

NON-SUICIDAL SELF-INJURIOUS BEHAVIOR: THE ROLE OF SHAME, GUILT,  
ANXIETY AND DEPRESSION

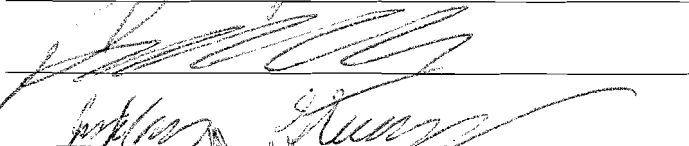
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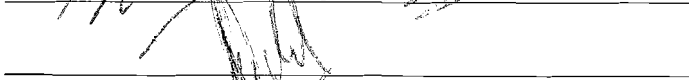
Susan E. VanDerhei  
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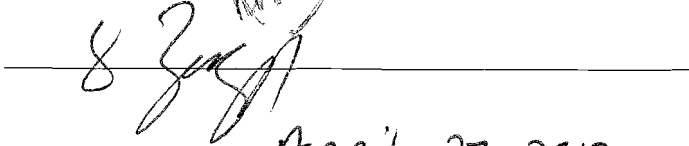


Director





Department Chairperson



Dean, College of Humanities  
and Social Sciences

Date:

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George Mason University  
Fairfax, VA

Non-Suicidal Self-Injurious Behavior: The Role of Shame, Guilt, Anxiety and  
Depression

A thesis submitted in partial fulfillment of the requirement for the degree of Master of  
Arts at George Mason University

By

Susan E. VanDerhei  
Bachelor of Arts  
University of Maryland, 2010

Director: Johannes Rojahn, Professor  
Department of Psychology

Spring Semester 2012  
George Mason University  
Fairfax, VA

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## ABSTRACT

### NON-SUICIDAL SELF-INJURIOUS BEHAVIOR: THE ROLE OF SHAME, GUILT, ANXIETY AND DEPRESSION

Susan E. VanDerhei, M.A.

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Thesis Director: Dr. Johannes Rojahn

Previous research has identified strong links between non-suicidal self-injurious behavior (NSSIB) and emotional vulnerabilities such as anxiety and depression. However, to date no studies have been published that examined the potential role of moral emotions such as shame and guilt on the presentation of NSSIB. This study examined the relationship of shame and guilt with NSSIB and the extent to which they may affect anxiety and depression as predictors of NSSIB (i.e., the presence of NSSIB and estimated daily rate of NSSIB). The participants were 378 university undergraduate students, who were predominantly female (71.2%), between 18 to 51 years old ( $M = 20.89$ ,  $SD = 4.77$ ). Participants completed the *Inventory of Statements about Self-Injury* (ISAS; Klonsky & Olino, 2008), the *Beck Anxiety Inventory* (BAI; Beck & Steer, 1990), the *Beck Depression Inventory* (BDI-II; Beck, Steer & Brown, 1996), and the *Test of Self-Conscious Affect* (TOSCA-3; Tangney, Dearing, Wagner, & Gramzow, 2000). Emotion dysregulation (defined as combined anxiety and depression scores), and shame were

positively related to the presence of NSSIB; guilt was negatively related to the presence of NSSIB. There was no interaction between emotion dysregulation and shame, nor between emotional dysregulation and guilt when predicting the presence of NSSIB. However, guilt and emotion dysregulation did interact to predict the daily rate of NSSIB, such that those participants with lower guilt scores had a stronger positive relationship between emotional dysregulation and daily rate of NSSIB than their high-guilt counterparts. The interaction between emotion dysregulation and shame approached significance, with patterns showing that participants with high shame scores had a stronger, more positive relationship between emotional dysregulation and daily rate of NSSIB, than those who were low on shame. These relationships were also examined in only the subsample of participants who had self-injured. Results suggest that guilt serves as a protective factor, while shame serves as a risk factor for the presence and rate of NSSIB.

## INTRODUCTION

Non-Suicidal Self-Injurious Behavior (NSSIB) is the direct, intentional destruction of one's own body tissue without the purpose of committing suicide (Nock & Favazza, 2009). NSSIB includes behaviors such as cutting, burning, scratching, banging, hitting, biting and interfering with wound healing (Klonsky, 2011). The rate of NSSIB has been estimated to range between 13% and 45% for adolescents (Nock, 2010), 13.8% in an undergraduate student population (Ross & Heath, 2002), and 4% in adults (Briere & Gil, 1998). Considering the potentially damaging effects of these behaviors, these disturbingly high rates of self-mutilative behaviors, especially in adolescents and young adults, make NSSIB an important topic of research. The relevance and urgency of this research is reflected in the recent campaign to include non-suicidal self-injury as its own diagnostic entity in the upcoming edition of the DSM-V (Klonsky, 2011).

NSSIB is distinct from other types of culturally sanctioned self-directed harmful behaviors, such as alcohol and nicotine consumption, getting tattoos or piercings, or over-eating (Favazza, 1996). It also differs from suicide attempts and ideation, specifically referring to their respective functions and diagnostic correlates (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). To what extent NSSIB is distinguishable from the self-injurious behaviors seen in intellectually disabled populations remains to be clarified (Rojahn, Schroeder, & Hoch, 2008).



The age of onset of NSSIB is consistently reported to be in early adolescence, but trends over the lifetime remain unknown (Nock, 2009). As for gender and race differences in prevalence, in their study examining over 500 middle-school children, Hilt, Nock, Lloyd-Richardson, and Prinstein (2008) found no significant differences for rates of NSSIB. Some studies, however, have reported that females engage in NSSIB more frequently than males, particularly in adolescence (Bhugra, Thompson, Singh, & Fellow-Smith, 2003).

The Center for Disease Control (2008) has reported an increasing trend in NSSIB over the past 10 to 20 years, a pattern which has been bolstered by a rise in anecdotal evidence from teachers, clinicians and other health professionals (Nock, 2010). An abundance of research has been devoted to finding correlates and risk factors for self-injurious behavior (Nock, 2010). For example, a history of childhood sexual abuse (Klonsky & Moyer, 2008), a family history of suicidal ideation, violence, drug and alcohol abuse (Deliberto & Nock, 2008) have all been found to be associated with the presence and maintenance of NSSIB. While these and additional environmental risk factors of NSSIB are of utmost importance to determine, it is also critical to evaluate the psychological correlates in order to create a more comprehensive model of factors which may lead to NSSIB onset and maintenance.

### **Emotional Correlates of NSSIB**

A review of the literature shows that specific emotional vulnerabilities such as major depression (Jacobson & Gould, 2007) and anxiety (Klonsky & Olino, 2008) are correlated with higher rates of NSSIB. For example, in a recent study of adults with a

history of criminal convictions by Sadeh, Javdani, Finy, and Verona (2011), it was reported that depressive tendencies positively predicted self-directed injurious behavior in both men and women. Higher depressive and anxious symptoms, along with increased rumination, were more likely to be reported in a sample of college students who had a history of NSSIB as opposed to those who did not (Hoff & Muehlenkamp, 2009). Using an internet-based survey to examine the correlates of self-injury, Gollust, Eisenberg, and Golberstein (2010) found that major depression, generalized anxiety disorder and panic disorder were all significantly related to self-injury in a sample of university students.

In one of the few studies which examine self-injurious behavior in an adolescent community sample, Ross and Heath (2002) reported a relationship between anxiety and depressive symptoms and self-mutilation. Using the Beck Depression Inventory (BDI) and the Beck Anxiety Inventory (BAI), these researchers found a significant difference in anxiety and depression scores between adolescents who did self-injure and those who did not. Ross and Heath suggested that adolescents who engage in NSSIB are at risk for greater general socioemotional difficulties, which necessitates the inclusion of additional emotional correlates into the study of NSSIB predictors.

### **Shame versus Guilt: The Moral Emotions**

Much research has examined the role of a variety of psychopathologies in NSSIB such as depression and anxiety (Nock, Wedig, Holmberg, & Hooley, 2008). However, no research has been published that explored the potential role of social or moral emotions in the development or maintenance of NSSIB. Two possible emotions to consider are shame and guilt, two negative and distinct emotions (Stuewig, Tangney, Heigel, Harty, &

McCloskey, 2010). Shame entails a negative evaluation of the entire *self*. Guilt, on the other hand, implies the negative evaluation of a *situation* or *behavior*. Shame and guilt also tend to have differential relationships with a host of outcomes. For example, shame and guilt have demonstrated to be risk and protective factors, respectively, for a number of behaviors that are associated with NSSIB. This includes both externalizing behavior such as aggression (Stuewig et al., 2010) and substance use (Dearing, Stuewig, & Tangney, 2005), as well as internalizing behavior such as different forms of psychopathology (Tangney, Stuewig, & Mashek, 2007). Research also suggests that shame leads to internalization of blame, while guilt, when controlling for shame, does not. Given the important role of shame and guilt regarding outer-directed aggression, as well as their relationship to internalization of blame, perhaps we should look closer at the possible role the moral emotions play in NSSIB.

A feeling of shame is elicited when one feels they are being negatively evaluated by others (Tangney et al., 2007). In their review of suicidal research, Hastings, Northman and Tangney (2000) concluded that shame is a stronger predictor of suicidality than guilt. While pathways to suicidal ideation are distinct from those that lead to NSSIB (Nock et al., 2006), the effects of varying levels of shame and/or guilt have not been previously analyzed in relationship to *acts* of NSSIB in a typically developing population. Brown, Linehan, Comtois, Murray and Chapman (2009) examined the effect of shame on self-inflicted injury in a population of individuals with borderline personality disorder (BPD). Persons with BPD are at very high risk for self-inflicted injury, both suicidal and non-suicidal (Brown et al., 2009). Self-reported shame was found to predict a higher

likelihood of self-inflicted injury and shorter time to the episodes of self-injury. After controlling for other emotions, such as sadness, fear and anger, however, the effect became non-significant.

A feeling of guilt is elicited when one is concerned about one's own behavior's effect on others (Tangney et al., 2007). Lewis' (1971) distinction between the self-directed feeling of shame and the behavior-directed feeling of guilt gives support to the theory that shame and guilt would have different effects on the presence and maintenance of NSSIB. If "shame is considered the more painful emotion because one's core self – not simply one's behavior – is at stake," (Tangney et al., 2007), then a person who is more shame-prone should be more likely to self-injure than a person who is more guilt-prone. Feelings of guilt are likely to serve as a protective factor from engaging in self-injurious behavior, because the guilt-prone person will correctly evaluate a negative situation as just that. They will be less inclined to evaluate *themselves* as negative, as their shame-prone counterparts may tend to do. Guilt may even serve as a protective factor because it is associated with proactive attempts to fix a problematic situation. Shame, on the other hand, which is associated with defensiveness, separation and distance (Tangney et al., 2007), may be a risk factor for NSSIB.

Shame may also compound the effect of high emotional dysregulation, leading to even higher rates of NSSIB than those who have lower levels of shame. The effect of being high in both emotional dysregulation and shame may be an especially risky combination. In contrast, guilt may serve as a protective factor against NSSIB, whereby guilt will interact with emotional dysregulation to result in lower rates of NSSIB for

participants with higher levels of guilt than those with lower levels of guilt. Being high in guilt-proneness may buffer the detrimental effects of emotional dysregulation on NSSIB. The addition of shame and guilt as both main effects and moderators in this proposed model (Figure 1) may help clarify and extend our knowledge of NSSIB.

### **The Current Study**

The present study seeks to determine the relationship between emotional dysregulation (as measured by anxiety and depression scores), moral emotions (shame and guilt), and non-suicidal self-injurious behavior.

As mentioned previously, it has been well established that anxiety and depression are strongly related to NSSIB (Nock et al., 2008). Previously proposed theoretical models of self-injury have not been able to account for multiple pathways to self-injurious behavior (Nock, 2010). Thus, a more inclusive set of predictors that goes above and beyond anxiety and depression must be determined to enhance this field of literature.

The first aim was to assess whether measures of emotional dysregulation (a combination of anxiety and depression), shame and guilt predict the *reported presence* of NSSIB. Of specific interest is the interaction effect that shame, when combined with emotional dysregulation, has on the presence of NSSIB. Similarly, the interaction between guilt and emotional dysregulation will be tested. The second aim was to assess whether measures of emotional dysregulation, shame and guilt predict the *reported daily rate* of NSSIB. The third and final aim of the study was to examine these relationships among those participants who engage in self-injury. In other words, for those who self-

injure, do emotional dysregulation, shame and guilt predict the *reported daily rate* of NSSIB?

**Hypotheses.** For the entire sample of individuals, it was hypothesized that:

1. Higher levels of emotional dysregulation and higher levels of shame will be positively related to the reported *presence* of NSSIB. In contrast, higher levels of guilt will be negatively related to the *presence* of NSSIB.

2. There will be an interaction between emotional dysregulation and the moral emotions on the *presence* of NSSIB. Specifically, I expect that for those with higher levels of shame, there will be a stronger, more positive relationship between emotional dysregulation and *presence* of NSSIB, compared to those who are lower in shame. I also expect that for those higher on guilt, the relationship between emotional dysregulation and *presence* of NSSIB will be weaker, compared to those who have low levels of guilt. In other words, I expect that shame will increase the likelihood of emotional dysregulation leading to NSSIB, while guilt will buffer this relationship.

3. Emotional dysregulation and shame will be positively related to the reported *daily rate* of NSSIB. Guilt, on the other hand, will be negatively related to the reported *daily rate* of NSSIB.

4. There will be an interaction between emotional dysregulation and the moral emotions on the reported *daily rate* of NSSIB. Specifically, I expect that for those higher in shame, there will be a stronger, more positive relationship between emotional dysregulation and the reported *daily rate* of NSSIB compared to those who are lower in shame. I also expect that for those higher in guilt, the relationship between emotional

dysregulation and *daily rate* of NSSIB will be weaker, compared to those who are lower in guilt.

For the subsample of individuals with NSSIB, it was hypothesized that:

5. Higher levels of emotional dysregulation and higher levels of shame will be positively related to the reported *daily rate* of NSSIB. In contrast, higher levels of guilt will be negatively related to the reported *daily rate* of NSSIB for those who engage in NSSIB.

6. There will be an interaction between emotional dysregulation and the moral emotions on the reported *daily rate* of NSSIB. Specifically, I expect that for those with higher levels of shame, there will be a stronger, more positive relationship between emotional dysregulation and the reported *daily rate* of NSSIB compared to those with lower levels of shame. I also expect that for those higher on guilt, the relationship between emotional dysregulation and *daily rate* of NSSIB will be weaker, compared to those who have lower levels of guilt in this sample of those who engage in NSSIB.

## METHOD

### **Participants**

Three hundred and seventy-eight George Mason University undergraduate students were recruited using an online research website to participate in this study about non-suicidal self-injurious behavior. Data were collected over a three-year period. Students were given course credit in exchange for their participation, which lasted approximately an hour and a half. Participants ranged in age from 18 years to 51 years ( $M = 20.89$ ,  $SD = 4.77$ ), with females accounting for 71.2% of the sample. The majority of participants identified themselves as Caucasian (51.2%), followed by Asian (22.9%), African-American (7.5%), Hispanic (7%), and 11.3% of the sample identified themselves as ‘Other’.

### **Materials**

#### **Non-suicidal self-injurious behavior.**

*Inventory of Statements about Self-Injury (ISAS).* The ISAS (Klonksy & Olino, 2008) is a self-report measure which assesses frequency and functions of NSSIB. Preliminary questions allow an individual to estimate the number of times twelve different self-injurious behaviors have been engaged in intentionally and without suicidal intent. After indicating engagement in NSSIB has occurred, the participant is asked about the main form of self-harm, age of onset, most recent date of self-injury, if they



experience physical pain when they self-harm, if they are alone when they self-harm and the time that typically elapses from the urge to self-harm and the occurrence of NSSIB. The proceeding section consists of 39 questions which assess 13 functions of NSSIB. Glenn and Klonsky (2011) determined the ISAS has good stability over one year and good test-retest reliability for both the behavioral and functional scales.

**Emotional dysregulation.**

***Beck Anxiety Inventory (BAI).*** The BAI (Beck & Steer, 1990) is a 21-item self-report questionnaire that assesses feelings of anxiety in the past week. Each item is scored on a four point Likert scale from 0 (“not at all”) to 3 (“severely”). Total scores range from 0 to 63, with higher scores indicating more severe anxious symptoms. Examples of items included in this inventory are: “numbness or tingling”, “terrified”, “fear of losing control” and “sweating (not due to heat)”. The BAI has high internal consistency ( $\alpha = .92$ ) and a test-retest reliability over one week of .75 (Beck, Epstein, Brown, & Steer, 1988).

***Beck Depression Inventory (BDI-II).*** The BDI-II (Beck, Steer, & Brown, 1996) is a 21-item self-report questionnaire that assesses feelings of depression in the past two weeks. Each item is scored on a four point Likert scale from 0 (“not at all”) to 3 (“severely”). Total scores range from 0 to 63 with higher scores indicate more severe depressive symptoms. Examples of items included in this inventory are: “sadness”, “sense of failure”, “crying”, and “social withdrawal”. The BDI-II has been reported as highly reliable across different population characteristics, such as age, gender and

ethnicity (Beck, Steer, & Brown, 2007). This scale has an average reliability coefficient of .86 and a test-retest reliability of .9 (Beck, Steer, & Brown, 2007).

### **Moral emotions.**

*Test of Self-Conscious Affect (TOSCA-3).* The TOSCA-3 (Tangney, Dearing, Wagned, & Gramzow, 2000) is a 16 scenario self-report measure that assesses shame and guilt. Each item describes a scenario followed by responses that represent shame-proneness, guilt-proneness, externalization of blame, and detachment; each response is rated on a Likert scale of one (“not likely”) to five (“very likely”). One hypothetical scenario would be: “You make a mistake at work and find out a co-worker is blamed for the error.” The four reactions given are a) You would think the company did not like the co-worker (indicating externalization of blame); b) You would think: “Life is not fair.” (indicating detachment); c) You would keep quiet and avoid the co-worker (indicating shame); and d) You would feel unhappy and eager to correct the situation (indicating guilt). It is important to note that the words shame and guilt are never directly used in the hypothetical scenarios or responses. Tangney and Dearing (2002) found the reliability range for shame-proneness to be from .77 to .88, and for guilt-proneness to be from .78 to .83. The test-retest reliability was .85 and .74 for shame and guilt measures, respectively, in a college sample (Tangney, Wagner, Fletcher, & Gramzow, 1992).

### **Procedure**

Undergraduate students participated in this study in exchange for course credit. Participants were informed that they could leave the study at any time, for any reason without penalty, and that the confidentiality of their responses would be maintained.

Confidentiality was maintained by assigning each participant a unique identification (ID) number at the beginning of the study. This ID number was known only to the researchers. The only identifying information was recorded on the informed consent form, and the participants' ID numbers were used for all proceeding analyses.

Participants were scheduled for a single group session at the University, at which time an undergraduate or graduate research assistant greeted them and gave them the packet of aforementioned self-report measures (along with other surveys not included in these analyses). Participants were able to complete the study in approximately an hour and a half at which time they were provided with the contact information of the research team in case they had any further questions about the study. All participants were told that they would be contacted by the research team if they had scores that fell beyond the predetermined threshold on the BAI and/or BDI-II. Breaching these thresholds would indicate serious depression and/or anxiety symptoms, and would thus be provided with information about the University's Counseling and Psychological Services Center via email. The Human Subjects Review Board approved this study.

## RESULTS

### **Emotional Dysregulation**

Consistent with previously reported findings, BAI and BDI-II scores were very highly correlated ( $r = .62, p < .01$ ). Therefore, I decided to aggregate participants' BAI and BDI-II scores to create a single emotional dysregulation variable. Total BAI scores ( $M = 9.69, SD = 8.28$ ) and total BDI-II scores ( $M = 10.71, SD = 9.49$ ) were multiplied and transformed into  $z$ -scores to create one unit weighted factor score. Eighteen participants did not complete either the BAI or the BDI-II, and were excluded pairwise from subsequent analyses.

### **Moral Emotions**

The moral emotions of shame and guilt were measured by the TOSCA-3. Total shame and guilt scores were computed by summing up the Likert scores (from 'not likely' to 'very likely') for each of the "shame-prone" and "guilt-prone" responses to the hypothetical scenarios. Shame and guilt scores were moderately correlated ( $r = .31, p < .01$ ) as both are considered negative emotions. In accordance with the literature (Tangney et al., 2007), in order to examine the unique influence of shame and guilt, I partialled out guilt from shame, and vice versa. The "shame-free guilt" variable was created by saving the standardized residuals from regressing guilt onto shame. By using the same process to partial out guilt from shame, the "guilt-free shame" variable was created. These

respective residualized variables were then standardized into z-scores to ease interpretation of results.

### **Prevalence of Non-Suicidal Self-Injurious Behavior**

To analyze the presence of NSSIB, a binary variable was created which assigned a “1” to participants who had reported any acts of self-injurious behavior in their lifetime on the ISAS. Conversely, a “0” was given to any participant who had reported no acts of NSSIB. Forty percent of this sample ( $n = 151$ ) reported self-injury. The most prevalent type of self-harm was “banging or hitting self” ( $n = 74$ ), followed by “pulling hair” ( $n = 68$ ), and “pinching” ( $n = 64$ ). See Table 1 for complete list of NSSIB acts and corresponding prevalence and frequencies.

[INSERT TABLE 1 HERE]

Participants’ daily rate of NSSIB needed to be calculated to test hypotheses three through six. In order to control for the length of time people have been self-injuring, participants’ total frequency of acts was divided by the total number of days they had indicated as having self-injured. The total number of days they had been self-injuring was calculated by subtracting the participant’s age of onset from their current age and multiplying this value by 365 (days). The resulting “daily rate” variable had a mean of 0.022 ( $SD = .137$ ), which means that participants in this sample self-injured an average of .02 times daily. Due to the highly skewed nature of the distribution (see Figure 2a), it was necessary to winsorize this variable (Tukey, 1962). Winsorizing reduces the influence of outliers; all daily rates exceeding five standard deviations above or below the mean were recoded. Only one case had a daily rate exceeding five standard deviations (daily rate =

2.4), and was thus recoded to be 0.7 which was the limit of five standard deviations above the mean (see Figure 2b). This winsorized ‘Daily Rate’ variable was used to address hypotheses three through six ( $M = .0174$ ,  $SD = .07$ ).

### **Preliminary Bivariate Analyses**

Pearson correlations were computed to examine the relationship between the predictor variables (emotional dysregulation, shame, and guilt), presence of NSSIB, and the daily rate of NSSIB, and are presented in Table 2. At the bivariate level, both emotion dysregulation and shame were positively related to whether or not someone had ever self-injured. Guilt, on the other hand, was negatively related. For daily rate of self-injurious behavior, only emotional dysregulation showed a significant relationship.

[INSERT TABLE 2 HERE]

### **Predictors of *Presence* of NSSIB: Hypotheses One and Two**

Multiple logistic regressions were used to test the hypotheses predicting the ‘presence of NSSIB.’ It was hypothesized that higher levels of emotional dysregulation, and higher levels of shame will be positively related to the reported presence of NSSIB. In contrast, it was hypothesized that higher levels of guilt will be negatively related to the presence of NSSIB. To test this first hypothesis, the emotional dysregulation, shame and guilt were entered as main effects in block method to predict the presence of NSSIB.

In support of the hypothesis, higher levels of emotional dysregulation significantly predict the presence of NSSIB. Higher levels of residualized shame also significantly predict the presence of NSSIB. Higher levels of residualized guilt negatively

predicts the presence of NSSIB. Results from the regressions of the main effects of emotional dysregulation and the moral emotions are presented in Table 3.

[INSERT TABLE 3 HERE]

When controlling for emotional dysregulation, however, the predictive power of residualized shame drops to only approaching significance ( $p = .06$ ). Residualized guilt, when controlling for emotional dysregulation, drops below significance levels, which suggests that guilt does not contribute unique variance above and beyond levels of emotional dysregulation.

It was also hypothesized that there will be an interaction between emotional dysregulation and the moral emotions on the presence of NSSIB. Specifically, I expected that for those with higher levels of shame, there will be a stronger, more positive relationship between emotional dysregulation and presence of NSSIB, compared to those who are lower in shame. I also expected that for those higher on guilt, the relationship between emotional dysregulation and presence of NSSIB will be weaker, compared with those who have low levels of guilt. To test this hypothesis, emotional dysregulation, the moral emotion (shame or guilt), and the interaction of the two were entered into a logistic regression.

As can be seen in Step 2 in Table 4.1, the interaction between shame and emotional dysregulation was not significant. Similarly, no significant interaction between guilt and emotional dysregulation was found (Table 4.2). Complete results from the interaction of emotional dysregulation and the moral emotions are presented in Tables 4.1 and 4.2, respectively.

[INSERT TABLES 4.1 AND 4.2 HERE.]

### **Predictors of *Daily Rate* of NSSIB: Hypotheses Three and Four**

In addition to exploring the relationship of whether or not people self-injured, we were also interested in how emotional dysregulation and the moral emotions were related to the reported *daily rate* of NSSIB. To account for the extremely skewed distribution (Figure 2) of the daily rate of NSSIB outcome variable, we used a negative binomial regression with log link (Hilbe J. M., 2011). Negative binomial regressions assume that the outcome variable is a non-negative integer; to satisfy this assumption, it was necessary to multiply the Daily Rate of NSSIB variable by a constant of 100,000 to remove decimals while still retaining the continuous nature of the construct.

One set of negative binomial regressions was used to test the bivariate relationships between NSSIB and each predictor. Consistent with our hypothesis, emotional dysregulation is positively related to the daily rate of NSSIB ( $\chi^2(1) = 40.85, p < .01$ ), whereas guilt is negatively related to the daily rate of NSSIB ( $\chi^2(1) = 6.97, p < .01$ ). Shame, however, was not related to the daily rate of NSSIB ( $\chi^2(1) = .01, p = .91$ ). It is noteworthy, however, that when controlling for emotional dysregulation, the main effect of residualized guilt drops yet is still significant ( $\chi^2(1) = 6.54, p = .011$ ).

To test the fourth hypothesis that there will be an interaction between emotional dysregulation and the moral emotions on the reported *daily rate* of NSSIB, we entered emotional dysregulation, the non-residualized moral emotions, and their interaction (emotional dysregulation by shame, and emotional dysregulation by guilt) into one model. The results of the negative binomial regression suggest that there was a significant



interaction between emotional dysregulation and guilt ( $\chi^2(1) = 6.8, p < .01$ ). The interaction between emotional dysregulation and shame approached significance ( $\chi^2(1) = 3.33, p = .07$ ) as well. Complete results from the negative binomial regression are provided in Table 5.

[INSERT TABLE 5 HERE.]

To understand the meaning of the moderation effect, the interactions of emotional dysregulation and shame, and the interaction of emotional dysregulation and guilt are plotted in Figures 3 and 4, respectively. In keeping with tradition, participants being labeled as “low” or “high” on the moral emotion variables with either one standard deviation below the mean (for “low”) or one standard deviation above the mean (for “high”). The graphical depiction of the interaction of shame and emotional dysregulation on the daily rate of NSSIB indicate that the relationship between emotional dysregulation and NSSIB is stronger and more positive for those who have high levels of shame. Conversely, those who have low levels of shame have a weaker relationship between emotional dysregulation and NSSIB.

Figure 4 illustrates the moderation of guilt on the relationship between emotional dysregulation and the daily rate of NSSIB. Those participants who have low levels of guilt have a moderate positive relationship between emotional dysregulation and daily rate of NSSIB. Those who have high levels of guilt, on the other hand, have practically no relationship between emotional dysregulation and daily rate of NSSIB.

[INSERT FIGURES 3 AND 4 HERE.]

## **Predictors of *Daily Rate* of NSSIB for Those who Self-Injure: Hypotheses Five and Six**

For the last two hypotheses, we were interested in the subsample of youth who were self-injurers. In other words, what is the relationship of emotional dysregulation and moral emotions to NSSIB for those who self-injure? To test this hypothesis, we selected the participants who had ever engaged in NSSIB ( $n = 146$ ), and conducted negative binomial regressions. For this sample, emotional dysregulation was positively related to the daily rate of NSSIB ( $\chi^2(1) = 18.44, p < .01$ ); guilt was negatively related to the daily rate of NSSIB ( $\chi^2(1) = 9.3, p < .01$ ). Shame was not related to the daily rate of NSSIB. It is important to note, once again, that when all of these predictors are loaded into one model (thus controlling for emotional dysregulation), that the significance of guilt as a predictor drops, yet stays significant ( $p = .30$ ), thus guilt has a relationship to NSSIB over and above the large relationship between emotional dysregulation and NSSIB. Complete results from the negative binomial regression are provided in Table 6. Contrary to our hypotheses, interactions of emotional dysregulation and the moral emotions were also tested but did not reach significance.

[INSERT TABLE 6 HERE.]

## DISCUSSION

This study examined the relationship between emotional dysregulation, moral emotions and non-suicidal self-injurious behavior. Specifically, I predicted that emotional dysregulation and shame would be positively related to the presence and daily rate of NSSIB, while guilt would be negatively related. In addition, the interaction of emotional dysregulation and shame would present itself such that those who are higher on shame would have a stronger, more positive relationship between emotional dysregulation and the presence and daily rate of NSSIB, compared to those who are lower in shame. Conversely, the interaction of guilt and emotional dysregulation would result in a pattern such that those who are higher in guilt would have a weaker relationship between emotional dysregulation and presence and daily rate of NSSIB, compared to those who have low levels of guilt.

Results from this study supported some, but not all of these hypotheses. When predicting the *presence* of NSSIB in the entire sample, higher levels of emotional dysregulation and higher levels of shame did predict the presence of NSSIB. Also, higher levels of guilt did negatively predict the presence of NSSIB. When testing the interaction of emotional dysregulation and shame, and emotional dysregulation and guilt, however, no significant effects were found above and beyond the main effects of emotional dysregulation.

When predicting the *daily rate* of NSSIB for the entire sample, the main effect of emotional dysregulation was positively related, and guilt was negatively related. The main effect of shame, however, was not related to the daily rate of NSSIB. When testing the interaction of emotional dysregulation and the moral emotions, there was a significant interaction between emotional dysregulation and guilt. As seen in Figure 4, the relationship of this moderation effect was consistent with that which was hypothesized. Those participants who were low on guilt show a stronger, positive relationship between emotional dysregulation and the daily rate of NSSIB. In contrast, those who were high on guilt had almost no relationship between emotional dysregulation and daily rate of NSSIB. This supports the hypothesis that guilt serves as a protective factor, since those with higher levels of guilt did not have the same positive relationship between emotional dysregulation and rate of NSSIB, as those who were low on guilt. Thus, for the entire sample, if a participant had high guilt, having high emotional dysregulation was less likely to result in higher rates of NSSIB. The relationship between emotional dysregulation and daily rate of NSSIB was moderated by the level of guilt a person has.

The interaction between emotional dysregulation and shame approached significance when predicting the daily rate of NSSIB. This can be interpreted as being a weaker relationship than the interaction between emotional dysregulation and guilt, but when examining Figure 3, we can see that the relationship proposed in this paper was supported. Those participants who were high on shame had a stronger, more positive relationship between emotional dysregulation and daily rate of NSSIB, as opposed to their low-shame counterparts who had a weaker positive relationship. This means that

those who have high shame and high emotional dysregulation typically show higher daily rates of NSSIB than those who have low shame, but high emotional dysregulation. The relationship between emotional dysregulation and daily rate of NSSIB was moderated by level of shame.

When assessing the relationship between emotional dysregulation, moral emotions and NSSIB only in the sample of participants who engaged in NSSIB, only some of the hypotheses were supported. The main effects of emotional dysregulation did positively predict the daily rate of NSSIB in this subsample, whereas the main effect of guilt did negatively predict the daily rate of NSSIB. Shame was not related to the daily rate of NSSIB, however. Neither interaction (emotional dysregulation by guilt, and emotional dysregulation by shame) were significant when predicting the daily rate of NSSIB in this subsample.

While it was expected that the interaction effects that were supported for entire sample would persist in the subsample of those who self-injured, there are a few reasons why this may have occurred. It is important to remember that the measure used to assess NSSIB (the ISAS) asked for a lifetime prevalence of self-injury acts. By doing this, any person who had ever intentionally self-injured would be counted in the subsample of participants who presented with NSSIB. It is likely, however, that there were two (or more) distinct populations within this subsample. It is reasonable to believe that a person who, for example, had a single hair pulling episode ten years ago, is inherently distinct from a person who frequently and consistently carves their skin. It would be prudent for future research in this area to distinguish between the separate populations of self-

injurers: those who are mild and less frequent versus those who are more severe and constant. It is possible that when examining those participants who were recent self-injurers, different patterns may have emerged regarding the relationship between emotional dysregulation and the moral emotions. Specifically, one could hypothesize that those participants who are currently self-injuring would have a very strong “shame-effect” on their emotional dysregulation-NSSIB relationship. By creating a more recent cutoff for self-injury episodes, the ISAS measure would also be temporally consistent with the BAI and the BDI, which also require participants to evaluate their symptoms in the past week or two weeks, respectively. It would also reduce the recall error.

This study has provided valuable insight into the effect that moral emotions have on the relationship between emotional dysregulation and non-suicidal self-injurious behavior. Analogous with previous research on other-directed aggressive behavior (Hastings et al., 2000; Stuewig et al., 2009; Tangney et al., 2007), guilt and shame were shown to be distinct moral emotions, with guilt serving as a protective factor and shame as a risk factor for presence and daily rate of NSSIB. This is important for advancing the literature addressing the relationship between moral emotions and maladaptive behaviors.

The results of this study have added an important factor to the theoretical model of NSSIB onset and maintenance. A person’s level of moral emotionality, especially guilt, provides significant predictive power as to whether a person will self-injure, and how often they will if they do. The relationship between a person’s emotional dysregulation and NSSIB is moderated by their level of guilt, such that a person with high levels of guilt will likely have lower rates of NSSIB than a person with low levels of

guilt, showing that guilt does serve as a protective factor. The relationship between emotional dysregulation and NSSIB is also moderated by the level of shame, such that higher levels of shame compound the negative effects of emotional dysregulation, resulting in higher rates of NSSIB than those who have lower levels of shame. To know a person's level of shame and guilt goes above and beyond the predictive power of knowing their emotional dysregulation, as measured by anxiety and depression scores, when assessing daily rate of NSSIB.

### **Limitations and Future Directions**

It is important to recognize the limitations inherent in using an undergraduate student sample. Generalizability to other group of individuals is always an issue due to factors that are unique to being a college student (i.e. living away from home for the first time, new independence, etc.). Nonetheless, the high prevalence rate of NSSIB in an undergraduate student population (Ross & Heath, 2002) does make this a sensible place to begin research. But it is important to further investigate these models in other groups, specifically adolescence, which is considered a high risk period with rates from 13% to 45% (Nock, 2010).

Future research should examine the functions of self-injury. It is likely the multiple functions that NSSIB may serve for individual people would result from unique pathways involving different levels of shame and guilt. Nock and Prinstein (2005) proposed a functional model of NSSIB which concluded that adolescents engage in self-injury for both automatic and social reinforcement. Evaluating *why* a person chooses to engage in self-injurious behavior will result in more precise, individualized and effective

treatment strategies. For example, it is likely that a person who engages in NSSIB for social, interpersonal reinforcement (i.e. attention-seeking) would require a different intervention plan than someone who engages in NSSIB for automatic, covert reinforcement (i.e. self-punishment). For instance, a person who engages in NSSIB for automatic, covert reasons would benefit more from a treatment strategy that attempts to alter their shame-prone self-evaluations to more guilt-prone situation evaluations.

Future intervention and treatment approaches for NSSIB may incorporate ways to help young adults adapt their thinking from negative internal self-evaluation (shame) processes to less harmful external situation-evaluation (guilt) strategies. Seeing as shame and guilt are likely moderators of the impact of emotional dysregulation on NSSIB, it is critical to examine potential clinical applications which are “guilt-inducing, [and] shame-reducing,” as Tangney and colleagues (2011) propose for a sample of jail inmates. More research is needed to evaluate the relationships addressed in this study in other populations (i.e. children, adults, community samples). The results from this study do present a new relationship between emotional dysregulation, moral emotions and non-suicidal self-injurious behavior worthy of future research



APPENDIX: TABLES AND FIGURES

Table 1

*Descriptive Information about NSSIB*

Type of Act	<i>n</i> *	Total Frequency
Banging or Hitting	74	4,188
Pulling Hair	68	2,207
Pinching	64	2,359
Cutting	59	2,824
Interfering with Wound Healing	57	7,404
Scratching	54	1,204
Biting	44	1,824
Burning	27	661
Rubbing Skin Against Rough Surface	20	348
Sticking Self with Needle	17	144
Swallowing Dangerous Substances	16	177
Carving	14	183

\*Number of participants who have reported engaging in this type of self-injurious act

Table 2

*Pearson Correlations of Emotional Dysregulation, Shame, Guilt, and NSSIB*

	Daily Rate NSSIB	Emotional Dysregulation	Shame <sup>1</sup>	Guilt <sup>1</sup>
Presence NSSIB	.30**	.34**	.21**	-.14**
Daily Rate NSSIB		.32**	.08	-.09
Emotional Dysregulation			.38**	-.22**
Shame <sup>1</sup>				

\*\*  $p < 0.01$ .

<sup>1</sup>Residualized values

Table 3

*Independent Logistic Regressions Predicting Presence of NSSIB from Emotional Dysregulation and Moral Emotions*

	B	SE	Wald	O.R.	95% Confidence Interval for O.R.	
Emotional Dysregulation	.78	.13	35.23**	2.19	1.69	2.83
Shame <sup>1</sup>	.46	.12	16.0**	1.59	1.27	1.99
Guilt <sup>1</sup>	-.30	.11	6.97**	.74	.59	.92

\*\* $p < .01$

O.R. = Odds Ratio

<sup>1</sup>Residualized values

Table 4.1

*Logistic Regressions Predicting Presence of NSSIB from Interactions of Emotional Dysregulation and Shame*

	B	SE	Wald	O.R.	95% Confidence Interval for O.R.	
<u>Step 1</u>						
Emotional Dysregulation	.69	.14	25.41**	2.00	1.53	2.62
Shame <sup>1</sup>	.24	.13	3.55*	1.28	.99	1.65
<u>Step 2</u>						
Emotional Dysregulation	.73	.15	25.12**	2.08	1.56	2.78
Shame <sup>1</sup>	.24	.13	3.2*	1.27	.98	1.64
Emot Dys* Shame <sup>1</sup>	-.12	.12	.92	.89	.70	1.13

\*\* $p < .01$  \* $p < .07$

O.R. = Odds Ratio

<sup>1</sup>Residualized values

Table 4.2

*Logistic Regressions Predicting Presence of NSSIB from Interactions of Emotional Dysregulation and Guilt*

	B	SE	Wald	O.R.	95% Confidence Interval for O.R.	
<u>Step 1</u>						
Emotional Dysregulation	.75	.13	31.65**	2.12	1.63	2.76
Guilt <sup>1</sup>	-.14	.12	1.26	.87	.69	1.10
<u>Step 2</u>						
Emotional Dysregulation	.76	.13	31.72**	2.13	1.64	2.78
Guilt <sup>1</sup>	-.14	.12	1.19	.87	.69	1.11
Emot Dys* Guilt <sup>1</sup>	.06	.13	.18	1.06	.82	1.38

\*\* $p < .01$

O.R. = Odds Ratio

<sup>1</sup>Residualized values

Table 5

*Negative Binomial Regression Predicting Daily Rate of NSSIB from Emotional Dysregulation, Moral Emotions and Their Interactions*

	B	SE	Wald	O.R.	95% Confidence Interval for O.R.	
Emotional Dysregulation	1.15	.17	48.1**	3.16	2.29	4.39
Shame	.00	.33	.00	1.00	.52	1.92
Guilt	-.32	.19	2.88*	.72	.50	1.05
Emot Dys* Shame	-.26	.14	3.33*	.77	.59	1.02
Emot Dys* Guilt	.27	.10	6.80**	1.31	1.07	1.60

\*\* $p < .01$  \* $p < .1$

O.R. = Odd Ratio

Table 6

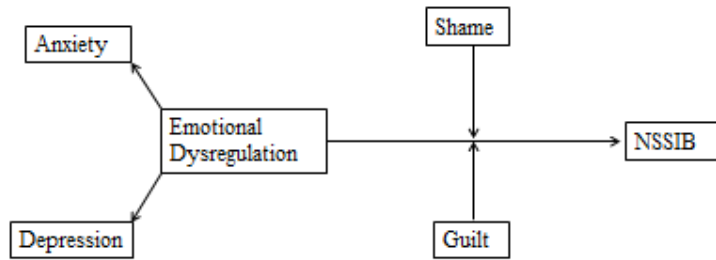
*Negative Binomial Regression Predicting Daily Rate of NSSIB from Emotional Dysregulation and Moral Emotions for those who Self-Injure*

	B	SE	Wald	O.R.	95% Confidence Interval for O.R.	
Emotional Dysregulation	.56	.15	14.47**	1.74	1.31	2.31
Shame <sup>1</sup>	-.21	.34	.36	.81	.42	1.60
Guilt <sup>1</sup>	-.33	.15	4.90*	.72	.53	.96

\*\* $p < .01$  \* $p < .1$

O.R. = Odds Ratio

<sup>1</sup>Residualized values



*Figure 1.* Proposed model of relationship between emotional dysregulation, moral emotions and non-suicidal self-injurious behavior





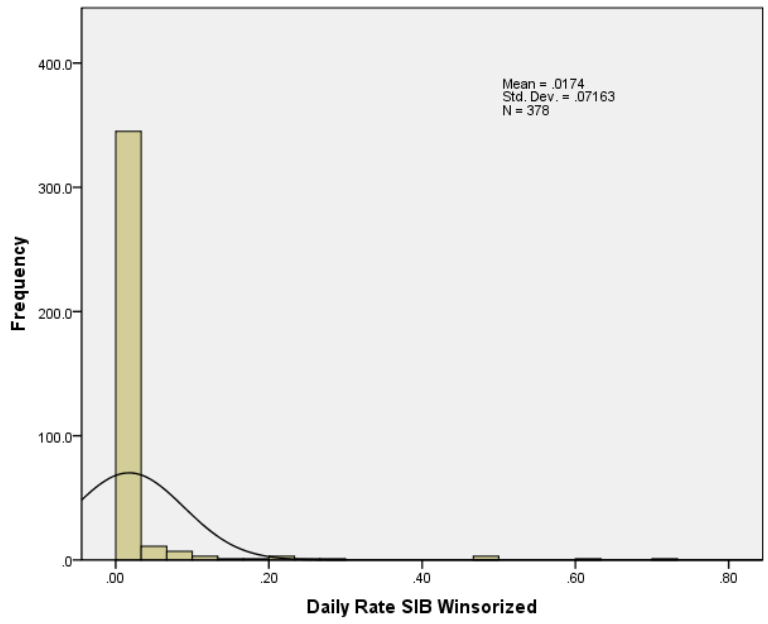
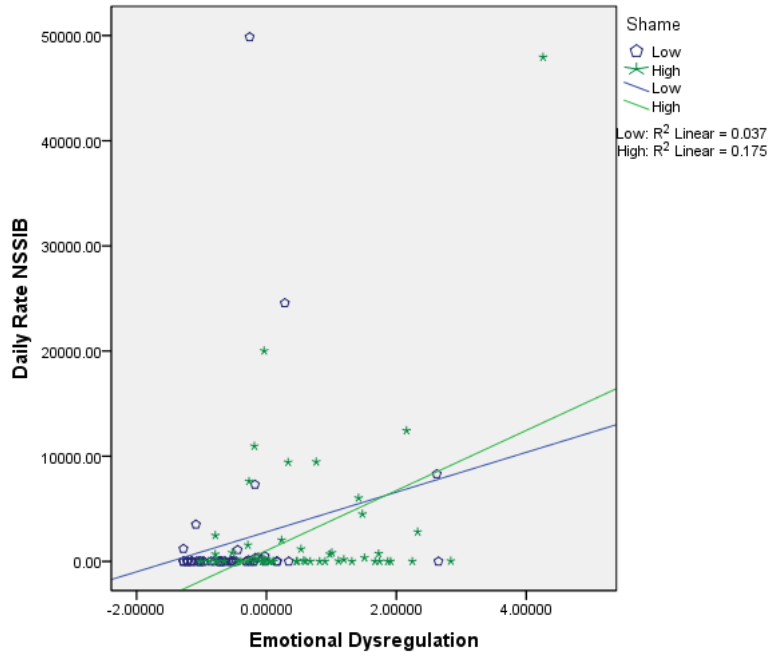


Figure 2b. Daily Rate NSSIB Distribution for entire sample after winsorizing



*Figure 3.* Interaction of emotional dysregulation and shame on daily rate of NSSIB (multiplied by 100,000)

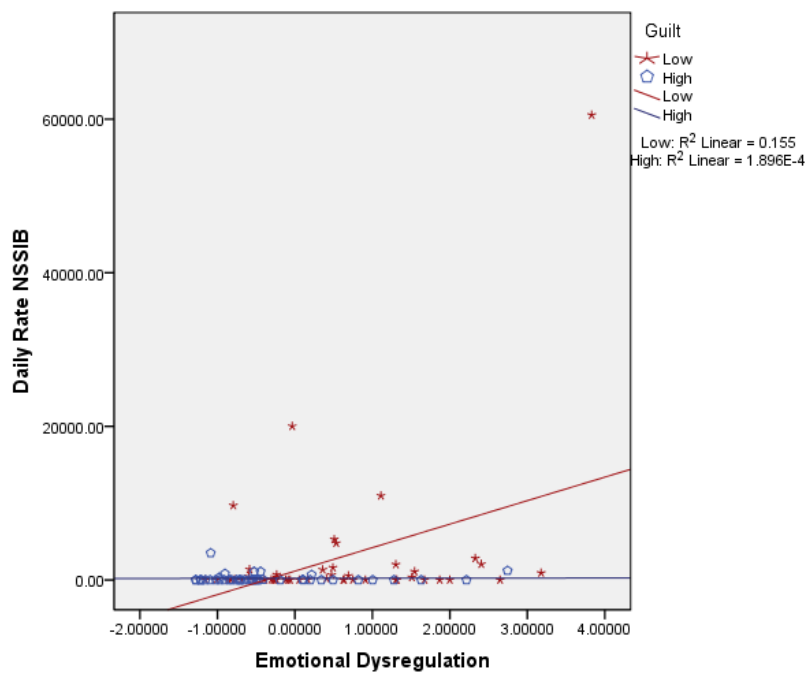


Figure 4. Interaction of emotional dysregulation and guilt on daily rate of NSSIB (multiplied by 100,000)

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## CURRICULUM VITAE

Susan E. VanDerhei graduated with a dual degree in Psychology and Criminology and Criminal Justice from the University of Maryland, College Park. Upon completion of her Master of Arts degree in Applied Developmental Psychology from George Mason University in Fairfax, Virginia, she will go on to the University of Pittsburgh, Pennsylvania to begin her doctoral program in Developmental Psychology. She plans to focus her research on predictors of maladaptive and risky behaviors in a typically developing adolescent population.