Identifying Risk for Self-Harm: Rumination and Negative Affectivity in the Prospective Prediction of Nonsuicidal Self-Injury

Katey Anne Nicolai, PhD, Madeline D. Wielgus, BA, and Amy Mezulis, PhD

Research suggests nonsuicidal self-injury (NSSI) may function as a maladaptive strategy to regulate negative emotions, and individuals high in trait negative affectivity (NA) may be particularly at risk. Rumination, a cognitive emotion regulation strategy, may amplify negative affect, increasing the likelihood of NSSI. The current study found that high NA and high rumination interacted to predict both likelihood of engagement in NSSI and frequency of NSSI. This study provides support for the joint contribution of cognitive and temperamental factors impacting the relationship between NA and NSSI and suggests that interventions targeted at maladaptive emotion regulation strategies may help inform individualized treatment.

Nonsuicidal self-injury (NSSI), or deliberate self-injury without suicidal intent, is a growing problem among adolescents and young adults (Jacobson & Gould, 2007). Prevalence among young adults may be as high as 38% (Gratz, Conrad, & Roemer, 2002), making the need for research in this particular age group pressing. NSSI, although specifically nonsuicidal, is a high-risk behavior that is associated with maladaptive outcomes and an increased risk of later suicidality (Gunnell & Frankel, 1994). In fact, NSSI has been found to be the strongest predictor of later suicide attempts, other than suicidal ideation, among inpatient samples (Klonsky, May, & Glenn, 2013). Thus, nonsuicidal self-injury is a behavior of particular clinical and research interest.

High negative affectivity (NA), or the temperamental tendency to experience intense and frequent negative emotions, may be considered a broad-spectrum predictor of psychopathology in adolescents and young adults (Anthony, Lonigan, Hooe, & Phillips, 2002; Lengua, West, & Sandler, 1998), but research has also demonstrated a specific association between NA and NSSI (Guerry & Prinstein, 2010). This suggests that NA is a key contributor to the behavior of NSSI. In fact, functional models, such as Nock and Prinstein's (2004, 2005) four-function model, suggest that NSSI is a maladaptive attempt to escape from high NA (Guerry & Prinstein, 2010). In other words, individuals may use NSSI as an emotion regulation strategy, particularly when they lack more adaptive strategies to manage negative affect.

However, not all individuals engage in NSSI when faced with high NA, suggesting that additional research is needed to identify moderators of the predictive relationship between NA and NSSI. One maladaptive cognitive emotion regulation strategy

Katey Anne Nicolai, Madeline D. Wielgus and Amy Mezulis, Department of Clinical Psychology, Seattle Pacific University, Seattle, WA, USA.

Address correspondence to Katey Anne Nicolai, Department of Clinical Psychology, Seattle Pacific University, Seattle, WA 98119; E-mail: kateyd@spu.edu

associated with increases in NA is rumination (Feldner, Leen-Feldner, Zvolensky, & Lejuez, 2006; Mezulis, Priess, & Hyde, 2011), or the repetitive focus on the experience of negative emotions, and their meaning, causes, and consequences (Nolen-Hoeksema, Wisco, & Lyubomirksy, 2008). Research has shown that rumination exacerbates and prolongs negative affective states (Nolen-Hoeksema, Morrow, & Fredrickson, 1993). This exacerbation of NA may increase the likelihood that high NA individuals resort to NSSI as a way to regulate their negative affect. The purpose of the current study was to examine rumination as a potential moderator of the prospective relationship between trait NA and NSSI.

NONSUICIDAL SELF-INJURY

Nonsuicidal self-injury is the "direct, deliberate destruction of one's own body tissue in the absence of suicidal intent" (Nock & Favazza, 2009, p. 9). NSSI often occurs within the context of extreme emotional distress and is recognized as serving varying functions to the individual (Nock & Favazza, 2009). Estimating prevalence of NSSI is challenging due to the varying definitions researchers have used; however, among college-age individuals (18–22), estimates of lifetime NSSI prevalence range from 12% to 38% (Favazza & Conterio, 1989; Gratz, 2001; Gratz et al., 2002; Swannell, Martin, Page, Hasking, & St John, 2014). This group currently accounts for the highest risk group for NSSI (White, Trepal-Wollenzier, & Nolan, 2002). NSSI is associated with a host of negative outcomes, including significant distress (Klonsky, 2007), bullying and academic difficulties (Shaffer & Jacobson, 2009), and medical complications and scarring (DiClementi, Ponton, & Hartley, 1991). Additionally, research indicates that NSSI has been shown in both clinical and community samples to be significantly prospectively associated with suicidal ideation and suicide attempts, above and beyond depressive

symptomatology, and even past suicide attempts (Guan, Fox, & Prinstein, 2012; Gunnell & Frankel, 1994; Klonsky et al., 2013). Given the high prevalence in this age group and the negative outcomes of NSSI, it is clear that continued research examining the vulnerabilities that lead to this behavior is needed.

NSSI AS AN EMOTION REGULATION STRATEGY

The four-function model proposes that an individual engages in NSSI for one of four purposes that differ along two dimensions: positive or negative reinforcement, and automatic or social contingencies (Nock & Prinstein, 2004, 2005). The automatic negative reinforcement (ANR) function of NSSI is the most frequently cited function in every study examining the four-function model (Nock & Cha, 2009). Individuals who endorse the ANR function use NSSI to regulate or escape negative affective states, and studies have demonstrated that NSSI is, unfortunately, an effective emotion regulation tool. These individuals also endorse experiencing heightened negative emotion (high NA) and more frequent attempts at thought suppression of suicide (Najmi, Wegner, & Nock, 2007; Nock & Prinstein, 2005), implying that high NA individuals attempt to use NSSI to escape or relieve a negative affective state to which they may be particularly prone. Using NSSI for affect regulation is the most well-supported function of this behavior (Nock & Cha, 2009), indicating that individuals with temperamental high NA may be at a higher risk for engaging in this behavior.

RUMINATION MAY EXACERBATE RISK FOR NSSI

Many high NA individuals are able to employ more adaptive emotion regulation strategies, and thus, the relationship between high trait NA and NSSI is imperfect. Examining moderators will allow for more

sensitive prediction of this outcome. One potential moderator of this relationship is rumination, a maladaptive cognitive coping strategy that has been shown to exacerbate negative affect (Nolen-Hoeksema et al., 1993). Rumination is associated with a number of maladaptive outcomes, including depression (Hankin & Abramson, 2001; Hyde, Mezulis, & Abramson, 2008), anxiety (Rood, Roelofs, Bögols, & Alloy, 2010), and substance use (Skitch & Abela, 2008), and it has also been shown to moderate the relationship between NSSI and depressive symptoms (Hilt, Cha, & Nolen-Hoeksema, 2008). Hoff and Muehlenkamp (2009) have also illustrated the association between NSSI and rumination in finding that college students who indicate a history of NSSI report significantly higher levels of rumination.

Individuals who engage in NSSI or rumination similarly show impaired abilities to generate or select adaptive behavioral strategies in response to stress. It has been shown that individuals who engage in NSSI have difficulty using adaptive strategies, such as problem solving (Kehrer & Linehan, 1996), and individuals who ruminate focus on their internal states rather than selecting a problem-solving or distraction approach in response to stressors (Compas, Connor-Smith, & Jaser, 2004; Lyubomirsky & Nolen-Hoeksema, 1995). Therefore, rumination may serve as a moderator between trait NA and NSSI, such that rumination exacerbates negative mood states and prevents individuals from selecting adaptive coping strategies, thus increasing the likelihood that individuals resort to NSSI to regulate their negative affect. This is consistent with recent research on the emotional cascades model (ECM), which proposes that emotional cascades, or positive feedback loops between high NA and high rumination, may lead to the use of maladaptive behaviors to disrupt the cascade (Selby, Anestis, & Joiner, 2008). In fact, NSSI has been shown to serve as a distraction from or a disruption of these emotional cascades among a sample of community members and college students (Selby, Franklin, Carson-Wong, & Rizvi, 2013).

THE CURRENT STUDY

No research to date has examined whether rumination moderates the effect of trait NA on NSSI (Hilt et al., 2008). Individuals who are already temperamentally predisposed to experience NA more intensely and frequently, and who exacerbate their high NA by engaging in rumination, may be particularly likely to engage in NSSI. The current study builds on existing research that has examined the correlates of NSSI by integrating the temperamental predisposition, high NA, with a central vulnerability known to predict NSSI and rumination. A short-term prospective study using an 8-week diary design was used to examine the hypothesis that the relationship between high NA and NSSI would be moderated by rumination, such that high NA individuals who endorse higher rumination at baseline will be most likely to engage in NSSI across the study period.

METHOD

Participants

Participants were 142 (72% female) undergraduate students aged 18 to 29 ($M = 19.3$, $SD = 1.66$) recruited from a university in the Pacific northwest. Approximately 69% identified as Caucasian, 4.2% as African American, 17.6% as Asian, 5.6% as Hispanic/Latino, and 3.5% as others.

Procedure

Following classroom recruitment presentations, participants were contacted via e-mail with information about the study and were sent a link to an online survey platform. Participants provided consent and

completed a set of baseline questionnaires (Part 1). Part 1 was completed within a 48-hour window of time to maintain an interval of approximately 1 week between assessments. The baseline questionnaires included measures of trait NA, trait rumination, and lifetime NSSI behaviors.

Participants who completed Part 1 were invited to participate in Part 2 of the study. In Part 2, participants were asked to complete weekly diary assessments via Qualtrics across the subsequent 7-week follow-up period. The diary method asks participants to respond to questionnaires referring to the previous week (see Hankin, Fraley, & Abela, 2005, for a detailed explanation of a diary design). In each weekly diary assessment, participants reported on that week's frequency of NSSI behaviors. Participants were given a 48-hour window to complete each weekly questionnaire. Participants received one research class credit for completing the baseline questionnaire and four research class credits for participating in the 7-week diary assessments. In addition, participants who completed six or seven weekly questionnaires of the Part 2 diary assessment were entered into a raffle awarding two participants $50 gift cards at the end of the study.

Measures

Trait NA. Trait NA was measured at baseline using the Negative Affectivity subscale of the Adult Temperament Questionnaire (ATQ-NA; Evans & Rothbart, 2007). The ATQ-NA is a 31-item subscale measuring fear, sadness, discomfort, and frustration. Participants rate how true each item is for them on a 7-point Likert scale, from (1) *Extremely untrue of you* to (7) *Extremely true of you*. Higher total scores represent higher temperamental NA. Example items include, "I feel sad after saying goodbye to friends or relatives" and "I rarely feel angry at people" [coded in reverse]. The NA subscale has demonstrated convergent validity with the Big Five personality factor

of neuroticism ($r = .69$). In a college sample, the internal consistency of the NA subscale is .74 (Evans & Rothbart, 2007); the internal consistency for this sample was .80.

Rumination. Rumination was measured at baseline using the Ruminative Response Scale of the Response Styles Questionnaire (RRS, RSQ; Nolen-Hoeksema & Morrow, 1991). The RRS is a 22-item self-report measure examining potential responses to negative mood that are focused on the self. Participants rate how frequently they engage in each response on a 4-point Likert scale from (1) *Not at all* to (4) *Very much*. Higher total scores represent higher levels of rumination. Example items include, "I think about how down I feel" and "I have a hard time concentrating on other things in my life." Among college students, the RRS has demonstrated an internal consistency of .89 (Nolen-Hoeksema & Morrow, 1991) and has demonstrated convergent validity with ruminative responses to depression in a diary study (Nolen-Hoeksema et al., 1993). Similarly, the internal consistency of the RRS for this sample was .91.

Nonsuicidal Self-Injury. Frequency of nonsuicidal self-injury was measured at baseline and in weekly questionnaires with the first section of the Inventory of Statements about Self-Injury (ISAS; Klonsky & Glenn, 2009). The first section of the ISAS is a 17-item scale split into two subsections. In the first subsection, 12 items assess for lifetime frequency of 12 NSSI behaviors: banging/hitting self, biting, burning, carving, cutting, wound picking, needle sticking, pinching, hair pulling, rubbing skin against rough surfaces, severe scratching, and swallowing chemicals. Participants selected from five options indicating how often they have engaged in each of these behaviors, from (1) *Never* to (6) *More than 50 times*. The second subsection contains five questions assessing descriptive and contextual factors, including age of onset, the experience of pain during NSSI, whether NSSI is

performed alone or around others, time between the urge to self-injure and the act, and whether the individual wants to stop engaging in NSSI. Participants responded using a multiple-choice format for the final four questions. At baseline, participants completed both subscales to measure lifetime NSSI. For weekly questionnaires, participants completed only the first subsection, which was modified to reflect the weekly frequency of NSSI behaviors. Participants were asked to rate how frequently they had engaged in each of the 12 NSSI behaviors *during the last week*. Within a college sample, the internal consistency of the ISAS ranges from .80 to .88 (Klonsky & Glenn, 2009); in this sample, the internal consistency was .78.

RESULTS

Descriptive Statistics

A total of 159 participants initiated the baseline questionnaire and/or some of the weekly questionnaires. Only participants who completed the baseline questionnaire and four of the seven weekly questionnaires were included in analyses. Seventeen participants did not complete the required questionnaires and were eliminated from the original sample, resulting in the final sample of 142 participants.

Of the 142 participants, 28 (20.4%) engaged in NSSI at least one time during the 8-week study period, ranging from 1 to 53 times, with an average of 1.71 times. Eighty participants (57%) reported a history of engaging in NSSI at least once in their lifetime, ranging from 1 to 37 times, with an average of 5.38 times, and a mode of 3 times.

Group differences in study variables were examined between the 28 individuals who engaged in NSSI during the study period and the 114 who did not. Individuals who identified as female were more likely to report engaging in NSSI during the study period than those who identified as male, $\chi^2(1, N = 142) = 5.25$, $p = .02$. Further, participants who reported a history of NSSI behavior were more likely to engage in NSSI during the study period, $\chi^2(1, N = 142) = 8.68$ $p < .01$. There were significant group differences for NA and rumination, with individuals who engaged in NSSI during the study period reporting higher scores on both NA [$t(140) = 1.98$, $p = .05$] and rumination [$t(140) = 3.15$, $p < .01$]. Means and standard deviations for study variables for both the NSSI and the non-NSSI groups are shown in Table 1. A correlation matrix of study variables can be seen in Table 2.

TABLE 1
Descriptive Statistics

Variable	NSSI		No NSSI	
	n = 28		*n* = 114	
	M	*SD*	*M*	*SD*
Age	19.11	1.26	19.34	1.74
Gender	89% female		68% female	
NA	4.18	.49	3.92	.68
Rumination	60.54	10.79	52.13	13.05
Lifetime NSSI	11.32	10.54	3.78	5.65
Weekly NSSI	8.71	11.36	–	–

Note. Total *N* = 142. Engaged in NSSI during study period (NSSI), did not engage in NSSI during study period (No NSSI), negative affectivity (NA).

Data Analysis

Given the expected skew in the dependent variable of NSSI, with 80% of the sample reporting no NSSI during the 7-week prospective study period and 20% of the sample reporting frequency of NSSI ranging from 1 to 53 incidents of NSSI, we elected to analyze the data in a stepwise fashion. First, binary logistic regression in SPSS 22.0 (IBM Corp., Armonk, NY, USA) was used to examine whether trait NA, rumination, and the NA by rumination interaction predicted whether or not participants engaged in any NSSI during the study period. For these analyses, NSSI was coded into a binary variable – whether each participant had engaged in NSSI or not. Next, the PROCESS macro for SPSS was used to examine whether NA, rumination, or the NA by rumination interaction predicted frequency of NSSI, both within the entire sample (N = 142) and/or specifically within the subsample (n = 28) of participants who engaged in any NSSI during the study period.

First, a logistic regression model was run with NSSI entered as the binary dependent variable, sex and NSSI history in Block 1 as covariates; trait NA and trait rumination in Block 2 as main effects; and the 2-way interaction between NA and rumination in Block 3. NA and rumination were standardized before analyses. As expected, both sex [β = 1.39 (.65), p = .03, OR = 4.01] and NSSI history [β = 1.47 (.54), p = .01, OR = 4.36] were significant predictors of engagement in NSSI prospectively. The block entering the main effects of NA and rumination indicated that adding these variables made only a marginally significant contribution to the model (Block χ^2 = 5.31, p = .07), and the main effect of rumination was significant [β = .60 (.27), p = .03, OR = 1.82], while the main effect of trait NA was not [β = .20 (.30), p = .50, OR = 0.82]. Finally, the block entering the interaction term was significant, indicating that the interaction made a significant contribution to the prediction of NSSI above and

beyond all other variables in the model (Block χ^2 = 7.90, p = .005). The interaction effect was also significant [β = .91 (.39), p = .02, OR = 0.40]. This significant interaction was explored by examining rates of prospective engagement in NSSI among groups based on median splits on NA and rumination. As seen in Figure 1, participants with high NA and high rumination were more than twice as likely (29.4%) to engage in NSSI during the 8-week study period compared to participants with low NA and low rumination (10.6%).

Next, we examined whether NA, rumination, or the NA by rumination interaction would predict the frequency of NSSI behaviors. We utilized PROCESS (model 1) with NA entered as the independent variable, rumination as the moderator, and sex and NSSI history as covariates. First, we ran this model with the entire sample (N = 142). The model was not significant (R^2 = .09, p = .17). The main effect of rumination approached significance [β = 1.63 (.83), p = .053, CI = −.02 to 3.28], but none of the other predictors or covariates were significant (all p > .20). Given the significant skew in the dependent variable of NSSI as a continuous variable, we ran the same model again with only the subsample of participants who engaged in any NSSI during the study (n = 28). This model was significant (R^2 = .52, p = .03). None of the main effects or covariates were significant (all p > .20), but the NA by rumination interaction was
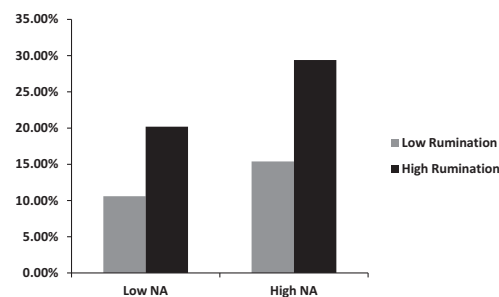

Figure 1. Rates of prospective engagement in NSSI among individuals with high and low NA and rumination.

significant [β = 12.35 (5.34), *p* = .04, CI = .70–24.00]. Analysis of the conditional effects found results consistent with hypotheses and with the binary logistic regression results: The effect of NA on NSSI behaviors was significant at high levels of rumination [at +1 *SD*, β = 15.99 (6.19), *p* = .02, CI = 2.71–29.28], but not at low levels of rumination [at – 1 *SD*, β = −4.45 (5.61), *p* = .44, CI = −16.49 to 7.59].

To interpret this interaction, we examined the mean number of NSSI incidents during the study period for individuals with low versus high rumination based on median splits on each predictor. Consistent with the binary regression results, individuals high in both rumination and NA engaged in significantly more NSSI behaviors (*M* = 13.30, *SD* = 16.35) than individuals low in both risk factors (*M* = 1.50, *SD* = .71), indicating that NA and rumination combined predict both likelihood of engaging in NSSI and frequency of NSSI behaviors.

DISCUSSION

The purpose of this study was to examine predictors of NSSI among young adults by gathering data from 142 participants across 8 weeks in order to prospectively predict NSSI. While NA has demonstrated an association with NSSI in prior studies, not every individual with this temperamental vulnerability engages in this behavior, suggesting the presence of moderating variables. Rumination has previously been

TABLE 2
Correlations of Study Variables

Variable	1	2	3	4
1. NA	–			
2. Rumination	.54**	–		
3. Impulsivity	.17*	.15	–	
4. Lifetime NSSI	.13	.26**	.07	–
5. Weekly NSSI	.12	.28**	.07	.35**

Note. Negative affectivity (NA); *N* = 142, *p* < .05, **p* < .01.

found to be associated with NSSI, but previous research has not examined it as a moderator of the relationship between NA and NSSI. Study results support the premise that individuals who use maladaptive emotion regulation strategies, such as rumination, to cope with high NA may be at particularly high risk for engaging in NSSI.

Rumination Moderates the Effect of NA on NSSI

Extant literature establishes that individuals who possess an inherent tendency to experience intense and frequent negative emotions (NA) are more likely to engage in NSSI (Baetens, Claes, Willem, Muehlenkamp, & Bijttebier, 2011). NA is a broad predictor of psychopathology (Anthony et al., 2002; Klein, Durbin, & Shankman, 2009; Willem et al., 2011), and confers risk for maladaptive outcomes by both lowering the threshold for the activation of negative emotions (Hyde et al., 2008) and lowering overall tolerance for distress (Nock & Mendes, 2008). Not only do individuals with high NA experience negative emotions more intensely, but they also experience them more frequently and have less inherent tolerance for them, putting them at increased risk for using NSSI as a maladaptive emotion regulation strategy. However, individuals who possess adaptive emotion regulation strategies may be able to cope with high NA without resorting to NSSI. By contrast, individuals with maladaptive emotion regulation strategies may be susceptible to intensified NA and thus more likely to engage in NSSI. As conceptualized in the emotional cascades model, individuals with these vulnerabilities may resort to NSSI as a coping strategy after a positive feedback loop of NA and rumination have overwhelmed coping resources (Selby et al., 2008). Consistent with this premise, we found that rumination significantly predicted engagement in NSSI during the 8-week study period, and also significantly moderated the relationship between NA and NSSI. Our results suggest that individuals

who possess higher temperamental NA and endorse rumination are more likely to engage in NSSI than their peers. While the associations between rumination and NA (see Nolen-Hoeksema et al., 1993) and rumination and NSSI (see Hoff & Muehlenkamp, 2009) have been previously demonstrated, to date, no study has examined rumination as a prospective predictor of NSSI, or as a moderator of the effect of trait NA on NSSI. The results of the present study suggest that the presence of rumination may help identify which individuals who possess a broad temperamental predisposition toward maladaptive outcomes will be more likely to engage in NSSI. Rather than resolving a negative mood state, rumination exacerbates NA in the moment, leading an individual to resort to a more extreme emotion regulation strategy, such as NSSI. This explanation is consistent with Selby and colleagues' (2013) finding that unstable rumination interacted with high negative emotions to predict NSSI engagement.

Risk Among Young Adults

This study adds to a growing body of research suggesting that young adult populations are particularly at risk for engaging in NSSI (Gratz et al., 2002). Twenty percent of the participants in this study reported engaging in NSSI during the 8-week study period, and more than half of the sample (57%) reported engaging in NSSI at least once in their lifetime. Several studies have attempted to illuminate what is driving the increase in this behavior among this population. Taliaferro and Muehlenkamp (2015) found that minority identity status (both racial/ethnic and sexual orientation), poor body image, and traumatic sexual experiences during college differentially predicted NSSI among college versus high school students. It is possible that the transition to college presents new challenges for individuals with vulnerabilities to NSSI such as trait NA and rumination.

Implications

This study highlights the importance of assessing for NSSI among young adults. The sample was not selected based on risk, so these results can be considered generalizable. This means that around 20% of individuals in college populations could be actively engaging in NSSI at any given period of time – findings consistent with extant literature (Gratz et al., 2002). Given this prevalence, mental health providers to college students and college-age individuals should be assessing for NSSI, especially given its association with suicide and other high-risk behaviors. The higher the frequency of NSSI, and the higher the number of methods used to self-injure, the more at-risk for suicide the college students have been shown to be (Victor & Klonsky, 2014). Therefore, NSSI severity should be assessed and used to inform risk level for suicide.

Given NSSI's association with NA and rumination that this study established, NSSI should be assessed when a client presents with symptoms of ruminative thought or internalizing disorders, such as depression or anxiety, that are typically present in individuals with high NA and rumination. Although depression and anxiety remain two of the most frequent reasons students cite for visiting a college counseling center (Kirsch, Doerfler, & Truong, 2015), assessment of NSSI in outpatient samples remains relatively low (Kamen, 2009). This study emphasizes that rumination places individuals at risk for NSSI, particularly in the presence of NA, making it essential that providers assess for NSSI when individuals present with these symptoms.

Limitations

Several limitations of the current study should be acknowledged. The sample lacked representation of diverse individuals. The sample was 72% female and 69% Caucasian, and while this is reflective of the college campus from where the data were collected, it is not reflective of the general

population. Also, only 28 participants (about 20% of the sample) reported engaging in NSSI during the study period; although this is consistent with prevalence in the literature, this small sample of individuals may not be representative of the general population. Results should be interpreted with caution. Future research using larger samples of individuals who self-harm is needed to continue understanding the processes contributing to NSSI.

CONCLUSIONS

This study sought to examine NA and rumination as prospective predictors of NSSI among young adults, in order to better understand what factors lead individuals with temperamental vulnerability to engage in this high-risk behavior. First, the hypothesized relationship that higher temperamental NA at baseline would predict higher frequency of NSSI across the 8-week study period was confirmed. Second, rumination, a maladaptive cognitive emotion regulation strategy, was hypothesized to moderate the relationship between NA and NSSI. Findings also supported this hypothesis, suggesting that individuals with high NA and rumination are at higher risk for engaging in NSSI. These findings contribute to the literature on NSSI among college students by supporting a prospective relationship between NA and NSSI, as moderated by rumination. Clinically, findings from this study suggest that interventions targeted at maladaptive cognition may help inform individualized treatment for NSSI.

REFERENCES

ANTHONY, J., LONIGAN, C., HOOE, E., & PHILLIPS, B. (2002). An affect-based, hierarchical model of temperament and its relations with internalizing symptomatology. *Journal of Clinical Child and Adolescent Psychology*, *31*, 480–490.

BAETENS, I., CLAES, L., WILLEM, L., MUEHLENKAMP, J., & BIJTTEBIER, P. (2011). The relationship between non-suicidal self-injury and temperament in male and female adolescents based on child- and parent-report. *Personality and Individual Differences*, *50*, 527–530.

COMPAS, B., CONNOR-SMITH, J., & JASER, S. (2004). Temperament, stress reactivity, and coping: Implications for depression in childhood and adolescence. *Journal of Clinical Child and Adolescent Psychology*, *33*, 21–31.

DICLEMENTI, R. J., PONTON, L. E., & HARTLEY, D. (1991). Prevalence and correlates of cutting behavior: Risk for HIV transmission. *Journal of the American Academy of Child and Adolescent Psychiatry*, *30*, 735–739.

EVANS, D. E., & ROTHBART, M. K. (2007). Developing a model for adult temperament. *Journal of Research in Personality*, *41*, 868–888.

FAVAZZA, A. R., & CONTERIO, K. (1989). Female habitual self-mutilators. *Community Mental Health Journal*, *24*, 22–30.

FELDNER, M. T., LEEN-FELDNER, E. W., ZVOLENSKY, M. J., & LEJUEZ, C. W. (2006). Examining the association between rumination, negative affectivity, and negative affect induced by a paced auditory serial addition task. *Journal of Behavior Therapy and Experimental Psychiatry*, *37*, 171–187.

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.

GRATZ, K. L., CONRAD, S. D., & ROEMER, L. (2002). Risk factors for deliberate self-harm among college students. *American Journal of Orthopsychiatry*, *72*, 128–140.

GUAN, K., FOX, K. R., & PRINSTEIN, M. J. (2012). Nonsuicidal self-injury as a time-invariant predictor of adolescent suicide ideation and attempts in a diverse community sample. *Journal of Consulting and Clinical Psychology*, *80*, 842–849.

GUERRY, J. D., & PRINSTEIN, M. J. (2010). Longitudinal prediction of adolescent nonsuicidal self injury: Examination of a cognitive vulnerability-stress model. *Journal of Clinical Child and Adolescent Psychology*, *39*, 77–89.

GUNNELL, D., & FRANKEL, S. (1994). Prevention of suicide: Aspirations and evidence. *British Medical Journal*, *308*, 693–698.

HANKIN, B. L., & ABRAMSON, L. Y. (2001). Development of gender differences in depression: An elaborated cognitive vulnerability–transactional stress theory. *Psychological Bulletin*, *127*, 773–796.

Hankin, B. L., Fraley, R. C., & Abela, J. R. Z. (2005). Daily depression and cognitions about stress: Evidence for a traitlike depressogenic cognitive style and the prediction of depressive symptoms in a prospective daily diary study. *Journal of Personality and Social Psychology*, *88*, 673–688.

Hilt, L. M., Cha, C. B., & Nolen-Hoeksema, S. (2008). Nonsuicidal self-injury in young adolescent girls: Moderators of the distress-function relationship. *Journal of Consulting and Clinical Psychology*, *76*, 63–71.

Hoff, E. R., & Muehlenkamp, J. J. (2009). Nonsuicidal self-injury in college students: The role of perfectionism and rumination. *Suicide and Life-Threatening Behavior*, *39*, 576–587.

Hyde, J. S., Mezulis, A. H., & Abramson, L. Y. (2008). The ABCs of depression: Integrating affective, biological, and cognitive models to explain the emergence of the gender difference in depression. *Psychological Review*, *115*, 291–313.

Jacobson, C. M., & Gould, M. (2007). The epidemiology and phenomenology of nonsuicidal self injurious behavior among adolescents: A critical review of the literature. *Archives of Suicide Research*, *11*, 129–147.

Kamen, D. G. (2009). How can we stop our children from hurting themselves? Stages of change, motivational interviewing, and exposure therapy applications for nonsuicidal self-injury in children and adolescents. *International Journal of Behavioral Consultation and Therapy*, *5*, 106–123.

Kehrer, C. A., & Linehan, M. (1996). Interpersonal and emotional problem solving skills and parasuicide among women with borderline personality disorder. *Journal of Personality Disorders*, *10*, 153–163.

Kirsch, D. J., Doerfler, L. A., & Truong, D. (2015). Mental health issues among college students: Who gets referred for psychopharmacology evaluation? *Journal of American College Health*, *63*, 50–66.

Klein, D. N., Durbin, C. E., & Shankman, S. A. (2009). Personality and mood disorders. In I. H. Gotlib & C. L. Hammen (Eds.), *Handbook of depression* (pp. 93–112). New York, NY: Guilford.

Klonsky, E. D. (2007). The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review*, *27*, 226–239.

Klonsky, E. D., & Glenn, C. R. (2009). Assessing the functions of non-suicidal self-injury: Psychometric properties of the Inventory of Statements About Self-injury (ISAS). *Journal of Psychopathology and Behavioral Assessment*, *31*, 215–219.

Klonsky, E. D., May, A. M., & Glenn, C. R. (2013). The relationship between nonsuicidal self-injury and attempted suicide: Converging evidence from four samples. *Journal of Abnormal Psychology*, *122*, 231–237.

Lengua, L., West, S., & Sandler, I. (1998). Temperament as a predictor of symptomatology in children: Addressing contamination of measures. *Child Development*, *69*, 164–181.

Lyubomirsky, S., & Nolen-Hoeksema, S. (1995). Effects of self-focused rumination on negative thinking and interpersonal problem-solving. *Journal of Personality and Social Psychology*, *69*, 176–190.

Mezulis, A. H., Priess, H. A., & Hyde, J. S. (2011). Rumination mediates the relationship between infant temperament and adolescent depressive symptoms. *Depression Research and Treatment*, *2011*, doi: 10.1155/2011/487873.

Najmi, S., Wegner, D. M., & Nock, M. K. (2007). Thought suppression and self-injurious thoughts and behaviors. *Behavior Research and Therapy*, *45*, 1957–1965.

Nock, M. K., & Cha, C. B. (2009). Psychological models of nonsuicidal self-injury. In M. K. Nock (Ed.), *Understanding nonsuicidal self-injury: Origins, assessment, and treatment* (pp. 65–77). Washington, DC: American Psychological Association.

Nock, M. K., & Favazza, A. R. (2009). Nonsuicidal self-injury: Definition and classification. In M. K. Nock (Ed.), *Understanding nonsuicidal self-injury: Origins, assessment, and treatment* (pp. 9–18). Washington, DC: American Psychological Association.

Nock, M. K., & Mendes, W. B. (2008). Physiological arousal, distress tolerance, and social problem-solving deficits among adolescent self-injurers. *Journal of Consulting and Clinical Psychology*, *76*, 28–38.

Nock, M. K., & Prinstein, M. J. (2004). A functional approach to the assessment of self-mutilative behavior. *Journal of Consulting and Clinical Psychology*, *72*, 885–890.

Nock, M. K., & Prinstein, M. J. (2005). Clinical features and behavioral functions of adolescent self-mutilation. *Journal of Abnormal Psychology*, *115*, 140–146.

Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology*, *61*, 115–121.

Nolen-Hoeksema, S., Morrow, J., & Fredrickson, B. L. (1993). Response styles and the duration of episodes of depressed mood. *Journal of Abnormal Psychology*, *102*, 20–28.

Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirksy, S. (2008). Rethinking rumination. *Perspectives on Psychological Science*, *3*, 400–424.

Rood, L., Roelofs, J., Bögols, S. M., & Alloy, L. B. (2010). Dimensions of negative thinking and the relations with symptoms of depression and anxiety in children and adolescents. *Cognitive Therapy and Research*, *34*, 333–342.

Selby, E. A., Anestis, M. D., & Joiner, T. E. (2008). Understanding the relationship between emotional and behavioral dysregulation: Emotional cascades. *Behaviour Research and Therapy*, *46*, 593–611.

Selby, E. A., Franklin, J., Carson-Wong, A., & Rizvi, S. L. (2013). Emotional cascades and self-injury: Investigating instability of rumination and negative emotion. *Journal of Clinical Psychology*, *69*, 1213–1227.

Shaffer, D., & Jacobson, C. (2009). Proposal to the DSM-V childhood disorder and mood disorder work groups to include nonsuicidal self-injury (NSSI) as a DSM-V disorder. Retrieved from www.dsm5.org.

Skitch, S. A., & Abela, J. R. Z. (2008). Rumination in response to stress as a common vulnerability factor to depression and substance misuse in adolescence. *Journal of Abnormal Child Psychology*, *36*, 1029–1045.

Swannell, S. V., Martin, G. E., Page, A., Hasking, P., & St John, N. J. (2014). Prevalence of nonsuicidal self-injury in nonclinical samples: Systematic review, meta-analysis and meta-regression. *Suicide and Life-Threatening Behavior*, *44*, 273–303.

Taliaferro, L. A., & Muehlenkamp, J. J. (2015). Factors associated with current versus lifetime self-injury among high school and college students. *Suicide and Life-Threatening Behavior*, *45*, 84–97.

Victor, S. E., & Klonsky, E. D. (2014). Correlates of suicide attempts among self injurers: A meta-analysis. *Clinical Psychology Review*, *34*, 282–297.

White, V. E., Trepal-Wollenzier, H., & Nolan, J. M. (2002). College students and self injury: Intervention strategies for counselors. *Journal of College Counseling*, *5*, 105–113.

Willem, L., Bijttebier, P., Claes, L., Sools, J., Vandenbussche, I., & Nigg, J. (2011). Temperamental characteristics of adolescents with substance abuse and/or dependence: A case control study. *Personality and Individual Differences*, *50*, 1094–1098.