting a limit of 6 items for each subscale and retaining only those items with the highest factor loadings, 40 items were retained in the final version of the RSSIQ with each of the nine subscales containing four – six items each. After minor adjustments, confirmatory factor analysis confirmed the nine subscales proposed in Turner's first study. Additionally, the two-factor hierarchical model of the interrelations between the nine subscales provided the best fit.

These two higher-order scales are Resiliency-related reasons and Vulnerability-related reasons. The higher-order scale of Resiliency-related reasons showed excellent internal consistency ($\alpha = .90$) and consisted of the following subscales: Desire for change, Negative emotional consequences, Negative impact of relationships, and Body concerns. The higher-order scale of Vulnerability-related reasons also showed excellent internal consistency ($\alpha = .86$) and consisted of the following subscales: Situational and environmental deterrents, Negative physical consequences, Fear of discovery, Addiction to NSSI, and Others' expectations. In this study, eight of the subscales showed excellent internal consistency ($\alpha > .70$); however, Situational and environmental deterrents showed poor internal consistency ($\alpha = .58$). In the current study, these two higher-order factors were also found to demonstrate excellent internal validity (Vulnerability-related reasons $\alpha = .90$; Resiliency-related reasons $\alpha = .94$).

Finally, Turner and colleagues (2014) sought to determine whether the two higher-order scales – Vulnerability-related reasons and Resiliency-related reasons – predict NSSI prospectively. Their results suggested that of those who reported engaging in NSSI at follow-up (almost half of the participants at 3 months), participants endorsed greater scores on subscales associated with Vulnerability-related reasons than Resiliency-related reasons. Additionally, those

who denied engaging in NSSI at follow-up endorsed higher scores on subscales related to Resiliency-related reasons.

The RSSIQ was developed to assess reasons to stop NSSI for either short periods (minutes, hours, days), or for longer periods of time (weeks, months, or years). Participants were asked when the last time they engaged in NSSI was and comparison groups were formed based on duration of reported discontinuation of NSSI. In this study, a cutoff of 12 months of being NSSI free was used to categorize participants as having Discontinued NSSI. The determination of a 12-month cutoff was made to provide additional certainty that engagement in NSSI had ceased.

Procedure

Upon approval from the university's Institutional Review Board, questionnaire items were loaded into Qualtrics online survey software. Once the survey was opened, announcements were made to students in the target university through the online research participation system (SONA). In order to ensure the confidentiality of individuals who may have been hesitant to complete a survey on sensitive material in a laboratory setting, surveys were available to be completed online at any computer the participant wished.

Once individuals had been recruited, they were provided with a digital copy of consent to participate, including the rationale for the investigation, estimated time to complete the survey, as well as possible risks and benefits involved in participation. It is important to note that research does not support the assumption that asking about suicide or related behaviors increases thoughts of, or risk for, these behaviors. In fact, several reviews of the literature that have investigated outcomes of participants asked about suicidal and related behaviors suggest that asking about these sensitive topics may reduce suicidal ideation in adolescent, adult, and general

at-risk populations (Dazzi, Dribble, Wessely, & Fear, 2014; Omerov, Steineck, Dyregrov, Runeson, & Nyberg, 2013). The ability for the participant to drop out of the study at any point without consequence was stated and participants received offered incentives regardless of their completion of the survey.

Participants were provided with information about local and national mental health resources in the event they felt they may be a danger to themselves or others, or if they would like to speak with a mental health professional about their own engagement in NSSI, or suicidal thoughts. The contact information for the university's counseling center was also provided to all participants who clicked on the link to the survey.

After the proposed sample of participants had been reached, the link to the study was closed, preventing future access. Data collected through Qualtrics software was imported into IBM SPSS software where data analysis took place. Identifying information such as IP addresses was stripped.

Analyses

This section will provide the statistical techniques used to answer the research questions presented at the beginning of this chapter. These techniques include descriptive information, logistic regression, and multiple regression. IBM SPPS (25) software was used to analyze all data for this study.

Descriptive information. This investigation provides descriptive information on the frequencies, means, and standard deviations of reported methods, frequency, and age of onset of engagement in NSSI. Additional analyses used responses to "when was the last time you engaged in NSSI" to determine differences in patterns of responding to the criterion variables.

Multiple logistic regression. Logistic regression uses continuous predictor variables to predict the probability of a participant fitting into a specific categorical criterion variable. In this analysis, the criterion variable was the Continuation or Discontinuation of NSSI. Therefore, this analysis used a binary logistic method (two categorical outcomes). The predictor variables used in this analysis were the four functions of NSSI derived from the FASM: a) *automatic-negative reinforcement,* b) *automatic-positive reinforcement,* c) *social-negative reinforcement,* and d) *social-positive reinforcement.*

This analysis provided information regarding which of the four functions of NSSI was the strongest predictor of the likelihood an individual would discontinue NSSI compared to if they would continue NSSI – answering research question one (RQ1). As there are not yet any theoretical bases for assuming one specific function of NSSI provides a more effective prediction of continuation or discontinuation of NSSI, a forced entry approach to the regression equations was used. Forced entry places all predictors into the regression model simultaneously, while making no decisions about the order in which variables are entered (Field, 2013). This type of regression model allowed for a comparison of predictor variable beta weights that is the most accurate. As a follow-up to the initial analysis, two multiple regression analyses were conducted.

Multiple linear regression. Six linear regression analyses were conducted in order to examine the relationships between varying function of NSSI behaviors and differences in motivations for discontinuation of NSSI. Multiple regression analyses were conducted with Vulnerability-related reasons as the criterion variable for the entire sample collected, and then again for individuals categorized at Continued NSSI and Discontinued NSSI. Three more analyses were conducted in the same fashion using Resiliency-related reasons for stopping NSSI as the criterion variable. Multiple linear regression is used when a researcher is attempting to

predict unknown scores on the criterion variable by using participants' scores on another variable (the predictor or independent variable). Unlike logistic regression, linear regression allows for a prediction to be made regarding scores on a continuous criterion variable (as opposed to a categorical variable in logistic regression). When more than one predictor variable is in question, multiple regression analysis also allows a researcher to examine which predictor variables have the most influence on the criterion variable. Assessment of the most influential variable on the criterion can be done by comparing beta weights of the predictor variables. Beta weights represent the change in the criterion (in standard deviations) associated with a change of one standard deviation of the predictor when holding the values of the other predictors constant.

As there are not yet any theoretical bases for assuming one specific function of NSSI provides a more effective prediction of reasons for stopping NSSI (based on scores on the RSSIQ), a forced entry approach (Enter) to the regression equations was used. Forced entry places all predictors into the regression model simultaneously, while making no decisions about the order in which variables are entered (Field, 2013). This type of regression model allowed for a comparison of predictor variables beta weights that is the most accurate.

In the first linear regression analysis investigating Vulnerability-related reasons for stopping NSSI, demographic information was entered into the first block of the model. Then, participants' scores on each of the four functions of NSSI gathered from the FASM were entered simultaneously into the model in the second block of the equation. This analysis was used to analyze participants' scores on the Vulnerability-related reason of the RSSIQ as the criterion variable. Beta weights for each of the four functions of NSSI were compared in order to determine which of the functions of NSSI maintenance is the most effective at predicting

whether individuals reported reasons for stopping NSSI that are related to Vulnerability-related reasons – answering research question two (RQ2).

Similarly, a second linear regression analysis examined the relationship between participants' scores on each of the four functions of NSSI from the FASM and participants' scores for Resiliency-related reasons for stopping NSSI gathered from the RSSIQ. Again, scores for each of the four functions were simultaneously added to the second block in the regression model after controlling for demographics, this time with Resiliency-related reasons as the criterion variable. Beta weights for each of the four functions of NSSI were once again compared in order to determine which of the functions of NSSI maintenance is the most effective at predicting whether individuals reported reasons for stopping NSSI related to Resiliency-related reasons – answering research question three (RQ3).

Summary and Conclusion

In Chapter Three, the focus was on introducing the participants studied, the instruments and measures used to assess the relationship between the function of NSSI maintenance and the motivations to discontinue NSSI later in life, and the statistical analyses used to explore this relationship. Approximately 360 college-age students were asked to complete the RSSIQ, the FASM, and a series of demographic and qualitative questions. Logistic multiple regression was used to explore which functions of NSSI were the best predictors of discontinuation later in life. Two linear multiple regression analyses were performed to explore which functions were the best predictors of Vulnerability-related reasons and Resiliency-related reasons to stop NSSI independently. The results of these findings will be discussed in Chapter Four.

CHAPTER FOUR

RESULTS

The aim of Chapter Four is to review the results of the analyses proposed in Chapter Three. Specifically, Chapter Four will provide a) descriptive statistics, b) means and standard deviations on the measures used in this study, and c) the results of the analyses.

As a review, the following research questions were examined as part of this study:

RQ1: Which of the four functions of NSSI is the strongest predictor that an individual will have discontinued NSSI later in life?

RQ2: Which of the four functions of NSSI is the strongest predictor of Vulnerability-related reasons for discontinuation of NSSI?

RQ3: Which of the four functions of NSSI is the strongest predictor of Resiliency-related reasons for discontinuation of NSSI?

In order to be included this study, participants must have reported that they had a) engaged in NSSI at some point in their lives, b) denied that they had ever had a suicide attempt, c) passed all validity checks included in the survey, d) and agreed to have their responses included in the final data analyses after completion of the survey. Three hundred and sixty-one (n = 361) participants opened the link to start the survey. However, a smaller proportion of participants met the inclusion criteria noted above, and therefore only those responses that met the criteria were included in the analyses (N = 103), a reduction of 258 participants (71.5%).

Demographics

Data were collected from April 2017 through October 2017. A total of 361 students accessed the study. Of the 361 students who volunteered to participate, only 147 (40.7%) reported they had engaged in NSSI at some point in their lives. Participants who did not answer

the question asking whether or not they engaged in NSSI, or who denied NSSI at any point in their lives, were directed to the end of the survey. Of the 147 participants who met the NSSI inclusion criteria, an additional 21 participants (14.3% of those reporting NSSI and 0.1% of the full sample, N = 361) were excluded from participating in the survey due to past suicide attempts, resulting in 126 participants who were allowed to continue with the survey. The 21 participants who endorsed a prior suicide attempt were removed from the analyses in order to delineate self-harm with the intent to die from self-harm without the intent to die, a distinction that has been supported in the literature. An additional 21 participants were excluded from data analysis either because they failed one or more validity checks (N = 11; 0.1% of the 126 allowed to complete the survey), or they did not agree to have their results included in analyses when asked at the conclusion of the study (N = 11; 0.1% of the 126 allowed to complete the survey). Additionally, 2 participants (<0.1% of the 126 allowed to complete the survey) did not report the last time they engaged in NSSI and therefore were unable to be categorized as continuing NSSI or having discontinued NSSI. The final number of participants included in the analyses was 103.

In terms of gender, 70.5% (N = 72) of participants identified as female, 28.6% (N = 30) identified as male, and 1.0% (N = 1) identified as Other. Age of participants ranged from 18 years old to 42 years old, with a mean age of 19.5 (SD = 3.38). While there were older individuals who participated in this study, 91.3% (N = 94) of the sample were in the traditional college-aged range of 18-21. Table 5 provides the means and standard deviations of the sample demographics and is organized by those who have continued NSSI, discontinued NSSI, and the total sample.

Table 5

Demographic Profiles of Participants

	Continued NSSI		Discontinued NSSI		Total	
Demographic Category	**N**	**%**	**N**	**%**	**N**	**%**
Gender						
Male	15	30.0	15	28.3	30	29.1
Female	34	68.0	38	71.7	72	69.9
Other	1	2.0	0	0.0	1	1.0
Age						
18-21	47	94.0	47	88.7	94	91.3
22-30	3	6.0	4	7.6	7	6.8
31-42	0	0.0	2	3.7	2	1.9
Race/Ethnicity						
White/Caucasian	34	68.0	35	66.0	69	67.0
Black/African American	9	18.0	5	9.4	14	13.6
Hispanic/Latinx	1	2.0	5	9.4	6	5.8
Asian/Pacific Islander	0	0.0	0	0.0	0	0.0
Native American	0	0.0	0	0.0	0	0.0
Other	1	2.0	3	5.7	4	3.9
Multiracial	5	10.0	5	9.4	10	9.7
Sexual Orientation						
Heterosexual	37	74.0	39	73.6	76	73.8
Bisexual	6	12.0	9	17.0	15	14.6
Gay	1	2.0	4	7.5	5	4.9
Lesbian	1	2.0	0	0.0	1	1.0
Other	5	10.0	1	1.9	6	5.8

Participants in the study were asked to select all the racial and ethnic categories with which they identified. Because participants may have selected multiple racial and ethnic identities, percentages may add up to more than 100%. Sixty-seven percent of the sample identified as (*N* = 69) White/Caucasian, 13.6% (*N* = 14) African American, 9.7% (*N* = 10) Multiracial, 5.8% (*N* = 6) Latino/Hispanic, 3.9% (*N* = 4) Other, 0.0% Native American, and 0.0% Asian/Pacific Islander. Sexual orientation of the utilized sample revealed that 73.8% (*N* = 76) identified as heterosexual, 14.6% (*N* = 15) as Bisexual, 5.8% (*N* = 6) as Other, 4.9% (*N* = 5) Gay, and 1.0% (*N* = 1) as Lesbian.

Discontinuation versus Continuation of NSSI

Participants who met inclusion criteria (i.e., Have you engaged in NSSI at some point in your life, do you deny a history of suicide attempts, and have you passed validity checks) were asked to report the last time they engaged in NSSI. Options included a) within the last week, b) 1 month, c) 3 months, d) 6 months, e) and 12 months or more. Those participants who reported that the last time that they had engaged in NSSI was 12 months or more were considered to have discontinued engagement in these behaviors. Those who reported the last time they engaged in "intentional self-harm without the intent to die within the last six months or more recently" were considered to be engaging in Continued NSSI. When grouped in this way, 48.5% (*N* = 50) of participants were considered to still be engaging in NSSI while 51.5% (*N* = 53) were considered to have discontinued their engagement in NSSI.

Age of Onset

The age of onset of NSSI was also assessed. Participants were asked, "How old were you when you first harmed yourself in this way?" Three participants (<0.1%) did not respond to this item, resulting in 100 respondents. When the entire sample was examined as a whole, the earliest

reported age of onset was 8 years old with the latest age of onset being 19 years old. The average age of onset for this sample of participants was 13.9 (*SD* = 2.28). For those individuals in the group considered to be actively engaged in NSSI, the earliest age of onset reported was 10 years old and the latest age of onset was 18 years old. The average age of onset for those in the Continued NSSI group was 13.9 (*SD* = 2.40). For those individuals in the group who were considered to have Discontinued NSSI, the earliest age of onset reported was 8 years old with the latest age of onset reported being 19. The average age of onset for those who have Discontinued NSSI was 13.9 (*SD* = 2.18). An independent sample t-test was conducted to evaluate mean differences. There was no significant difference between the average age of onset between those with Continued NSSI (*M* =13.86) and the average age of onset of those who had Discontinued NSSI (*M* = 13.86); t (98) = 0.0, p = 1.0.

Mental Health History

Participants in this study were also asked about their mental health history, including previous counseling and whether that counseling was related to NSSI, psychiatric prescription history, depressive symptoms as measured by the PHQ-9, as well as history of traumatic experiences. Independent samples t-test suggested that scores on the measure of depressive symptoms were the only scores that varied significantly based on Continued or Discontinued NSSI, t (101) = 3.442, p = .001 (see Table 6).

Table 6

Mental Health History of Participants

	Continued NSSI		**Discontinued NSSI**		**Total**	
Mental Health Item	**N**	**%**	**N**	**%**	**N**	**%**
NSSI Status	50	48.5	53	51.5	103	100
Received Mental Health Counseling	32	64.0	24	45.3	56	54.4
Counseling related to NSSI	11	33.4	8	33.3	19	33.9
Prescribed Medication	19	38.0	16	30.2	35	34.0
Trauma	32	64.4	32	60.4	64	62.1
Sexual	14	28.0	10	18.9	24	23.3
Physical	13	26.0	7	13.2	20	19.4
Witnessing	12	24.0	13	24.5	25	24.3
Psychological	24	48.0	22	41.5	46	44.7
Other	5	10.0	5	9.4	10	9.7
	M	***SD***	***M***	***SD***	***M***	***SD***
PHQ-9 Scores	12.4	7.8	7.6	6.3	10.0	7.4

Of the 103 individuals included in this study, 54.3% (*N* = 56) reported that they had received mental health counseling in the past. When examined between the groups of Continued NSSI and Discontinued NSSI, 64.0% (*N* = 32) of Continued NSSI and 45.3% (*N* = 24) of Discontinued NSSI reported having received mental health counseling in the past. Of those individuals who reported mental health counseling in the past, 33.9% (*N* = 19) reported that mental health counseling was related to self-injury. Specifically, 34.4% (*N* =11) of those Continued NSSI and 33.3% (*N* = 8) of those who had Discontinued NSSI reported that the mental health counseling they received was related to NSSI. Thirty-four percent (*N* = 35) of participants reported being prescribed medication of a psychological concern at some point in their lives. Specifically, 38.0% (*N* =19) of those continuing NSSI and 30.2% (*N* = 16) of those who had Discontinued NSSI reported having been prescribed medication for a psychological concern.

Participants who reported that they had engaged in NSSI within the past 6 months had statistically significant higher levels of depression (*M* = 12.4, *SD* = 7.8) than those who were considered to have Discontinued NSSI based on PHQ-9 scores (*M* = 7.6, *SD* = 6.3), t (101) = 3.4, $p < .001$.

Traumatic experiences. Traumatic experiences were also assessed in this study. Participants were asked if they had experienced, at any point in their life, a traumatic event and to identify those events. When looking at the entire sample (*N* =103), responses reflect that 62.1% (n = 64) of participants had experienced a traumatic event. Of these participants, 23.3% (*n* = 24) reported sexual trauma, 19.4% (n = 20) reported physical trauma, 24.3% (n = 25) reported witnessing a traumatic event, 44.7% (n = 46) reported psychological trauma, and 9.7% (n = 10) reported they had experienced some other type of trauma in the past.

Of the participants who reported they had experienced a traumatic event, 64.4% (n = 32) were considered to be continuing their engagement in NSSI. Of these participants, 64.4% (n = 32) who reported a past traumatic event and were considered to be continuing their engagement in NSSI, 28.0% (n = 14) reported sexual trauma, 26.0% (n = 13) reported physical trauma, 24.0% (n = 12) reported witnessing a traumatic event, 48.0% (n = 24) reported psychological trauma, and 10.0% (n = 5) reported they had experienced some other type of trauma in the past.

Of the participants who reported they had experienced a traumatic event, 60.4% (n = 32) were considered to have discontinued their engagement in NSSI. Of these participants, 18.9% (n = 10) reported sexual trauma, 13.2% (n = 7) reported physical trauma, 24.5% (n = 13) reported witnessing a traumatic event, 41.5% (n = 22) reported psychological trauma, and 9.4% (n = 5) reported they had experienced some other type of trauma in the past.

Descriptive Results Related to NSSI

In order to understand the methods used to engage in NSSI (e.g., cutting, burning), the Functional Assessment of Self-Mutilation (FASM; Lloyd et al., 1997) was used in this study. Descriptive results captured by the FASM include the frequency of NSSI behaviors within the past 12 months, at some point in their lives, whether or not medical attention was sought (a measure of severity), and how often individuals have engaged in reported NSSI behaviors. Table 7 reports the number of individuals who reported engaging in each of the 11 behaviors for the total sample (*N* =103), for those who were considered to be Continued NSSI (n = 50), and for those who were considered to have Discontinued NSSI (n = 53). Table 7 also includes the means and standard deviations of the reported number of life-time occurrences of each behavior for the total sample (*N* =103), for those who were considered to be Continued NSSI (n = 50), and for those who were considered to have Discontinued NSSI (n = 53). It should be noted that

participants who were classified as Discontinued NSSI still had the option to report frequency of occurrences of NSSI behaviors over the past 12 months. Later in the survey they were asked, "Approximately, when was the last time you engaged in intentional self-harm without the intent to die?" Participants were classified as having Discontinued NSSI based on their response to this one item.

Data were collected on 11 types of nonsuicidal self-injurious behaviors commonly reported (i.e., cutting, hitting, hair pulling, self-tattooing, wound picking, burning, inserting objects into the skin, biting, skin picking, scraping of the skin, and erasing of the skin). When occurrences were analyzed, *z*-scores were calculated for the number of times individuals reported engaging in each NSSI behavior they reported. These calculations provided an opportunity to remove outliers from the analyses. Responses were removed if they had a *z* score above 3.29 or below -3.29. Removing outliers in this way resulted in 7 reports of occurrences being removed from the data analyses (see Table 7).

Table 7

Descriptive Results Related to NSSI

NSSI Behavior	Continued NSSI		Discontinued NSSI		Total	
	N	%	N	%	N	%
Cutting						
At some point	40	80.0	35	66.0	75	72.8
Past 12 months	19	38.0	2	3.8	21	20.4
Medical attention	9	18.0	6	11.3	15	14.6
Hitting						
At some point	37	74.0	32	60.4	69	67.0
Past 12 months	17	34.0	5	9.4	22	21.4
Medical attention	2	4.0	0	0.0	2	1.9
Hair pulling						
At some point	17	34.0	17	32.1	34	33.0
Past 12 months	7	14.0	2	3.8	9	8.7
Medical attention	1	2.0	0	0.0	1	1.0
Self-tattoo						
At some point	7	14.0	7	13.2	14	13.6
Past 12 months	1	2.0	1	1.9	2	1.9
Medical attention	0	0.0	0	0.0	0	0.0
Wound picking						
At some point	24	48.0	25	47.2	49	47.6
Past 12 months	13	26.0	7	13.2	20	19.4
Medical attention	1	2.0	1	1.9	2	1.9
Burning						
At some point	20	40.0	17	32.1	37	35.9
Past 12 months	11	22.0	5	9.4	16	15.5
Medical attention	1	2.0	0	0.0	1	1.0
Inserting objects						
At some point	10	20.0	10	18.9	20	19.4
Past 12 months	5	10.0	1	1.9	6	5.8
Medical attention	0	0.0	0	0.0	0	0.0

(continued)

Table 7 (continued)

Descriptive Results Related to NSSI

Biting						
At some point	25	50.0	18	34.0	43	41.7
Past 12 months	13	26.0	4	7.5	17	16.5
Medical attention	0	0.0	1	1.9	1	1.0
Skin picking						
At some point	16	32.0	12	22.6	28	27.2
Past 12 months	7	14.0	2	3.8	9	8.7
Medical attention	0	0.0	1	1.9	1	1.0
Scraping						
At some point	24	48.0	19	35.8	43	41.7
Past 12 months	14	28.0	2	3.8	16	15.5
Medical attention	0	0.0	0	0.0	0	0.0
Erasing						
At some point	14	28.0	6	11.3	20	19.4
Past 12 months	5	10.0	0	0.0	5	4.9
Medical attention	1	2.0	0	0.0	1	1.0

Life-time occurrences

	M	**SD**	***M***	**SD**	***M***	**SD**
Cutting	21.2	33.93	10.96	20.02	16.65	28.81
Hitting	10.58	9.32	4.80	3.33	8.07	7.83
Hair pulling	7.67	8.90	3.33	2.73	6.22	7.61
Self-tattoo	1.2	0.45	3.00	2.10	2.18	1.78
Wound picking	10.57	10.50	4.92	4.36	7.85	8.47
Burning	3.55	2.58	2.43	2.28	2.92	2.43
Inserting objects	3.80	3.56	9.14	10.04	6.92	8.20
Biting	11.73	10.69	4.50	3.23	8.52	8.91
Skin picking	8.70	9.04	6.57	6.58	7.82	7.96
Scraping	12.94	15.31	8.40	14.86	11.19	15.01
Erasing	5.56	3.78	1.67	.56	4.58	3.68

Note. Participants who were classified as discontinued engagement in NSSI still had the option to report frequency of occurrences of NSSI behaviors over the past 12 months.

Cutting or carving. The most frequently endorsed NSSI behavior for the total sample as well as for both the groups of Continued NSSI and Discontinued NSSI was cutting or carving of the skin. Of the total sample, 72.8% (n = 75) of participants reported cutting or carving their skin at some point in their lives and 20.04% (n = 21) of the total sample reported they had done this

within the past 12 months. When asked about cutting and carving behaviors, 14.6% (n = 15) of the total sample reported that they received medical attention for their NSSI. When only considering reports from those considered to have Continued NSSI, 80.0% (n = 40) reported that they had engaged in cutting or carving of the skin at some point in their lives, with 38.0% (n =19) reporting having done so in the past 12 months. When asked about cutting behaviors, those who were considered to have Continued NSSI, 18.0% (n = 9) reported that they had received medical attention for this type of injury at some point in their lives. When only considering reports from those who were categorized as having Discontinued NSSI, 66.0% (n = 35) reported cutting or carving of the skin at some point in their lives with 3.8% (n = 2) reported having done so in the past 12 months. When asked about cutting behaviors, 11.3% (n = 6) reported that they had received medical attention for this type of injury at some point in their lives.

Frequency of NSSI behaviors varied. Lifetime occurrence of cutting and carving behaviors for the entire sample ranged from 1 to 150 occurrences (M = 16.65, SD = 28.81). Occurrence of cutting and carving behaviors for those in the Continued NSSI group ranged from 1 to 150 (M = 21.20, SD = 33.93) and occurrences for those considered Discontinued NSSI ranged from 1 to 100 (M = 10.96, SD = 20.02).

Self-hitting. Of the total sample, 67.0% (n = 69) of participants reported hitting themselves at some point in their lives and 21.0% (n = 22) of the total sample reported they had done this within the past 12 months. When asked about hitting behaviors, 1.9% (n = 2) of the total sample reported that they received medical attention for this specific NSSI behavior. When only considering reports from those considered to have Continued NSSI, 74.0% (n = 37) reported that they had engaged in self-hitting at some point in their lives with 3.0% (n =17) reporting having done so in the past 12 months. When asked about hitting behaviors for those

who were considered to have Continued NSSI, 4.0% (*n* = 2) reported that they had received medical attention for this type of injury at some point in their lives. When only considering reports from those who were categorized as having Discontinued NSSI, 60.4% (*n* = 32) reported self-hitting at some point in their lives with 9.4% (*n* =5) reported having done so in the past 12 months. When asked about self-hitting behaviors, there were no participants who reported that they had received medical attention for this type of injury at any point in their lives.

Frequency of NSSI behaviors varied. Lifetime occurrence of self-hitting behaviors for the entire sample ranged from 1 to 30 occurrences (*M* = 8.07, *SD* = 7.83). Occurrence of self-hitting behaviors for those considered to have Continued NSSI ranged from 1 to 30 (*M* = 10.58, *SD* =9.33) and occurrences for those considered Discontinued from NSSI ranged from 1 to 13 (*M* = 4.80, *SD* = 3.34).

Hair pulling. Participants were also asked about engaging in hair pulling with the intent to hurt oneself but not to die. Of the total sample, 33.0% (*n* = 34) of participants reported hair pulling at some point in their lives and 21.0% (*n* = 22) of the total sample reported they had done this within the past 12 months. When asked about hair pulling behaviors, 1.0% (*n* = 1) of the total sample reported that they received medical attention for this specific type of NSSI. When only considering reports from those considered to have Continued NSSI, 34.0% (*n* = 17) reported that they had engaged in hair pulling at some point in their lives with 14.0% (*n* = 7) reporting having done so in the past 12 months. When asked about hair pulling, those who were considered to have Continued NSSI, 1.0% (*n* = 1) had received medical attention for this type of injury at some point in their lives. When only considering reports from those who were categorized as having Discontinued NSSI, 32.1% (*n* = 17) reported hair pulling at some point in their lives with 3.8% (*n* = 2) reported having done so in the past 12 months. When asked about

hair pulling behaviors, there were no participants who reported that they had received medical attention for this type of injury at any point in their lives.

Frequency of hair pulling varied. Lifetime occurrence of hair pulling behaviors for the entire sample ranged from 1 to 30 occurrences (M = 6.22, SD = 7.61). Occurrence of hair pulling for those considered to have Continued NSSI ranged from 1 to 30 (M = 7.67, SD = 8.90) and occurrences for those considered to have Discontinued NSSI ranged from 1 to 8 (M = 3.33, SD = 2.73).

Self-tattooing. Participants were also asked about engaging in self-tattooing with the intent to hurt oneself but not to die. Of the total sample, 13.6% (n = 14) of participants reported self-tattooing at some point in their lives and 1.9% (n = 2) of the total sample reported they had done this within the past 12 months. When asked about self-tattooing behaviors, there were no participants in the sample who reported that they received medical attention for this specific type of NSSI. When only considering reports from those considered to have Continued NSSI, 14.0% (n = 7) reported that they had engaged in self-tattooing at some point in their lives with 2.0% (n =1) reporting having done so in the past 12 months. When only considering reports from those who were categorized as having Discontinued NSSI, 13.2% (n = 7) reported self-tattooing at some point in their lives with 1.9% (n =1) reported having done so in the past 12 months.

Frequency of self-tattooing varied. Lifetime occurrence of self-tattooing behaviors for the entire sample ranged from 1 to 7 occurrences (M = 2.18, SD = 1.78). Occurrence of self-tattooing behaviors for those considered to have Continued NSSI ranged from 1 to 2 (M = 1.20, SD = 0.45) and occurrences for those considered to have Discontinued NSSI ranged from 1 to 7 (M = 3.00, SD = 2.01).

Wound picking. Participants were also asked about engaging in picking wounds with the intent to hurt oneself but not to die. Of the total sample, 47.6% (n = 49) of participants reported wound picking at some point in their lives and 19.4% (n = 20) of the total sample reported they had done this within the past 12 months. When asked about wound picking behaviors, 1.9% (n = 2) of the total sample reported that they received medical attention for this specific type of NSSI. When only considering reports from those considered to have Continued NSSI, 48.0% (n = 24) reported that they had engaged in wound picking at some point in their lives with 26.0% (n = 13) reporting having done so in the past 12 months. When asked about wound picking, those who were considered to have Continued NSSI reported 1.0% (n = 1) had received medical attention for this type of injury at some point in their lives. When only considering reports from those who were categorized as having Discontinued NSSI, 47.2% (n = 25) reported wound picking at some point in their lives with 13.2% (n = 7) reported having done so in the past 12 months. When asked about wound picking, 1.9% (n = 1) reported that they had received medical attention for this type of injury at some point in their lives.

Frequency of wound picking varied. Lifetime occurrence of wound picking behaviors for the entire sample ranged from 1 to 40 occurrences (M = 7.85, SD = 8.46). Occurrence of wound picking behaviors for those considered to have Continued NSSI ranged from 1 to 40 (M =10.57, SD =10.45) and occurrences for those considered to have Discontinued NSSI ranged from 1 to 15 (M = 4.92, SD = 4.37).

Burning. Participants were also asked about intentionally burning themselves. Of the total sample, 35.9% (n = 37) of participants reported burning at some point in their lives and 15.5% (n = 16) of the total sample reported they had done this within the past 12 months. When asked about burning behaviors, 1.0% (n = 1) of the total sample reported that they received

medical attention for this specific type of NSSI. When only considering reports from those considered to have Continued NSSI, 40.0% (*n* = 20) reported that they had engaged in burning at some point in their lives with 22.0% (*n* = 11) reporting having done so in the past 12 months. When asked about burning, those who were considered to have Continued NSSI reported 1.0% (*n* = 1) had received medical attention for this type of injury at some point in their lives. When only considering reports from those who were categorized as having Discontinued NSSI, 32.1% (*n* = 17) reported intentionally burning themselves at some point in their lives with 9.4% (*n* = 5) reported having done so in the past 12 months. When asked about burning behaviors, there were no participants categorized as having Discontinued NSSI who reported that they had received medical attention for this type of injury at some point in their lives.

Frequency of intentional burning varied. Lifetime occurrence of burning behaviors for the entire sample ranged from 1 to 10 occurrences (*M* = 2.29, *SD* = 2.43). Occurrence of burning behaviors for those considered to have Continued NSSI ranged from 1 to 10 (*M* = 3.55, *SD* = 2.58) and occurrences for those considered to have Discontinued NSSI ranged from 1 to 10 (*M* = 2.43, *SD* = 2.27).

Inserting objects. Participants were also asked about inserting objects under their nails or skin with the intent to hurt oneself but not to die. Of the total sample, 19.4% (*n* = 20) of participants reported inserting objects under their skin at some point in their lives and 5.8% (*n* = 6) of the total sample reported they had done this within the past 12 months. When asked about inserting objects into the skin, there were no participants in this study who reported having sought medical attention for having done so. When only considering reports from those considered to have Continued NSSI, 20.0% (*n* = 10) reported that they had inserted objects under their skin at some point in their lives with 10.0% (*n* = 5) reporting having done so in the past 12

months. When only considering reports from those who were categorized as having Discontinued NSSI, 18.9% (*n* = 10) reported inserting objects under their skin at some point in their lives with 1.9% (*n* = 1) reported having done so in the past 12 months.

Frequency of object insertion varied. Lifetime occurrence of inserting objects under skin for the entire sample ranged from 1 to 30 occurrences (*M* = 6.92, *SD* = 8.20). Occurrence of object inserting for those considered to have Continued NSSI ranged from 1 to 10 (*M* = 3.8, *SD* = 3.56) and occurrences for those considered to have Discontinued NSSI ranged from 1 to 30 (*M* = 9.14, *SD* = 10.04).

Biting. Participants were also asked if they had ever bitten themselves with the intention of hurting themselves. Of the total sample, 41.7% (*n* = 43) of participants reported biting themselves at some point in their lives and 16.5% (*n* = 17) of the total sample reported they had done this within the past 12 months. When asked about biting behaviors, 1.0% (*n* = 1) of the total sample reported that they received medical attention for this specific type of NSSI. When only considering reports from those considered to have Continued NSSI, 50.0% (n = 25) reported that they had engaged in self-biting behaviors at some point in their lives with 26.0% (n =13) reporting having done so in the past 12 months. When asked about biting, those who were considered to have Continued NSSI did not report ever having received medical attention for this type of injury at any point in their lives. When only considering reports from those who were categorized as having Discontinued NSSI, 34.0% (*n* = 18) reported intentionally biting themselves at some point in their lives with 7.5% (*n* = 4) reported having done so in the past 12 months. When asked about biting behaviors, 1.0% (*n* = 1) of those who were categorized as having Discontinued NSSI reported that they had received medical attention for this type of injury at some point in their lives.

Frequency of intentional biting behaviors varied. Lifetime occurrence of biting behaviors for the entire sample ranged from 1 to 40 occurrences (M = 8.52, SD = 8.91). Occurrence of biting behaviors for those considered to have Continued NSSI ranged from 3 to 40 (M = 11.73, SD = 10.69) and occurrences for those considered to having Discontinued NSSI ranged from 1 to 10 (M = 4.50, SD = 3.23).

Skin picking. Participants were also asked about picking skin on areas of the body to the point of drawing blood with the intent to hurt oneself. Of the total sample, 27.2% (n = 28) of participants reported skin picking at some point in their lives and 8.7% (n = 9) of the total sample reported they had done this within the past 12 months. When asked about skin picking behaviors, 1.0% (n = 1) of the total sample reported that they received medical attention for this specific type of NSSI. When only considering reports from those considered to have Continued NSSI, 32.0% (n = 16) reported that they had engaged in skin picking at some point in their lives with 14.0% (n = 7) reporting having done so in the past 12 months. When asked about burning, those who were considered to have Continued NSSI did not report having received medical attention for this type of injury at any point in their lives. When only considering reports from those who were categorized as having Discontinued NSSI, 22.6% (n = 12) reported intentionally picking skin to the point of drawing blood at some point in their lives with 3.8% (n = 2) reported having done so in the past 12 months. When asked about skin picking behaviors, 1.9% (n = 1) of participants categorized as having Discontinued NSSI reported that they had received medical attention for this type of injury at some point in their lives.

Frequency of skin picking varied. Lifetime occurrence of skin behaviors for the entire sample ranged from 2 to 30 occurrences (M = 7.82, SD = 7.96). Occurrence of skin picking behaviors for those considered to have Continued NSSI ranged from 2 to 30 (M = 8.70, SD =

9.04) and occurrences for those considered to have Discontinued NSSI ranged from 2 to 20 (*M* = 6.57, *SD* = 6.58).

Scraping. Participants were also asked about intentionally scraping their skin. Of the total sample, 41.7% (*n* = 43) of participants reported scraping at some point in their lives and 15.5% (*n* = 16) of the total sample reported they had done this within the past 12 months. There were no participants in this sample who reported that they received medical attention for this specific type of NSSI at any time. When only considering reports from those considered to have Continued NSSI, 48.0% (*n* = 24) reported that they had engaged in scraping at some point in their lives with 28.0% (*n* = 14) reporting having done so in the past 12 months. When only considering reports from those who were categorized as having Discontinued NSSI, 35.8% (*n* = 19) reported intentionally scraping their skin at some point in their lives with 3.8% (*n* = 2) reported having done so in the past 12 months.

Frequency of intentional scraping varied. Lifetime occurrence of scraping behaviors for the entire sample ranged from 1 to 50 occurrences (*M* = 11.19, *SD* = 15.01). Occurrence of scraping behaviors for those considered to have Continued NSSI ranged from 2 to 50 (*M* = 12.94, *SD* = 15.31) and occurrences for those considered to have Discontinued NSSI ranged from 1 to 50 (*M* = 8.4, *SD* = 14.86).

Erasing. Participants were also asked about erasing their skin to the point of drawing blood. Of the total sample, 19.4% (*n* = 20) of participants reported erasing at some point in their lives and 4.9% (*n* = 5) of the total sample reported they had done this within the past 12 months. When asked about erasing behaviors, 1.0% (*n* = 1) of the total sample reported that they received medical attention for this specific type of NSSI. When only considering reports from those considered to have Continued NSSI, 28.0% (*n* = 14) reported that they had engaged in erasing at

some point in their lives with 10.0% (*n* = 5) reporting having done so in the past 12 months. When asked about erasing, those who were considered to have Continued NSSI reported 1.0% (*n* = 1) had received medical attention for this type of injury at some point in their lives. When only considering reports from those who were categorized as having Discontinued NSSI, 11.3% (*n* = 6) reported intentionally erasing themselves at some point in their lives. There were no participants in this sample who were categorized as having Discontinued NSSI who reported erasing skin within the past 12 months or who reported ever having received medical attention for this specific type of NSSI behavior.

Frequency of intentional erasing varied. Lifetime occurrence of erasing behaviors for the entire sample ranged from 1 to 10 occurrences (*M* = 4.58, *SD* = 3.68). Occurrence of erasing behaviors for those considered to have Continued NSSI ranged from 1 to 10 (*M* = 5.56, *SD* = 3.78) and occurrences for those considered to have Discontinued NSSI ranged from 1 to 2 (*M* = 1.67, *SD* = .58).

Descriptive statistics of the main variables. Table 8 displays the means, standard deviations, and ranges of participant scores for RSSIQ Vulnerability-related reasons for stopping NSSI, RSSIQ Resiliency-related reasons for stopping NSSI, FASM *automatic-positive reinforcement*, FASM *automatic-negative reinforcement*, FASM *social-positive reinforcement*, and FASM *social-negative reinforcement.*

Table 8

Means, Standard Deviations, and Ranges of Main Variables

	M	*SD*	Range	Minimum	Maximum
FASM: ANR	2.84	1.03	3.00	1.00	4.00
FASM: APR	2.42	0.88	3.00	1.00	4.00
FASM: SNR	1.30	0.45	2.00	1.00	3.00
FASM: SPR	1.31	0.37	2.23	1.00	3.23
RSSIQ: Resiliency	2.90	1.05	4.00	1.00	5.00
RSSIQ: Vulnerability	2.05	0.92	3.53	1.00	4.53

Note. ANR = *automatic-negative reinforcement*; APR = *automatic-positive reinforcement*; SNR = *social-negative reinforcement*; SPR = *social-positive reinforcement*.

Data Cleaning

For the main variables in question (i.e., Discontinued versus Continued NSSI; RSSIQ: Vulnerability-related reasons and RSSIQ: Resiliency-related reasons; and FASM*: automatic-positive reinforcement*, FASM: *automatic-negative reinforcement*, FASM: *social-positive reinforcement*, and FASM: *social-negative reinforcement*) one (1.0%) participant of the 103 participants failed to respond to one item of out four. For this single item, the mean value was calculated for that measure based on the other completed items for that participant, and this value was imputed for the missing value.

Factor Analysis of RSSIQ

Factor loadings for the RSSIQ were important to the current study as the criterion variables for two of the original research questions involved a determination whether individuals scored higher on vulnerability or resiliency factors for stopping NSSI. The original factor loadings used in the development of the RSSIQ were not obtainable. Despite the note in the original publication on the development of the RSSIQ scale indicating, “Factor loadings for each item are available from the first author on request” (Turner et al., 2014), the author was unable to furnish the data when contacted by the current researcher. Therefore, a factor analysis was

conducted to determine the higher-order factors reported for this measure: Vulnerability- and Resiliency-related reasons to stop self-injury. As described in Chapter Three, the RSSIQ originally showed nine factors (Desire for change, Negative emotional control, Negative impact on relationships, Body concerns, Situational and environmental, Addiction/NSSI getting worse, and Other's expectations). These nine factors were then organized into two higher-order factors that were used as the dependent variables in this study (Vulnerability-related reasons and Resiliency-related reasons). When the factor analysis was conducted forcing two components to be extracted, there were three items that did not meet the criteria for inclusion in this study (no cross loadings within 0.100 of each other). The three items that were excluded were a) item 27 *"I have supportive and caring people around me who can help me when I feel the urge,"* b) item 32 *"I don't want to lose too much blood or pass out,"* and c) item 33 *"I want my scars to heal."* These three items were excluded from analyses. The factor loadings for each item on the RSSIQ are found in Table 9.

Table 9

Factor Loadings of the RSSIQ

Item	Factor		Item	Factor	
	1	2		1	2
8.	.718	.109	19.	.518	.378
38.	.715	.188	40.	.493	.391
20.	.710	.081	*27.	.482	.479
31.	.700	.297	*33.	.459	.404
14.	.676	.130	15.	.219	.768
30.	.673	.361	26.	.152	.754
16.	.663	.350	28.	.166	.690
17.	.644	.355	29.	.190	.682
21.	.643	.336	23.	-.007	.660
37.	.638	.243	10.	.203	.651
4.	.628	.139	3.	.223	.645
39.	.620	.139	11.	.225	.643
5.	.614	.073	34.	.468	.620
2.	.608	-.033	36.	.318	.600
22.	.601	.271	18.	.243	.599
35.	.590	.212	*32.	.498	.568
1.	.585	.141	12.	.410	.515
9.	.565	.192	24.	-.117	.442
25.	.521	.178	6.	.292	.416
13.	.520	.273	7.	.186	.347

Note. Extraction method: Principle Component Analysis. Rotation method: Varimax with Kaiser Normalization. Rotation converged in 3 iterations.
* = Items that were not retained.

The regression models that were performed in this study were based on the independent factor analyses conducted with the collected sample and not with those provided by the measure's original authors.

Main Analyses

Correlations for the main research variables are displayed in Table 10, including a) RSSIQ: Vulnerability-related reasons, b) RSSIQ: Resiliency-related reasons, c) FASM: *automatic-positive reinforcement*, d) FASM: *automatic-negative reinforcement*, e) FASM:

s*ocial-positive reinforcement*, and f) FASM: *social-negative reinforcement.* Correlations for the main research variables including covariates are displayed in Table 11.

Table 10

Correlations Among Variables

Variable	1	2	3	4	5	6
1. FASM: ANR	--					
2. FASM: APR	.67**	--				
3. FASM: SNR	.22*	.12	--			
4. FASM: SPR	.26**	.12	.51*	--		
5. RSSIQ: Resiliency	.13	.19*	.08	.207*	--	
6. RSSIQ: Vulnerability	.21*	.29**	.215*	.221*	.648*	--

Note. ANR = *automatic-negative reinforcement*; APR = *automatic-positive reinforcement*; SNR = *social-negative reinforcement*; SPR = *social-positive reinforcement*.
*$p < .05$, **$p < .001$.

Table 11

Correlations Among Variables and Covariates.

Variable	1	2	3	4	5	6	7	8
1. FASM: ANR	--							
2. FASM: APR	.67**	--						
3. FASM: SNR	.23*	.12	--					
4. FASM: SPR	.26*	.12	.51**	--				
5. RSSIQ: Resiliency	.14	.20*	.08	.21*	--			
6. RSSIQ: Vulnerability	.22*	.29**	.21*	.21*	.63**	--		
7. PHQ-9	.41**	.36**	.05	.04	.28*	.25*	--	
8. Age	.03	.07	-.09	-.14	-.02	-.12	-.07	--

Note. ANR = *automatic-negative reinforcement*; APR = *automatic-positive reinforcement*; SNR = *social-negative reinforcement*; SPR = *social-positive reinforcement*.
*$p < .05$, **$p < .001$.

Prior to running main analyses, a test of multicollinearity was performed as suggested by Field (2013). Field (2013) suggested running the intended equation as a linear regression and having SPSS report collinearity statistics, $F(6, 96) = 2.19$, $p = .05$. Using suggested guidelines for assessing tolerance (Menard, 1995), none of the variables were less than .1, suggesting there were no problems with multicollinearity. Additionally, no VIF scores were greater than 10, which again suggests there is no problem with multicollinearity (Myers, 1990). Tolerance and VIF scores for the main variables are provided in Table 12.

Table 12

Collinearity Statistics

	Tolerance	VIF Scores
FASM: ANR	.51	1.96
FASM: APR	.52	1.93
FASM: SNR	.71	1.42
FASM: SPR	.69	1.46
RSSIQ: Resiliency	.59	1.70
RSSIQ: Vulnerability	.56	1.80

Note. Guidelines suggest VIF scores > 10.0 or tolerance < 0.1 may indicate a problem with multicollinearity.

RQ1: Which of the four functions of NSSI is the strongest predictor that an individual will have discontinued NSSI later in life?

In order to answer this question, a logistic regression analysis was conducted. The purpose of conducting a logistic regression on the accumulated data was to determine if there was predictive ability of a measure, which assessed the motivation for engaging in non-suicidal self-injury on whether individuals were considered to be actively engaging in NSSI or to have discontinued such behavior.

In conducting this analysis, an original classification with no predictor variables entered into the model determined a non-significant correct classification (51.5%) of participants who either engaged or denied NSSI. In other words, without using any predictor variables, there was a nearly 50:50 chance of being able to correctly predict if someone would have been in the Continued NSSI or Discontinued NSSI group. This analysis was conducted to determine the random chance of participants falling into either the Continued NSSI classification or the Discontinued classification of NSSI. This was important to the current study to ensure that participants were not uniformly continuing or discontinuing NSSI regardless of the predictor variables in question.

Predictors were then entered into two blocks in the analyses using the Enter method. The first block contained control variables: PHQ-9, Age, Counseling, Medication, Trauma, and Gender. Scores on a measure of depression (PHQ-9) were the first entered into Block One because of the high overlap between depressive symptoms and NSSI. Next, age was entered into the block. Age and PHQ-9 scores were continuous variables and therefore were not altered in any way. The next four variables were categorical and therefore adjustments needed to be made dichotomous in order for them to be used in this regression analysis. Medication, Trauma, and

Counseling were recoded (Medication 0 = No, Trauma 0 = Yes, and Counseling 0 = No). Due to there only being one participant that identified gender as neither male or female and the majority of participants reported that they were female, Gender was recoded into a dichotomous variable of 0 = female, 1 = not female. Sexual orientation and ethnicity were not included as predictors in an attempt to protect the power of the analysis. For these variables, there was a lack of heterogeneity and ANOVA analyses suggested no significant difference on the outcome variable based on these predictors: sexual orientation $F(4, 98) = 1.53$, $p = .201$; ethnicity $F(4, 98) = 1.18$, $p = .324$.

The first regression analyses assessed the likelihood that a participant would have discontinued NSSI in the past 12 months. This equation was significant, X^2 (6, N =1-3) = 15.72, $p = .015$ (see Table 13). Specifically, results indicated that those individuals with higher scores on a measure of depressive symptoms (PHQ-9) were more likely to have Discontinued NSSI (β = -.09, $p = .01$). The Nagelkerke R^2 for the first step in this model was .189 and there was a 64.1% ability to correctly predict if an individual would continue or discontinue NSSI.

In the second step of this regression, the same variables included in step one were added (PHQ-9, Age, Gender, Counseling, Medication, and Trauma) in addition to the four predictor variables. These additional four predictor variables were derived from the FASM and represent the four different motivational categories for engaging in NSSI. They were a) *automatic-positive reinforcement*, b) *automatic-negative reinforcement*, c) s*ocial-positive reinforcement*, and d) *socia- negative reinforcement.* The second step of the model was not found to be significant, X^2 (4, N =1-3) = 1.83, $p = .767$. The Nagelkerke R^2 for the first step in this model was .21, resulting in a change of .02 from the first step. With the addition of the second step, the model was able to correctly classify Continued or Discontinued NSSI 68% of the time, an increase of 3.9%

predictive ability. Scores for the measure of depressive symptoms (PHQ-9) remained significant (β = -.07, *p* = .043). The four additional predictor variables in question failed to reach significance: a*utomatic-negative reinforcement* (β = -.39, *p* = .224), *automatic-positive reinforcement* (β = .09, *p* = .807), *social-negative reinforcement* (β = .30, *p* = .629), and *social-positive reinforcement* (β = -.13, *p* = .861). The overall model did not achieve significance, X^2 (10, *N* = 103) = 17.551, *p* = .063.

Table 13

Logistic Regression Models for Research Question One

Step and Variable(s)	Discontinued versus Continued NSSI							
	X^2	*df*	*p*	% Correct	*B*	*SE B*	*β*	*p*
1. Covariates	15.72	6	.015	64.1				
PHQ-9					-.09	.03	.92	.010*
Age					.14	.11	1.15	.214
Counseling					-.69	.58	.50	.236
Medication					<-.01	.59	1.00	.997
Trauma					-.20	.46	.82	.661
Gender					-.46	.50	.63	.351
2. FASM	1.83	4	.767	68.0				
PHQ-9					-.07	.04	.93	.043*
Age					.14	.12	1.15	.230
Counseling					-.78	.62	.46	.208
Medication					.17	.62	1.19	.777
Trauma					-.31	.50	.73	.530
Gender					-.75	.57	.44	.19
ANR					-.39	.32	.68	.224
APR					.09	.35	1.09	.807
SNR					.30	.61	1.34	.629
SPR					-.13	.73	.88	.861

Note. Final model for Research Question One: X^2 (10, *N* = 103) = 17.551, *p* = .063
*$p < .05$

RQ2: Which of the four functions of NSSI is the strongest predictor of Vulnerability-related reasons for discontinuation of NSSI?

The second question that this study attempted to answer was "Which of the four functions of NSSI (*automatic-positive reinforcement, automatic-negative reinforcement, social-positive reinforcement,* and *social-negative reinforcement*) is the strongest predictor of Vulnerability-related reasons for discontinuation of NSSI?" The purpose of conducting multiple linear regressions was to determine whether there was predictive ability related to the function served by NSSI and the reasons participants stated they stopped such behaviors. The dependent variable used to answer this research question was Vulnerability-related reasons for stopping NSSI.

Three separate analyses were conducted to answer this research question, the first looking at the ability of the four functions of NSSI to predict scores on Vulnerability reasons to stop NSSI for the entire sample. The second two analyses used the same model to analyze these relationships for those who were considered Continued NSSI, and for those who were considered to have Discontinued NSSI independently (see Table 14).

Analysis with the entire sample. When analyzing Vulnerability factors for the entire sample of participants, covariate predictors were entered in the same way as in the analysis performed to answer research question one. The variables Age, Gender, PHQ-9, Counseling, Medication, and Trauma were all placed into the first step of the model using the Enter method. The dichotomous variables were coded in the same manner as in previous analyses. Next the predictor variables in question (*automatic-positive reinforcement, automatic-negative reinforcement, social-positive reinforcement,* and *social-negative reinforcement*) were added into the second step of the model.

Overall, the first step of this regression model predicting scores for Vulnerability-related reasons to stop NSSI was not significant, $R^2 = .09$, $F(6, 96) = 1.65$, $p = .143$. Although this covariate first step was not found to be significant, PHQ-9 scores were significantly related to scores for Vulnerability reasons for stopping NSSI ($\beta = .24$, $p = .026$). When the predictor variables in question were added to the model in the second step, the model reached significance, $\Delta R^2 = .09$, $F(10, 92) = 2.56$, $p = .044$. At this step, PHQ-9 scores were no longer significant in predicting scores for Vulnerability-related reasons for stopping NSSI. Instead, participants' ratings of *automatic-positive reinforcement* as a function of NSSI significantly predicted higher scores for Vulnerability-related reasons for stopping NSSI ($\beta = .27$, $p = .005$). When examining the entire sample of Continued and Discontinued NSSI groups, the answer to research question two is that *automatic-positive reinforcement* motivations for engaging in NSSI is the strongest predictor of Vulnerability-related reasons for stopping NSSI later in life.

Analysis with Continued NSSI sample. When analyzing Vulnerability factors for the portion of the participants who were categorized as Continued NSSI, covariate predictors were again entered in the same way as in the previous analysis. The variables Age, Gender, PHQ-9, Counseling, Medication, and Trauma were all placed into the first step of the model using the Enter method. The dichotomous variables were coded in the same manner as in previous analyses. Next the predictor variables in question (*automatic-positive reinforcement, automatic-negative reinforcement, social-positive reinforcement,* and *social-negative reinforcement*) were added into the second step of the model.

The first step of this model was not found to be significant in prediction of scores for Vulnerability-related reasons for stopping NSSI, $R^2 = .15$, $F(6, 43) = 1.30$, $p = .278$. None of the covariates at this step of the model was found to be individually significant in predicting scores

for Vulnerability-related reasons for stopping NSSI for the portion of the sample that were categorized as continued engagers in NSSI. Again, the four functions of NSSI were entered into the second step of the model, specifically for continued engagers. Although approaching significance, this second step was also found to be nonsignificant, ΔR^2 =.17, $F(4, 39) = 2.50$, p = .058. However, when individual predictors were analyzed, it was found that both *automatic-positive reinforcement* (β = .46, p = .036) and *social-positive reinforcement* (β = .37, p = .032) were determined to be significant predictors of higher scores on Vulnerability-related reasons for stopping NSSI. When considering the answer to research question two, *automatic-positive reinforcement* again seems to be the strongest predictor of Vulnerability-related reasons for stopping engagement in NSSI.

Analysis with Discontinued NSSI sample. When analyzing Vulnerability factors for the portion of the participants who were categorized as Discontinued NSSI, covariate predictors were again entered in the same way as in the previous analysis. The variables Age, Gender, PHQ-9, Counseling, Medication, and Trauma were all placed into the first step of the model using the Enter method. The dichotomous variables were coded in the same manner as in previous analyses. Next the predictor variables in question (*automatic-positive reinforcement, automatic-negative reinforcement, social-positive reinforcement,* and *social-negative reinforcement*) were added into the second step of the model.

The first step of this model for those who were categorized as having Discontinued NSSI was not significant, R^2 =.14, $F(6, 46) = 1.28$, p = .285. When looked at individually, there were no covariate factors in this model that were determined to be significant. Additionally, for this subset of the entire sample, the second step of the model did not reach significance, ΔR^2 = .09, $F(4, 42) = 1.20$, p = .326. Although the final model of this analysis was not significant and none

of the individual predictors reached significances, the strongest predictor of Vulnerability-related reasons for stopping NSSI for the portion of participants who were categorized as having Discontinued NSSI was *social-negative reinforcement* ($\beta = .29$, $p = .103$).

Table 14

Hierarchical Multiple Linear Regression Models for Research Question Two

	Total Sample[a]							
Step and Variable(s)	*df*	R^2	ΔR^2	ΔF	*B*	*SE B*	β	*t*
1. Covariates	(6, 96)	.09	.09	1.65				
PHQ-9					.03	.01	.24	2.27*
Age					-.02	.03	-.08	-.78
Counseling					.06	.25	.03	.23
Medication					-.25	.25	-.13	-1.04
Trauma					-.18	.19	-.09	-.92
Gender					.03	.20	.01	.12
2. FASM	(10, 92)	.18	.09	2.56*				
PHQ-9					.02	.01	.19	1.69
Age					-.02	.03	-.06	-.55
Counseling					-.04	.25	.02	-.17
Medication					-.23	.25	-.12	-.95
Trauma					.04	.20	.02	.19
Gender					.11	.22	.06	.51
ANR					-.03	.13	-.03	-.20
APR					.28	.14	.27	2.02*
SNR					.19	.24	.09	.77
SPR					.36	.30	.14	1.21

	Continued NSSI[b]							
Step and Variable(s)	*df*	R^2	ΔR^2	ΔF	*B*	*SE B*	β	*t*
1. Covariates	(6, 43)	.15	.15	1.30				
PHQ-9					.04	.02	.31	2.00
Age					-.06	.12	-.08	-.48
Counseling					-.10	.36	-.05	-.29
Medication					-.33	.34	-.17	-.98
Trauma					.11	.30	.05	.36
Gender					-.39	.35	-.19	-1.31
2. FASM	(4, 39)	.36	.17	2.50				
PHQ-9					.02	.02	.16	1.00
Age					.01	.12	.01	.09
Counseling					-.17	.36	-.09	-.48
Medication					-.51	.33	-.26	-1.52
Trauma					.37	.30	.19	1.23
Gender					-.17	.39	-.08	-.44
ANR					-.11	.22	-.11	-.49
APR					.48	.22	.46	2.17*
SNR					-.10	.38	-.04	-.26

SPR					1.17	.52	.37	2.22*
	Discontinued NSSI[c]							
Step and Variable(s)	*df*	R^2	ΔR^2	ΔF	*B*	*SE B*	β	*t*
1. Covariates	(6, 46)	.14	.14	1.28				
PHQ-9					.03	.02	.21	1.37
Age					-.02	.03	-.08	-.55
Counseling					-.07	.37	-.04	-.19
Medication					.08	.37	.04	.21
Trauma					-.35	.26	-.20	-1.37
Gender					.47	.28	-.08	1.67
2. FASM	(4, 42)	.23	.09	1.20				
PHQ-9					.03	.02	.20	1.30
Age					-.02	.03	-.08	-.51
Counseling					-.13	.39	-.08	-.33
Medication					.12	.39	.07	.31
Trauma					-.22	.28	-.12	-.78
Gender					.41	.30	.22	1.40
ANR					-.07	.17	-.02	-.01
APR					.12	.20	.11	.59
SNR					.53	.32	.29	1.67
SPR					-.04	.38	-.02	-.11

Note. Dependent variable: Vulnerability-related reasons for discontinuing NSSI.
[a] Final model for Research Question Two, Total Sample: $F(4, 92) = 2.56$, $p = .044$
[b] Final model for Research Question Two, Continued NSSI: $F(4, 39) = 2.50$, $p = .058$
[c] Final model for Research Question Two, Discontinued NSSI: $F(4, 42) = 1.20$, $p = .326$
*$p < .05$

RQ3: Which of the four functions of NSSI is the strongest predictor of Resiliency-related reasons for discontinuation of NSSI?

The third research question intended to answer "Which of the four functions of NSSI is the strongest predictor of Resiliency-related reasons for discontinuation of NSSI?" The purpose of conducting multiple linear regressions was to determine whether there was predictive ability related to the function served by NSSI and the reasons participants stated they stopped such behaviors. The dependent variable used to answer this research question was Resiliency-related reasons for stopping NSSI.

Three separate analyses were conducted to answer this research question, the first looking at the ability of the four functions of NSSI to predict scores on Resiliency-related reasons to stop NSSI for the entire sample. The second two analyses used the same model to analyze these relationships for those who were considered Continued NSSI, and for those who were considered to have Discontinued NSSI independently (see Table 15).

Analysis with the entire sample. When analyzing Resiliency-related reasons for the entire sample of participants, covariate predictors were entered in the same way as in the analysis performed to answer research question one. The variables Age, Gender, PHQ-9, Counseling, Medication, and Trauma were all placed into the first step of the model using the Enter method. The dichotomous variables were coded in the same manner as in previous analyses. Next, the predictor variables in question (*automatic-positive reinforcement, automatic-negative reinforcement, social-positive reinforcement,* and *social-negative reinforcement*) were added into the second step of the model.

Overall, the first step of this regression model predicting scores for Resiliency-related reasons to stop NSSI was not significant, $R^2 = .09$, $F(6, 96) = 1.58$, $p = .160$. Although this

covariate first step was not found to be significant, PHQ-9 scores were again significantly related to scores for Resiliency-related reasons for stopping NSSI (β = .26, p = .016). When the predictor variables in question were added to the model in the second step, the model again failed to reached significance, ΔR^2 = .05, F(4, 92) = 1.39, p = .243. At this step, PHQ-9 scores continued to be significant in predicting scores for Resiliency-related reasons for stopping NSSI (β = .27, p = .019). None of the predictor variables in question reached significance when entered into the second step of the model. When looking at the entire sample of Continued and Discontinued NSSI, the answer to research question three is *social-positive reinforcement* (β = .21, p = .085) is the strongest predictor of Vulnerability-related reasons for stopping NSSI later in life, despite not reaching significance.

Analysis with Continued NSSI sample. When analyzing Resiliency-related reasons for the portion of the participants who were categorized as Continued NSSI, covariate predictors were again entered in the same way as in the previous analysis. The variables Age, Gender, PHQ-9, Counseling, Medication, and Trauma were all placed into the first step of the model using the Enter method. The dichotomous variables were coded in the same manner as in previous analyses. Next the predictor variables in question (*automatic-positive reinforcement, automatic-negative reinforcement, social-positive reinforcement,* and *social-negative reinforcement*) were added into the second step of the model.

The first step of this model was not found to be significant in prediction of scores for Resiliency-related reasons for stopping NSSI, R^2 = .15, F(6, 46) = 1.25, p = .101. The only variable that was found to have a significant relationship with scores on Resiliency-related reasons for stopping NSSI for the portion of the sample that was categorized as Continued NSSI was PHQ-9 (β = .31, p = .05). Again, the four functions of NSSI were entered into the second

step of the model, specifically for discontinued engagers. The second step was also found to be nonsignificant, ΔR^2 =.15, $F(4, 39) = 2.08$, $p = .103$. However, *social-positive reinforcement* was found to be a significant predictor of Resiliency-related reasons for stopping NSSI for those who were categorized as continuing NSSI (β =.43, $p = .015$). When considering the answer to research question three, *social-positive reinforcement* seemed to be the strongest predictor of Vulnerability-related for stopping engagement in NSSI.

Analysis with Discontinued NSSI sample. When analyzing Resiliency-related reasons for the portion of the participants who were categorized as Discontinued NSSI, covariate predictors were again entered in the same way as in the previous analysis. The variables Age, Gender, PHQ-9, Counseling, Medication, and Trauma were all placed into the first step of the model using the Enter method. The dichotomous variables were coded in the same manner as in previous analyses. Next the predictor variables in question (*automatic-positive reinforcement, automatic-negative reinforcement, social-positive reinforcement,* and *social-negative reinforcement*) were added into the second step of the model.

The first step on this model for those who were categorized as having Discontinued NSSI was not significant, R^2 =.18, $F(6, 46) = 1.69$, $p = .146$. For the first step in this model, PHQ-9 scores were significant in predicting the scores on Resiliency-related reasons for stopping NSSI in the portion of this sample who were considered to have Discontinued NSSI (β = .40, $p = .010$). Additionally, for this subset of the sample who Discontinued NSSI, the second step of the model did not reach significance, $\Delta R^2 = .03$, $F(4, 42) = .33$, $p = .857$. Scores for PHQ-9 were again significant (β = .41, $p = .014$). Although the final model of this analysis was not significant and none of the individual predictors of interest reached significances, the strongest predictor of

Resiliency-related reasons for stopping NSSI for the portion of participants who were categorized as having discontinued NSSI was *social-positive reinforcement* ($\beta = .11$, $p = .555$).

Table 15

Hierarchical Multiple Linear Regression Models for Research Question Three

	Total Sample[a]							
Step and Variable(s)	*df*	R^2	ΔR^2	ΔF	*B*	*SE B*	β	*t*
1. Covariates	(6, 96)	.09	.09	1.58				
PHQ-9					.04	.02	.26	2.44*
Age					<.01	.03	.01	.11
Counseling					-.13	.28	-.06	.46
Medication					-.14	.28	-.06	-.49
Trauma					-.08	.22	-.04	-.38
Gender					-.41	.23	-.18	-1.77
2. FASM	(4, 92)	.14	.05	1.39				
PHQ-9					.04	.02	.27	2.38*
Age					.01	.03	.04	.42
Counseling					-.14	.29	-.07	-.47
Medication					-.13	.29	-.06	-.43
Trauma					.07	.23	.03	.31
Gender					-.39	.26	-.17	-1.50
ANR					-.16	.15	-.16	-1.07
APR					.21	.16	.18	1.28
SNR					.03	.28	.01	.11
SPR					.61	.35	.21	1.74

	Continued NSSI[b]							
Step and Variable(s)	*df*	R^2	ΔR^2	ΔF	*B*	*SE B*	β	*t*
1. Covariates	(6, 46)	.15	.15	1.25				
PHQ-9					.04	.02	.31	2.01*
Age					-.09	.13	-.11	-.67
Counseling					-.28	.40	-.13	-.72
Medication					-.08	.37	-.04	-.20
Trauma					.26	.33	.12	.78
Gender					-.55	.38	-.24	-1.43
2. FASM	(4, 42)	.30	.15	2.08				
PHQ-9					.03	.02	.25	1.51
Age					-.02	.13	-.02	-.14
Counseling					-.36	.40	-.16	-.90
Medication					-.26	.37	-.12	-.70
Trauma					.46	.34	.21	1.37
Gender					-.47	.43	-.21	-1.08
ANR					-.31	.25	-.27	-1.25
APR					.42	.25	.36	1.73
SNR					-.08	.43	-.03	-.19

SPR					1.49	.58	.43	2.54*
	Discontinued NSSI[c]							
Step and Variable(s)	*df*	R^2	ΔR^2	ΔF	*B*	*SE B*	β	*t*
1. Covariates	(6, 46)	.18	.18	1.69				
PHQ-9					.06	.02	.40	2.69*
Age					<.01	.03	.01	.09
Counseling					-.04	.43	-.02	-.10
Medication					-.13	.45	-.06	-.30
Trauma					-.33	.30	-.16	-1.10
Gender					-.11	.32	-.05	-.33
2. FASM	(4, 42)	.21	.03	.33				
PHQ-9					.07	.03	.41	2.56*
Age					.01	.04	.03	.19
Counseling					<-.01	.47	<-.01	-.01
Medication					-.10	.47	-.05	-.21
Trauma					-.21	.33	-.10	-.62
Gender					-.12	.36	-.05	-.31
ANR					-.08	.20	-.09	-.41
APR					.08	.24	.07	.35
SNR					.16	.38	.08	.41
SPR					.27	.46	.11	.60

Note. Dependent variable: Resiliency-related reasons for discontinuing NSSI.
[a] Final model for Research Question Three, Total Sample: $F(4, 92) = 1.39$, $p = .243$
[b] Final model for Research Question Three, Continued NSSI: $F(6, 43) = 2.08$, $p = .103$
[c] Final model for Research Question Three, Discontinued NSSI: $F(4, 42) = .329$, $p = .857$
*$p < .05$

Summary and Conclusions

Chapter Four reviewed the results of the analyses conducted in an attempt to answer each research question proposed. In addition to the analyses required to answer these questions, demographic and descriptive data were analyzed in order to provide a better understanding of the sample used and the typical profile of NSSI onset, frequency, and types of behaviors in which participants engaged. Chapter Five will discuss the implications of the results presented in this chapter and will explore the possible implications of these results for clinical practice.

CHAPTER FIVE

DISCUSSION

Chapter Four presented the results of the statistical analyses performed to answer the research questions, which were the aims of this study. The aim of Chapter Five is to provide an interpretation and discussion of the results generated from this study. This chapter will also provide a discussion on the external validity and generalizability of the findings. Research and clinical implications of the findings will be discussed. Finally, strengths, limitations, implications, and directions for future study will be presented.

Interpretation of Results

Descriptive information. Similar to the findings of others (Ferrara, Terrinoni, & Williams, 2012; Muehlenkamp & Brausch, 2012; Rodham & Hawton, 2009), results from the current study suggest that the average age of onset for NSSI is between 12-14 years of age. In the current study, the average age of onset for NSSI behaviors was 13.9 years of age, which falls in the range of the findings reported in prior literature. Also supported by the existing literature and reinforced by the findings of the current study, individuals who have engaged in NSSI in the past discontinue these behaviors later in life (Rodham & Hawton, 2009). Approximately half of the college-aged population utilized in the current study were considered to have Discontinued NSSI. The current study considered individuals who had not engaged in NSSI for 12 months or more to be in the Discontinued NSSI group.

In term of specific NSSI behaviors, statistical analyses were not performed in the current study. However, it is worth noting that the participants in this study did report cutting as the most commonly engaged NSSI behavior, which is consistent with the findings of others (Laye-Gindhu et al., 2005; Messer & Fremouw, 2008; Walsh, 2012). In addition to cutting, burning–which is

often cited as one of the most common NSSI techniques (Walsh, 2012)–was reported less frequently in the current study than other NSSI behaviors (e.g., hitting, wound picking). One possible explanation for the difference in frequency is that the types of NSSI behaviors in which people engage are changing. For example, Kiekens and colleagues (2017) cited "severely scratched or pinched with fingernails or other objects to the point that bleeding occurs, or marks remain on skin" as the most commonly reported method of NSSI for both Discontinued and Continued NSSI groups comparable to the sample utilized in the current study. These researchers found cutting as the second most reported method of NSSI with "banging" oneself or objects to the point of bleeding following as the third most frequently reported method. Kiekens and colleagues (2017) also found that burning skin was less commonly reported than previously documented. Findings from the current study, as well as recently published articles on the investigation on methods of NSSI, suggest trends toward less severe forms of NSSI being reported more commonly.

An additional explanation is that research has been more inclusive in the types of behaviors considered to be NSSI. Early identification of NSSI was primarily focused on cutting behaviors (Angelotta, 2015). More recently, measures of NSSI–specifically the one used in the current study–include 11 different types of NSSI (FASM; Lloyd et al., 1997). In fact, a study published in 2013 suggested biting or hitting oneself are the most prevalent methods of NSSI (Zetterqvist et al., 2013). When the most recent available research is compared to the findings of the current study, additional support is provided for the changing methods of NSSI engaged in by adolescents and emerging adults.

Similarities were found in the NSSI behaviors of participants and now what follows is a discussion of the research questions and how one might make sense of the findings within the body of current literature around NSSI.

Research question one. The first question this study attempted to answer was "Which of the four functions of NSSI (*automatic-positive reinforcement, automatic-negative reinforcement, social-positive reinforcement,* and *social-negative reinforcement*) is the strongest predictor that an individual will have Discontinued NSSI later in life?"

Contrary to the hypothesis, the results of this analysis did not suggest that the four functions of NSSI could statistically predict whether an individual would have discontinued NSSI. Because the overall model was not significant, Beta weights and order of predictive ability of the four functions of NSSI on Continued or Discontinued NSSI could not be interpreted.

The current findings are inconsistent with previous research that suggest that both social (important relationships to others) and intrapersonal (self-awareness, ability to regulate emotion) reasons played important roles in discontinuation of NSSI (Mummè, Mildred, & Knight, 2017; Whitlock et al., 2015). How does one make sense of the findings? Three possible explanations may offer insight: a) how FASM measures interpersonal and intrapersonal factors, b) other possible predictors, and c) sample size.

Measurement of interpersonal and intrapersonal factors. The measurement of interpersonal and intrapersonal factors may have played a role in the results found in the current study. Each of the four functions utilized in the current study could be categorized as interpersonal (*social*) or intrapersonal (*automatic*). One possible explanation for the lack of results is that the specific questions used on the FASM in the current study did not accurately capture the specific interpersonal and intrapersonal factors that previous research found to be associated with

discontinuation of NSSI. For example, Kiekens and colleagues (2017) found that affective imbalance (positive/rewarding and negative/punishing experiences) was the most commonly cited function of NSSI by those who were considered to have Discontinued NSSI. In their study (Kiekens et al., 2017), affective imbalance involved management of depressive or dissociated emotion states, as well as management of agitating or high energy affective states. Again, affective imbalance could be viewed as a similar construct to *automatic-negative reinforcement,* yet the current study did not find this function to be a significant predictor of having Discontinued NSSI. Kiekens and colleagues' (2017) research documented affective imbalance as being associated with Discontinued NSSI. One key difference between the research by Kiekens and colleagues (2017) and the current study is that previous research examined emotional regulation more broadly. The current study differentiated between *positive* and *negative* intrapersonal (*automatic*) functions of NSSI. A possible explanation for why results were not replicated in the current study is that *automatic*, or intrapersonal functions of NSSI, should be looked at as a broad category and not differentiated between *positive* and *negative*.

***Other possible predictors*.** Another additional explanation for the findings in the current study is that other predictors of Discontinued versus Continued NSSI were more influential than the predictors used. While the four factors (*automatic-positive reinforcement, automatic-negative reinforcement, social-positive reinforcement,* and *social-negative reinforcement*) identified by Nock and Cha (2009) have empirical support, it is possible that other factors influence NSSI discontinuation. For example, research has indicated that there are other factors associated with discontinuation of NSSI, such as life satisfaction, perceived social support, and perceived emotional regulatory capability (Kiekens et al., 2017). It may be that changes in how satisfied individuals are with their lives (Kress, Newgent, Whitlock, & Mease, 2015; Whitlock, Prussien,

& Pietrusza, 2015), increased perceived support from those around them (Muehlenkamp, Brausch, Quigley, & Whitlock, 2013; Whitlock et al., 2015), and/or an increased confidence in their ability to manage their emotions (Whitlock et al., 2015; Wilcox et al., 2012) are more important changes occurring in individuals' lives, which influence them to discontinue NSSI over the specific reasons why they were initially engaging in NSSI to begin with. Indeed, Glenn and Klonsky (2011) found that when comparing longitudinal data to cross-sectional studies on predictors of NSSI over time, functions of NSSI was a not significant predictor. It may be that for the sample used in the current study, participants either continued or discontinued NSSI for reasons other than the function that maintained the behavior.

***Sample size*.** While research suggests additional variables associated with discontinuation of NSSI, as noted previously (i.e., social support, perceived emotional regulator capability, and others.), it is possible that the sample size was too small to detect a meaningful difference. Although the Power analysis conducted for this study suggested that the sample size utilized would be adequate enough to find significance, a larger sample size may have helped to clarify if there was predictive ability of the FASM on whether or not individuals would have Discontinued NSSI by lowering the chances of a Type II error. That is, given the strong support in the literature for similar constructs as the FFM used in the current study to show relationships to Discontinuation of NSSI, it is possible that a relationship was not found due to error.

Research question two. The second question this study attempted to answer was "Which of the four functions of NSSI (*automatic-positive reinforcement, automatic-negative reinforcement, social-positive reinforcement,* and *social-negative reinforcement*) is the strongest predictor of Vulnerability-related reasons for discontinuation of NSSI?"

This question was analyzed with the entire sample, and then the sample of those with Continued NSSI and those with Discontinued NSSI. When examining the model with the full sample, the predictors of interest were found to be significant in their predictive ability for Vulnerability-related reasons for discontinuing NSSI as expected (p = .044). Specifically, *automatic-positive reinforcement* was found to be significantly predictive of higher likelihood of higher scores on Vulnerability-related reasons for stopping NSSI. NSSI aims to create some sort of feeling in the absence of emotion in individuals who endorse this function. Individuals who endorsed higher scores on *automatic-positive reinforcement* may feel numb and use NSSI as a way to elicit some sort of feeling. Research has suggested that NSSI could serve to help an individual to feel excitement, to gain a sense of control, or to stop dissociative experiences (Gratz, 2003; Nixon, Cloutier, & Aggarwal, 2002; Peterson, Freedenthal, Sheldon, & Anderson, 2008). In fact, Calati, Bensassi, and Courtet (2017) found that NSSI was more common among individuals with dissociative disorders and those individuals with higher scores on a measure of dissociative symptoms than in those without a dissociative disorder or who had lower scores on a measure of dissociative symptoms. One possible explanation for the finding that *automatic-positive reinforcement* is predictive of Vulnerability-related reasons for stopping NSSI is that it is experienced by individuals with symptoms of serious and persistent mental illnesses such as Posttraumatic Stress Disorder (PTSD) or Depersonalization/Derealization Disorder. Ford and Gomez (2015) investigated the relationship of psychological trauma and dissociative and posttraumatic stress disorders to NSSI and suicidality. The researchers' findings suggest that "Dissociative disorders and [Posttraumatic Stress Disorder] (PTSD) are consistently associated with increased NSSI." Individuals experiencing Dissociative disorders or PTSD often report symptoms such as "I know I have feelings but I don't feel them," or "Difficulty experiencing

positive affect" (DSM-5; APA, 2013). While literature on motivations for engaging in NSSI and its predictive ability on reasons for discontinuing NSSI has been sparse, research has begun to examine why individuals in their emerging adulthood stop engaging in NSSI. For example, Mummè and colleagues (2017) found that almost 80% of individuals wanted to stop NSSI and 56% of participants cited thoughts that NSSI was "unhealthy" as a motivation for stopping. However, research has not related feelings of numbness or other dissociative symptoms to long-term engagement of NSSI. That is, it is unclear if individuals who report engaging in NSSI for reasons related to numbness or dissociation will experience a poorer prognosis as related to their NSSI as suggested by the current study. The current study may add a consideration of dissociation and feeling numbness to the understanding of the function and treatment of NSSI.

When analysis of the second research question was conducted for the Continued NSSI group only, the final model did not reach significance and therefore was not interpreted. Because this model did not reach significance, the Beta weights of the predictor variable of interest were not compared for their predictive ability on scores for Vulnerability-related reasons for stopping NSSI.

One might make sense of the findings through three possible explanations: a) lack of variability in Vulnerability-related reasons for stopping NSSI based on Continued/Discontinued NSSI, b) reduced sample size, and c) alternative functional models of NSSI.

Lack of variability in vulnerability-related reasons for stopping NSSI based on continued/discontinued NSSI. One possibility for why the current study found the results presented is that Vulnerability-related reasons for NSSI do not vary as a result of whether or not individuals Continued or Discontinued NSSI throughout emerging adulthood. Turner and colleagues (2014) suggested, in the development of their measure of reasons individuals

provided for stopping NSSI (RSSIQ), that certain reasons for stopping NSSI—specifically Vulnerability-related reasons—were more likely to be associated with individuals suffering from more chronic presentations of NSSI throughout the lifespan. In the current study, the variable of Vulnerability-related reasons taken from the RSSIQ was used as a criterion variable to answer research question two. While theoretically and intuitively this notion makes sense, results were not found to be significant in the current study when research question two was analyzed specifically looking at those who were considered to have Continued NSSI, and those who were considered to have Discontinued NSSI. One possible explanation for why is that Vulnerability-related reasons for stopping NSSI do not truly vary as a function of Continued NSSI into emerging adulthood. This proposed rationale hopes to explain why the FFM of NSSI (Nock & Prinstien, 2004) was found to be a significant predictor of Vulnerability-related reasons for stopping NSSI for the entire sample utilized in the current study, but failed to reach significance for each the Continued NSSI and Discontinued NSSI groups independently.

Reduced sample size. An additional explanation for the lack of findings is the research design of the current study. One aspect of research design that may have resulted in retaining the null hypothesis is that of sample size. This model may have failed to reach significance due to the reduced sample size when analyzing the Discontinued and Continued NSSI groups independently. That is, the a priori power analysis and effect size calculations were based on the entire sample and not divided groups. This power analysis for a medium effect size conducted using G*Power Data Analysis software (G*Power 3.0.10) suggested that analyses utilize a sample of at least 95 participants. Fields (2009) has suggested that using a sample size that is too small may result in a decrease in Power to the analyses performed. In turn, the researcher suggested that a decrease in statistical power may reduce the ability of the analyses to detect and

effect when there is one to be detected. The reduced sample size may have impacted the results by having only 50-53 participants' data to analyze once split into Continued versus Discontinued NSSI status.

Alternative functional models of NSSI. Furthermore, there are additional models of NSSI that may be better predictors of NSSI. While the previously mentioned rationale may explain, in part, the lack of significant predictive ability of the FFM model of NSSI on participants' scores for Vulnerability-related reasons for stopping NSSI in Discontinued or Continued groups in the current study, one additional possible reason for this absence of findings is the functional model of NSSI used as a predictor in the current study. Turner and colleagues (2014) cited the FFM of NSSI as one of the main functional models of NSSI in current research. However, the researchers also cited the Experiential Avoidance Model (EAM; Chapmen, Gratz, & Brown, 2006) as another possible explanation for the functional maintenance of NSSI behaviors in individuals. It could be that the EAM of NSSI, which suggests that NSSI is maintained through avoidance or reduction of unwanted thoughts, emotions, somatic sensations, or other distressing or uncomfortable internal experiences, is a better predictor of scores for Vulnerability-related reasons for stopping NSSI. It is possible that this theoretical model may align more accurately with the factors of the RSSIQ utilized as outcome variables in the current study than functions associated with the FFM of NSSI.

Research question three. The third question this study attempted to answer was "Which of the four functions of NSSI is the strongest predictor of Resiliency-related reasons for discontinuation of NSSI?"

This question was examined with the entire sample, and again with Continued NSSI and Discontinued NSSI independently. When the entire sample was analyzed, the final model did not

reach significance, contrary to expectation. Therefore, Beta weights of the predictor variables of interest were not interpreted or compared to determine the strongest predictor of Resiliency-related reasons to stop NSSI.

When analysis of the third research question was conducted for the Continued NSSI group only, the final model did not reach significance and therefore was not interpreted, contrary to expectations. The model did not reach significance, and therefore, Beta weights of the predictor variables of interest were not interpreted or compared in order to determine the strongest predictor of Resiliency-related reasons to stop NSSI.

When analysis of the third research question was conducted for the Discontinued NSSI group only, the final model did not reach significance and therefore was not interpreted, contrary to expectations. The model did not reach significance, and therefore, Beta weights of the predictor variables of interest were not interpreted or compared to determine the strongest predictor of Resiliency-related reasons to stop NSSI.

Support for this research question was not found. Two possible explanations may make sense of the absence of findings: a) other possible predictors and b) research design.

Other possible predictors. An explanation for the findings in the current study is that other predictors of Discontinued versus Continued NSSI were more influential than the predictors used. As mentioned previously, researchers have indicated that there are factors associated with discontinuation of NSSI such as life satisfaction, perceived social support, and perceived emotional regulatory capability that are outside of the scope of the FFM utilized in the current study (Kiekens et al., 2017). It could also be that the EAM model of NSSI (Chapman et al., 2006) could have better predicted Resiliency-related reasons for NSSI. For participants in this sample who indicated a stronger level of Resiliency-related reasons for discontinuing NSSI,

the previously mentioned factors may have had a more significant contributing effect than the function that NSSI served for these individuals when using the FFM of NSSI. It also may be that participants who cited Resiliency-related reasons for stopping NSSI may have been engaging in less severe forms of NSSI. In their meta-analysis, which did not report specific results of severity, frequency, or number of different methods used in NSSI, Mummè and colleagues (2017) suggested that overall, severity, frequency, and number of different methods were the most stable predictors of continued NSSI. In the current study, severity of NSSI (as measured by receiving medical attention for NSSI) was low. That is, it was uncommon for individuals to report that they received medical attention for NSSI-related wounds. Frequency of engagement in NSSI in the current study varied widely from 1 occurrence to estimations of 150 engagements in NSSI. One possibility is that the less severe nature of NSSI reported in the current study impacted the results. It could be that function of NSSI plays a more critical role in the reasons individuals provide for discontinuing NSSI than for individuals who report more severe forms of NSSI.

Research design. An additional plausible explanation for why the overall sample utilized in this study, as well as the Discontinued NSSI sample, failed to demonstrate predictive ability for individuals who scored higher on the measure of Resiliency-related reasons for stopping NSSI is the nature of the research design. Specifically, those who may have reported stronger Resiliency-related reasons for stopping NSSI have been theorized to demonstrate more permanent discontinuation from NSSI once stopped (Tuner et al., 2014). One possible explanation for the reason the current study did not find predictive ability of the FFM of NSSI on Resiliency-related reasons for stopping NSSI is that using long-term retrospective accounts may significantly limit the reliability and validity of observations (Nock, 2012). If participants in the

Discontinued NSSI group had not engaged in NSSI for long periods of time, they may have had difficulty recalling specific functions that NSSI served for them when they were engaging. Difficulty recalling specific functions may have limited the reliability and validity of this portion of the current study as suggested by Nock (2012).

Limitations

Three key limitations impact this study: a) categorization of participants, b) generalization, and c) the validity of measures used in the analyses.

Categorization of NSSI. When considering the results and interpretation, it is important to note that in the current study, the Continued NSSI group consisted of those individuals who had engaged in NSSI at some point in the last 12 months. The Discontinued NSSI consisted of those individuals who had not engaged in NSSI in 12 months or more. The cutoff period for Discontinued vs Continued NSSI was arbitrarily set at 12 months. While arbitrary, other research has used 12 months as a cutoff period (Kiekens et al, 2017). While unlikely given the current body of research, which commonly uses 12 months or less in making the distinction between Continued or Discontinued NSSI (Kieken et al., 2017; Muehlenkam, Brausch, & Washburn, 2017; Rodham & Hawton, 2009), it could be that those who reported not having engaged in NSSI for the past 12 months may engage in these behaviors once again in the future. However, there remains a lack of longitudinal research in the field of NSSI. Similarly, it is possible that those who reported engaging in NSSI within the past 12 months may never do so again. One study (Glenn & Klonsky, 2011) evaluated relapse rates for individuals who were considered to have Discontinued NSSI. Research by Glenn and Klonsky (2011) suggested that more individuals in their longitudinal study relapsed after 1 year of NSSI abstinence than individuals with 2 years of abstinence, suggesting that a 2-year cutoff period may be more appropriate than a

1-year cutoff. Glenn and Klonsky (2011) posited that 2 years of abstinence may be a better indicator of "genuine NSSI remission." The 12-month cutoff for Continued versus Discontinued NSSI may serve as a limitation in the current study as it is unclear if participants who were considered to have Discontinued NSSI relapsed at any point after their participation in the study. This relates to the current study as the current study utilized a 12-month cutoff point to consider participants as Continued NSSI or to have Discontinued NSSI.

Generalizability. Caution should be used when generalizing the findings from the current study to the general population. The sample utilized was comprised primarily of heterosexual, Caucasian, college females 18 to 21 years of age. It may be that individuals who fall outside of these demographics experience different motivations for engaging in or for discontinuing NSSI. Research suggests that individuals engage in NSSI regardless of race or socioeconomic status (DeAngelis, 2015). However, it has been well documented that those in the LGBTQ+ community are at a significantly higher risk for NSSI (DeAngelis, 2015; Muehlenkamp et al., 2015). Additionally, it is clear that NSSI occurs outside of the college population. For example, studies on community samples have suggested rates of approximately 47.0% (Lloyd-Richardson, Perrine, Dierker, & Kelly, 2007), 24.0% (Giletta, Scholte, Engels, Ciairano, & Prinstein, 2012), and nearly 36.0% (Zetterqvist, Lundh, Dahlström, & Svedin, 2013). However, it is unclear if individuals in a community sample engage in NSSI for the same reasons as college students or if they have similar reasons for stopping NSSI.

Validity of measures. Perhaps one of the greatest limitations of this study was the lack of available factor loadings for the RSSIQ. Completing a factor analysis of this measure was not part of the initially proposed methods and therefore was not considered when planning for projected sample size. At the time the decision was made to complete a factor analysis, data

collection had already ended. The sample size used to complete the factor analysis of the RSSIQ (N= 103) was less than would have been desired if completing a factor analysis was part of the original proposed methodology. Research suggests that for the current study, an $N > 200$ would have been the minimal number of participants to conduct an appropriate factor analysis (Myers, Ahn, & Jin, 2011). The smaller than recommended sample size may have produced factors that were not accurate to the original development of the measure on which the current study was based. The factors taken from the RSSIQ (i.e., Resiliency-related reasons and Vulnerability-related reasons for stopping NSSI) were used as criterion variables in the analyses performed to answer research questions two and three. It is possible that the results for the analyses performed to answer research questions two and three may have varied if the original factor loadings had been provided. The theoretical basis on which the current study was designed used the information from the findings on the original development of the RSSIQ. If the factors determined in the current study varied from those discussed in the development of the measure, there may be room for error in interpreting results if the measure used in the current study was not accurately assessing what it intended. This may serve as a limitation to the current study because it remains unclear if the factors used in the current study were the same as the original RSSIQ. Without the factor loadings from the original development of the measure, one cannot be certain that the measure was assessing the same constructs. Using factor loadings and categorizing Resiliency- and Vulnerability-related reasons for stopping NSSI, which were researched to a greater extent as in the development publication of the measure, may have been more accurate.

Strengths

Despite the limitations of this study discussed above, two strengths have been identified: a) the sample utilized and b) the novelty of the research. These strengths will be discussed in further detail to follow.

Sample utilized. First, this study was purposeful in selecting the sample used. A college student sample was selected for this investigation because college-age students reported high prevalence rates of NSSI (Rodham & Hawton, 2009). At the same time, Whitlock and colleagues (2006) suggested that the time of emerging adulthood is a period of resolution for NSSI. This was the case in the current study. While prevalence rates were not directly assessed in this study, as all participants had engaged in NSSI, over 100 students reported engaging in NSSI at some point in their lives. This response rate could be interpreted as suggesting a significant number of students at the university surveyed who have engaged in NSSI. Additionally, of those who were included in this study, approximately half were considered to have Discontinued NSSI. This reflects previous research that suggest that the developmental period that is typical of a college student is a time when individuals may discontinue NSSI (Whitlock, Eckenrode, & Silverman, 2006).

Novelty. In addition to a purposeful sample, this study demonstrated strength in its novelty. Much of the research in the field of NSSI has focused on correlates and functions of NSSI. More recently, researchers have begun to look into why individuals stop NSSI. To the researcher's knowledge, there have yet to be investigations into how correlates and functions are related to reasons for stopping NSSI. This study aimed to fill this gap in the literature and did so by examining the predictive ability of function of NSSI on discontinuation of NSSI in general, as well as Resiliency- and Vulnerability-related reasons for stopping NSSI.

Research and Clinical Implications

The findings presented in this study have several implications for research in the field of NSSI among college students. The descriptive data that were obtained in this study add to the growing literature base on the age of onset of NSSI, types of behaviors engaged in, frequency of specific NSSI behaviors, and mental health history of those who engage in NSSI. These contributions help to clarify inconsistencies in the literature (e.g., differences in age of onset, types of behaviors, frequency of behaviors, and mental health history) on these descriptive features of NSSI. The findings contribute to the literature by providing an additional study that supports previous research findings that suggest similar age of onset (Rodham & Hawton, 2009), types of behaviors (Kiekens et al., 2017; Walsh, 2012), frequency of behaviors (Kiekens et al., 2017), and mental health history of those who engage in NSSI (Mummè et al., 2017). Additionally, this study highlights the importance of continued research and development of validated measures that assess for reasons individuals stop engaging in NSSI.

Clinically, the findings from this study could be useful for the understanding and treatment of NSSI. The findings suggest that those who endorsed that NSSI was used to "create a desirable physiological state" were more likely to have endorsed Vulnerability-related reasons to stop NSSI. Previous research suggests that those who reported higher Vulnerability-related reasons for stopping NSSI were more likely to have more chronic presentations of NSSI (Turner et al., 2014). Those who reported engaging in NSSI due to *automatic-positive reinforcement* (i.e., to feel anything, even if it was pain) may benefit from longer-term or more intensive treatment targeted at these specific motivations for engagement.

Directions for Future Study

It is clear that research on NSSI is still in its formative stages and that more investigations will help the field to better understand this phenomenon. This section will highlight some areas that may be useful to consider to further study based on the literature reviewed and the results of this study. First, longitudinal rather than retrospective research could be invaluable to the field of research on NSSI. As it relates to this study, longitudinal research could have been instrumental in determining a more accurate cutoff point for which participants should have been considered Continued NSSI or Discontinued NSSI. Longitudinal research could help determine how long of a period would be most appropriate to consider an individual as having discontinued their engagement in NSSI. Longitudinal research could also contribute more accurate accounts of age of onset, frequency, and age of discontinuation of NSSI, which is important for an overall understanding of NSSI.

Second, the sample used in the current study was largely homogeneous. While previous researchers have investigated NSSI in LGBT populations (Muehlenkamp et al., 2015), it is important that research be conducted across genders, ethnicities, and education levels to understand how NSSI may vary based on demographic features. Finally, much more research is needed on the investigation of reasons why individuals stop NSSI and measures should be developed and validated to do so. Learning about the reasons why individuals stop NSSI in emerging adulthood could help clinicians have a better understanding of how they may tailor their interventions to increase the likelihood that an individual will discontinue using NSSI to serve whatever function it does for that individual.

While the current study did not demonstrate a strong predictive ability of functions of NSSI on whether or not an individual would have discontinued NSSI, it is important that the link

between function and reasons for stopping NSSI continue to be explored. This could be done utilizing different theories of functions of NSSI or using different ways to measure either function of NSSI or reasons to stop NSSI.

Summary and Conclusion

Chapter Five discussed the interpretation of the results presented in Chapter Four, the limitations and strengths of this study, research and clinical implications of the results of this study, as well as suggestions for directions of future research in the study of NSSI. Overall, this study concluded that *automatic-positive reinforcement* significantly predicted higher scores on Vulnerability-related reasons for stopping NSSI.

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Appendix A

Survey

Department of Psychology

P.O. Box 6946
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www.radford.edu

RU RADFORD UNIVERSITY

You are invited to participate in a research survey, entitled "Examining the Relationship between the Function of Nonsuicidal Self-Injury (NSSI) and Motivation to Stop NSSI in Emerging Adulthood." The study is being conducted by Dr. Tracy Cohn, Stephen Casazza, Dr. Pei-Chun Tsai, and Dr. Jenessa Steele, from the psychology department of Radford University. For questions or concerns please contact Dr. Tracy Cohn at P.O. Box 6946, Radford, VA 24142, 1-540-831-5361, or tcohn@radford.edu.

The purpose of this study is to examine patterns of reinforcement that maintain self-injurious behavior and how those patterns relate to continued nonsuicidal self-injury or discontinuation of those behaviors later in life. We hope to have approximately 300 students respond to this survey. Your participation in the survey will contribute to a better understanding of factors that predict a favorable, or higher risk trajectory of nonsuicidal self-injury. We estimate that it will take about thirty minutes of your time to complete the questionnaire. You are free to contact the investigator at the above address and phone number to discuss the survey.

Risks to participants are considered slight as some questions may cause some individuals to feel uncomfortable. There will be no costs for participating. You will receive 1 SONA credit for your participation in this study. A limited number of research team members will have access to the data during data collection. Your participation in this survey is completely anonymous and no identifying information is being collected, including IP addresses.

Your participation in this survey is voluntary. Some questions may be of personal or sensitive nature and you may decline to answer any question. Additionally, you have the right to withdraw from participation at any time without penalty. If you wish to withdraw from the study, you may do so by pressing the X at the upper right corner to close the screen. At the end of the study, you will be able to determine whether your information will be used in this research project, prior to clicking Submit. Only participants who affirm their responses to be included will be analyzed.

If you feel the need for support with self-injurious behavior the following may be useful resources:

- 1-800-273-TALK (8255) is a 24-hour crisis hotline if you are about to self-harm or are in a crisis situation.
- The following website can be useful for referrals to therapists in your area and tips for how to stop self-injury: http://www.selfinjury.com.
- If you are a student at Radford University, Student Counseling Services can be reached at 1-540-831-5226 and is located in Tyler Hall, Lower Level.

If you have any questions please call Dr. Tracy Cohn at 1-540-831-5361 or send an email to tcohn@radford.edu.

If you have questions about your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact Dr. Dennis Grady, Dean, College of Graduate and Professional Studies, Radford University, dgrady4@radford.edu, 1-540-831-7163.

If you agree to participate, please **press the arrow button at the bottom right of the screen**. Otherwise use the X at the upper right corner to close this window and disconnect.

Thank you.

Have you ever intentionally committed any act which resulted in damage to your body tissue without the intent to die (such as but not limited to cutting/carving, burning, or hitting yourself)?

Yes

No

Have you ever attempted suicide?

Yes

No

Have you ever intentionally engaged in the following behaviors without the intent to kill yourself?

	Please fill in response	Please check all that apply			
	Approximately how many times have you engaged in this behavior?	No	Yes, within the past 12 months	Yes, at some point in my life	Did you receive medical attention for this behavior?
Cut or carved your skin					
Hit yourself on purpose					
Pulled your hair out (with the intent of hurting yourself)					
Gave yourself a tattoo					
Picked at a wound (with the intent of hurting yourself)					
Burned your skin (i.e., with a cigarette, match or other hot object)					
Inserted objects under your nails or skin					
Bit yourself (e.g., you mouth or lip) (with the intent of hurting yourself)					
Picked areas of your body (with the intent of hurting yourself)					
Scraped your skin					

"Erased" your skin to the point of drawing blood					

If you have ever intentionally engaged in a behavior not listed above without the intent to kill yourself, please list it below and answer the accompanying questions about that behavior

		Please check all that apply			Please fill in response
	Please fill in the behavior	I have engaged in this behavior within the past 12 months	I have engaged in this behavior at some point in my life	I received medical attention for this behavior	Approximately how many times have you engaged in this behavior?
Other					
Other					
Other					

On average, how long did you think about doing the above act(s) before actually doing it (please provide the number of minutes)?

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

No

Sometimes

Yes

Did you experience pain during this self harm?

Severe pain

Moderate pain

Little pain

No pain

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

If not in the past year, have you ever done any of the above acts?

Yes

No

Approximately, when was the last time you engaged in intentional self-harm without the intent to die?

Within the last week

One month

Three months

Six months

Twelve months or more

Please provide your best estimate of the last date you engaged in intentional self-harm without the intent to die.

Please select option three for this question.

One

Two

Three

The following is a list of reasons some people give for engaging in self-injury
Did you harm yourself for any of the reasons below? Check all that apply.

	Never	Rarely	Sometimes	Often
To avoid school work or other activities				
To relieve feeling numb or empty				
To get attention				
To feel something, even if it was pain				
To avoid doing something unpleasant you don't want to do				
To get control of the situation				
To try to get a reaction from someone, even if it's negative				

To avoid being with people				
To punish yourself				
To get other people to act differently or change				
To be like someone you respect				
To avoid punishment or paying the consequences				
To stop bad feelings				
To let others know how desperate you were				
To feel more a part of a group				
To get your parents to understand or notice you				
To give yourself something to do when alone				
To give yourself something to do with others				
To get help				
To make others angry				
To feel relaxed				

Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at all	Several days	More than half the days	Nearly every day
Little interest or pleasure in doing things				
Feeling down, depressed, or hopeless				
Trouble falling or staying asleep, or sleeping too much				
Feeling tired or having little energy				
Poor appetite or overeating				
Feeling bad about yourself- or that you are a failure or have let yourself or your family down				
Trouble concentrating on things, such as reading the newspaper or watching television				
Moving or speaking so slowly that other people could notice? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual				

Thoughts that you would be better off dead or of hurting yourself in some way				

What is your age?

What is your gender?

Male

Female

Transgender

Other

What is your race/ethnicity (choose all that apply)?

White/Caucasian

African American

Asian/Pacific Islander

Native American

Latino/Hispanic

Other

What is your sexual orientation?

Heterosexual

Gay

Lesbian

Bisexual

Asexual

Other

Have you ever received any type of mental health counseling?

Yes

No

Was the mental health counseling you received related to self-injury?

Yes

No

Have you ever been prescribed medication for a psychological concern?

Yes

No

Have you experienced any past traumatic events?

Yes

No

You responded yes to experiencing past traumatic events, please select all that apply

Sexual trauma

Physical trauma

Witnessing a traumatic event

Psychological trauma

Other

The following is a list of reasons some people give for not engaging in self-injury. We would like to know how important each reason is for you for not engaging in self-injury.
Each reason can be rated from Not At All Important to Very Important. Please carefully rate each item. If you do not feel an item applies to you, or you don't feel the item is true, you should rate it Not At All Important.

	Not at all important	Slightly important	Moderately important	Quite important	Very important
Self-injury makes me feel like there is something wrong with me.					
I don't want to make my body look bad.					
My self-injury is getting worse (more frequent, more serious injury, or more urges).					
I don't want to upset or hurt my friends, family, or loved ones.					
I want to be supportive of a friend/romantic partner/family member.					

Someone is forcing me to stop.					
I replaced self-injury with other self-damaging behaviors (eating disorders, substance use, etc.).					
I would feel bad about myself as a person if I self-injured.					
The scars are problematic.					
My self-injury is becoming hard to control.					
Other people want me to quit.					
I don't want to be punished if I'm caught.					
I would be mad or angry with myself if I self-injured.					
I want my body to look good.					
I am trapped in a cycle of bad feelings and self-injury.					
I don't want to disappoint or let other people down.					
I don't want to have to worry					

about hiding the scars.					
I promised someone I would stop.					
I would feel guilty.					
I care about my body.					
I'm afraid someone might question me about what I did.					
I want to set a healthy example for a friend, family member, or romantic partner.					
I could be kicked out of my treatment program if I self-injure.					
If I go into the hospital again, I'll miss work or school.					
I feel in control of my emotions and of my life.					
If I start again, I might not be able to stop.					
I have supportive and caring people around me who can help me when I feel the urge.					
I couldn't self-injure safely.					

I have too many injuries already.					
I don't want other people to judge me.					
I don't want other people to gossip or spread rumors about me.					
I don't want to lose too much blood or pass out.					
I want my scars to heal.					
I don't want to get an infection.					
I just don't need to or want to self-injure anymore.					
The scars make doctor visits uncomfortable.					
I have the willpower to stop.					
I feel better about myself.					
I want to be kind to myself and not abuse myself.					
I feel like I have to stop self-injuring.					

Are there other reasons why you have decided to stop engaging in Nonsuicidal self-injury? If so, please briefly describe those reasons below.

Are there reasons why you have decided to continue engaging in Nonsuicidal self-injury? If so, please briefly describe those reasons below.

Were you honest in answering this survey?

Yes

No

I agree/I don’t agree to allow my information to be used in this project.

I agree

I don’t agree