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# Negative Urgency and Lack of Perseverance: Identification of Differential Pathways of Onset and Maintenance Risk in the Longitudinal Prediction of Nonsuicidal Self-Injury

Elizabeth N. Riley

University of Kentucky, enriley1231@gmail.com

Jessica L. Combs

University of Kentucky, jessica.combs3@uky.edu

Carol E. Jordan

University of Kentucky, carol.j@uky.edu

Gregory T. Smith

University of Kentucky, gsmith@uky.edu

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Negative urgency and depression: Trait-based predictors of self-injury over time

Elizabeth N. Riley, Jessica L. Combs, Carol E. Jordan, Gregory T. Smith

University of Kentucky

Running Head: Negative urgency, trait depression, and self-injury

Abstract

Many researchers consider non-suicidal self-injury (NSSI) to be a negatively reinforced coping strategy used to avoid or relieve unwanted emotional experiences. We investigated whether two personality traits potentially related to negative reinforcement predicted increases in NSSI during the first year of college: Trait depression, or depressive personality, and negative urgency, or the tendency to act rashly when distressed. In a sample of  $n = 1158$  college women, we found that both trait depression and negative urgency, measured prior to college entry, predicted NSSI behavior across the first year of college, controlling for prior NSSI. The effects of the two traits were additive and also interactive. High levels of trait depression consistently predicted NSSI, regardless of level of negative urgency. In addition, at low levels of trait depression, negative urgency significantly predicted future NSSI. Thus, (a) depressive personality appears to increase risk for NSSI and (b) at low levels of trait depression, the tendency to act rashly when distressed also increases risk for NSSI. These findings are consistent with models identifying NSSI as providing negative reinforcement.

Negative urgency and depression: Trait-based predictors of self-injury over time

Non-suicidal self-injury (NSSI) refers to the direct, deliberate destruction of bodily tissue without any suicidal intent (Nock, 2009). NSSI is differentiated from other harmful behaviors that are either indirect (e.g. smoking, the intentions of which are not to cause harm) or for which there is an intent to die or an ambivalence about the potential consequence of dying (Nock, 2010). Many researchers consider this behavior to be a negatively reinforced coping or emotion-regulation strategy that temporarily relieves or helps avoid unwanted emotional arousal or feelings of guilt, sadness, or distress (Chapman et al., 2006; Favazza, 1998). Although NSSI has received increased attention from researchers in the past two decades (Favazza, 1998; Klonsky, 2007; Nock, 2010), there is still a great deal more to learn about the predictors of self-injurious behavior.

A number of variables have been identified as correlates of, and possible risk factors for, NSSI, including childhood abuse and loss (Gratz, 2003), biological vulnerabilities to emotional dysregulation (Linehan, 1993; Nock, 2010), borderline personality disorder features (Glenn and Klonsky, 2011; Lynam et al., 2011), as well as alcohol use, drug use and smoking (Deliberto & Nock, 2008; Serras et al., 2010). In light of these advances, there is a need for more prospective research to identify risk factors for subsequent NSSI.

Both depression and impulsivity have been suggested as potential predictors of self-harm behavior (Hankin and Abela, 2011; Bresin et al., 2013). Past research findings on depression are fairly consistent, showing that it is an important correlate and predictor of NSSI; findings on the relationship between impulsivity NSSI are mixed, as we describe below. In this paper, we propose and test a prospective risk model for self-injury

based on (a) the possible role of trait-based depression, or depressive personality disposition, and (b) advances in understanding the multiple personality traits that contribute to impulsive action and their possible contribution to NSSI. To introduce our test, we first review findings concerning depression and impulsivity in relation to NSSI.

### *Depression and NSSI*

Researchers have long cited depression as an important risk factor and correlate of self-injurious behavior. There is a positive relationship between self-injury and depression, such that those individuals who engage in self-injury report elevated levels of depression (Brunner et al., 2007; Hankin and Abela, 2011; Klonsky, Oltmanns, and Turkheimer, 2003; Muehlenkamp and Gutierrez, 2007; Ross, Shana, and Heath, 2002). It has been suggested that those who are more depressed may engage in NSSI as a mechanism of affect-regulation, often to cope with negative emotions (Klonsky, 2007; Marshall et al., 2013). It is important to note that most studies that examine the relationship between NSSI and depression use state-based measures of depressive symptomatology as opposed to trait-based measures of depressive disposition, so the possible influence of depressive personality traits on NSSI is less well understood. The distinction between the two is that depressive symptomatology refers to current endorsement of diagnostic criteria for a depressive disorder, whereas the latter refers to a personality disposition to respond to experiences in a depressive way.

There have been few studies examining the prediction of self-harm over time, but those that do exist cite depression as an important prospective predictor of NSSI. Hankin and Abela (2011) studied the longitudinal prediction of NSSI across 2 ½ years from early through middle adolescence in a community sample of 103 participants. These authors

found that negative cognitive style, onset of maternal depression, youths' recent depressive symptoms, and lack of support predicted the prospective incidence of NSSI (Hankin & Abela, 2011). Similarly, Moran et al. (2012) found that threshold levels of mixed anxiety and depressive symptomatology in adolescence predicted the onset of self-injurious behavior in young adults (odds ratio (OR) = 5.9) in a large clinical sample. Finally, in a college student sample of 1801, Wilcox et al. (2011) found that depression was associated with subsequent lifetime and past-year NSSI, although prior engagement in self-injurious behavior was not controlled.

### *Impulsivity and NSSI*

Impulsivity has been identified as an important correlate of NSSI, but the findings on this relationship have been inconsistent. Glenn and Klonsky (2010) posit that these mixed results are due to a non-unified definition of impulsivity in general and among the studies that have examined the NSSI-impulsivity relationship. A number of researchers have provided support for the contribution of multiple personality traits to impulsive action (see review by Smith & Guller, in press). One useful model was developed by Whiteside and Lynam (2001) and added to by Cyders and Smith (2007); they identified five personality traits that can lead to impulsive action. The traits are (1) negative urgency: the tendency to act rashly when distressed; (2) positive urgency: the tendency to act rashly when in an unusually positive mood; (3) lack of planning: the tendency to act without forethought; (4) lack of perseverance: the inability to maintain focus on tasks; and (5) sensation-seeking: the need to seek out novel, thrilling, risky stimulation). One advantage of this model for the study of NSSI is the identification of emotion-based traits; in particular, negative urgency has been shown to predict engagement in multiple



behaviors that are understood to provide negative reinforcement or relief from distress, including problem drinking and disordered eating (Adams et al., 2012; Coskunpinar & Cyders, 2012; Martens et al., 2011; Pearson, Combs, Zapolski, & Smith, 2012; Settles et al., 2010).

We hypothesize that among these five impulsivity-related traits, negative urgency is the most relevant in the prospective prediction of NSSI, because we conceptualize NSSI as a behavior functioning in a negative reinforcement pattern used to relieve distress. Chapman et al. (2006) suggested the importance of this negative reinforcement pattern in their Experiential Avoidance Model of deliberate self-harm. They argue that self-harm is perpetuated by a negative reinforcement cycle based on the avoidance of unwanted emotional experience, which is relieved through the act of deliberate self-harm. Furthermore, these authors propose that individuals high in impulsivity may tend to choose more destructive coping strategies that alleviate distress quickly (Chapman et al., 2006). Indeed, there is evidence that NSSI serves to help an individual avoid unwanted emotional experiences (e.g., Favazza, 1998; Gratz, 2000, 2003; Linehan, 1993).

Consistent with this framework, several researchers have demonstrated the importance of negative urgency in relation to NSSI using cross-sectional designs. Glenn and Klonsky (2010) found that individuals who engaged in NSSI were best distinguished from individuals who did not engage in NSSI by trait levels of negative urgency and, to a lesser degree, by lack of premeditation and sensation seeking. In a sample of individuals seeking treatment for substance abuse, Lynam et al. (2011) found incremental validity of negative urgency, lack of premeditation, and their interaction in the statistical prediction of NSSI above and beyond borderline personality disorder diagnosis. In a college sample

of people who engaged in self-harm and matched controls, negative urgency was significantly associated with self-harming frequency, variety of self-harm methods, and number of years self-harming. In addition, negative urgency was the only impulsivity-related trait that was a common risk factor associated with increased self-harm, alcohol used and problematic eating, which are all behaviors typically associated with negative reinforcement (Dir et al., 2013).

Bresin et al. (2013) used a daily diary methodology to gather ratings of negative affect and the urge to engage in NSSI for two weeks. Negative urgency significantly predicted the urge to engage in NSSI, and for those high in negative urgency, daily sadness was a positive predictor of urge to engage in NSSI. To our knowledge, this is the only longitudinal study that examines negative urgency as a prospective predictor of NSSI-related traits. This finding that negative urgency predicted the subsequent urge to engage in self-harm over a two-week interval speaks to the value of research designed to test whether negative urgency predicts NSSI across a longer interval as well.

### *The Current Study*

Based on the above findings, we hypothesized that both trait depression and negative urgency would prospectively predict NSSI beyond the influence of prior NSSI. We also considered whether the two traits would interact to further predict this problem behavior. To test these hypotheses, we studied a sample of 1,158 women going through their first year of college. We assessed these women at two time points: in July, prior to their arrival at the university, and in April, near the end of their first year of school. We proceeded in a series of steps. In the first step, we predicted NSSI at the end of the first year of college from three variables measured prior to college entry: prior NSSI behavior,

trait depression, and trait anxiety. This step was taken to determine if trait depression had incremental validity over both prior NSSI behavior and the construct of trait anxiety, which is similar to that of trait depression. In the second step, we predicted NSSI from prior NSSI and all five of the impulsivity-related traits we described above. We took this step to determine whether negative urgency, known to predict negatively reinforced behaviors, had incremental predictive ability beyond that provided by other, related traits. In the third step, we predicted NSSI from prior NSSI, those traits that emerged as significant predictors at steps one and two (we anticipated trait depression and negative urgency emerging), and the interaction of the significantly predicting traits. This design is the first longitudinal test of the predictive roles of trait depression and negative urgency and constitutes a rigorous test of their potential predictive power.

## Methods

### *Participants*

Participants in this study were incoming freshman women at a large Southern-Midwest university. Participants were recruited the summer before their freshman year of college to participate in a nine-month-long longitudinal study. The participant sample was limited to “traditional” incoming freshmen women, defined as entering college within three years of graduating high school. A sample of 1158 women participated at two time points: the month before the school year began (July) and at the end of the freshman year (April). The retention rate was 75% from Time 1 to Time 2; of the 92% of students who stayed in school for the full year, we retained 82% (Sugarman, 2012). Retained and lost participants did not vary on any study variables, suggesting that data were missing at random. As a result, expectation maximization procedures were used to

impute missing data. This procedure produces more reliable estimates of population parameters than traditional methods, such as mean substitution or case deletion (Enders, 2006).

The mean age of participants at the initiation of the study was 18.04. Most participants were European American (87.7%), followed by African American (9.3%); the remainder identified as Asian American (2.1%), Native American/American Indian (0.5%), and Pacific Islander (0.4%).

### *Measures*

*Demographic Information.* The participants filled out a demographic questionnaire obtaining information on estimated household income, age, ethnicity, and parental education.

*Deliberate Self-Harm Inventory (DSHI; Gratz, 2001).* The DSHI is a 17-item, behaviorally-based, self-report questionnaire that assesses the presence and nature of deliberate self-harm on several dimensions, including type, frequency, duration, and severity of self-harming behavior. The DSHI is conceptually grounded in the idea of deliberate self-harm, defined by Gratz (2001) as “the deliberate, direct destruction or alteration of body tissue without conscious suicidal intent, but resulting in injury severe enough for tissue damage (e.g., scarring) to occur.” The DSHI demonstrated high internal consistency ( $\alpha = .82$ ), adequate test-retest reliability over a period of time ranging from 2 to 4 weeks, mean 3.3 weeks ( $\phi = .68, p < .001$ ), and adequate construct, discriminant, and convergent validity (Gratz, 2001). In the present study, we constructed a dichotomous variable, reflecting the presence or absence of any self-harming behavior, past or present.

*UPPS-P Impulsivity Scale* (Lynam, Smith, Cyders, & Whiteside, 2007). The UPPS-P is a 59 item Likert type scale designed to assess five distinct personality traits that are related to impulsive behavior: negative urgency, positive urgency, lack of perseverance, lack of planning, and sensation seeking

Negative urgency, the tendency to act rashly in response to distress, and positive urgency, or the tendency to act rashly when in an unusually positive mood, each have positive loadings on neuroticism and negative loadings on conscientiousness and agreeableness (Cyders & Smith, 2008). Example items of negative urgency (in this study,  $\alpha = .89$ ) include: “When I feel bad, I will often do things I later regret in order to make myself feel better now,” and “I often make matters worse because I act without thinking when I am upset.” Example items of positive urgency ( $\alpha = .93$ ) include: “When I am very happy, I can’t seem to stop myself from doing things that can have bad consequences,” and “Others are shocked or worried about the things I do when I am feeling very excited.”

Sensation seeking, the tendency to seek out novel and thrilling experiences, is analogous to the excitement seeking facet of extraversion on the NEO PI-R (Costa & McCrae, 1992). Example items of sensation seeking ( $\alpha = .85$ ) include: “I generally seek new and exciting experiences and sensations,” and “I would enjoy fast driving.” Lack of planning, the tendency to act without thinking, is analogous to low scores on the deliberation facet of conscientiousness. Example items of lack of planning ( $\alpha = .84$ ) include: “My thinking is usually careful and purposeful,” and “I don’t like to start a project until I know exactly how to proceed” (both reverse-coded). Lack of perseverance, the inability to remain focused on a task, is analogous to low scores on the self-discipline

facet of conscientiousness on the same measure. Example items of lack of perseverance ( $\alpha = .83$ ) include: “I generally like to see things through to the end,” and “Once I get going on something I hate to stop” (both reverse-coded).

*Revised NEO Personality Inventory, Neuroticism domain (NEO-PI-R; Costa & McCrae, 1992).* The NEO-PI-R is a 240-item measure assessing the personality traits in the FFM. The NEO-PI-R has demonstrated good internal and external validity (Costa & McCrae, 1992). In the present study, we used the Depression and Anxiety facets of the Neuroticism domain ( $\alpha = .83$  and  $.75$  respectively).

### *Procedure*

*Time 1.* The study was online and accessible through the university’s Qualtrics survey system. The Time 1 assessment took place in July prior to the participants’ first day of move-in. We sent an e-mail to all incoming first-year women with instructions on accessing the Qualtrics system. Eligibility was determined by questions regarding sex, nature of enrollment (traditional or otherwise), and English-speaking ability; prospective participants who were not women, who were more than three years post-high school graduation, or who were unable to speak English were not able to complete the online survey. Upon completion, participants were entered in a raffle to win one of 8 \$250 gift cards to Target.

*Time 2.* The Time 2 assessment took place in late April of the participants’ freshman year; participants were paid \$10 for their participation. The participants completed the same group of demographic, personality and self-injury measures as they completed at Time 1.

### *Data Analysis*

We conducted a series of binomial logistic regression analyses involving the prediction of Time 2 NSSI status. In the first, we predicted Time 2 NSSI from Time 1 NSSI status, trait depression, and trait anxiety. Next, we predicted Time 2 NSSI from Time 1 NSSI and all five impulsivity-related traits. In the third regression analysis, we predicted Time 2 NSSI from Time 1 NSSI, those trait predictors that emerged as significant in steps one and two, and their interaction.

## Results

### *Descriptive Statistics*

Complete descriptive statistics for self-injury at Time 1 and Time 2 can be found in Table 1. At Time 1, 21.2% of incoming freshman women reported having engaged in some form of non-suicidal self-injury during their lifetime, up until the time of assessment. At Time 2, 15.3% of freshman women reported engaging in self-injurious behavior during their lifetime, up until the time of assessment. Around 2.2% of the sample reported onset of self-harming behavior over the 9-month study period (from Time 1 to Time 2), and 8.2% of participants reported engaging in NSSI at Time 1 but no longer reported it at Time 2 (discussed below). Breakdowns of the demographic profile relative to lifetime NSSI prevalence at Time 1 and Time 2 can be found in Table 1.

Means, variances and ranges of trait scores for the self-harming and non-self-harming groups at Time 1 can be found in Table 2. The mean score for each of the studied traits except sensation seeking was higher for the self-harming group than for the non-self-harming group. Correlations among the 16 key study variables can be found in Table 3. Of note, self-harm presence at Time 2 was significantly correlated with negative urgency, lack of perseverance, and positive urgency at Time 1. Self-harm presence at

Time 2 was also significantly correlated with self-harm presence at Time 1, as expected, and with trait anxiety and trait depression at Time 1. The Time 1 measurement of each trait was significantly and highly correlated with Time 2 measurements of the same trait. As anticipated, the traits were stable over time.

*Trait depression at Time 1 predicting self-injury at Time 2*

The first regression compared the predictive effects of trait anxiety and trait depression. The predictor variables were Time 1 NSSI behavior, trait anxiety and trait depression. The outcome variable was reported lifetime prevalence of self-injury at Time 2. As anticipated, past NSSI behavior was an overwhelmingly strong predictor of future engagement in self-injury (OR = 40.60,  $p < .001$ ). In addition, trait depression at Time 1 also predicted NSSI behavior at Time 2 (OR = 1.10,  $p < .001$ ). Time 1 trait anxiety did not predict subsequent NSSI.

*Negative urgency at Time 1 predicting self-injury at Time 2*

We next analyzed the predictive effects of the impulsivity-related traits (negative urgency, lack of planning, lack of perseverance, sensation seeking, and positive urgency). We tested the Time 1 scores on each of the five traits as well as Time 1 NSSI in the prediction of Time 2 NSSI. Past NSSI behavior again emerged as a significant predictor of NSSI at Time 2 (OR = 50.66,  $p < .001$ ). Negative urgency was the only impulsivity-related trait measured at Time 1 that significantly predicted self-harming behavior at Time 2 (OR = 1.07,  $p < .002$ ).

*Joint prediction of self-injury from negative urgency and trait depression*

The final regression analysis used trait depression, negative urgency, and the interaction of trait depression X negative urgency as predictors of self-harm presence at



Time 2, again controlling for NSSI at Time 1. Past NSSI predicted Time 2 NSSI (OR = 41.52,  $p < .001$ ). Even after controlling for NSSI at Time 1, trait depression and negative urgency both emerged as significant predictors of NSSI at Time 2 (depression OR = 1.10,  $p < .001$ ; negative urgency OR = 1.04,  $p < .05$ ). The main effect of negative urgency is qualified by an interaction between trait depression and negative urgency. At high levels of depression, there was no effect of negative urgency (OR = 1.00,  $p = .952$ ), but at low levels of depression, negative urgency emerged as a significant predictor of membership in the NSSI group at Time 2 (OR = 1.07,  $p < .02$ ). A plot of the interaction can be seen in Figure 1.

### Discussion

The findings of this study provide a number of important advances in understanding the prospective prediction of NSSI. First, trait depression predicted subsequent increases in NSSI. Above and beyond prior NSSI and trait anxiety, each one unit increase in trait depression was associated with a 10% greater likelihood of reporting NSSI 9 months later. Whereas past research has identified state-based measures of depressive symptomatology as a predictor of self-injurious behavior, the current study found that trait-based depression led to subsequent NSSI. Second, following recent advances in distinguishing among different personality traits that are related to impulsive action, we found that only one impulsivity-related trait, negative urgency, predicted subsequent increases in NSSI. This finding is consistent with negative reinforcement models of NSSI, because negative urgency, the tendency to act rashly when distressed, has repeatedly been associated with risky behaviors that provide negative reinforcement (e.g., Dire et al., 2013). Third, the two predictors of negative urgency and trait depression

each predicted subsequent NSSI while controlling for the other: both stable, ongoing depressive disposition and the trait tendency to act rashly when distressed predict a greater likelihood of NSSI over time above and beyond prior NSSI. Prediction from neither is an artifact of the prediction from the other, or of prediction from prior NSSI. Fourth, and importantly, negative urgency only predicted subsequent NSSI for those women low in trait depression.

These findings might help clarify why past research with impulsivity has yielded mixed results. There are a number of personality traits that predict impulsive behavior. In the model we used, only one of the five impulsivity-related traits predicted NSSI prospectively. As reflected in Table 2 and consistent with past research, negative urgency shares little variance with lack of planning, lack of perseverance, and sensation seeking (it is highly related to positive urgency: Cyders & Smith, 2007). In addition, the different traits have different correlates (Smith & Guller, in press): they are far from interchangeable.

There are several important implications of these findings. Because trait depression is relatively stable (Costa & McCrae, 1992), it is possible that NSSI risk could be identified early by assessing personality traits, even prior to the onset of clinical depressive symptomatology. Researchers should consider incorporating trait depression into NSSI risk models. In addition, among the many personality traits related to impulsive behavior, negative urgency may be particularly important for NSSI risk. Further focus on this trait may prove useful as researchers continue to clarify the role of impulsivity in self-harm.

It is also important to appreciate the conditional predictive role of negative urgency. At high levels of trait depression, negative urgency did not predict future NSSI. This indicates that in individuals with a depressive disposition, it is not necessary to act rashly when distressed in order to engage in self-injurious behavior. The mechanism behind the transition from a stable, depressive personality to engaging in NSSI behavior is not yet clear, but the relationship does not seem to rely on the tendency to act rashly when distressed. In contrast, in the relative absence of trait depression, each one-unit increase in negative urgency was associated with a 7% greater likelihood of reporting NSSI 9 months later. This finding could represent another pathway towards engagement in self-injurious behavior: in the absence of a depressed mood, the tendency to act rashly when distressed can lead to the use of self-harm as a coping mechanism for this distress.

It is also the case that the findings of this study are consistent with negative reinforcement models of NSSI (Chapman et al., 2006; Favazza, 1998). Certainly a depressive disposition results in more frequent experiences of distress and increased need for negative reinforcement. Negative urgency has been shown to operate as part of a negative reinforcement process, in which rash, impulsive acts provide relief or distraction from distress and are thus reinforced in the future (Birkley & Smith, 2011; Dir et al., 2013; Pearson et al., 2012; Pearson, Riley, Davis, & Smith, in press). Chapman et al. (2006) argued that experiential avoidance through deliberate self-harm may be particularly relevant to individuals high in impulsivity. The data from the present study support this notion; that is, NSSI for the function of experiential avoidance may be more likely for those high in negative urgency.

Should the current findings be replicated, there are important potential implications for intervention and the treatment of NSSI. Assessments of depressive personality could help guide treatment. For those low in trait depression, interventions designed to reduce the likelihood of rash action when distressed, such as is provided in Dialectical Behavior Therapy (Linehan, 1993), may prove useful. For women high in trait depression, pharmacological and cognitive behavioral interventions to address a depressive disposition may prove more useful.

The current findings should be considered in the context of the study's limitations. First, data were collected by self-report questionnaire using a web-based format, so we did not have the opportunity to clarify questions or responses, particularly concerning the wording of the self-harm measure. Second, our data revealed a lower percentage of individuals endorsing lifetime presence of NSSI at Time 2 than at Time 1, despite a small subset of participants that *began* self-harming between Time 1 and Time 2. We cannot be sure why this occurred. We believe that some participants may have read the measure incorrectly and answered the questions based on their current self-harm status as opposed to their lifetime status; others may have forgotten or re-framed early self-harm behaviors by the end of their first year in college. Possibly, the use of an interview method could have reduced this problem. Third, the rate of retention was not optimal, although missing participants did not vary from retained participants on study variables. Finally, the sample is made up of predominantly white college women, which limits the generalizability of the findings in two ways. We cannot make any definitive statements about similarities or differences in NSSI and its risk factors as a function of race. In addition, because a great deal of self-harm behavior begins prior to college, the

current sample may not have been ideal for studying the initial experience of self-injurious behavior. Nonetheless, it is important to consider and study the experience of this age group.

In summary, the prospective finding that both depressive disposition and negative urgency predicted subsequent self-harm behavior beyond prior self-harm behavior is striking. In particular, the finding that there may be two trait-based pathways to risk for self-harm (high trait depression and, for those low in trait depression, high negative urgency) may prove useful for the development of new risk and intervention models. These findings both provide support for existing negative reinforcement models of NSSI risk and provide direction for future research designed to study the roles of distress and impulsivity.

References

- Adams, Z. W., Kaiser, A. J., Lynam, D. R., Charnigo, R. J., & Milich, R. (2012). Drinking motives as mediators of the impulsivity-substance use relation: Pathways for negative urgency, lack of premeditation, and sensation seeking. *Addictive Behaviors, 37*(7), 848-855.
- Birkley, E. L., & Smith, G. T. (2011). Recent advances in understanding the personality underpinnings of impulsive behavior and their role in risk for addictive behaviors. *Current Drug Abuse Reviews, 4*(4), 215.
- Bresin, K., Carter, D. L., & Gordon, K. H. (2013). The relationship between trait impulsivity, negative affective states, and urge for nonsuicidal self-injury: A daily diary study. *Psychiatry Research, 205*(3), 227-231.
- Brunner, R., Parzer, P., Haffner, J., Steen, R., Roos, J., Klett, M., & Resch, F. (2007). Prevalence and psychological correlates of occasional and repetitive deliberate self-harm in adolescents. *Archives of Pediatrics & Adolescent Medicine, 161*(7), 641.
- Chapman, AL, Gratz, K., Brown, M. (2006). Solving the puzzle of deliberate self-harm: The experiential avoidance model. *Behaviour Research and Therapy, 44*, 371–394.
- Coskunpinar, A., & Cyders, M. A. (2012). Mediation–moderation analysis of problematic alcohol use: The roles of urgency, drinking motives, and risk/benefit perception. *Addictive Behaviors, 37*(7), 880-883.
- Costa, P.T., & McCrae, R.R. (1992). *NEO PI-R. Professional Manual*. Odessa, FL: Psychological Assessment Resources, Inc.

- Cyders, M. A., & Smith, G. T. (2007). Mood-based rash action and its components: Positive and negative urgency. *Personality and Individual Differences, 43*(4), 839-850.
- Deliberto, T. L., & Nock, M. K. (2008). An exploratory study of correlates, onset, and offset of non-suicidal self-injury. *Archives of Suicide Research, 12*(3), 219-231.
- Dir, A. L., Karyadi, K., & Cyders, M. A. (2013). The uniqueness of negative urgency as a common risk factor for self-harm behaviors, alcohol consumption, and eating problems. *Addictive Behaviors, 38*(5), 2158-2162.
- Enders, C. K. (2006). Analyzing structural equation models with missing data. *Structural Equation Modeling: A Second Course, 313-342*.
- Favazza, A.R. (1998). The coming of age of self-mutilation. *The Journal of Nervous and Mental Disease, 186*(5), 259-268.
- Glenn, C. R., & Klonsky, E. D. (2010). A multimethod analysis of impulsivity in nonsuicidal self-injury. *Personality Disorders: Theory, Research, and Treatment, 1*(1), 67.
- Glenn, C. R., & Klonsky, E. D. (2011). Prospective prediction of nonsuicidal self-injury: a 1-year longitudinal study in young adults. *Behavior Therapy, 42*(4), 751-762.
- 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. (2000). The measurement, functions, and etiology of deliberate self-harm. Unpublished master's thesis, University of Massachusetts Boston.
- Gratz, K.L. (2003). Risk Factors for and Functions of Deliberate Self-Harm: An

- Empirical and Conceptual Review. *Clinical Psychology: Science and Practice*, 10(2), 192–205.
- Gollust, S. E., Eisenberg, D., & Golberstein, E. (2008). Prevalence and correlates of self-injury among university students. *Journal of American College Health*, 56(5), 491-498.
- Hankin, B. L., & Abela, J. R. (2011). Nonsuicidal self-injury in adolescence: Prospective rates and risk factors in a 2 ½year longitudinal study. *Psychiatry Research*, 186(1), 65-70.
- Klonsky, E. D. (2007). The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review*, 27(2), 226-239.
- Klonsky, E. D., Oltmanns, T. F., & Turkheimer, E. (2003). Deliberate self-harm in a nonclinical population: Prevalence and psychological correlates. *American Journal of Psychiatry*, 160(8), 1501-1508.
- Linehan, M. M. (1993) *Cognitive-behavioral treatment of borderline personality disorder*. New York: Guilford Press.
- Lynam, D., Smith, G. T., Cyders, M. A., Fischer, S., & Whiteside, S. A. (2007). The UPPS-P: A multidimensional measure of risk for impulsive behavior. *Unpublished technical report*.
- Lynam, D. R., Miller, J. D., Miller, D. J., Bornovalova, M. A., & Lejuez, C. W. (2011). Testing the relations between impulsivity-related traits, suicidality, and nonsuicidal self-injury: A test of the incremental validity of the UPPS model. *Personality Disorders: Theory, Research, and Treatment*, 2(2), 151.
- Marshall, Sheila K., Lauree C. Tilton-Weaver, and Håkan Stattin. "Non-suicidal self-



- injury and depressive symptoms during middle adolescence: a longitudinal analysis." *Journal of Youth and Adolescence* (2013): 1-9.
- Martens, M. P., Pedersen, E. R., Smith, A. E., Stewart, S. H., & O'Brien, K. (2011). Predictors of alcohol-related outcomes in college athletes: The roles of trait urgency and drinking motives. *Addictive Behaviors*, *36*(5), 456-464.
- Moran, P., Coffey, C., Romaniuk, H., Olsson, C., Borschmann, R., Carlin, J. B., & Patton, G. C. (2012). The natural history of self-harm from adolescence to young adulthood: a population-based cohort study. *The Lancet*, *379*(9812), 236-243.
- Muehlenkamp, J. J., & Gutierrez, P. M. (2007). Risk for suicide attempts among adolescents who engage in non-suicidal self-injury. *Archives of Suicide Research*, *11*(1), 69-82.
- Nock, M.K. (2009). Why do people hurt themselves? New insights into the nature and functions of self-injury. *Current Directions in Psychological Science*, *18*, 78–83.
- Nock, M.K. (2010). Self-Injury. *Annual Review of Clinical Psychology*, *6*, 339–63.
- Pearson, C. M., Combs, J. L., Zapolski, T. C., & Smith, G. T. (2012). A longitudinal transactional risk model for early eating disorder onset. *Journal of Abnormal Psychology*, *121*(3), 707.
- Pearson, C. M., Riley, E. N., Davis, H. A., & Smith, G. T. (in press). Two pathways toward impulsive action: An integrative risk model for bulimic behavior in youth. *Journal of Child Psychology and Psychiatry*.
- Ross, S., & Heath, N. (2002). A study of the frequency of self-mutilation in a community sample of adolescents. *Journal of Youth and Adolescence*, *31*(1), 67-77.

- Serras, A., Saules, K. K., Cranford, J. A., & Eisenberg, D. (2010). Self-injury, substance use, and associated risk factors in a multi-campus probability sample of college students. *Psychology of Addictive Behaviors, 24*(1), 119.
- Settles, R. F., Cyders, M., & Smith, G. T. (2010). Longitudinal validation of the acquired preparedness model of drinking risk. *Psychology of Addictive Behaviors, 24*(2), 198.
- Sugarman, R. (2012). *Preliminary report on performance of first-year, full-time students status of students, over a 6-year reporting period*. Retrieved from [http://www.uky.edu/IRPE/students/ret\\_grad/Section1.pdf](http://www.uky.edu/IRPE/students/ret_grad/Section1.pdf)
- Smith, G. T., & Guller, L. (in press). Psychological underpinnings to impulsive behavior. In L. Cooper & R. Larsen (Eds.), *Handbook of Personality Processes and Individual Differences*. American Psychological Association.
- Whiteside, S. P., & Lynam, D. R. (2001). The five factor model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and Individual Differences, 30*(4), 669-689.
- Whitlock, J., Eckenrode, J., & Silverman, D. (2006). Self-injurious behaviors in a college population. *Pediatrics, 117*(6), 1939-1948.
- Wilcox, H. C., Arria, A. M., Caldeira, K. M., Vincent, K. B., Pinchevsky, G. M., & O'Grady, K. E. (2011). Longitudinal predictors of past-year non-suicidal self-injury and motives among college students. *Psychological Medicine, 42*, 717-26.

Table 1. Descriptive statistics: Lifetime presence of self-injurious behavior and demographic data at Time 1 and Time 2.

	<i>Time 1</i>		<i>Time 2</i>	
	Yes (21.2%)	No (78.8%)	Yes (15.3%)	No (84.7%)
<i>Race</i>				
AI/AN	.4%	.5%	1.1%	.4%
Asian	1.2%	2.3%	1.7%	2.1%
NH/PI	.8%	.3%	1.1%	.3%
Black/AA	9.8%	9.2%	11.3%	9.0%
White/EA	87.8%	87.6%	84.7%	88.2%

Note. AI/AN = American Indian/Alaska Native, NH/PI = Native Hawaiian/Pacific Islander, AA = African American, EA = European American.

Table 2. Descriptive statistics of trait depression, anxiety and the UPPS-P impulsivity traits at Time 1.

	<b>Mean</b>		<b>SD</b>		<b>t-value</b>
	<i>SH at Time 1</i>	<i>No SH at Time 1</i>	<i>SH at Time 1</i>	<i>No SH at Time 1</i>	
Trait Depression	24.89	19.88	6.34	6.57	-12.23**
Trait Anxiety	26.37	23.52	5.04	5.20	-8.04**
Negative Urgency	27.61	25.52	7.09	6.57	-6.45**
Lack of Planning	22.43	21.69	5.47	4.85	-2.07*
Lack of Perseverance	19.32	18.00	4.87	4.35	-4.11**
Sensation Seeking	33.42	33.26	6.75	6.79	-.33
Positive Urgency	24.16	22.25	7.57	6.70	-3.85**

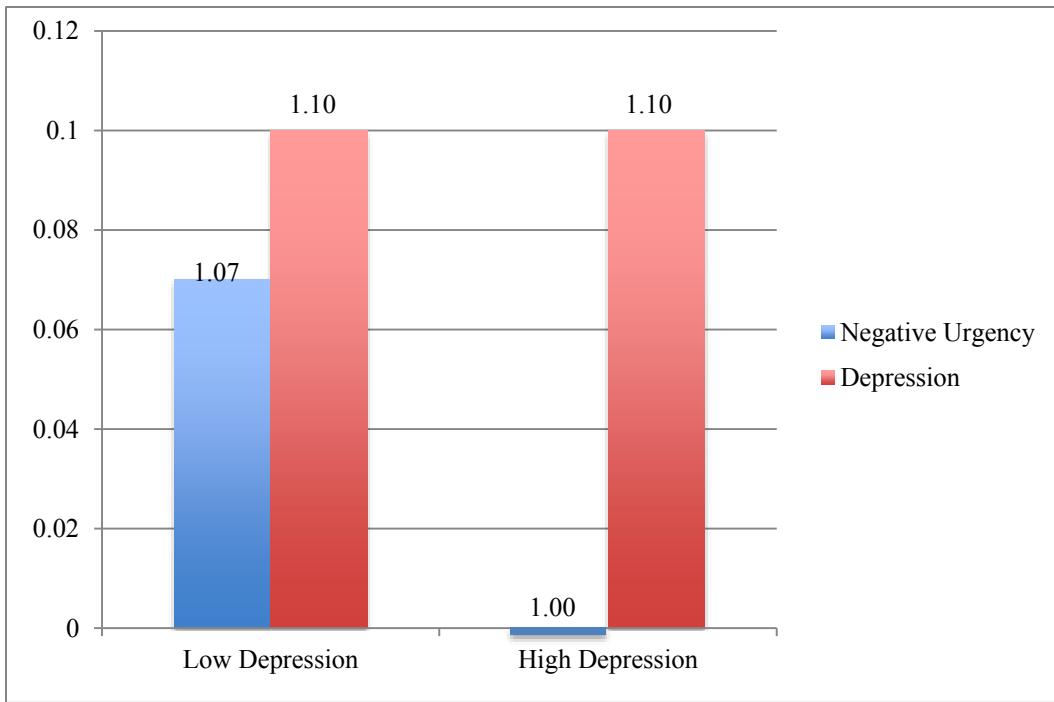
Note. N=1158. Trait depression and anxiety were measured using the Neuroticism domain of the Revised NEO Personality Inventory (Costa & McCrae, 1992). The UPPS-P impulsivity traits are those identified by the Whiteside-Lynam model of impulsivity, measured using the UPPS-P Impulsivity Scale (Lynam, Smith, Cyders, & Whiteside, 2007). Group membership: SH at Time 1 n=912, SH at Time n=246, t-values: mean differences between SH at Time 1 and No SH at Time 1 groups on all variables, \* =  $p < .05$ , \*\* =  $p < .001$ .

Table 3. Correlation matrix for key study variables.

	SH 1	SH 2	NU 1	Plan 1	Pers 1	SS 1	PU 1	Anx 1	Dep 1	NU 2	Plan 2	Pers 2	SS 2	PU 2	Anx 2	Dep 2
SH 1																
SH 2	.67*															
NU 1	.19*	.20*														
Plan 1	.06	.06	.35*													
Pers 1	.12*	.13*	.07*	.43*												
SS 1	.01	-.03	.06	.28*	-.13*											
PU 1	.11*	.09*	.65*	.43*	.37*	.14*										
Anx 1	.23*	.21*	.42*	-.10*	.21*	-.29*	.22*									
Dep 1	.34*	.33*	.55*	.08	.33*	-.13*	.35*	.62*								
NU 2	.20*	.20*	.69*	.29*	.31*	.09*	.51*	.29*	.41*							
Plan 2	.04	.03	.30*	.65*	.29*	.23*	.37*	-.08*	.06	.37*						
Pers 2	.13*	.10*	.29*	.32*	.66*	-.09*	.29*	.16*	.26*	.41*	.51*					
SS 2	.02	-.03	.06	.23*	-.08	.77*	.12*	-.25*	-.11*	.13*	.14*	-.12*				
PU 2	.08*	.03	.45*	.30*	.25*	.19*	.61*	.11*	.21*	.73*	.44*	.38*	.26*			
Anx 2	.25*	.26*	.37*	-.05	.20*	-.26*	.18*	.70*	.56*	.41	-.05	.22*	-.29*	.18*		
Dep 2	.32*	.34*	.44*	.10*	.32*	-.11*	.28*	.46*	.70*	.56*	.13*	.38*	-.15*	.31*	.65*	

Note. \* Significant at  $p < .01$ . SH 1: Self-harm presence at Time 1; SH 2: Self-harm presence at Time 2; NU 1: UPPS-P Negative urgency measured at Time 1; Plan 1: UPPS-P Lack of Planning measured at Time 1; Pers 1: UPPS-P Lack of Perseverance measured at Time 1; SS 1: UPPS-P Sensation Seeking measured at Time 1; PU 1: UPPS-P Positive Urgency measured at Time 1; Anx 1: Trait (NEO) anxiety measured at Time 1; Dep 1: Trait (NEO) depression measured at Time 1; NU 2: UPPS-P Negative urgency measured at Time 2; Plan 2: UPPS-P Lack of Planning measured at Time 2; Pers 2: UPPS-P Lack of Perseverance measured at Time 2; SS 2: UPPS-P Sensation Seeking measured at Time 2; PU 2: UPPS-P Positive Urgency measured at Time 2; Anx 2: Trait (NEO) anxiety measured at Time 2; Dep 2: Trait (NEO) depression measured at Time 2.

Figure 1. Odds ratios of NSSI at Time 2 for negative urgency at low and high levels of trait depression.



Note: At low levels of depression, negative urgency was a significant predictor of membership in the NSSI group at Time 2 (OR = 1.07). At high levels of depression, there was no effect of negative urgency on future NSSI (OR = 1.00).