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# AN EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF SELF-COMPASSION AND SELF-CRITICISM ON IMPLICIT ASSOCIATIONS WITH NON-SUICIDAL SELF-INJURY

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AN EXPERIMENTAL INVESTIGATION  
OF THE EFFECTS OF SELF-COMPASSION AND SELF-CRITICISM  
ON IMPLICIT ASSOCIATIONS WITH  
NON-SUICIDAL SELF-INJURY

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DISSERTATION

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A dissertation submitted in partial fulfillment of the  
requirements for the degree of Doctor of Philosophy in the  
College of Arts and Sciences  
at the University of Kentucky

By  
Laura Marie Nagy

Lexington, Kentucky

Director: Dr. Ruth A. Baer, Professor of Psychology

Lexington, Kentucky

2017

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## ABSTRACT OF DISSERTATION

### AN EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF SELF-COMPASSION AND SELF-CRITICISM ON IMPLICIT ASSOCIATIONS WITH NON-SUICIDAL SELF-INJURY

Non-suicidal self-injury (NSSI) is the intentional destruction of bodily tissue in the absence of suicidal motives. NSSI is strongly associated with self-criticism (Gilbert et al., 2010) and individuals who self-injure often report doing so to punish themselves. Conversely, self-compassion, or the tendency to be caring with oneself, is associated with psychological well-being (Neff et al., 2007). The aim of the present study was to determine whether experimentally inducing self-criticism or self-compassion would lead to changes in implicit identification with NSSI. The Self-Injury Implicit Association Test (SI-IAT; Nock & Banaji, 2007) is an assessment of the strength of the automatic associations that a person holds between themselves and NSSI. Participants were randomly assigned to a self-criticism induction, a self-compassion induction, or a neutral condition and completed the SI-IAT before and after the induction. Results showed that participants in the self-criticism induction experienced an increase in their implicit associations with NSSI while implicit associations in the self-compassion and control conditions generally did not change. Results were not significantly different for those with or without a history of NSSI and highlight the importance of self-criticism in NSSI. Future research should examine increases in self-criticism as a potential precursor of NSSI in longitudinal samples.

**KEYWORDS:** Non-suicidal self-injury, Implicit Association Test, Self-criticism, Self-compassion

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Laura Marie Nagy

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8/16/2017

Date

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For Josh, for everything

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## **CHAPTER ONE: INTRODUCTION**

Non-suicidal self-injury (NSSI), or the intentional destruction of bodily tissue in the absence of suicidal motives, is a serious and prevalent health concern with studies finding that up to 35% of undergraduate students have self-injured at least once in their lifetimes (Gratz, 2001; Ross & Heath, 2002). It is associated with a wide range of mental health issues from depression and anxiety to post-traumatic stress disorder to borderline personality disorder (Bentley, Cassiello-Robbins, Vittorio, Sauer-Zavala, Barlow, 2015; Linehan, 1993) as well as number of negative outcomes including intentional or accidental suicide (Anestis, Pennings, Lavender, Tull, & Gratz, 2013; Turner, Layden, Butler, & Chapman, 2013). Having a history of NSSI behaviors is even a better predictor of future suicide attempts than a history of suicide attempts (Bryan, Rudd, Wertenberger, Young-McCaughon, & Peterson, 2015; Guan, Fox, & Prinstein, 2012). Most individuals who self-injure report doing so more than once in their lifetimes (Gratz, 2006) and there are a number of different methods by which individuals harm themselves (e.g., cutting, burning, wound picking, scratching, hitting; Klonsky, 2007) with most people who self-injure reporting that they use multiple methods (Klonsky & Muehlenkamp, 2007).

### **Functions of Non-Suicidal Self-Injury**

A growing number of studies have begun to examine the reasons why people self-injure. Identifying these reasons can help with the creation of prevention and treatment programs. For instance, NSSI has been conceptualized as a maladaptive emotion regulation strategy. Individuals who self-injure generally report higher levels of overall emotional distress and fewer coping skills (Nock & Mendes, 2008). Negative emotions such as anger and anxiety tend to immediately precede episodes of NSSI (Nock &

Prinstein, 2004; Ross & Heath, 2002) and individuals who self-injure frequently report doing so in order to manage these types of negative emotions (Brown, Comtois, & Linehan, 2002; Klonsky, 2007). Individuals who engage in NSSI also report a decrease in negative affect immediately after self-injuring (Klonsky, 2009), which likely reinforces these behaviors as an emotion regulation strategy (Chapman & Dixon-Gordon, 2007; Klonsky & Muelenkamp, 2007). Specifically, these behaviors are maintained by negative reinforcement such that NSSI allows for the “escape from or avoidance of unwanted emotional experiences” (Chapman, Gratz, & Brown, p. 371).

Individuals who self-injure also often report doing so in order to punish themselves or express self-hatred (Brown, Comtois, & Linehan, 2002; Flett, Goldstein, Hewitt, 2012; Klonsky, 2007; Penn, Esposito, Schaeffer, Fritz, & Spirito, 2003); therefore, self-injuring behaviors have been theorized to be an attempt to cope specifically with negative, self-directed emotions such as shame (Chapman & Dixon-Gordon 2007) and self-injuring in order to self-punish may constitute a specific type of emotion regulation strategy (Turner, Chapman, Layden, 2012). Despite these advances in understanding the functions of NSSI, the specific reasons that a person may choose to self-injure in spite of natural instincts to avoid pain and injury are still not well understood.

### **The Role of Self-Criticism and Self-Compassion in Non-Suicidal Self-Injury**

Self-referential emotions such as shame have become increasingly identified as important factors in various forms of psychopathology, including NSSI (Brown, Linehan, Comtois, Murray, & Chapman, 2009; Gilbert & Irons, 2005). Along these lines, self-criticism, or thinking marked by shame, self-consciousness, and inferiority, has been

associated with NSSI in a number of studies (Baetens, Claes, Hasking, Smits, Grietens, Onghena, & Martin, 2015; Cohen et al., 2015; Gilbert, McEwan, Irons, Bhundia, Christie, Broomhead, & Rockliff, 2010) and people with a history of NSSI tend to have higher levels of trait self-criticism than those who have never self-injured (Claes & Vandereycken, 2007; Hooley, Ho, Slater, & Lockshin, 2010; You & Lin, 2015). Studies have also shown that individuals who engage in NSSI tend to endure pain significantly longer than those who have never self-injured, leading to theories that this is because self-injurers feel that they “deserve” to experience pain (Glenn, Michel, Franklin, Hooley, & Nock, 2014; Hooley, Ho, Slater, & Lockshin, 2010). Along these lines, Hamza, Willoughby, & Armiento (2014) found that people who engage in NSSI specifically to self-punish tolerated pain following a stressful task significantly longer than those who engage in NSSI for other reasons. Hooley and St. Germain (2014) corroborated these findings by experimentally inducing feelings of self-worth in individuals with and without a history of NSSI. They found that for those with a history of NSSI, increased self-worth led to decreased willingness to endure pain. The authors interpreted these findings to mean that interventions that increase feelings of self-worth (and conversely decrease self-critical thoughts) may decrease the belief in individuals who self-injure that they “deserve” to be injured.

Conversely, self-compassion, or the tendency to be sympathetic and caring with oneself, has been shown to be predictive of a variety of adaptive health behaviors (Neff, 2011). According to Neff (2003a), self-compassion is a multifaceted construct that involves treating oneself with kindness during difficult times, being non-judgmental of personal failings or shortcomings, remembering that all people fail or have difficult

times, and remaining mindful of one's negative emotions rather than avoiding them or becoming overwhelmed by them. Because self-compassion is generally conceptualized as a manner in which individuals treat themselves in times of pain and failure, it is considered to be distinct from self-esteem (Barnard & Curry, 2011) which is a global evaluation of the self (Rosenberg, 1965).

Trait self-compassion has large, negative associations with multiple forms of psychopathology (for a meta-analysis, see MacBeth & Gumley, 2012) and is positively associated with psychological well-being, satisfaction with life, optimism, and happiness (Neely, Schallert, Mohammed, Roberts, & Chen, 2009; Neff, Rude, & Kirkpatrick, 2007). Individuals with higher levels of trait self-compassion also tend to utilize more adaptive emotion regulation strategies (Neff, Hseih, & Dejithirat, 2005). Because of this, self-compassion has begun to be utilized in psychotherapy. For instance, Compassion-Focused Therapy (CFT; Gilbert, 2009) and the Mindful Self-Compassion Program (MSC; Neff & Germer, 2012) are two such interventions that focus on training clients to be more self-compassionate using psychoeducation about the functions of self-criticism and the benefits of self-compassion, various compassion-focused meditation exercises, and various cognitive-behavioral exercises such as learning to re-frame self-critical thoughts. Randomized controlled trials comparing self-compassion therapies to waitlist control groups have found that participants who received self-compassion training had significant increases in well-being, life satisfaction, and happiness and decreases in depression, anxiety, and worry compared to those in waitlist control groups (Jazaier, McGonigal, Jinpa, Doty, Gross, & Goldin, 2014; Neff & Germer, 2012).

While there are no self-compassion based treatments specifically developed for NSSI, Van Vliet and Kalnins (2011) described the theoretical foundations of using interventions that utilize self-compassion training, specifically CFT, to treat NSSI behaviors. They assert that because one of the functions of NSSI is to self-punish, CFT may be particularly useful in counteracting self-directed hostility. In a recent study, Gregory, Glazer, and Berenson (2017) demonstrated that a brief self-compassion induction led participants with a history of NSSI to become more sensitive to pain, equaling those without a history NSSI, suggesting that self-compassion can help “correct” pain insensitivity that develops among people who engage in NSSI. Increasing sensitivity to pain may then lead to a decreased willingness to self-injure. Although these results are promising, more research is needed to examine whether self-compassion can be an effective treatment for NSSI.

Short-term self-compassion inductions are beginning to be utilized more frequently in laboratory studies as a way to investigate the effects of self-compassion on various outcomes. For instance, Leary et al. (2007) used a writing task to instruct participants to recall a negative event that involved failure or rejection. Participants were then randomly assigned to either a self-compassion induction condition, a self-esteem induction condition, or a control condition. In the self-compassion induction condition, participants were asked to write about the event in a self-compassionate manner (i.e., expressing self-kindness, reminding oneself that others experience similar events). Participants in the self-compassion condition reported less negative affect than those in either of the other conditions. The authors interpreted these results as indicating that self-compassion may act as a buffer against experiencing negative emotions in the face of

personal failure. Breines and Chen (2013) asked participants to write for 3 minutes on the prompt “Imagine that you are talking to yourself about this weakness from a compassionate and understanding perspective. What would you say?” (p. 1135) in response to a personal weakness identified by the participant. They found that participants who were asked to write compassionate statements reported increases in self-compassion and increases in a desire to improve the self, compared with a self-esteem induction condition and a control condition. They found that these results occurred above and beyond the effect of positive affect. Zabelina and Robinson (2010) utilized a 10 min writing task to induce self-compassion in which participants were asked to write about “a negative event that they experienced in high school or college that made them feel badly about themselves – something that involved failure, humiliation, or rejection” (p. 289) for five minutes and then write for another five minutes on the “ways in which others also experience similar events” and expressing understanding, kindness, and concern for themselves “in a manner similar to the way in which they would sympathize with a friend who had undergone the experience” (p. 289). Participants in a control group wrote about a negative event but did not complete a follow-up writing task. Results indicated participants in the self-compassion condition expressed less judgmental thoughts about themselves than individuals in the control condition. The results of these studies indicate that experimentally-inducing self-compassion via a writing prompt is potentially a valuable way to investigate the effects of self-compassion on various outcomes.

### **Limitations in the Literature on NSSI**

The majority of research on NSSI to date has been done using self-report measures. This poses problems as participants may lack awareness about why they



engage in these behaviors or they may be motivated to conceal their true opinions on these behaviors as to not negatively influence the researcher's or clinicians' opinions of them (Klonsky, 2007). Using performance-based measures of implicit attitudes makes it difficult for the respondent to manipulate their results (Steffens, 2004) and can reveal information about how an individual thinks that they may be either unwilling or unable to report themselves (Greenwald & Banaji, 1995).

Implicit attitudes can be understood as “automatic affective reactions resulting from the particular associations that are activated automatically when one encounters a relevant stimulus” (Gawronski & Bodenhausen, 2006, p. 693). Explicit attitudes on the other hand, are based on these automatic affective reactions, but are filtered through logic and reasoning, meaning that if a person's automatic affective reactions conflict with their ways of thinking about the world, often the explicit judgments are reported over the automatic reactions, especially if the person is motivated to conceal his or her automatic reactions (Gawronski & Bodenhausen, 2006). This means that implicit and explicit attitudes are not always congruent (Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005). Examining implicit attitudes may provide a valuable method by which to understand topics such as NSSI where participants may not always be willing share their true opinions.

Greenwald, McGhee, and Schwartz (1998) created the Implicit Association Test (IAT) in order to assess automatic implicit associations. IATs are computerized reaction-time tests that take advantage of the fact that people tend to classify related stimuli (e.g., sky and blue) together more quickly than unrelated stimuli (e.g., sky and red). Several different versions of the IAT have been developed to test implicit associations with a

number of different topics including those related to social attitudes (e.g., race, religion) and mental health (e.g., psychotherapy, anxiety). The Self-Injury Implicit Association Test (SI-IAT; Nock & Banaji, 2007) is an assessment of the strength of the automatic associations that participants hold between themselves and self-harming behaviors. This association is determined through a fast-paced binary sorting task in which the respondent sorts self-harming images (i.e., images of a forearm with wounds from cutting) and non-self-harming images (i.e., images of the same forearm with no wounds) as well as words related to the self (e.g., “mine”) and those not related to the self (e.g. “they) into their correct categories. The pictures and words are paired so in some trials cutting images are paired with words related to the self and in others they are paired with words not related to the self. The means of the reaction times of the different pairings are compared to determine implicit attitudes such that those who associate self-harm with themselves will be faster at pairing self-harm words and words related to the self. Accumulating evidence on the SI-IAT indicates that performance on the task discriminates between individuals with and without a history of NSSI in both adults and adolescents (Nock & Banaji, 2007; Dickstein, Puzia, Cushman, Weissman, Wegbreit, Kin, Nock, & Spirito, 2015; Franklin, Lee, Puzia, & Prinstein, 2014).

### **Factors Affecting Change in Implicit Associations**

Several studies have begun to utilize IATs to examine whether or not it is possible for implicit associations to change. For instance, Gemar, Segal, Sagrati, & Kennedy (2001) administered an IAT of positive or negative judgments about the self before and after a negative mood induction. Similarly, Dasgupta, SeSteno, Williams, & Hunsinger (2009) measured the effects of anger and disgust inductions on changes in an IAT for

intergroup attitudes. In each of these studies, the various mood inductions were found to significantly impact scores on the IATs measured before and after the induction.

More relevant to the current study are the findings of Kang, Gray, and Dovidio (2014) who examined the impact of a 6-week compassion-focused intervention group on an IAT of attitudes towards African Americans and homeless individuals. Results indicated that participants' scores on the IAT in the compassion-focused intervention group changed as a result of the intervention. No changes were found in a control group. Hutcherson, Seppala, and Gross (2008) investigated the whether a brief (7 minute) Loving-Kindness meditation impacted implicit evaluations of the self and others. While no significant changes were found for implicit evaluations of others, implicit evaluations of the self became marginally more positive after the Loving-Kindness Meditation compared to baseline. Results of these studies indicate that it may be possible for scores on IATs to change as a result of not only mood inductions, but also self-compassion interventions as well.

### **The Present Study**

The aim of the present study was to determine whether experimentally induced self-criticism or self-compassion is associated with changes in implicit associations with NSSI. Additionally, it tested whether these changes are different for individuals with a history of NSSI versus those without. In order to do this, individuals with and without a history of NSSI completed the SI-IAT. Participants were randomly assigned to one of three experimental conditions: a self-criticism induction, a self-compassion induction, and a neutral, control condition. Participants then completed the SI-IAT again to

determine if implicit associations with NSSI changed as a result of the experimental induction. It was hypothesized that:

1. Participants with a history of NSSI would implicitly associate NSSI with themselves significantly more than individuals without such a history.

2. Scores on the SI-IAT would change as a result of the different experimental inductions such that:

a. Participants who underwent the self-criticism induction would experience an increase in SI-IAT scores indicating an increase in implicit associations between the self and NSSI.

b. Participants who underwent the self-compassion induction would experience a decrease SI-IAT scores indicating a decrease in implicit associations between the self and NSSI.

c. Participants in the control condition would have no significant changes in their SI-IAT scores.

3. There would be a significant 3-way interaction between NSSI history, experimental condition, and time, such that for participants with a history of NSSI, the self-criticism induction would lead to significantly greater increases in implicitly associating NSSI with the self than for those without a history of NSSI in self-criticism condition.

4. For the participants with a history of NSSI, the frequency of NSSI (i.e., how many times an individual has engaged in self-injury in his or her lifetime) would moderate the effect of experimental condition on changes in SI-IAT scores such that

individuals with a history of more NSSI behaviors would be more strongly influenced by the self-criticism induction than those with a history of fewer NSSI behaviors.

5. For the participants with a history of NSSI, the recency of NSSI (i.e., how many days since the participant last engaged in self-injury) would moderate the effect of experimental condition such that those with a more recent history of NSSI would be more strongly influenced by the self-criticism induction.

## **CHAPTER TWO: METHODS**

### **Participants**

Participants in the study were 242 undergraduate students enrolled in introductory psychology classes at the University of Kentucky. NSSI history data for 7 participants (2.9%) were unavailable; therefore, these participants were excluded from study analyses. Two participants had invalid SI-IAT data (both in the non-NSSI group). These participants were also excluded from study analyses leaving a final sample of 233 participants. Participants ranged in age from 18-39 ( $M = 19.37$ ,  $SD = 2.12$ ) and were 74.2% female and 73.8% Caucasian. Previous research using the SI-IAT has found moderate effect sizes ( $d = .34-.54$ ), therefore a priori power analyses were conducted to determine how many participants would be needed to find a small to moderate effect ( $d = .30$ ). Analyses revealed that 84 participants would be required in order to achieve adequate power (power = .80,  $p = .05$ ) in order to find between-subject effects for three experimental conditions and 68 participants would be required in order to find between-subject effects for two groups (NSSI or no NSSI). Participant recruitment was designed to exceed these numbers.

Previous research has shown that on average, 17-32% of undergraduate populations have a lifetime history of NSSI (Armiento, Hamza, & Willoughby, 2014; Whitlock, Eckenrode, & Silverman, 2006). To ensure an adequate number of participants with an NSSI history, a brief measure of NSSI history was included in a screening packet administered to the entire psychology research subject pool early in the semester. Participants who endorsed a history of NSSI were recruited through emails and phone calls. This procedure resulted in 72 participants with a history of NSSI.

### **Measures**

**Self-criticism.** The Levels of Self-Criticism Scale (LOSC; Thompson & Zuroff, 2003) is a measure of trait self-criticism (e.g., “I frequently compare myself with my goals and ideals.” and “When I don’t succeed, I find myself wondering how worthwhile I am.”). Participants rate each item on a 7-point Likert scale from “not at all” to “very well.” The LOSC was used to determine if there were differences in trait-level self-criticism between the different experimental conditions at baseline. It was also expected that participants with a history of NSSI would have higher scores on the LOSC than those without a history of NSSI. The LOSC demonstrated excellent reliability in the present sample ( $\alpha = .90$ ).

**Self-compassion.** The Self-Compassion Scale (SCS; Neff, 2003b) is a 26-item measure of compassion towards oneself. It measures several aspects of self-compassion including self-kindness (e.g. “I’m tolerant of my own flaws and inadequacies.”), mindfulness (e.g. “When I’m feeling down I try to approach my feelings with curiosity and openness.”), and the tendency to see oneself as a part of humanity as a whole (e.g. “When things are going badly for me, I see the difficulties as part of life that everyone

goes through.”). Participants are asked to rate statements on a 5-point Likert scale from “almost never” to “almost always.” The SCS was used to determine if there were differences in trait-level self-compassion between the different experimental conditions at baseline. It was also expected that participants with a history of NSSI would report lower scores on the SCS than those without a history of NSSI. The SCS demonstrated excellent reliability in the present sample ( $\alpha = .93$ ).

**Manipulation check.** A 2-item manipulation check was included to assess participants’ state levels of self-criticism and self-compassion before and after the experimental inductions. Items included “How self-critical are you feeling right now?” and “How self-compassionate are you feeling right now?” Participants responded on a 6-point Likert scale from “not at all” to “extremely.” Participants answered these questions before the first administration of the SI-IAT and again after the second administration of the SI-IAT.

**NSSI behaviors.** The Inventory of Statements about Self-Injury (ISAS; Klonsky, 2007) is a 46-item self-report questionnaire designed to measure frequency and recency of NSSI behaviors as well as the functions of those behaviors. In the first half of the questionnaire, the frequency of several types of NSSI (e.g., cutting, burning, scratching) are assessed providing an index of the number of times the respondent has engaged in NSSI in their lifetime. Respondents who report at least one previous instance of NSSI then complete the second half of the questionnaire which consists of 39 items which ask the respondent to rate the reasons why they self-injure (e.g., “When I self-harm I am expressing anger towards myself for being worthless or stupid.”) and items assessing the date at which they most recently engaged in NSSI. The ISAS was used to divide

participants into an NSSI group (those with a history of NSSI) and a no NSSI group (those who have never self-injured). The ISAS was also used to determine the number of times that the participants in the NSSI group have self-injured (NSSI frequency) and when the most recent episode of NSSI occurred (NSSI recency).

**Implicit associations with NSSI.** The Self-Injury Implicit Association Task (SI-IAT; Nock & Banaji, 2007) is a reaction-time test in which participants are asked to quickly classify words and pictures into categories. Implicit association tasks are based on the idea that people tend to classify related concepts together more quickly than unrelated concepts. In the self-injury version of the task, participants are asked to quickly classify stimuli either related to NSSI (image of an arm with wounds from cutting) or not related to NSSI (image of arm with no injury) and stimuli related to either the self (e.g., the words “me,” “I”) or not related to the self (e.g., the words “they,” “them”) as quickly as possible into the categories “cutting” or “no cutting” and “me” or “not me.” All picture and word stimuli used are the same as those validated in Nock and Banaji (2007). See Appendix A for all picture stimuli used in the SI-IAT.

In the SI-IAT, participants complete several blocks where they are asked to sort these stimuli. In the first two blocks, participants practice sorting stimuli into the correct categories to become familiar with the task. For instance, in the first practice block if a picture of an arm appears with no wounds, participants press the button that corresponds to the “not cutting” category. When a picture of an arm with self-harm wounds appears, participants press the button that corresponds to the “cutting” category. In the second practice block, if the word “myself” appears, participants press the key that corresponds to the “me” category. If the word “they” appears, participants press the key that



corresponds to the “not me” category. A red “X” appears on-screen if the participant misclassifies any stimulus during the task. In the third block, the categories are paired (“cutting”/ “me” and “no cutting”/ “not me”) such that the participant presses the same key for both stimuli related to self-harm as well as stimuli related to the self. Participants press the other key for both stimuli related to no self-harm and stimuli related to others. The fourth block is another practice block in which participants sort “cutting” and “not cutting” images again, however this time the images are switched to be on the opposite sides of the computer screen. In the final block, the pairings of the categories are switched such that “cutting” is now paired with “not me” and “no cutting” is now paired with “me.” The entire task takes approximately 5 minutes to complete.

Scores on the SI-IAT are calculated by subtracting the mean response latency (in milliseconds) of block three (the “cutting/me” block) from the mean response latency of block five (the “cutting/not me” block) and then dividing by the standard deviation of the response latency for all trials together to get a standardized difference score (see Greenwald, Nosek, & Banaji, 2003). Scores range from 2 to -2, with positive scores reflecting faster responding during the “cutting/me” trials indicating that the respondent associates NSSI with him or herself and negative scores reflecting faster responding during the “cutting/not me” trials indicating that the respondent does not associate themselves with NSSI (Nock & Banaji, 2007).

### **Procedures**

Participants were recruited through the online research registration system in the Psychology department and signed up for individual data collection sessions lasting approximately 1 hour. After informed consent was obtained, participants were given a

risk assessment to ensure that no participant was at immediate risk for suicide or self-harm before beginning the study. No participants had to stop participation due to imminent risk. Participants then completed the manipulation check questions and the SI-IAT (described above) to provide baseline measurements. Following the task, participants were randomly assigned to one of three groups: a self-compassion condition, a self-criticism condition, and a neutral, control condition.

The self-compassion condition used a self-compassion induction identical to the one utilized by Leary, Tate, Adams, Allen, and Hancock (2007). Participants were asked to write for five minutes about a negative event using the following prompt: “Think about a negative event that you experienced in high school or college that made you feel badly about yourself—something that involved failure, humiliation, or rejection” (p. 899). Participants were then asked to write for five minutes about ways in which other people also experience similar events and how they could express understanding, kindness, and concern to themselves.

Because no studies to date have attempted to induce self-criticism in a laboratory setting, the self-criticism induction was designed to be parallel to the self-compassion induction. Participants in the self-criticism group were also asked to write for five minutes about a negative event using the prompt described above. After writing about a negative event, participants were asked to write for another five minutes about how the event they described was their fault, how they disapproved of what happened, and to critically evaluate how they acted during the event. Finally, participants in the control group were asked to write for five minutes about their daily schedule. All writing prompts used in the study can be found in Appendix B. Following the writing task, all

participants were asked to complete the SI-IAT a second time, followed immediately by the manipulation check questions. Participants completed the self-report measures (listed above) last. Participants in the self-criticism condition were asked to complete the second part of the self-compassion induction after the experimental procedures in order to ensure participants did not leave the laboratory in a self-critical state. All participants were given another risk assessment at the end of the study to ensure that viewing images of NSSI did not increase their level of risk. Consistent with Cha et al. (2016) who found that there are no iatrogenic increases in risk from the SI-IAT, no participants reported a change in risk for suicide or self-harm after the study; however, all participants were provided with referrals for psychological services. Participants were compensated with partial course credit. All study procedures were approved by the University of Kentucky's Institutional Review Board.

## **CHAPTER THREE: RESULTS**

### **Data Screening**

Results were analyzed using SPSS 22.0. Data were screened for normality and outliers according to recommendations outlined by Tabachnick and Fidell (2013). All study variables were approximately normally distributed with no outliers identified.

### **NSSI Characteristics among NSSI Participants**

Three of 72 participants who reported a history of NSSI did not complete the second half of the ISAS which assessed for NSSI frequency and recency; therefore, the NSSI characteristics presented below are for the remaining 69 participants. NSSI frequency ranged from 1 episode to 1075 episodes with participants reporting that they have harmed themselves on average 151 times in their lives ( $SD = 229.81$ ). Cutting was

the most frequently endorsed method of NSSI, with 56 participants (81.16%) reporting cutting at least once. Severe scratching was the next most common form of NSSI (reported by 42 participants, 60.87%), followed by hitting (reported by 39 participants, 56.52%). Most participants (89.86%) reported engaging in multiple methods of NSSI. The average number of methods used was 4.29 ( $SD = 2.42$ ).

Participants reported that their most recent episode of NSSI ranged from the day before the experiment to 2,856 days prior to the experiment ( $M = 649.56$ ,  $SD = 682.70$ ). It should be noted that NSSI recency had to be estimated for several participants ( $n = 6$ ) who listed simply a year as their most recent NSSI date instead of a specific date. For these participants, a midpoint from that year (July 1) was used to calculate the number of days since most recent NSSI episode. There were no significant differences in NSSI frequency or recency for the different experimental conditions,  $F(2, 67) = .342$ ,  $p = .712$  and  $F(2, 67) = 1.516$ ,  $p = .227$ , respectively.

### **Zero-Order Correlations**

Zero-order correlations were computed to examine the relationships between the self-report measures and the SI-IAT scores (see Table 3.1). Analyses revealed significant correlations between NSSI history and the SCS and LOSC such that participants with a history of NSSI had higher levels of trait self-criticism and lower levels of trait self-compassion. Higher frequency of NSSI was associated with higher levels of trait self-criticism and lower levels of trait self-compassion. A significant, positive correlation was also found between NSSI history and SI-IAT scores at both time points. Scores on the SI-IAT were not correlated with NSSI frequency or recency indicating that participants with a history of NSSI behaviors tended to associate NSSI with themselves implicitly

regardless of the number of times they have engaged in self-injury or how recently or long ago that behavior occurred. Recency of NSSI behavior was also not significantly correlated with any self-report variables.

### **Baseline Differences Between Experimental Conditions**

To determine if the randomization procedure worked as intended, the experimental conditions were compared on demographic characteristics, trait self-criticism and self-compassion, and baseline SI-IAT scores. No significant differences were found for age ( $F(2, 232) = .570, p = .566$ ), gender ( $\chi^2[2, N = 233] = .210, p = .900$ ), or race ( $\chi^2[8, N = 233] = 8.356, p = .399$ ). Furthermore, no significant differences were found for either trait self-criticism ( $F(2, 232) = .321, p = .726$ ) or trait self-compassion ( $F(2, 232) = .508, p = .603$ ) between experimental conditions. Finally, the experimental conditions did not have significantly different SI-IAT scores at baseline,  $F(2, 232) = .122, p = .885$ . See Table 3.2 for self-report descriptive statistics and Table 3.3 for SI-IAT descriptive statistics by experimental condition. Because no significant differences were found between the experimental conditions, none of these variables were controlled for in the subsequent analyses.

### **Baseline Differences Between NSSI Groups**

Baseline SI-IAT data from individuals with a history of NSSI were compared to individuals without a history of NSSI using an independent t-test. As predicted, individuals with a history of NSSI scored higher on the baseline SI-IAT ( $M = .11, SD = .39$ ) than participants with no history of NSSI ( $M = -.01, SD = .34$ ),  $t(231) = -2.377, p = .018$ , indicating that participants with a history of NSSI implicitly associate NSSI with themselves more than those without an NSSI history.

Independent t-tests were also used to compare scores on the LOSC and SCS for those with and without a history of NSSI. Participants with a history of NSSI reported significantly higher levels of trait self-criticism ( $M = 4.42, SD = 1.02$ ) than participants with no history of NSSI ( $M = 3.37, SD = .86$ ),  $t(231) = -8.112, p < .001$ , and significantly lower levels of trait self-compassion ( $M = 2.61, SD = .69$ ) than participants with no history of NSSI ( $M = 3.36, SD = .63$ ),  $t(231) = 8.286, p < .001$ . See Table 3.2 for self-report descriptive statistics and Table 3.3 for SI-IAT descriptive statistics by NSSI group.

### **Manipulation Checks**

To determine if the experimental inductions affected the participants' state levels of self-criticism and self-compassion, participants answered two manipulation check questions: 1) How self-critical are you feeling right now? and 2) How self-compassionate are you feeling right now? A mixed-design multivariate analysis of variance (MANOVA) test with was conducted with time (pre-induction, post-induction) as a within-subjects factor and condition (self-compassion, self-criticism, control) and group (NSSI history, no NSSI history) as between-subjects factors to test the effect of experimental condition on state self-criticism and compassion. As there were unequal sample sizes in each group and condition, Box's test was used to inspect the assumption of equal covariance matrices. A nonsignificant test indicated that the covariance matrices of the dependent variables were equal across groups and Pillai's trace should be used as the test statistic (Field, 2009). Results showed that there was a significant effect of experimental condition over time on both state self-criticism and state self-compassion,  $V = .050, F(4, 454) = 2.890, p = .022$ . Separate univariate ANOVAs on the outcome

variables revealed a significant effect of condition over time for state self-compassion,  $F(2, 227) = 4.741, p = .010$ , but not for state self-criticism,  $F(2, 227) = 1.973, p = .141$ .

One-way analyses of variance revealed that before the inductions, the experimental conditions did not significantly differ on levels of state self-criticism  $F(2, 232) = .383, p = .682$ , or state self-compassion,  $F(2, 232) = .738, p = .479$ , but that following the inductions, the conditions reported significantly different levels of state self-criticism,  $F(2, 232) = 4.480, p = .012$ , and state self-compassion,  $F(2, 232) = 5.377, p = .005$ . Examination of the group means revealed that participants in the self-criticism condition reported more state self-criticism after the induction ( $M = 2.32, SD = 1.33$ ) than before the induction ( $M = 2.05, SD = 1.31$ ),  $t(75) = -2.000, p = .049$ , and lower levels of state self-compassion after the induction ( $M = 2.23, SD = 1.09$ ) than before the induction ( $M = 2.65, SD = .98$ ),  $t(75) = 4.393, p < .001$ . Participants in the self-compassion induction reported approximately the same levels of state self-compassion following the induction ( $M = 2.79, SD = 1.00$ ) as before the induction ( $M = 2.76, SD = 1.00$ ),  $t(76) = -.231, p = .818$ , and approximately the same levels of state self-criticism following the induction ( $M = 1.82, SD = 1.36$ ) than before the induction ( $M = 1.88, SD = 1.32$ ),  $t(76) = .608, p = .545$ . Participants in the control group rated their state self-criticism approximately the same before ( $M = 1.90, SD = 1.33$ ) and after ( $M = 1.72, SD = 1.33$ ) the induction,  $t(81) = 1.420, p = .160$ , and their state self-compassion approximately the same before ( $M = 2.57, SD = .97$ ) and after ( $M = 2.46, SD = 1.09$ ) the induction,  $t(81) = 1.136, p = .259$ . Taken together, these results indicate that participants reported the self-critical experimental induction to be generally effective in increasing state self-criticism and decreasing state self-compassion, while the self-compassion or control conditions

generally did not affect participants' self-reported state levels of self-compassion or self-criticism. See Figures 3.1, 3.2, and 3.3 for changes in the manipulation checks for the self-criticism, self-compassion, and control conditions, respectively.

There was also a significant main effect for NSSI group,  $V = .115$ ,  $F(2, 229) = 14.810$ ,  $p < .001$ , indicating that participants with a history of NSSI reported significantly different levels of state self-criticism and self-compassion regardless of time or condition. Examination of group means revealed that participants with an NSSI history rated their state levels of self-criticism higher and their state levels of self-compassion lower than those without a history of NSSI across all time points and experimental conditions. However, the three-way interaction between time, experimental condition, and NSSI group was not significant,  $V = .017$ ,  $F(2, 229) = .970$ ,  $p = .423$ , indicating that the time by condition interaction was not significantly different among those with and without an NSSI history.

### **Changes in Implicit Associations with NSSI by Experimental Condition and NSSI History**

In order to test the hypothesis that the experimental inductions would impact implicit associations with NSSI and that these effects would be more pronounced for participants with a history of NSSI, a mixed-design ANOVA with time (pre-induction, post-induction) as a within-subjects factor and condition (self-compassion, self-criticism, control) and group (NSSI history, no NSSI history) as between-subjects factors was conducted. Consistent with Hypothesis 1, results revealed a significant main effect of NSSI group,  $F(1, 227) = 7.611$ ,  $p = .006$ , partial  $\eta^2 = .032$ , suggesting that participants with a history of NSSI had higher SI-IAT scores than those without such a history



regardless of timepoint or experimental condition. A significant interaction effect of time and condition was also found indicating that there were significant differences on pre- and post- SI-IAT scores depending on experimental condition,  $F(2,227) = 3.509, p = .032$ , partial  $\eta^2 = .030$ . The predicted interaction of time, condition, and group was not significant indicating that the time by condition interaction was not significantly different for those with or without a history of NSSI,  $F(2,227) = 1.958, p = .144$ , partial  $\eta^2 = .017$ . No other main effects or interaction effects were hypothesized or significant. Figure 3.4 shows the changes in SI-IAT scores by condition.

Three contrasts were planned to compare the effects of the different experimental conditions on SI-IAT scores over time. First the self-criticism and self-compassion conditions were each compared to the control condition. The effect of the self-compassion condition on SI-IAT scores over time was significantly different from the control condition,  $F(1, 227) = 3.936, p = .048$ ; however, the effect of the self-criticism condition on SI-IAT scores over time was not significantly different from the control condition,  $F(1, 227) = .035, p = .854$ . Finally, the self-compassion and self-criticism conditions were compared to one another. Results showed that they were marginally different from each other,  $F(1, 227) = 3.209, p = .075$ .

Finally, to test the specific hypotheses about how the inductions would lead to changes in SI-IAT scores, paired sample t-tests were used to determine if the SI-IAT scores changed for each condition. Consistent with Hypothesis 2a, scores in the self-criticism induction significantly increased from time 1 to time 2 as a result of the self-criticism induction ( $\bar{Y}\Delta = .113$ ),  $t(74) = -2.217, p = .030$ . Inconsistent with Hypothesis 2b, scores in the self-compassion condition did not significantly change following the

induction ( $\bar{Y}\Delta = .035$ ),  $t(75) = .737$ ,  $p = .463$ . Consistent with Hypothesis 2c, scores in the control condition did not significantly change, ( $\bar{Y}\Delta = -.069$ ),  $t(81) = -1.408$ ,  $p = .163$ .

### **Moderation by NSSI characteristics**

Finally, NSSI frequency and recency were examined as potential moderators of the relationship between experimental condition and changes in SI-IAT scores within participants with a history of NSSI. Consistent with guidelines outlined by Judd, Kenny, & McClelland (2001), a difference score was calculated between the pre- and post-induction SI-IAT scores to serve as the dependent variable. In two separate analyses, the PROCESS Macro for SPSS version 2.16.3 Model 1 (Hayes, 2013) was used to test the hypotheses that NSSI frequency and recency would moderate the relationship between condition and changes in SI-IAT scores. The PROCESS macro automatically computes dummy codes for three-group categorical independent variables (Hayes & Montoya, 2017). In the present study, indicator coding was used with the control condition as the reference group.

Results showed that NSSI frequency did not moderate the relationship between experimental condition and changes in SI-IAT scores,  $R^2$  increase due to interaction = .040,  $F(2, 63) = 1.424$ ,  $p = .248$ . NSSI recency also did not moderate the effect of condition on changes in SI-IAT scores,  $R^2$  increase due to interaction = .059,  $F(2, 62) = 2.097$ ,  $p = .132$ . These results indicate that the effects of the experimental conditions were not different depending on the number of episodes of NSSI or their recency.

**Table 3.1***Relationships among self-report measures and SI-IAT scores*

	1.	2.	3.	4.	5.	6.	7.
1. NSSI history	---						
2. NSSI frequency <sup>a</sup>	---	---					
3. NSSI recency <sup>a</sup>	---	-.106	---				
4. SI-IAT time 1	.155*	.161	-.186	---			
5. SI-IAT time 2	.132*	.222	-.029	.338***	---		
6. Self-compassion scale	-.479***	-.293*	.133	-.312***	-.226***	---	
7. Levels of self-criticism scale	.471***	.344**	-.086	.236***	.210***	-.821***	---

*Note.* \* $p < .05$ . \*\* $p < .01$ , \*\*\* $p < .001$ , <sup>a</sup> Among participants with a history of NSSI ( $n = 72$ ).

**Table 3.2***Descriptive statistics for self-report measures by experimental condition and NSSI group*

Condition	NSSI history			No NSSI history			Total		
	LOSC	SCS	<i>n</i>	LOSC	SCS	<i>n</i>	LOSC	SCS	<i>n</i>
	<i>M(SD)</i>	<i>M(SD)</i>		<i>M(SD)</i>	<i>M(SD)</i>		<i>M(SD)</i>	<i>M(SD)</i>	
Self-compassion	4.63(0.96)	2.50(0.69)	25	3.33(0.98)	3.49(0.68)	51	3.76(1.15)	3.16(0.83)	76
Self-criticism	4.43(0.94)	2.70(0.70)	24	3.34(0.98)	3.24(0.58)	51	3.71(0.93)	3.07(0.67)	75
Control	4.19(1.15)	2.66(0.68)	23	3.41(0.90)	3.38(0.60)	59	3.63(1.03)	3.18(0.70)	82
Total	4.42(1.02)	2.61(0.69)	72	3.37(0.86)	3.37(0.63)	161	3.70(1.04)	3.14(0.73)	235

*Note.* LOSC = Levels of Self-Criticism Scale, SCS = Self-Compassion Scale, *M* = Mean, *SD* = Standard deviation, *n* = Sample size

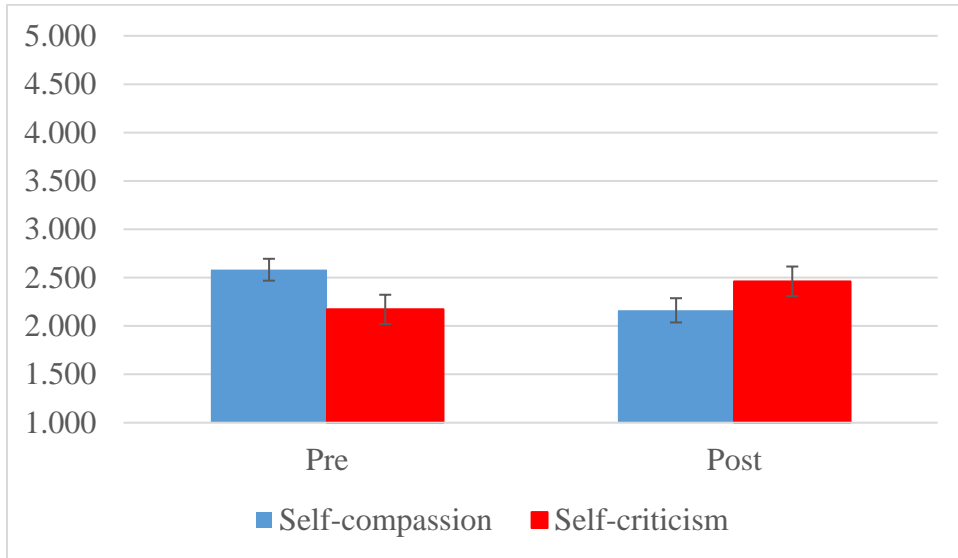
**Table 3.3***Mean SI-IAT scores before and after experimental inductions by condition and NSSI group*

Condition	NSSI history			No NSSI history			Total		
	Pre	Post	<i>M(SD)</i>	Pre	Post	<i>M(SD)</i>	Pre	Post	<i>M(SD)</i>
Self-compassion	0.101(0.460)	-0.018(0.323)	-0.029(0.300)	-0.023(0.357)	0.014(0.362)	-0.021(0.344)	0.014(0.362)	0.014(0.362)	-0.021(0.344)
Self-criticism	0.054(0.289)	0.277(0.471)	0.010(0.348)	0.070(0.351)	0.024(0.329)	0.136(0.402)	0.024(0.329)	0.024(0.329)	0.136(0.402)
Control	0.179(0.409)	0.219(0.441)	-0.012(0.373)	0.072(0.404)	0.042(0.390)	0.111(0.417)	0.042(0.390)	0.042(0.390)	0.111(0.417)
Total	0.110(0.391)	0.154(0.429)	-0.010(0.342)	0.041(0.374)	0.027(0.361)	0.076(0.394)	0.027(0.361)	0.027(0.361)	0.076(0.394)

*Note. M = Mean, SD = Standard deviation*

**Figure 3.1**

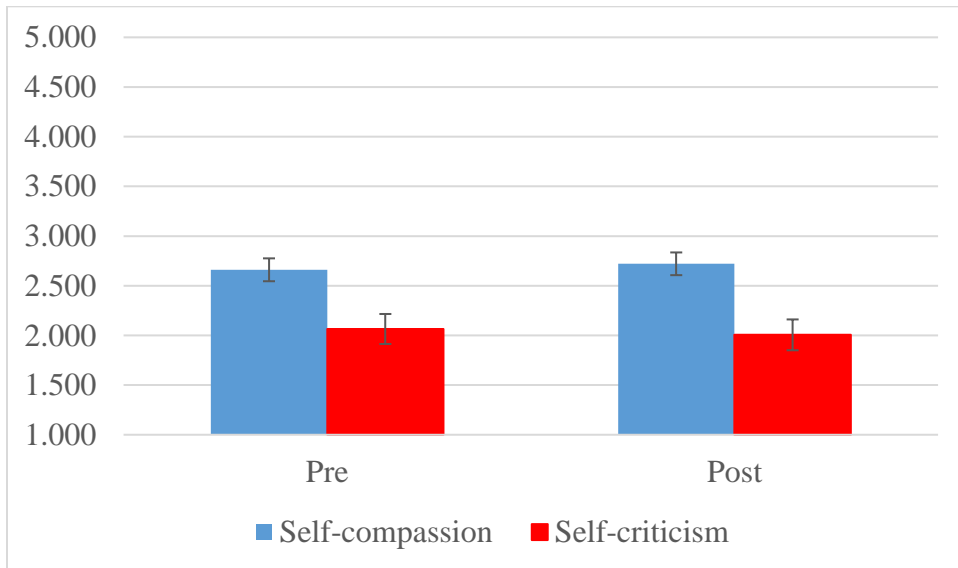
*Manipulation check results for the self-criticism induction*



*Note:* Error bars represent standard errors.

**Figure 3.2**

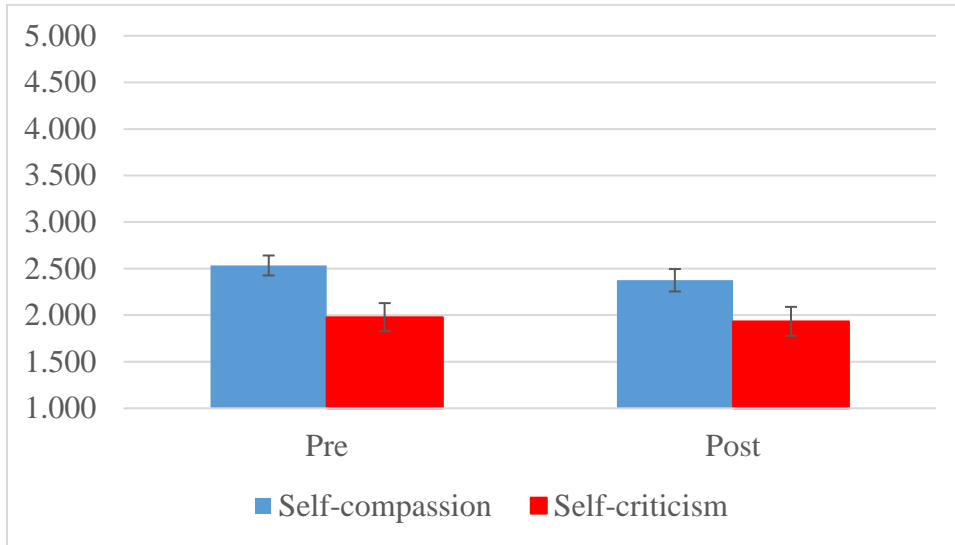
*Manipulation check results for the self-compassion induction*



*Note:* Error bars represent standard errors.

**Figure 3.3**

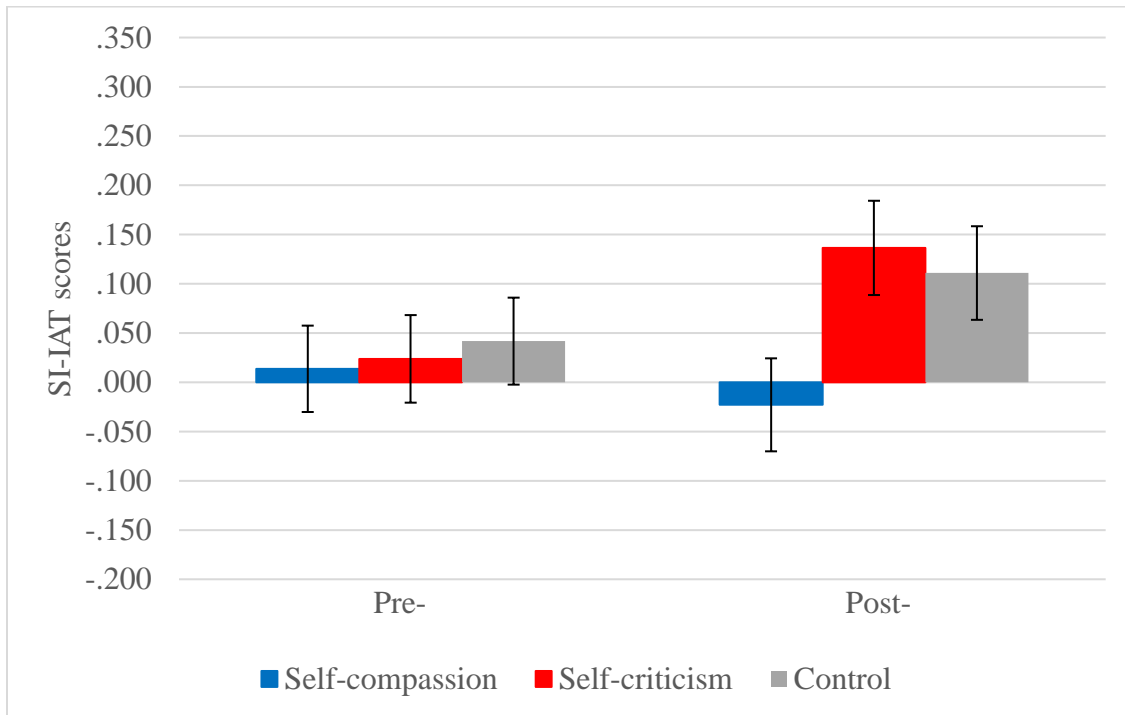
*Manipulation check results for the control group*



*Note:* Error bars represent standard errors.

**Figure 3.4**

*Changes in SI-IAT scores across time by condition*



*Note:* Error bars represent standard errors.

## CHAPTER FOUR: DISCUSSION

The goal of the present study was to investigate the effects of experimentally induced self-criticism and self-compassion in implicit associations with NSSI. Consistent with previous research, results showed that participants with a history of NSSI tended to implicitly associate NSSI with themselves more than participants without a self-injury history regardless of timepoint or condition (Franklin et al., 2014) and reported higher self-criticism and lower self-compassion on both trait and state measures. Results also showed that there was a significant time by condition interaction indicating that SI-IAT scores changed differently as a result of the different experimental conditions. Specifically, the self-criticism induction led to significant increases in SI-IAT scores suggesting that participants in the self-criticism induction began to implicitly associate NSSI with themselves more following the induction. These results are consistent with the idea that people engage in NSSI in an attempt to down-regulate negative emotions such as shame by punishing themselves (Chapman, Gratz, & Brown, 2006).

Contrary to the study hypotheses, the self-compassion induction did not result in any changes in SI-IAT scores; however, participants in the self-compassion induction also generally reported no changes in their state levels of self-criticism and self-compassion indicating that the induction was not effective in increasing self-compassion. The self-compassion induction utilized in this study was identical to one used in previous studies (Breines & Chen, 2012; Breines & Chen, 2013; Leary et al., 2007); therefore, it is unclear why it was not effective in the present sample. Because the induction first asks participants to write about an event that resulted in feelings of shame and embarrassment,



it is possible that the self-compassion portion of the induction was not able to overcome any negative feelings resulting from this initial portion of the induction. This was also the first study that utilized this induction in a sample of people with a history of NSSI. Given the significant relationship between NSSI and self-criticism (Cohen et al., 2015; Gilbert et al., 2010), it is possible that it was more difficult for people with a history of NSSI to come up with self-compassionate statements unaided. As the use of brief self-compassion inductions is rapidly increasing in the literature, more research should be done to examine if there are more effective ways to induce self-compassion, particularly in people with a history of NSSI.

The predicted interaction of time, condition, and group was also not significant indicating that the changes in SI-IAT scores as a result of condition over time were not different for participants with or without a history of NSSI. The self-criticism induction increased participants' implicit identification with NSSI while the groups in the self-compassion and control conditions generally did not see a change in scores. Furthermore, these results were not different depending on participants' frequency or recency of NSSI behaviors. Although these results were not consistent with the study hypotheses, they provide potentially important insight into the role of self-criticism in the development of NSSI. If participants with a history of NSSI responded more strongly to the self-criticism condition, then the results would indicate that there were differences among people with and without a history of NSSI that make those with an NSSI history more sensitive to self-criticism. In contrast, the results showed that all participants, regardless of NSSI history or history severity, responded similarly to self-criticism – with an increase in implicit associations with NSSI. These results suggest that self-criticism

could be an important antecedent of the development of self-injury, although longitudinal research is needed to test this directly.

### **Limitations**

The results of the present study should be interpreted in light of several limitations. Primarily, the self-compassion induction was not effective in changing self-reported state-levels of self-compassion or self-criticism indicating that it was not effective. Recent research has demonstrated that a values-based self-compassion induction in which the participant writes about an important value was effective people with people with histories of NSSI (Gregory, Glazer, & Berenson, 2017). Future research should compare different self-compassion inductions to determine if they are differentially effective in people with and without NSSI.

The present study also utilized a two-question manipulation check which makes it difficult to investigate the potential reasons that the self-compassion induction was not effective. Ideally, state self-compassion and self-criticism would have also been assessed immediately after the first writing prompt and before the second to parcel out the effects of writing about the negative event versus the respective induction. Furthermore, as this study was the first to utilize this type of self-criticism induction, more work should be done to validate that it is an effective method of inducing self-criticism in the laboratory.

Finally, it should be noted that although the SI-IAT discriminates between people with and without an NSSI history (Cha, Augenstein, Frost, Gallagher, D'Angelo, & Nock, 2016; Glenn, Wentz, Slama, Steinman, Teachman, & Nock, 2016), scores on the SI-IAT are not the same as actually engaging in NSSI. Just because an individual's implicit associations with NSSI increase, does not mean that they will self-injure. In fact,

research is mixed on whether SI-IAT scores are predictive of future NSSI behaviors with some studies finding that they do predict future behaviors (Nock & Banaji, 2007) and others finding that they do not (Glenn & Klonsky, 2011). Future research should examine whether changes in self-criticism and self-compassion affect the probability that a person will engage in self-injury.

### **Conclusions**

This study was the first to examine if experimentally induced self-criticism and self-compassion could affect implicit identification with NSSI. Because people who self-injure may not always be willing or able to be honest about their reasons for engaging in self-injury, understanding the implicit attitudes that underlie NSSI behaviors has the potential to provide valuable information about how to prevent and treat these behaviors. The present results highlight the potential importance of self-criticism in NSSI by demonstrating that experimentally-induced self-criticism increased implicit identification with NSSI in people with and without a history of NSSI behaviors. Future research should examine increases in self-criticism as a potential precursor of NSSI in longitudinal samples.

## APPENDICES

### Appendix A: Picture Stimuli Used in the SI-IAT



## **Appendix B: Experimental Stimuli**

### **Self-compassion induction:**

Part 1:

Think about a negative event that you experienced in high school or college that made you feel badly about yourself—something that involved failure, humiliation, or rejection. Describe the event, who was, present, and what happened. Describe how you felt and behaved during the event. Please keep writing until the experimenter tells you to stop.

Part 2:

Please describe some ways in which other people also experience similar events. Write a paragraph expressing understanding and kindness to yourself in the same way that you might talk to a friend who had undergone the same experience. Try not to judge yourself or how you acted during the event. Please keep writing until the experimenter tells you to stop.

### **Self-criticism induction:**

Part 1:

Think about a negative event that you experienced in high school or college that made you feel badly about yourself—something that involved failure, humiliation, or rejection. Describe the event, who was, present, and what happened. Describe how you felt and behaved during the event. Please keep writing until the experimenter tells you to stop.

Part 2:

Please describe some ways in which the event that occurred was your fault. Write a paragraph expressing disapproval of what happened and how you acted during the event. Try to critically evaluate yourself and your role in the event. Please keep writing until the experimenter tells you to stop.

### **Control condition:**

Please describe your typical daily routine. Please keep writing until the experimenter tells you to stop.

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## VITA

### EDUCATION

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<b>Graduate Certificate in College Teaching and Learning</b> University of Kentucky; Lexington, Kentucky	2017
<b>M.S. in Clinical Psychology</b> University of Kentucky; Lexington, Kentucky <u>Thesis</u> : Development and validation of a measure of self-critical rumination	2013
<b>B.S. in Psychology</b> University of Georgia; Athens, Georgia <u>Honors Thesis</u> : Distraction as a distress tolerance skill: Using the Cold Pressor to determine efficacy	2011

### HONORS & AWARDS

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#### University of Kentucky

Provost's Outstanding Teaching Award	2017
Arts & Sciences Certificate for Outstanding Teaching	2017
Award for Exceptional Clinical Performance	2016
Association of Emeriti Faculty Endowed Doctoral Fellowship	2016
Jesse G. Harris Jr. Scientist-Practitioner Award	2015
Award for Excellent Clinical Performance	2015
Douglas Marshall Wilson Make A Difference Award	2011-2017
Department of Psychology Travel Award	2011-2014
Daniel R. Reedy Quality Achievement Award	2011-2012
Kentucky Opportunity Fellowship	

#### University of Georgia

William T. James Award for Outstanding Senior Psychology Major	2011
Outstanding Senior Leader Award	2011
Summer Research Fellow, UGA Honors Department	2010-
Scott Torgesen Award for Outstanding Junior Psychology Major	2011
Southeastern Psychological Association Travel Grant	2010
Best Undergraduate Poster Presentation, 33 <sup>rd</sup> Annual University of Georgia Psi Chi Convention of Behavioral Sciences	2010

## PEER-REVIEWED PUBLICATIONS

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- Nagy, L. M.** & Baer, R. A. (2017). Mindfulness: What should teachers of psychology know? *Teaching of Psychology*, 44(4), 353-359.
- Peters, J. R., Eisenlohr-Moul, T. A., & **Smart, L. M.** (2016). Mindfulness and rejection sensitivity: The critical role of nonjudgment. *Personality and Individual Differences*, 93, 125-129.
- Smart, L. M.**, Peters, J. R., & Baer, R. A. (2016). Development and validation of a measure of self-critical rumination. *Assessment*, 23(3), 321-332.
- Peters, J. R., **Smart, L. M.**, Eisenlohr-Moul, T. A., Geiger, P. J., Smith, G.T., & Baer, R. A. (2015). Anger rumination as a mediator of the relationship between mindfulness and aggression: The utility of a multidimensional mindfulness model. *Journal of Clinical Psychology*, 71(9), 871-884.
- Peters, J. R., **Smart, L. M.**, & Baer, R. A. (2015). Difficulties in emotion regulation mediate the cross-sectional relationship between rejection sensitivity and borderline personality features. *Journal of Personality Disorders*, 29(2), 231-240.
- Franks, D. W., Dewitt, M., Hudgens-Haney, M., Schaeffer, D. J., Ball, B. H., Schwartz, N., Hussein, A. A., **Smart, L. M.**, & Sabatinelli, D. (2014). Emotion regulation: Quantitative meta-analysis of functional activation and deactivation. *Neuroscience and Biobehavioral Reviews*, 45, 202-211.
- Boggero, I. A., **Smart, L. M.**, Kniffin, T. C., & Walker, R. A. (2014). Neuroticism and resting mean arterial pressure interact to predict pain tolerance in pain-free adults. *Personality and Individual Differences*, 69, 140-143.
- Peters, J. R., Geiger, P. J., **Smart, L. M.**, & Baer, R. A. (2014). Shame and borderline personality features: The potential mediating roles of anger and anger rumination. *Personality Disorders: Theory, Research, and Treatment*, 5(1), 1-9.
- Reidy, D.E., Wilson, L.F., Sloan, C.A., Cohn, A.M., **Smart, L.M.** & Zeichner, A. (2013). Psychopathic traits and men's anger response to interpersonal conflict: A pilot study. *Personality and Individual Differences*, 55(8), 957-961.

## BOOK CHAPTERS

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Baer, R. A. & **Nagy, L. M.** (In Press). Professional ethics and personal values in mindfulness-based programs: A secular psychological perspective. In Monteiro et al. (Eds.), *A Practitioner's Guide to Ethics in Mindfulness-Based Programs*.

Baer, R. A., Caldera, C. A., **Nagy, L. M.** (In Press). Mindfulness. In Zeigler-Hill & Shackelford (Eds.), *Encyclopedia of Personality and Individual Differences*.

## TEACHING EXPERIENCE

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Adjunct Instructor, Eastern Kentucky University	Fall 2014; Fall 2017-Present
Adjunct Instructor, University of Kentucky	Spring 2015-Summer 2016
Invited Guest Teacher, Gaoxin No. 1 High School, Xi'an, China	Summer 2016

## RESEARCH POSITIONS

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<b>Graduate Student Researcher</b>	2011-Present
Baer Mindfulness Lab; University of Kentucky, Lexington, KY	

<b>Research Assistant</b>	2015-2016
Realizing Aptitudes Foundation, nonprofit organization	

<b>Research Assistant</b>	2014-2015
Center for Drug and Alcohol Research Translation (NIDA DA005312)	

<b>Research Assistant</b>	2014
Psychoneuroimmunology Lab (NIA AG046116-R01)	

## CLINICAL POSITIONS

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<b>Clinical Psychology Intern</b>	2017- Present
University of Kentucky Internship Consortium	

<b>Practicum Therapist</b>	2012-2017
Jesse G. Harris Jr. Psychological Services Center	

<b>Practicum Therapist</b>	2016-2017
Cardinal Hill Rehabilitation Hospital, Lexington, KY	

<b>Peer Supervisor</b>	2014-2015
University of Kentucky Clinical Psychology Program	

<b>Clinic Assistant Coordinator</b> Jesse G. Harris Jr. Psychological Services Center	2014
<b>Assessment Coordinator</b> Jesse G. Harris Jr. Psychological Services Center	2013
<b>Practicum Therapist</b> University of Kentucky Counseling Center	2012-2013