

Beliefs Behind the Scars

The Role of Entity Beliefs About Emotion in Non-Suicidal Self-Injury

Amanda K. Irion

University of California, Berkeley

ABSTRACT. Non-suicidal self-injury (NSSI; deliberate harm to the body without the intent to die) in college-age individuals is a growing concern. While an increasing body of research aims to describe the functions of NSSI, little is known about why certain individuals turn to such damaging and potentially life-threatening behaviors. This study aimed to understand why some individuals turn to these behaviors. Specifically, it was hypothesized that NSSI may be associated with entity beliefs about emotions (i.e., that one's emotional response is uncontrollable). Participants completed a negative emotion induction task by recalling an argument and subsequently reported their beliefs about these emotions and their urges to engage in NSSI. Results showed a significant correlation between urges to engage in NSSI and entity beliefs. These findings suggest that entity beliefs about emotions are a correlate of—and potentially a risk factor for—NSSI. Understanding the factors that may drive the urge to engage in NSSI may inform new ways of treating these individuals. Improved treatments may decrease the alarmingly high rate of NSSI in college-age individuals.

1. Introduction

Non-suicidal self-injury (NSSI) is defined as causing deliberate harm to the body without the intent to die (Nock, 2009; Barrocas et al., 2011). This type of harm results in damage of the skin tissue to the point of scarring (Gratz, 2001). Common types of self-injury include cutting or burning the skin, scratching the skin to draw blood, and picking wounds to the degree of interfering with healing (Gratz, 2001). Although other behaviors such as tattooing or piercing the body result in alteration of the skin tissue, NSSI is commonly seen as a non-culturally sanctioned behavior (Barrocas et al., 2011) due to this specific type of skin alteration (American Psychiatric Association, 2013).

NSSI is commonly found in individuals with psychiatric diagnoses, including major depression, anxiety disorders, post-traumatic stress disorder, eating disorders, and many types of personality disorders (Haw, Hawton, Houston, & Townsend, 2001; Klonsky, 2007; Suyemoto, 1998); NSSI is a particularly common symptom of Borderline Personality Disorder (BPD; Klonsky, 2007; Barrocas et al., 2011). Moreover, NSSI rates in samples of those diagnosed with BPD can be as high as 90% (Zanarini et al., 2008; Barrocas et al., 2011). However, NSSI is not a symptom solely confined to specific psychiatric disorders. NSSI rates are as high as 38% in college-age

samples as well (Rodham & Howton, 2009), which indicate the need to examine the properties of this unsettling phenomenon in non-clinical samples.

The Role of Emotion Regulation in NSSI

NSSI in young adult populations is a growing concern. Although many laymen believe that the driving force behind NSSI stems from the need to get attention or to experience physical pain (Suyemoto, 1998), the research suggests that NSSI may arise from emotion regulation deficits (Davis et al., in review). Emotion regulation is essential to healthy functioning (Werner & Gross, 2009; De Castella et al., 2013). It is a skill that is acquired early in life (e.g. infants shifting their gaze in an effort to autonomously regulate emotions; Gross & Thompson, 2007) and often operates without having to make a conscious effort to do so (Hopp, Troy & Mauss, 2011; Mauss, Bunge & Gross, 2007). Emotion regulation consists of the ability to use cognitive strategies to change one's response to emotions (Troy, Wilhelm, Shallcross & Mauss,

AUTHOR'S NOTE: *This study would not have come to fruition without the unwavering support of the Emotion and Emotion Regulation Lab. Thank you to Tchiki Davis for the constant push for excellence, to Iris Mauss for continual inspiration and to Maya Kuehn for encouragement to conduct this study.*

2010). Emotion regulation influences which emotions individuals will have and how they will experience these emotions (Gross, 1998).

Many researchers (see De Castella et al., 2013; Troy et al., 2010) agree that a fundamental strategy for successful emotion regulation is the ability to reappraise a situation. Reappraisal is the ability to change how one thinks about a situation, specifically an emotion-eliciting one. Through this cognitive change, one is able to change the emotional meaning and significance of the situation (De Castella et al., 2013). For example, Gross (1998) conducted a laboratory study examining the role reappraisal plays in emotion regulation. Participants who were instructed to use reappraisal when watching an emotional film clip reported less negative emotions subsequent to watching the clip than did those who were told to “just watch” (Troy et al., 2010). Reappraisal as an emotion regulation strategy proves to be effective for clinical populations as well. Reappraisal has been found to be negatively associated with depressive symptoms (Troy et al., 2010; Garnefski & Kraaij, 2006; Garnefski, Kraaij & Spinhoven, 2001). Moreover, in a study conducted over a 10-week treatment period, men who received intervention treatment exhibited increased reappraisal, which in turn was associated with decreased depressive symptoms (Carrico, Antoni, Weaver, Lechner & Schneiderman, 2005). Indeed, these studies support the importance of emotion regulation as a means to healthy functioning.

Conversely, poor emotion regulation refers to the inability to change one’s emotional reactions to a situation (Davis et al., in review; Aldao, Hoeksma, & Schweizer, 2010; Gross & Thompson, 2007). Initial evidence suggests that NSSI is often associated with poor emotion regulation abilities (Crowell et al., 2012; Slee et al., 2008). Those with a history of NSSI report engaging in NSSI for various reasons that commonly include: to relieve negative emotions such as depression, anxiety, guilt; to punish self (Lloyd-Richardson, Nicholas, Dierker & Kelley, 2007); to distract from negative thoughts (Nock, 2009); to relieve feelings of numbness (Barrocas et al., 2011). An explanation of this behavior proposes that emotion-eliciting situations and events can produce extreme arousal in individuals who have poor emotion regulation strategies (Davis et al., in review; Chapman, Gratz & Brown, 2006; Linehan et al., 2007; Nock, 2009). NSSI reduces this high arousal (Klonsky, 2007).

Reduction of arousal is thought to come, in part, from the production of endogenous endorphins (producing an opioid-like feeling) that alleviate negative emo-

tional states (Favazza & Conterio, 1988; Richardson & Zaleski, 1986). The pain produced by self-injurious behavior may produce a rush of endorphins, culminating in a pleasant, relaxed state (Favazza & Conterio, 1988; Richardson & Zaleski, 1986). Thus NSSI increases levels of endogenous endorphins. Conversely, conducting research analyzing cerebrospinal fluid from individuals with a history of NSSI, Stanley et al. (2010) found that some individuals who engage in NSSI have lower levels of endorphins. Individuals who engage in NSSI to experience physical pain (i.e., as a way to punish oneself) may be those who have low levels of these opioids and in turn experience more intense pain, rather than a reduction of psychological pain (Stanley et al., 2010). Indeed, both findings support the understanding that endorphins influence the pain threshold, and that NSSI is used as a way to relieve emotional tension.

Individuals may also turn to NSSI as a way to quell ruminative thoughts (Selby & Joiner, 2009). Rumination—continually thinking about the causes and outcomes of negative, emotional events (Nolen-Hoeksema, 1991)—may make it harder to direct attention away from emotion-eliciting situations (Selby & Joiner, 2009). Minor distractions that shift attention in an effort to regulate emotions (i.e., an intense workout or cold shower) often prove to be insufficient in lowering high arousal. An individual may need to engage in something that is more intense or shocking to the system. More specifically, a jolt to the system, such as severe pain to the body, may be the only way to shift focus away from the intense emotions resulting from an external situation (Selby & Joiner, 2009).

Functional Models of NSSI

Prior research has tended to focus mainly on the functions of NSSI, and numerous models of the function of NSSI have been proposed. In a meta-analysis, Klonsky (2007) concludes that NSSI serves seven main functions: to decrease or alleviate negative emotions and/or high arousal (Affect-regulation model); to abate the experience of dissociation (Anti-dissociation model); as a way of fighting urges to attempt suicide (Anti-suicide model); as a cry for help (Interpersonal-influence model); to demonstrate or affirm boundaries between oneself and others (Interpersonal boundaries model); as a way to express anger felt towards the self (Self-punishment model); and as a way of generating exhilaration comparable to extreme sporting (Sensation-seeking model).

Another functional model of NSSI, the Cascade

model (Selby & Joiner, 2009), posits that NSSI functions as short-term emotion regulation, but also explains why it is not effective in long-term emotion regulation. Due to heightened focus on emotional stimuli, individuals may experience greater negative affect which becomes harder and harder to regulate. Jolting the system through NSSI may be the only effective way to short-circuit this emotional cascade. However, this is only a temporary solution, and the shame or embarrassment surrounding the injurious behavior may thereby perpetuate the emotional cascade (Selby & Joiner, 2009).

Nock (2009) offers an additional hypothesis for the function of NSSI and suggests that NSSI that may contribute to a cyclical pattern of self-injury. Nock proposes that the reason why people may engage in NSSI is that it is a fast and often very accessible way of regulating emotions (Pragmatic Hypothesis; Nock 2009). Importantly, self-injurers report feeling little or no pain while they engage in NSSI (Pain Analgesia/Opiate Hypothesis; Nock, 2009), therefore creating a cyclical pattern of using a fast technique to regulate emotions that becomes easily reinforced by pain analgesia.

A New Idea: Beliefs about Emotions

Much of the past research has focused on functional models of NSSI and how poor emotion regulation may be the driving force leading individuals to intentionally harm themselves. However, it's unclear exactly why poor emotion regulation would increase risk for NSSI. Recent research (see Tamir, John, Srivastava & Gross, 2007; De Castella et al., 2013) indicates that people hold different implicit beliefs about emotion: either emotions are an experience that can be regulated or changed (incremental beliefs) or emotions are something that cannot be controlled or changed (entity beliefs; De Castella et al., 2013). Research has shown that people who hold entity beliefs about emotion are less likely to engage in adaptive emotion regulation (i.e., reappraisal; Tamir et al., 2007). Beliefs about controllability, in any domain, impact daily functioning. For individuals holding incremental beliefs, goals appear to be more attainable, and strategies for attaining these goals are implemented (Tamir & Mauss, 2011).

However, a distinction must be made between beliefs about general controllability and beliefs about personal controllability of one's own emotions. Individuals may believe that in general people can control their emotions, while they themselves are powerless to control their own emotions. Subsequently, this belief of lack of

personal controllability may contribute to feelings of personal failure (Tamir & Mauss, 2011). Continually experiencing feelings of personal failure may limit the ability to problem solve (Tamir & Mauss, 2011). Therefore, individuals may engage in NSSI to alleviate negative emotional states (through the release of endogenous endorphins). Thus, individuals who believe they are powerless to control their emotions may engage in NSSI for reasons that the functional models propose. In addition, individuals may engage in NSSI as a way to distract themselves from negative thoughts or feelings. However, NSSI is only a temporary solution; engaging in this behavior only provides temporary relief from the current emotions. It does not solve the root cause. In sum, although past research has primarily focused on the functions that NSSI serves, burgeoning research indicates the need to further investigate its relationship with beliefs about emotion.

Limitations to Prior Research

Limitations of prior research have impacted a wide range of domains including research, theory, and treatment (Suyemoto, 1998). Conducting studies with inpatient populations or adolescents create biased results as NSSI has a higher prevalence in these populations (Suyemoto, 1998). Therefore, it is imperative to expand the scope of research to non-clinical samples due to research findings indicating that NSSI is not solely limited to adolescents or individuals in inpatient settings. Furthermore, prior research has failed to control for pivotal variables such as depression and anxiety. Due to the salience of depression in many psychiatric disorders, it is crucial to control for depression to indicate the rates of NSSI in the general public that may not necessarily been diagnosed with depression. Moreover, standardized measures of self-reported emotions and emotion regulation assess variables in general (e.g. "I feel sad"; Beck, Steer & Brown, 1996). Assessing variables in general may be confounded due to memory bias (Robinson & Clore, 2002). Therefore, it is of utmost importance to assess these variables in real time through lab-based emotion inductions. This greatly reduces memory bias and may provide a more accurate understanding of the relationship between emotion beliefs and NSSI.

Present Study

Given that emotion beliefs and emotion regulation play a role in coping with negative emotions (Tamir et al., 2007), this study will be the first to examine the relationships between individual beliefs about emotions, emotion regulation, and NSSI. This is achieved through assessing

implicit beliefs about emotions during a mood induction, emotion regulation in general, and NSSI before and after the mood induction. Memory bias may confound results insofar as participants may not accurately remember their emotional beliefs at the time they engaged in NSSI behaviors. To avoid this negative emotions are induced through a recall scenario and both emotion beliefs and NSSI urges are assessed. It is hypothesized that individuals who experience greater entity beliefs about emotions will report greater NSSI frequency, and show greater NSSI urges.

2. Method

Participants

Four hundred and thirty-nine participants (72% female) between the ages of 18 years and 51 years ($M = 21$, $SD = 3.4$) were recruited through UC Berkeley's online Research Participation Pool (RPP). Students enrolled in specific courses in the Psychology Department are required to complete a certain number of RPP credits (3 credits for each psychology course they are enrolled in) as part of their final grade. Psychology students can choose what studies to participate in, and those who chose this online study received 0.5 credits.

Measures

Demographics. Participants responded to two general demographic questions asking their gender and their age.

History of NSSI. A single question ("I have hurt myself on purpose several times") from the Schedule for Nonadaptive and Adaptive Personality (Simms & Clark, 2006) was used to measure whether subjects had a history of NSSI. "Several times" was removed so as to allow participants to rate NSSI on a Likert scale (1 = never, 4 = frequently).

Implicit emotion beliefs. Two questions from the Implicit Beliefs Scale (Tamir et al., 2007) were used to assess implicit beliefs in response to the emotion induction: "No matter how hard they try, people can't really change the emotions they have" and "The truth is, people have very little control over their emotions."

Verbal intelligence. Verbal intelligence was assessed through the 40-item Shipley Institute of Living Scale (Zachary, Crumpton, & Spiegel, 1985).

Depression symptoms. Depression symptoms were assessed using the 21-item Beck Depression Inventory (BDI; Beck, Steer & Garbin, 1988).

Anxiety symptoms. Anxiety symptoms were assessed using the 21-item Beck Anxiety Inventory (BAI; Beck, 1990).

Emotion regulation and beliefs. Emotion regulation and beliefs were assessed using the Response Styles Questionnaire (RSQ; Nolen-Hoeksema, 1991), the Emotion Regulation Questionnaire (ERQ 21; Gross & John, 2003), the Behavioral Emotion Regulation Inventory and the Implicit Beliefs Scale (Tamir et al., 2007).

Emotions. Emotions were assessed using the Positive and Negative Affect Schedule (PANAS; Watson, Clark & Tellegan, 1988).

Procedure

Participants read a brief description of the study on the RPP website that indicated that the study was assessing emotion beliefs and emotion regulation. After reading the consent form and agreeing to participate, participants were asked two demographic questions ("What is your gender?" and "What is your age?"). Participants then completed questionnaires assessing verbal intelligence (Shipley Institute of Living Scale), depression (Beck Depression Inventory), anxiety (Beck Anxiety Inventory), and emotion regulation and beliefs (Response Style Questionnaire; Emotion Regulation Questionnaire; The Behavioral Emotion Regulation Inventory; Implicit Beliefs Scale), respectively, and single question assessing their history of NSSI ("I have hurt myself on purpose many times.") After completing these assessments, participants watched an instructional video clip on how wooden bowls are made. The purpose of this video clip was to neutralize participants' emotions before completing the rest of the study and to establish a baseline for each participant. Participants were then asked to rate how strongly they were feeling certain emotions, using the PANAS scale, after watching the bowl-making clip. Participants were then asked to recall an argument that they had had with a significant other or a friend. They were given a minimum of one minute to focus on the argument and to reflect on how they felt in the moment of the argument and what their beliefs about their emotions were at that time. After one minute, a "next" button appeared on the screen to allow participant to continue with the study.

Participants were then asked to again rate how strongly they were feeling the emotions that they rated before the clip, again using the PANAS scale, and also how they responded internally to these emotions. To conclude the study, participants watched a positive, mood-altering

film clip to repair any negative emotions or thoughts that may have arisen during their participation. A clip from Planet Earth was chosen, depicting the change of winter to spring on Mt. Denali. In the unlikely event that longer lasting negative effects occurred from participating in the study, each participant was given a list of campus resources, such as numbers for the Counseling and Psychological Services at the Tang Student Health Center, suicide and crisis hotline, and resources on identifying depression and anxiety.

3. Results

Manipulation Check

In order to assure that the mood induction increased negative emotions, paired t-tests were computed to compare the average of negative emotions prior to mood induction to the average of negative emotions post mood induction. Participants experienced significant increase in sadness ($M = 4.22$, $SD = 2.54$) post mood induction compared to the baseline assessment ($M = 2.00$, $SD = 1.72$), $t(424) = -16.90$, $p < 0.01$. Similarly, participants experienced an increase in anxiety ($M = 3.82$, $SD = 2.456$) post mood induction compared to the baseline assessment ($M = 1.60$, $SD = 1.35$), $t(425) = -17.87$, $p < 0.01$. There was no significant increase in anger post mood induction $t(427) = 0.72$, $p = 0.11$.

Primary Analyses

A total of 439 participants completed the study with 19% reporting a history of NSSI. It was predicted that NSSI frequency would be associated with entity beliefs about emotions. An ANOVA revealed that there was no effect of entity beliefs about emotions on NSSI frequency $F(1,432) = 2.02$, $p = 0.16$. However, consistent with our hypothesis that individuals who experience greater entity beliefs about emotion will show greater NSSI urges, a Pearson's correlation confirmed this hypothesis $r(420) = 0.14$, $p < 0.01$.

4. Discussion

Research investigating NSSI has primarily focused on the functions that NSSI serves. However, little research has been conducted to understand why individuals initially turn to NSSI as a form of emotion regulation rather than culturally sanctioned and safer methods. Due to recent research attention on belief systems, specifically in the emotion domain (see Tamir & Mauss, 2011; De Castella et al., 2013), this study explored whether individ-

uals with a history of NSSI may turn to this behavior due to beliefs that they cannot control their emotions.

Main Findings

Contrary to the first hypothesis that individuals who experience greater entity beliefs about emotions will report more frequent NSSI behaviors, results showed that entity beliefs were not associated with frequency of NSSI behaviors. However, consistent with the second hypothesis that individuals who experience greater entity beliefs about emotions will show greater NSSI urges, results showed that there was an association between entity beliefs and NSSI urges.

The finding of an association between entity beliefs about emotions and NSSI urges expands the framework of NSSI beyond the functional models that prior research has investigated. Previous research has primarily focused on why NSSI is such an effective form of emotion regulation (see Stanley et al., 2010; Kemperman et al., 1997) and what functions these behaviors provide. Results from this study suggest that while understanding the functions of NSSI are important, having insight into individuals' beliefs about why they choose such harmful, and potentially life-threatening methods of emotions regulation is paramount in understanding NSSI. In sum, research must expand its inquiries to encompass a broader, yet deeper understanding of the origins of NSSI.

In addition to our hypothesis that individuals who experience greater entity beliefs about emotions will show greater NSSI urges, analyses showed that for some emotions individuals responded differently to subtypes of entity beliefs ("no matter how hard they try, people can't really change their emotions" and "the truth is, people have very little control over their emotions"). While this only held true for anxiety measured post mood induction, this finding adds further evidence for the need to better understand the origins of NSSI as well as the role certain emotions play in emotion regulation.

Theoretical Interpretations of Main Findings

It is logical to assume that NSSI behaviors and NSSI urges would stem from a common underlying cause, i.e. urges to engage in NSSI are an antecedent to the behavior. However, the results of this study did not confirm that NSSI behaviors and NSSI urges both are associated with underlying entity beliefs about emotions. While this may seem contrary to expected results, it is imperative to remember the role that lab-based emotion

inductions play in real-time measurements of emotions, beliefs, and NSSI urges.

While studies often measure urges to engage in NSSI in general (in general, how strong are your urges to hurt yourself?), this was the first study to assess urges to engage in NSSI in response to a negative emotional situation. This was executed through the mood induction where participants were asked to recall a painful argument with a significant other or friend. Due to real-time measurement of urges alongside questions assessing entity beliefs about emotion, this study was able to reduce the effects of memory bias often found when assessing NSSI behaviors, yielding data to better test the hypotheses.

In sum, through inducing negative emotions and measuring urges to engage in NSSI concurrently, data were obtained that were not distorted by memory bias, thus confirming the association between entity beliefs about emotion and urges to engage in NSSI. However, due to the ethical principal of beneficence, a conclusive association between entity beliefs about emotion and NSSI behaviors could not be confirmed.

Limitations and Future Directions

It is inevitable that research studies will have limitations, yet with every limitation comes the promise of greater knowledge for future studies. While this study assessed NSSI, only one single-item measure was used to assess NSSI (“I have hurt myself on purpose”). No criteria were given as to what constituted NSSI. Subjects may have believed that they have not engaged in NSSI since their NSSI behaviors may not be “typical” behaviors. Therefore, we cannot be sure whether in fact more of the participants may have a history of NSSI.

A second limitation to this study was the inability to have participants engage in NSSI behaviors during this study. Since doing so would raise ethical concerns this was not possible. While urges to engage in NSSI were measured in real time, NSSI behaviors were assessed in general. No restrictions were set to include only participants who had engaged in NSSI within a certain time frame, e.g. in the last 6 months. Therefore, when a participant responded to the statement “I have hurt myself on purpose” it could not be determined whether he or she may have engaged in NSSI recently or many years ago. Similarly, although participants were provided with a Likert scale to measure the frequency of their engagement in NSSI (1 = never, 4 = frequently) it could not be determined whether these behaviors occurred occasion-

ally in the past or were happening in the present.

Likewise, this study used correlational tests to assess the data. Correlation does not imply causation and the direction could not be determined from this type of test. Therefore, it is unknown whether individuals experience urges to engage in NSSI because they believe that they were powerless to control their emotions, or individuals who hold entity beliefs about emotions are at a higher risk for using maladaptive coping strategies.

A further limitation was the sample used for this study. UC Berkeley is among a handful of highest ranked universities in the world. Therefore, the pressure to excel in academic achievement may be more extreme at this institution compared to many other colleges and universities, thus leading to higher levels of stress in students. While current research indicates that NSSI rates may be close to 40% in college age individuals (Rodham & Hawton, 2009), further studies with diverse samples and detailed background information are needed to replicate the finding of an association between entity beliefs and urges to engage in NSSI and to confirm generalizability.

Although no study is without limitations, this study’s initial findings may help inform how treatment is conducted with individuals who have a history of NSSI. This study supports prior research findings that individuals who engage in NSSI exhibit poor emotion regulation strategies. The findings of increased anxiety and sadness post mood induction further support the belief that individuals who engage in NSSI have poor emotion regulation abilities. Reappraisal—the ability to change how one thinks about a situation—is paramount in successful emotion regulation, and may be an emotion regulation strategy that these individuals lack. Teaching individuals who have a history of NSSI urges or behaviors to learn to view and understand emotion-eliciting situations from different perspectives may decrease not only negative affect but NSSI urges or behaviors as well.

Moreover, the findings of increased anxiety and sadness post mood induction illustrate NSSI’s ineffectiveness to change how an individual thinks about a situation or to understand the root cause of the emotional pain. An individual may engage in NSSI believing that the behaviors will permanently alleviate negative affect. Instead, NSSI only provides temporary relief from the negative emotions, leaving the cause of the emotions themselves unresolved. This lack of resolution may lead individuals to believe that ultimately they have no power to change their emotions. This confirms Klonsky’s (2007) Affect-Reg-

ulation model in which individuals engage in NSSI to decrease or alleviate high arousal or negative emotions. Through this cycle of emotional turmoil and temporary relief, followed by a surge of negative emotions (resulting from the originally unprocessed emotion), an individual comes to believe that he or she in truth has no control over his or her emotions. Therefore, it is imperative that individuals with poor emotion regulation abilities not only challenge negative emotions but also challenge their belief systems. Furthermore, helping individuals process the situations that cause negative emotions to arise, as well as teaching reappraisal skills and promoting healthy coping strategies, may decrease the high rates of NSSI in the young adult population and in turn decrease misdiagnoses.

5. Conclusion

This study expands upon previous research to investigate the link between emotional beliefs and NSSI. The findings of this study support the hypothesis that individuals who experience urges to engage in NSSI hold beliefs of powerlessness to control emotions. Most importantly, this study validates the power of real-time measures to assess the often secretive behaviors and their emotional correlates; furthermore, it proposes a new way of treating individuals who have a history of NSSI that eliminates misdiagnosis and treats what may be the root of the problem. This study was the first of its kind to assess current NSSI urges through lab-based mood induction. However, because of ethical limitations, an association between NSSI and entity beliefs could not be established. It is hoped that with the increase in new and creative ways to conduct psychological research, future studies will not only continue to work within the ethical guidelines, but also find creative ways to assess hard to measure co-variables such as entity beliefs about emotion and NSSI behaviors.

Acknowledgments

This study would not have come to fruition without the unwavering support of the Emotion and Emotion Regulation Lab. Thank you to Tchiki Davis for the constant push for excellence, to Iris Mauss for continual inspiration and to Maya Kuehn for encouragement to conduct this study.

References

- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review, 30*, 217-237. doi:10.1016/j.cpr.2009.11.004
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Barrocas, A. L., Jenness, J. L., Davis, T. S., Oppenheimer, C. W., Tech now, J. R., Gulley, L. D., & Hankin, B. L. (2011). Developmental perspectives on vulnerability to nonsuicidal self-injury in youth. In J. B. Benson (Ed.), *Advances in Child Development and Behavior* (Vol. 40, pp. 301-336): JAI.
- Beck, A. T., Steer, R. A., & Carbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical psychology review, 8*(1), 77-100.
- Beck, A. T., & Steer, R. A. (1990). *Manual for the Beck anxiety inventory*.
- Beck, A.T., Steer, R.A., & Brown, G.K. (1996). *Manual for the Beck Depression Inventory-II*. San Antonio, TX: Psychological Corporation.
- Carrico, A. W., Antoni, M. H., Weaver, K. E., Lechner, S. C., & Schneiderman, N. (2005). Cognitive-behavioural stress management with HIV positive homosexual men: Mechanisms of sustained reductions in depressive symptoms. *Chronic Illness, 1*, 207-215.
- Chapman, A. L., Gratz, K. L., & Brown, M. Z. (2006). Solving the puzzle of deliberate selfharm: The experiential avoidance model. *Behavior Research & Therapy, 44*, 371-394. doi: 10.1016/j.brat.2005.03.005
- Crowell, S. E., Beauchaine, T., Hsiao, R., Vasilev, C., Yaptangco, M., Linehan, M., & McCauley, E. (2012). Differentiating adolescent self-injury from adolescent depression: Possible implications for borderline personality development. *Journal of Abnormal Child Psychology, 40*, 45-57. doi: 10.1007/s10802-011-9578-3
- Davis, T. S., Mauss, I. B., Lumian, D., Troy, A. S., Shallcross, A. J., Ford, B. Q., & McRae, K. (In Review). Emotional Reactivity And Emotional Regulation Among Adults with a History of Self-Harm: Laboratory Self-Report and fMRI Evidence.
- Davis, T. S., Mauss, I. B., Young, J. F., & Hanken, B. L. (In review). Affect Regulation Negative Affect, and Nonsuicidal Self-Injury in Youth.
- De Castella, K., Goldin, P., Jazairei, H., Ziv, M., Dweck, C.S, & Gross, J.J. (2013). Beliefs About Emotions: Links to emotion regulation, well-being, and psychological distress. *Basic and Applied Social Psychology, 35*, 1-9.
- Favazza, A. R., & Conterio, K. (1998). The Plight of Chronic Self-mutilators. *Community Mental Health Journal, 24*(1), 22-30. doi:10.1007/BF00755050.
- Garnefski, N., & Kraaij, V. (2006). Relationships between cognitive emotion regulation strategies and depressive symptoms: A comparative study of five specific samples. *Personality and Individual Differences, 40*, 1659-1669.
- Garnefski, N., Kraaij, V., & Spinhoven, P. (2001). Negative life events, cognitive emotion regulation and emotional problems. *Per*

- sonality and Individual Differences*, 30, 1311–1327.
- Gratz, K. L. (2001). Measurement of deliberate self-harm: Preliminary data on the deliberate self-harm inventory. *Journal of psychopathology and behavioral assessment*, 23, 253-263. doi: 10.1023/A:1012779403943
- Gross, J. J. (1998). Antecedent and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology*, 74, 224–237.
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2(3), 271-299. doi:http://dx.doi.org/10.1037/1089-2680.2.3.271
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, 85(2), 348.
- Gross, J. J., & Thompson, R. A. (2007). *Emotion Regulation: Conceptual Foundations*. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 3-24). New York, NY US: Guilford Press.
- Haw, C., Hawton, K., Houston, K., & Townsend, E. (2001). Psychiatric and personality disorders in deliberate self-harm patients. *The British Journal of Psychiatry*, 178, 48-54. Retrieved from <http://search.proquest.com/docview/619675248?accountid=14496>
- Hopp, H., Troy, A. S., & Mauss, I. B. (2011). The unconscious pursuit of emotion regulation: Implications for psychological health. *Cognition and Emotion*, 25(3), 532-545. doi:http://dx.doi.org/10.1080/02699931.2010.532606
- Kemperman, I., Russ, M. J., Clark, W. C., Kakuma, T., Zanine, E., & Harrison, K. (1997). Pain assessment in self-injurious patients with borderline personality disorder using signal detection theory. *Psychiatry Research*, 70(3), 175-183.
- Klonsky, D. E. (2007). The Functions of Deliberate Self-Injury: A review of evidence. *Clinical Psychology Review*, 27, 226-239.
- Linehan, M. M., Bohus, M., & Lynch, T. R. (2007). *Dialectical behavior therapy for pervasive emotion dysregulation: Theoretical and practical underpinnings*. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 581-605). New York, NY US: Guilford Press.
- Lloyd-Richardson, E. E., Perrine, N., Dierker, L., & Kelley, M. L. (2007) Characteristics and Functions of Non-suicidal Self-injury in a Community Sample of Adolescents. *Psychological Medicine* 37(8), 1183–1192. doi:http://dx.doi.org/10.1017/S003329170700027X.
- Mauss, I. B., Bunge, S. A., & Gross, J. J. (2007). Automatic emotion regulation. *Social and Personality Psychology Compass*, 1, 146-167.
- Nock, M. K. (2009). Why do people hurt themselves? New insights into the nature and functions of self-injury. *Current Directions in Psychological Science*, 18, 78-83. doi:10.1111/j.1467-8721.2009.01613.x
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*, 100, 555–561
- Richardson, J.S. & Zaleski, W.A. (1986) Endogenous opiates and self-mutilation. *American Journal of Psychiatry*, 143, 938-939.
- Robinson, M. D., & Clore, G. L. (2002). Belief and feeling: Evidence for an accessibility model of emotional self-report. *Psychological Bulletin*, 128, 934-960. doi: 10.1037/0033-2909.128.6.934
- Rodham, K., & Hawton, K. (2009). Epidemiology and phenomenology of nonsuicidal self-injury. M. K. Nock (Ed.), *Understanding non-suicidal self-injury: Origins, assessment, and treatment* (pp. 37-62). Washington, DC: American Psychological Association.
- Selby, E. A., & Joiner, T. E. (2009). Cascades of emotion: The emergence of borderline personality disorder from emotional and behavioral dysregulation. *Review of General Psychology*, 13, 219-229.
- Simms, L. J., & Clark, L. A. (2006). The schedule for nonadaptive and adaptive personality (SNAP): A dimensional measure of traits relevant to personality and personality pathology. In S. Strack (Ed.), *Differentiating normal and abnormal personality* (2nd ed.) (pp. 431-450). New York, NY US: Springer Publishing Co.
- Slee, N., Garnefski, N., Spinhoven, P., & Arensman, E. (2008). The influence of cognitive emotion regulation strategies and depression severity on deliberate self-harm. *Suicide and Life-Threatening Behavior*, 38, 274-286. doi: 10.1521/suli.2008.38.3.274
- Stanley, B., Sher, Leo, Wilson, S., Ekman, R., Yung-yu, H., & Mann, J. J. (2010) Non-suicidal self-injurious behavior, endogenous opioids and monoamine neurotransmitters. *Journal of Affective Disorders*, 124(1-2), 134-140. <http://dx.doi.org/10.1016/j.jad.2009.10.028>
- Suyemoto, K, L. (1998). The Functions of Self Mutilation. *Clinical Psychology Review*, 18(5), 531-554.
- Tamir, M., John, O. P., Srivastava, S., & Gross, J. J. (2007) Implicit theories of emotion: Affective and social outcomes across a major life transition. *Journal of Personality and Social Psychology*, 92, 731–744.
- Tamir, M., & Mauss, I. B. (2011). Social Cognitive Factors in Emotion Regulation: Implications for Well-Being. In I. Nyklíček, A. Vingerhoets & M. Zeelenberg (Eds.), *Emotion Regulation and Well-Being* (pp. 31-47): Springer New York.
- Troy, A. S., Wilhelm, F. H., Shallcross, A. J., & Mauss, I. B. (2010). Seeing the silver lining: Cognitive reappraisal ability moderates the relationship between stress and depressive symptoms. *Emotion*, 10, 783-795. doi: 10.1037/a0020262
- Watson, D., Clark, L. A., & Tellegan, A. (1988). Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scales. *Journal of Personality and Social Psychology*, 54(6), 1063-1070.
- Werner, K., & Gross, J. J. (2010). *Emotion regulation and psychopathology: A conceptual framework*. (pp. 13-37) Guilford Press, New York, NY.
- Zachary, R. A., Crumpton, E., & Spiegel, D. E. (1985). Estimating WAIS-R IQ from the Shipley Institute of Living Scale. *Journal of Clinical Psychology*, 41(4), 532-540.
- Zanarini, M. C., Frankenburg, F. R., Reich, D. B., Fitzmaurice, G., Weinberg, I., & Gunderson, J. G. (2008). The 10-year course of physically self-destructive acts reported by borderline patients and axis II comparison subjects. *Acta Psychiatrica Scandinavica*, 117, 117-184.