ORIGINAL ARTICLE

The Pernicious Blend of Rumination and Fearlessness in Non-Suicidal Self-Injury

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Abstract Recent theory suggests that people may engage in dysregulated behaviors, such as non-suicidal self-injury (NSSI), as a way to distract from rumination and emotional cascades (Selby et al. 2008); similarly, another theory suggests that people may not engage in self-injurious behavior without habituation to fear through repeated exposure to painful events (Joiner 2005). We hypothesized that both high rumination and habituation to the fear of pain may strongly influence NSSI because those who lack a fear of pain and ruminate intensely will not be afraid to inflict physical pain as a way to distract from negative affect. Participants were undergraduate students ($N = 94$), a large portion of whom reported engaging in NSSI. These participants were given measures of past painful experiences, rumination, and frequency of recent self-injury. Using hierarchical linear regression, evidence was found to support the interaction effect of rumination and painful/provocative experiences on the frequency of NSSI, even after controlling for important variables such as age, gender, and sensation seeking. Although the interaction significantly predicted NSSI, it did not predict dysregulated eating behaviors or drinking to cope.

Keywords Rumination · Self-injury · Self-harm · Emotional cascades · Acquired capability

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Introduction

Non-suicidal self-injury (NSSI) refers to the deliberate harm of one's body without the presence of suicidal intent. Self-injurious behaviors are often associated with Borderline Personality Disorder (BPD), but they can often be found in patients who are not diagnosed with BPD (Klonsky 2007). Approximately 4% of the total population engages in NSSI, and NSSI can be found at high rates in college student samples (Gratz 2006; Gratz et al. 2002), making it a growing problem for universities. There is evidence that NSSI functions as a form of automatic negative reinforcement (Nock and Prinstein 2004; Chapman et al. 2006), a function that involves the use of NSSI for a reduction in tension or negative affect (Brown et al. 2002). Yet a variety of behaviors have also been linked to reduction of negative affect, including dysregulated eating behaviors (Selby et al. 2008; Smyth et al. 2007) and alcohol use (Cooper et al. 1992; Selby et al. 2008). Thus, although NSSI is a behavior with evidence linking it to affect regulation, research remains unclear as to why some individuals might choose NSSI to regulate affect over other behaviors which may be less provocative and less painful. The purpose of this paper was to explore our hypothesis that two factors may be particularly involved in NSSI: (1) intense rumination, which contributes to the affective dysregulation that initiates NSSI, and (2) fearlessness of the pain resultant from self-injury. When combined, it may be these two factors which predict NSSI because individuals who experience intense negative affect and are not afraid of pain may be more willing to use self-inflicted pain as a distraction from rumination and emotional cascades.

The first factor that we hypothesize may greatly influence NSSI, rumination, may cause or contribute to the initial emotional disturbance that eventually leads to NSSI.

Rumination is a cognitive process that involves repetitive focus of attention on one's thoughts and emotions (Nolen-Hoeksema and Morrow 1991). Previous studies have indicated that rumination has a tendency to aggravate and prolong the influences of negative emotion (Moberly and Watkins 2008; Thomsen 2006). Building on these findings, Emotional Cascade Theory (Selby et al. 2008; Selby and Joiner 2009) suggests that intense rumination results in a state of snowballing negative affect, referred to as an *emotional cascade*; this process may initiate behaviors such as NSSI because those behaviors provide potent physical sensations that distract from rumination, thus inhibiting the emotional cascade. Accordingly, when a negative emotion is triggered in some individuals, intense rumination may lead to a state of extremely aversive negative affect, and emotional cascade theory suggests that NSSI may be used as a distraction because of the associated sensations of pain or the site of blood (Selby et al. 2008), or because of opponent-processes where the initial pain of NSSI is habituated to and replaced with feelings of relief (Joiner 2005). It is important to note that although emotional cascade theory posits that the affect regulating properties of NSSI are a result of distraction from rumination, there are other potential mechanisms through which NSSI may serve to diminish negative affect, such as biological or self-punishment mechanisms (see Chapman et al. 2006 for a review).

Importantly, rumination has been linked to NSSI in a variety of studies (Armey and Crowther 2008; Hilt et al. 2008; Selby et al. 2009). Yet, rumination has also been linked to a variety of other dysregulated behaviors (Bushman et al. 2005; Nolen-Hoeksema et al. 2007; Selby et al. 2008), so emotional cascades may only be the first half of the story, suggesting why someone might engage in NSSI, but not who will or is capable of engaging in NSSI.

The second component that we propose may influence NSSI, and which may separate those who engage in this behavior from those who engage in less painful/provocative behaviors, may be overcoming the fear of pain. Self-injury is likely to be painful, at least for some who self-injure (Nock et al. 2006; Russ et al. 1992). Thus, to self-injure one must not be deterred by the pain involved. Yet, how does one overcome the fear of pain? Joiner's (2005) Interpersonal-Psychological Theory of suicidal behavior suggests that individuals who have experienced numerous painful events, such as injuries or abuse, may habituate to the fear of pain and injury. Joiner refers to this diminished fear of engaging in pain-inducing behaviors as "acquired capability." Essentially, those who have not experienced many painful events in life are more likely to be afraid of pain, and are more likely to avoid it. Yet those who have

habituated to the fear of pain through repetitive exposure to painful and provocative events, and have thus developed an acquired capability, may be more willing to engage in behaviors that induce pain, especially in the case of desire for death by suicide. This same habituation to the fear of pain that Joiner proposes increases suicide risk may also be relevant to NSSI. Those who have developed the acquired capability may be more willing to try extreme methods of regulating negative affect. Evidence for the role of decreased fear of pain due to painful life events in NSSI can be found in studies in which childhood abuse was an important predictor of NSSI (Romans et al. 1995; Weierich and Nock 2008), indicating that frequent abuse and the attendant habituation to pain may be one way fear of pain is overcome. Similarly, individuals who engage in NSSI have been found to have a higher pain threshold and tolerance than those who do not self-injure (Kemperman et al. 1997).

The two components discussed, rumination and a decreased fear of pain, may be jointly combined to predict self-injury because if one experiences an emotional cascade but is afraid of pain, he or she may engage in another behavior rather than self-injure; yet one is unlikely to self-injure even if he or she is capable, but does not experience emotional states that would propagate NSSI. Thus, Emotional Cascade Theory may predict why people self-injure (i.e. to distract from rumination), while Joiner's theory may provide important information on who self-injures (those capable of overcoming the fear of pain). An interaction between acquired capability and emotional cascades may also help explain why some individuals engage in NSSI rather than other dysregulated behaviors. Those individuals who experience emotional cascades but have not experienced repetitive painful life events (e.g., abuse, serious injuries) in their lives may be too afraid to engage in NSSI, and may choose another behavior instead, such as drinking alcohol or binge-eating.

Essentially, fear of pain may be a protective factor that inhibits NSSI, but as individuals experience physically painful events in their lives, the fear of pain may erode, and protection from NSSI along with it. The current study was conducted to explore if an interaction between frequent painful life events and an elevated tendency to ruminate predicts recent frequency of NSSI because those who have a decreased fear of self-injury may be more willing to use extreme methods to regulate negative emotion. We also explored the same interaction to determine if it would predict other potentially affect-regulating behaviors, such as dysregulated eating behaviors or drinking to cope, as these behaviors are not as provocative and might be engaged in by someone afraid of pain.

Methods

Participants

This study analyzed data from a sample of 94 undergraduate students at a large southeastern university in the United States. Prior to the study, participants who endorsed a self-injurious behavior question ("Have you ever injured yourself on purpose?") on the introduction to psychology mass screening assessment (given to all students at the start of the semester) were encouraged to participate through email invitations to the study. The study involved completing a packet of questionnaires during individual sessions in a laboratory setting. The study was open to any interested student, however, regardless of whether he or she had engaged in self-injury; so the sample consisted of both self-injuring and non-self-injuring participants. Records of response rates for those identified as self-injurers and emailed to participate in the study, and those who actually participated, were not maintained due to concerns about confidentiality.

The sample of 94 participants was 76% female with 69% of the participants being Caucasian, 10.6% being African American, 14.1% reporting Hispanic ethnicity, and 2.8% being Asian. Also, 2.1% reported being Native American and 1.4% claimed other. Approximately 48% of the sample reported engaging in NSSI at least once in the last year. The most common forms of NSSI endorsed by participants were picking at a wound (31%), biting oneself (24%), cutting (12%), scraping skin (10%), burning skin (6%), and picking skin to the point of drawing blood (6%). All participants were fully informed and signed consent forms; the study was approved by the university Institutional Review Board (IRB).

Measures

Independent Variables

Rumination The *Ruminative Responses Scale* (RRS; Treynor et al. 2003) contains 22 items which ask questions regarding responses to depressed moods that are self-focused, symptom-focused, and consequence-focused. Participants were asked to rate each item based on a scale from 1 (almost never) to 4 (almost always). The RRS also has two subscales for different forms of rumination: brooding and reflection. Brooding refers to a tendency to deeply engage in focused rumination when upset, while reflection refers to a tendency to think and attempt to problem-solve and is less intense. In this study, the brooding and reflection subscales were combined as an overall measure of rumination. Follow-up tests were then conducted with each individual subscale in the interaction

to determine if both subscales predicted NSSI. In this study, the alpha for the combined rumination scale was $\alpha = .87$, while it was $\alpha = .81$ for the brooding subscale, and $\alpha = .77$ for the reflection subscale. Combining the two subscales was also supported by a significant positive correlation between them ($r = .64$, $p < .001$).

Painful Life Events The *Painful and Provocative Events Scale* (PPE; Van Orden et al. 2008) is a 25 item self-report measure that asks the participant to report how many times he or she experienced certain painful or provocative events. These events range from the experience of childhood physical or sexual abuse, to having a broken bone, being shot or stabbed, and to being in a car accident. Importantly, this scale does not include any questions pertaining to NSSI, so there is no overlap with this scale and the frequency of NSSI outcome variable. Participants rated the frequency of exposure to these painful experiences on a 5-point scale of 1 being never and 5 being regularly. In this sample, this measure demonstrated adequate internal consistency ($\alpha = .76$).

Outcome Variables

NSSI Frequency The *Functional Assessment of Self-Mutilation* (FASM; Lloyd et al. 1997) scale measured the method, frequency, and functions of NSSI. Participants were to indicate how often they had engaged in NSSI in the previous 12 months. They reported on various forms of self-injury, ranging from cutting, to burning, to scratching. The FASM has been used in normative and psychiatric samples, and has adequate internal consistency of $\alpha = .65$ (Nock and Prinstein 2004; Guertin et al. 2001). In this study, the frequency of engaging in self-injurious acts was the only portion of the scale used, and all forms of self-injury were summed to create an overall frequency of NSSI variable. The Cronbach's alpha for the use of different forms of NSSI was $\alpha = .58$, which may be somewhat low because endorsing one form of NSSI (e.g., cutting) does not necessarily imply that another form of NSSI (e.g., picking at a wound) will be endorsed. Overall, using a frequency measure of NSSI in across various forms appears acceptable for the current study.

Dysregulated Eating Behaviors Binging and purging were assessed using the Eating Disorder Inventory (EDI; Garner et al. 1983). The EDI is a self-report questionnaire that consists of 64 items that measure the degree to which participants exhibit pathological eating behaviors and cognitions. In additional to a total score, the EDI yields eight subscales, with the primary scale for this study being the Bulimia subscale. This subscale measures the tendency of individuals to engage in dysregulated eating behaviors such as binge-eating and purging. Individual items use a Likert scale (1 = strongly agree; 5 = strongly disagree)

and the internal validity of the measure has been widely reported. The alpha for this subscale in the current sample was α = .82.

Drinking to Cope This behavior was assessed with the *Drinking Motives Questionnaire* (DMQ; Cooper et al. 1992), a self-report questionnaire that assesses motives for alcohol consumption. The scale consists of three dimensions—coping motives, enhancement motives, and social motives. Each dimension is measured with five questions and the individual test items utilize a Likert style format ranging from 1 (almost never/never) to 4 (almost always). In this study, we utilized only the Coping subscale, which assesses the degree to which participants consume alcohol explicitly to reduce sensations of negative affect. The alpha for this scale was α = .87.

Covariates

Urgency and Sensation Seeking The *Urgency, (lack of) Premeditation, (lack of) Perseverance, and Sensation Seeking Impulsive Behavior Scale* (UPPS; Whiteside and Lynam 2001) is a 45-item self-response scale that features four subcategories: Urgency, Sensation Seeking, (lack of) Premeditation, and (lack of) Perseverance. In this study only the Sensation Seeking subscale was used. The Sensation Seeking subscale of the UPPS measures the degree to which individuals act impulsively for the thrill or exhilarating feelings of certain behaviors. The scale consists of 12 questions such as, "I would enjoy driving fast," and is rated using a Likert-type scale ranging from 1 "Not true of me" to 5 "Very true of me." This subscale served as covariate in the follow-up analysis because individuals with high sensation seeking may be more prone to experiencing painful life events (i.e. accidental injury from thrill seeking behaviors). The Cronbach's alpha for the Sensation Seeking subscale in this sample was .77.

Data Analytic Strategy

The interaction between high rumination and frequent painful life events (PPE) in predicting NSSI frequency was examined with hierarchical multiple regression. The interaction was then graphed and then evaluated with simple slope analyses. Following the initial analyses, the interaction was then tested with three covariates in order to perform a more stringent test of the interaction: age, gender, and sensation seeking. Age was chosen as a covariate because of its significant correlation with NSSI ($r = .40$, $p < .01$). Gender was chosen as a covariate because of a significant correlation with rumination ($r = .24$, $p < .05$), such that women tend to ruminate more. Sensations seeking was included as a covariate because it may increase the

experience of painful life events, such as car accidents, and some instances of NSSI may be a form of sensation seeking. Including sensation seeking as a covariate is further justified by its significant correlation with the PPE ($r = .42$, $p < .05$). The final analyses included use of the competing outcome behaviors, dysregulated eating behaviors and drinking to cope, as outcomes predicted by the rumination and painful life events interaction. Accordingly, dysregulated eating and drinking should be predicted by high rumination and low PPE (indicating decreased fearlessness), instead of the high rumination and high PPE interaction, which we hypothesized will predict NSSI. Dysregulated eating and drinking behaviors have been successfully studied in previous college samples (Anestis et al. 2007), so the current sample is adequate for evaluating the hypothesized interaction in predicting these behaviors. Although the sample size was relatively small, it was adequate for a power of .96 to detect a medium effect using up to six predictors (power analyses were conducted using G*Power 3.0; Faul et al. 2007). Power decreased to .27 for detecting a small effect using up to six predictors, indicating low power for detecting small effects.

Results

Preliminary Analyses

The means, standard deviations, and correlations for the predictor, outcome, and control variables can be found in Table 1. The mean frequency for engaging in NSSI over the last 12 months for the sample was 4.8 times (SD = 15.0). As stated previously, approximately 48% of the sample reported self-injury, indicating that although this was not a clinically impaired self-injuring sample, there were a number of individuals who reported multiple instances of NSSI throughout the last year; this supports findings that NSSI is a behavior found in college students. The NSSI variable was explored with regard to outliers and distribution. One participant reported over 1,000 instances of self-injury (with cutting and biting oneself as the most frequently endorsed forms of NSSI), a score many standard deviations above the second highest score (105 episodes of NSSI). This individual's NSSI score was brought to 105 in order to reduce the potential impact of being an outlier but keep the individual's high score intact. SPSS analysis indicated that the NSSI variable was still positively skewed even after addressing this outlier (*skew* = 5.67), so a square-root transformation was applied to the NSSI variable. Following this transformation, SPSS indicated that the level of skew for the NSSI variable was in an acceptable range (*skew* = 2.6; Kline 2005, pp. 50).

Table 1 Means, standard deviations, range, and intercorrelations between all variables

Variable	1	2	3	4	5	6	7	8
1. NSSI	–							
2. Rumination	.24*	–						
3. PPE	.24*	.10	–					
4. Age	.40*	.12	.18	–				
5. Gender	−.11	.24*	−.09	−.19	–			
6. Sensation	.17	−.01	.42**	.12	−.12	–		
7. DYS EAT	.13	.32**	.17	.01	.28**	.05	–	
8. DYS DRINK	.07	.40**	.25*	.19	.21*	.19	.29**	–
Mean	4.81	20.99	44.10	18.71	76[a]	39.33	15.44	11.00
SD	15.02	6.81	9.09	1.09	N/A	7.37	6.93	4.72

$N = 94$

NSSI non-suicidal self-injury, *PPE* painful and provocative events, *SENSATION* sensation seeking, *DYS EAT* bulimia scale of the EDI, *DYS DRINK* drinking to cope scale of the DMQ

[a] Indicates percent female

* Correlation is significant at $p < .05$, ** $p < .01$

Regression Analyses

Hierarchical multiple regression was used to examine the relationship between painful/provocative events, rumination, and NSSI. The variables in the equation were added in two steps: Step 1: rumination and PPE scores were entered as predictors of NSSI. Step 2: the interaction term for rumination and PPE was entered. The results of the analysis are displayed in Table 2. Step 1 of the analysis indicated that both the PPE ($\beta = .27$, $p < .05$) and rumination ($\beta = .22$, $p < .05$) significantly predicted NSSI frequency. These two variables accounted for approximately 13% of the variance in NSSI. As predicted, the interaction in the second step was also significant ($\beta = 1.47$, $p < .05$). The interaction term for Step 4 accounted for an additional 6% of the variance, and the effect size of the interaction was $f^2 = .06$, a small effect.

In order to establish the form of the interaction, the interaction was graphed as can be seen in Fig. 1. This graph indicates that the interaction was in the predicted

Table 2 Hierarchical multiple regression equation predicting frequency of NSSI

Predictors entered in set	F for set	R^2	t for predictors	df	β	p
1	6.61	.13		91		<.01
Rumination			2.16		.22	.03
PPE			2.71		.27	<.01
4	6.87	.19		90		<.001
Rumination × PPE			2.56		1.47	.01

$N = 94$

PPE painful and provocative events

Interaction between Rumination and Painful/ Provacative Life Events to Predict NSSI
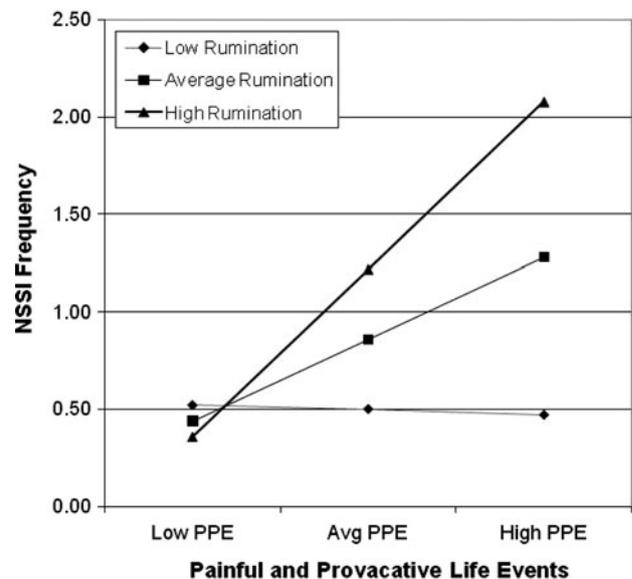
Fig. 1 Interaction between rumination and painful/provocative life events to predict NSSI. *Note* Low and high levels refer to one standard deviation below or above the mean score, respectively

direction, such that individuals who reported high levels of painful events and high levels of rumination also reported the highest frequency of NSSI over the last year. The interaction term was decomposed using simple slope analyses to determine if level of PPE was a significant predictor of NSSI across levels of rumination. These analyses indicated that level of PPE was a significant predictor of NSSI for those with high levels of rumination ($B = .14$, $SE = .022$, $t = 6.36$, $p < .01$) and average

levels of rumination ($B = .045$, $SE = .019$, $t = 2.37$, $p < .05$), but was a non-significant predictor for those reporting low levels of rumination ($B = -.003$, $SE = .018$, $t = 1.67$, $p > .05$). These analyses indicate that those who have experience many painful/provocative events and ruminate are more likely to self-injure than similar individuals with low rumination.

For a more stringent evaluation, the interaction was tested again with age, gender, and sensation seeking as covariates in the model. All of these covariates, as well as the PPE and rumination were entered in step one, and the interaction was included in step two. This analysis indicated that the interaction was again significant ($\beta = 1.47$, $p < .05$), even after controlling for the covariates. Age was the only covariate to significantly predict NSSI frequency ($\beta = .27$, $p < .05$), indicating older participants reported more episodes of NSSI. The total set of covariates and the interaction accounted for approximately 30% of the variance, with the interaction again accounting for 6% of that variance. To further test the interaction, the rumination scale was broken down into its brooding and reflection components and the interaction was tested separately with each. In these analyses both brooding ($\beta = 1.10$, $p < .05$) and reflection ($\beta = 1.68$, $p < .05$) significantly predicted NSSI frequency individually, even after inclusion of the covariates. These findings indicate that both forms of rumination may contribute to emotional cascades and NSSI. Interestingly, the interaction including reflection appeared to have the stronger relationship with NSSI.

The interaction between rumination and the PPE was also examined with regard to dysregulated eating and drinking. It was expected that there would be main effects for these variables such that high rumination as well as high PPE would predict high levels of these behaviors. Furthermore, an interaction between high rumination and low PPE predicting dysregulated eating and drinking would be expected if this interaction distinguishes who uses these behaviors rather than NSSI. Dysregulated eating behaviors were predicted by rumination ($\beta = .31$, $p < .05$), while PPE was a nonsignificant predictor ($\beta = .13$, $p = .18$). The interaction term was not significant ($\beta = .31$, $p = .60$). Similarly, significant main effects were found for both rumination ($\beta = .39$, $p < .001$) and the PPE ($\beta = .22$, $p < .05$) in predicting drinking to cope, but the interaction term was not significant ($\beta = -.80$, $p = .16$). The interactions for both dysregulated eating and drinking remained nonsignificant when the covariates were included in the models. Thus, the results of these comparison analyses indicate that the interaction between rumination and frequent painful life events significantly predicted NSSI, but not other dysregulated behaviors that may have a similar affect-regulating function.

Discussion

The results of this study indicated that there was an interaction between painful events and rumination, such that high rumination and the experience of numerous painful events predicted higher frequency of NSSI. This relationship maintained significance even after controlling for age, gender, sensation seeking. These findings indicate that Emotional Cascade Theory (Selby et al. 2008) and Joiner's (2005) Interpersonal-Psychological Theory of suicidal behavior may provide important directions for research on who is capable of self-injury and why they may do so.

One potential implication of this study is that understanding who engages in NSSI may be somewhat clarified. Various reasons for engaging in NSSI have been implicated that are akin to affect regulation, such as tension reduction and self-punishment. Yet, with the current framework two seemingly different reasons for engaging in NSSI may actually be different descriptions of the same psychological process involved in NSSI. For example, the self-punishment hypothesis of NSSI (see Klonsky 2007) suggests that desire to punish oneself for a mistake or failure is the primary cause of NSSI. Yet this hypothesis lacks specificity in that many individuals experience negative feelings about themselves and regret over mistakes, but do not engage in NSSI. By taking into account the findings of the current study, the self-punishment hypothesis can interpreted more specifically in that those who ruminate over their mistakes and negative feelings about themselves may be more likely to self-injure as a form of self-punishment if they have developed the acquired capability to overcome the fear of pain. This behavior may then result in relief or tension reduction, perhaps due to distraction from rumination. Other individuals may have these same negative self-views and rumination, and a desire to punish themselves, but if afraid of pain, they may avoid NSSI in favor of a less directly painful distracting behavior.

The findings of this study may provide some preliminary evidence for understanding why some individuals may engage in NSSI for affect regulation purposes. Given many behaviors may be involved in affect regulation, identifying why some individuals engage in one or two behaviors while others may use many behaviors may provide important treatment-relevant information. It may also be important to explore adaptive affect-regulating behaviors (e.g. reading a book or working on a hobby) and determine why some individuals may use those behaviors when upset rather than behaviors often considered maladaptive (i.e. NSSI).

There are some limitations to consider with this study. One important limitation with this study is the way that habitation to fear of death and pain was measured. The measure used in this study (the PPE) has been found to

have a significant positive correlation ($r = .29$) with a separate measure of fearlessness about pain, death, and suicide (Van Orden et al. 2008). Thus, although frequency of exposure to painful and provocative events does tap this construct to a certain degree, it is imperfect as this scale does not directly measure fear of pain. For example, an individual may experience a number of painful/provocative events and still potentially experience a fear of pain, or it is possible that he or she may even become sensitized to pain. Future studies should test this interaction using more precise measurements of an individual's reduced fear of pain, perhaps through an interview or pain tolerance task.

Another limitation is that this was a cross-sectional study. Therefore, causal conclusions about the relationships of rumination, painful events, and NSSI cannot be determined. Future studies using longitudinal designs may be able to explore how these variables actually contribute to the development of NSSI, as well as establish temporal precedence. Another potential limitation is that the effect size of the interaction in predicting NSSI was small. This may be because the proposed interaction may explain who is capable of self-injury and why they may use it, but it does not explain why might be NSSI a desirable behavior to them. Even if NSSI serves as a potent distraction from/reducer of negative affect, it is still unclear why this method would be desirable over other methods of coping. Emotional cascade theory might imply that it is because emotional cascades are so intense that NSSI is one of the few behaviors providing distraction potent enough to distract from rumination. Yet, future studies should attempt to explore why NSSI is desirable for affect regulation, rather than other coping behaviors. Further limitations include the small sample size and the use of an undergraduate sample, so the results may not generalize to a clinical setting.

It is also important to discuss the findings that the interaction explored in this study did not significantly predict dysregulated eating or drinking. This should not necessarily be taken as evidence for the specificity of the interaction to NSSI. If dysregulated eating and drinking are defined by less experience with painful and provocative experiences (and thus may involve more fear of pain), then the interaction should have been significant such that high rumination and low PPE predicted dysregulated eating and drinking. Thus, there may be other factors that account for the failure of the interaction to predict these behaviors. For example, the interaction may be modified by gender or attitudes about weight or alcohol. Relatively low power may also have contributed to the failure to find significant interactions predicting dysregulated eating and drinking, so future studies should explore the interaction in clinical samples that include individuals with dysregulated eating and drinking behaviors.

The findings of the current study have important implications for the treatment of self-injury, especially regarding cognitive approaches. Rumination is a cognitive process, and mental health professionals may benefit from assessing people who self-injure for the thoughts involved in rumination. By doing so clinicians may identify a potential target to work on reducing negative emotion and NSSI. When treating rumination in individuals who self-injure, it may be important to identify the causes of rumination. Was it an interpersonal problem, a fear, or a perceived failure that triggered the rumination? By identifying the triggers of rumination with the patient, and explaining how rumination may contribute to self-injury, the patient may become better at perceiving situations that might normally lead to NSSI. Identification of those situations may also help the patient learn to employ alternative methods of distraction early, following these initial triggers, but before rumination becomes a fully blown emotional cascade. Furthermore, the therapists should work with the patient to generate a list of alternative behaviors that can be used for distraction instead of NSSI. These behaviors should be distracting enough that they draw attention away from rumination, and in turn inhibit the emotional cascade process. Alternative behaviors to self-injury, which may be effective in reducing emotional cascades due to the distracting nature of these activities, may include puzzles (such as cross-word puzzles or Sodoku), and/or physical exercise (Wallenstein and Nock 2007). It may also be important for therapists to emphasize use of these behaviors at early stages of rumination for the best effect. Finally, it may also be helpful for therapy to explore the patient's view of pain as well as what it is that makes NSSI a desirable behavior. Identifying if NSSI is used to regulate emotion, due in part to a diminished fear of pain, the therapist may help the patient identify how past painful/provocative events, such as abuse, may contribute to current NSSI.

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