

# Brooding, Reflection, and Distraction: Relation to Non-Suicidal Self-Injury versus Suicide Attempts

Lillian Polanco-Roman, Justyna Jurska, Victoria Quiñones, and Regina Miranda

*The present study examined the relation between cognitive response styles (i.e., brooding, reflection, distraction) and cognitive inflexibility in differentially predicting history of non-suicidal self-injury (NSSI) only, suicide attempt (SA) only, or both (NSSI + SA). College students (N = 352) completed self-report measures of rumination, distraction, and self-harm history, a diagnostic interview, and a computerized task measuring cognitive flexibility. Brooding uniquely predicted SA-only history, while reflection uniquely predicted history of NSSI-only and NSSI + SA. Distraction was associated with lower odds of NSSI-only and NSSI + SA. Cognitive inflexibility was not significantly associated with self-harm history. Cognitive vulnerabilities may help identify individuals who are at risk for self-harm and may differentiate between NSSI and SA.*

**Keywords** cognitive inflexibility, distraction, non-suicidal self-injury, rumination, suicide attempts

Self-harm behaviors are common during young adulthood (Kessler, Berglund, Borges et al., 2005; Serras, Saules, Cranford et al., 2010; Whitlock & Knox, 2007), and are comprised of suicide attempts (SAs)—self-inflicted injury with intent to die—and non-suicidal self-injury (NSSI)—characterized as any deliberate, self-inflicted injury without intent to die (Prinstein, 2008). Estimates suggest that about a quarter of young adults have a history of self-harm behaviors (Whitlock & Knox, 2007), with nearly 10% of 18–24 year-olds having attempted suicide (Kessler, Berglund, Borges et al., 2005), and 14–17% having engaged in NSSI

(Serras et al., 2010; Whitlock, Eckenrode, & Silverman, 2006), within the year preceding inquiry. Thus, the high rates of SAs and NSSI among young adults constitute a major public health concern that has garnered recent attention from clinicians and researchers (Prinstein, 2008), and warrants further investigation.

While there is growing evidence demonstrating the strong relation between SAs and NSSI, as both are self-directed acts of physical harm that often co-occur (Klonsky, May, & Glenn, 2013; Nock, Joiner, Gordon et al., 2006; Whitlock & Knox, 2007), research suggests that NSSI and SA serve distinct functions. Contemporary theories

of self-harm propose that individuals engage in such behaviors in response to a negative mood due to deficits in generating adaptive strategies to cope with distress (Baumeister, 1990; Chapman, Gratz, & Brown, 2006; Klonsky, 2007; Nock & Prinstein, 2004). Baumeister (1990) postulated that suicidal behavior results from a desire to escape a state of self-awareness resulting from an aversive emotional stimulus, whereby cognitive inflexibility impairs inhibitory processes and further amplifies the appeal of suicide as an option to escape negative affect. Thus, he identified cognitive responses characterized by perseverative thinking as an underlying mechanism that impacts vulnerability to SAs. Similarly, Nock and Prinstein (2004) proposed a functional model for deliberate self-harm whereby NSSI is employed as an emotion regulation strategy to abate psychological distress caused by unwanted negative thoughts and/or emotions. Further, they have demonstrated that NSSI is automatically, negatively reinforced and becomes a method of managing future distress (Nock & Prinstein, 2004). While NSSI emerges as a maladaptive way to distract from unwanted negative thoughts and/or mood because of an inability to manage distress in more adaptive or effective ways, SAs may be employed as a final resignation to psychological pain, as it is perceived as irreducible (Muehlenkamp & Gutierrez, 2004; Whitlock & Knox, 2007).

Cognitive characteristics have been found to differentiate individuals who engage in NSSI from those who attempt suicide (Brausch & Gutierrez, 2010; Muehlenkamp & Gutierrez, 2004; 2007; Nock & Kessler, 2006; Nock, Prinstein, & Sterba, 2009; Taliaferro, Muehlenkamp, Borowsky et al., 2012). For instance, adolescents who engage in NSSI and attempt suicide have been found to have more negative attitudes toward life and fewer reasons for living than individuals who

engage in NSSI and no SA (Muehlenkamp & Gutierrez, 2004; 2007). A better understanding of the cognitive characteristics that may differentiate between NSSI and SA may provide insight into the distinct etiologies of each self-harm behavior.

#### Cognitive Inflexibility and Self-Harm Behaviors

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Cognitive inflexibility involves a difficulty adjusting to feedback from the environment and in shifting set (Lezak, Howieson, Bigler et al., 2012), and there is limited and mixed evidence linking cognitive inflexibility to self-harm behaviors. For instance, Patsiokas, Clum, and Luscomb (1979) found that psychiatric patients admitted for attempting suicide exhibited more cognitive inflexibility than patients with no attempt history, and this difference was most pronounced among young adults compared to older adult patients. More recently, another study found that depressed suicidal inpatients made more perseverative errors on the Wisconsin Card Sorting Test (WCST) than did depressed non-suicidal inpatients, and they also exhibited other deficits in executive functioning, including attention and processing speed (Marzuk, Hartwell, Leon et al., 2005). In contrast, other research comparing cognitive performance in adults with and without a suicide attempt history found no differences in cognitive inflexibility, as measured by the WCST (Bartfai, Winborg, Nordstrom et al., 1990; Ellis, Berg, & Franzen, 1992; Keilp, Gorlyn, Russell et al., 2013). Furthermore, cognitive inflexibility, also measured by the WCST, was found to prospectively predict suicidal ideation among a non-clinical sample of young adults with a SA history (Miranda, Gallagher, Bauchner et al., 2012), and the brooding subtype of rumination was found to mediate the relation between cognitive

inflexibility and suicidal ideation (Miranda, Valderrama, Tsypes et al., 2013), suggesting that difficulty adapting to changes in environmental contingencies influence the tendency to cope with a negative mood through perseverative thinking. No research of which we are aware has examined the relation between cognitive inflexibility and NSSI, specifically.

Models that implicate cognitive inflexibility in risk for suicide suggest that a rigid cognitive style may lead to the inability to generate alternative solutions to problems, which may in turn, contribute to suicidal thinking (Schotte & Clum, 1982, 1987; Schotte, Cools, & Payvar, 1990). Individuals who ruminate in response to negative moods have been found to have higher levels of cognitive inflexibility, compared to individuals with low levels of rumination (Davis & Nolen-Hoeksema, 2000). Cognitive inflexibility among young adults at risk for SAs may impede their ability to generate adaptive cognitive responses, other than rumination, to manage their distress. It is unclear whether cognitive inflexibility might also be implicated in NSSI. Therefore, we specifically examined cognitive inflexibility, as opposed to other risk factors for suicidal behavior, because research suggests that high levels of cognitive inflexibility are characteristic of individuals who ruminate (Davis & Nolen-Hoeksema, 2000), and that cognitive inflexibility may increase brooding and thus confer risk for suicidal thinking (Miranda, Valderrama, Tsypes et al., 2013). In order to better understand this relationship and to determine whether cognitive inflexibility plays a similar role in contributing to NSSI, it is necessary to examine whether cognitive inflexibility confers risk for different self-harm behaviors. Furthermore, it is necessary to examine cognitive inflexibility because of its relation to other risk factors for suicidal behaviors—e.g., rumination, social problem solving deficits, depression (Davis &

Nolen-Hoeksema, 2000; Martin, Oren, & Boone, 1991; Schotte & Clum, 1987).

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#### Rumination and Self-Harm Behaviors

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Rumination is a maladaptive cognitive response style that involves a repetitive focus on the causes, meanings, and consequences of one's depressed mood (Nolen-Hoeksema, 1991), and it has been found to exacerbate and prolong depressive symptoms (Moberly & Watkins, 2008; Nolen-Hoeksema & Morrow, 1993). Research on rumination has extended from depression to self-harm behaviors, including SAs (Morrison & O'Connor, 2008), and more recently, NSSI (Hilt, Cha, & Nolen-Hoeksema, 2007; Hoff & Muehlenkamp, 2009; Selby, Connell, & Joiner et al., 2010; Selby, Franklin, Carson-Wong et al., 2013), suggesting that it may increase vulnerability to self-harm.

Research has demonstrated that rumination may exist in multiple forms, namely brooding (i.e., passively contemplating the reasons for one's negative mood), or reflection (i.e., an attempt to understand the causes of one's negative mood) (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Brooding is considered to be more maladaptive than reflection, as brooding has been linked to increases in depressive symptoms over time, while reflection has been found to be associated with decreases in depressive symptoms over time (Burwell & Shirk, 2007; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). However, findings from the self-harm literature remain equivocal. A longitudinal study of a community sample of adults found that both brooding and reflection prospectively predicted suicidal ideation (Miranda & Nolen-Hoeksema, 2007). A study of college students, meanwhile, reported that brooding, but not reflection, mediated the

relation between negative life events and suicidal ideation (Chan, Miranda, & Surrence, 2009). Thus, while there is strong evidence implicating brooding in increasing risk of self-harm, less information is known about reflection.

Furthermore, brooding and reflection have also been found to be differentially associated with self-harm behaviors (Grassia & Gibb, 2009; Hoff & Muehlenkamp, 2009). One study found that reflection, but not brooding, was associated with having a history of NSSI (Hoff & Muehlenkamp, 2009). Another study found that psychiatric patients with an SA history had higher levels of brooding, but not reflective rumination, than patients without an attempt history (Grassia & Gibb, 2009). Finally, a study of 32 community volunteers who were in recovery from major depression found that those with a history of SAs reported higher levels of brooding than of reflection, while those without a history of suicidal ideation or attempts reported higher levels of reflection than of brooding (Crane, Barnhofer, & Williams, 2007). These findings begin to suggest that brooding may be uniquely associated with SAs, while reflection may be associated with NSSI. However, there is limited information on the unique contributions of brooding, reflection, distraction, and cognitive inflexibility in relation to NSSI, SAs, or both types of self-harm behaviors in non-clinical samples of young adults.

### Distraction and Self-Harm Behaviors

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Unlike brooding and reflection, which appear to function as maladaptive cognitive response styles, distraction is thought to be a more adaptive way to cope with distress, as it redirects focus away from a negative mood to more positive thoughts and behaviors (Knowles, Tai, Christensen et al., 2005; Nolen-Hoeksema, 1991). For

instance, distraction has been found to decrease and shorten the duration of depressive symptoms (Nolen-Hoeksema & Morrow, 1993). Although distraction may function as a more adaptive alternative to rumination, it has received relatively little attention in the literature beyond its relation to depression. Moreover, the few studies that exist report mixed findings, with some researchers finding a positive relationship between distraction and depressive symptoms, and others reporting either a negative relationship or no relationship at all (for a review, see Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Thus, the nature of the relationship between depression and distraction remains unclear (see Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008, for review). However, adaptive distraction maybe a buffer against self-harm behaviors. Given that self-harm is commonly employed to decrease negative affect and thoughts (Nock & Prinstein, 2004; Nock, Prinstein, & Sterba, 2009), individuals may engage in self-harm because they are unable to adequately distract themselves from their distress. In a clinical trial of women with borderline personality disorder, Brown and colleagues (2002) found that those who engaged in NSSI reported distraction as a reason for their behavior, whereas the women who attempted suicide reported their behavior was an effort to make others better off. Additionally, Nock, Prinstein, and Sterba's (2009) daily diary study of 30 adolescents and young adults with NSSI found that adolescents who thought about NSSI refrained from harming themselves by distracting themselves with other thoughts or behaviors, lending support to the idea that NSSI serves to regulate negative emotions and cognitions. However, no research of which we are aware has examined the relation between use of distraction as a cognitive response style and different types of self-harm behaviors in a non-clinical group of young adults.

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 The Present Study
 

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The present study sought to elucidate the cognitive characteristics unique to NSSI and those unique to SAs by examining the relation between cognitive response styles (i.e., brooding, reflection, distraction), cognitive inflexibility, and history of self-harm, specifically NSSI, SAs, or both NSSI and SAs, among a nonclinical group of young adults. We hypothesized that cognitive inflexibility would be associated with endorsement of a history of any form of self-harm. Furthermore, we expected that a maladaptive cognitive response style characterized by brooding would be uniquely associated with endorsement of a history of SA, whereas reflection would be uniquely associated with a history of NSSI. We also expected that higher levels of both brooding and reflection would be associated with endorsement of SA and NSSI history. Finally, we expected that distraction would be associated with lower risk for any self-harm history compared to no history of self-harm.

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 METHODS
 

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 Participants
 

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A total of 354 young adults (74% female), ages 18–34 ( $M = 19.08$ ,  $SD = 2.22$ ) who were first- or second-year college students, were recruited from a public college in the northeastern United States and other colleges in the surrounding metropolitan area. Two individuals failed to report self-harm history and were excluded from data analyses. Therefore, the final sample consisted of 352 young adults. The racial/ethnic composition of the sample was 32% Asian, 30% White, 19% Latino, 11% Black, and 9% who identified as another race/ethnicity. Approximately two-thirds ( $N = 229$ ) of participants were born in the United States.

Participants were recruited from a larger sample ( $N = 2054$ ) of individuals who were screened for a history of suicidal ideation or attempts to take part in a study of cognitive risk factors for suicidal thoughts and behavior in young adults. Individuals were selected via stratified random sampling, using an online random number generator ([www.random.org](http://www.random.org)), so that approximately one-third of the sample had endorsed a history of suicidal ideation or attempts and two-thirds of the sample reported no history of suicidal ideation or attempts.

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 Measures
 

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*Demographic Information.* Information about each participant's age, gender, race/ethnicity, place of birth (of self and parents), number of years in the United States, and year in college was collected.

## SELF-HARM BEHAVIORS.

The Self Harm Behavior Questionnaire (SHBQ; Gutierrez, Osman, Barrios et al., 2001) is a self-report questionnaire designed for use with non-clinical samples of young adults to assess lifetime history of self-harm. It consists of four sections that inquire about a history of NSSI, SAs, suicidal ideation, and suicide-related communication. Specifically, individuals are asked about instances in which they purposely tried to hurt themselves (“Have you ever hurt yourself on purpose? e.g., scratched yourself with finger nails or other sharp object”) with follow-up questions about the method, age of first and last episode, frequency of the behavior, whether they have disclosed the behavior to others, and whether they sought medical attention. The measure also inquires about SAs (“Have you ever attempted suicide?”), with follow-up questions about the number of previous attempts, age, method, and wish to die during the most recent attempt, disclosure to a counselor or others, and need

for medical attention. Responses on the SHBQ were used to divide participants into four mutually exclusive self-harm groups. Those who reported no history of NSSI or SA were classified as the “No Self-Harm” group. Participants who indicated NSSI, but no SAs, were classified as the “NSSI Only” group. Individuals who reported SAs, but no NSSI history were classified as the “Suicide Attempt Only” group. Finally, participants who reported both types of self-harm behavior were classified as the “Both” group. Close examination of the methods participants listed for NSSI and SAs was used to confirm classification into a particular self-harm group (For instance, if a participant endorsed a suicide attempt but indicated that he/she thought about engaging in a particular method of attempt but did not actually follow through with the method, the individual was reclassified into the “no self-harm” group). The SHBQ has good internal consistency, with alpha estimates ranging from .89 to .96 among the four sections (Gutierrez, Osman, Barrios et al., 2001). Convergent validity for the SHBQ has been demonstrated via acceptable correlations with existing measures of suicidal behavior ( $r = .34-.70$ ). Total scores have also been found to significantly discriminate between suicidal and non-suicidal individuals (Gutierrez, Osman, Barrios et al., 2001). There was good internal consistency in the present sample, with alpha estimates among the four sections ranging from .70-.96.

#### COGNITIVE RESPONSE STYLE.

The Response Styles Questionnaire (RSQ; Nolen-Hoeksema, Larson, & Grayson, 1999) is a 33-item self-report questionnaire used to assess cognitive response styles to negative moods—including rumination and distraction. The rumination scale consists of 22 items, with five items that assess brooding, or a

tendency to dwell on one’s symptoms of distress or negative mood (e.g., “Think about a recent situation, wishing it had gone better”), and five items that assess reflection, or a tendency to try to understand the reasons for a negative mood (e.g., “Go away by yourself and think about why you feel this way”). The other 12 items of the rumination scale have previously been found to overlap with symptoms of depression, and it has thus been recommended that they not be included in calculation of total scores (Treyner, Gonzalez, & Nolen-Hoeksema, 2003). The remaining 11 items of the RSQ assess distraction, which involves attempts to engage in behaviors that distract from a negative mood (e.g., “Do something fun with a friend”). Each item is scored on a Likert-type scale ranging from 1 (*almost never*) to 4 (*almost always*), and average scores were computed for each subscale to allow for comparison across scales. The RSQ subscales have demonstrated good internal consistency: reflection ( $\alpha = .72$ ), brooding ( $\alpha = .77$ ), and distraction ( $\alpha = .82$ ) (Knowles, Tai, Christensen et al., 2005; Treyner, Gonzalez, & Nolen-Hoeksema, 2003). There was good internal consistency in the current sample: reflection ( $\alpha = .76$ ), brooding ( $\alpha = .77$ ), and distraction ( $\alpha = .82$ ).

#### MAJOR DEPRESSION.

The Computerized Diagnostic Interview Schedule for Children - Young Adult version (C-DISC; Shaffer, Fisher, Lucas et al., 2000) was used to assess the presence of a major depressive episode within the previous year. The C-DISC is a computer-administered, structured diagnostic interview based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (American Psychiatric Association, 1994) and designed to be administered by lay interviewers. It has demonstrated moderate to very good agreement with clinicians’ ratings of symptoms (Shaffer, Fisher, Lucas

et al., 2000). The C-DISC was administered by research assistants with at least a B.A. degree.

#### COGNITIVE INFLEXIBILITY.

The computerized version of the Wisconsin Card Sorting Test (WCST; Heaton, Chelune, Talley et al., 1993) was used to measure cognitive inflexibility. Participants are instructed to correctly match cards that appear in a fixed random order to one of four key cards that appear across the top of the screen. Cards can be matched either by color, shape, or number, but participants are not provided instructions on how to match the cards. Instead, they receive feedback after each attempt on whether the card was matched correctly or incorrectly. After 10 consecutive correct matches, the sorting rule changes. Cognitive inflexibility is measured by the amount of perseverative errors made following changes in sorting rules—i.e., the number of times participants continue to match the cards incorrectly using an old sorting rule. Prior research has provided evidence for the validity of the WCST as a measure of executive dysfunction (Robinson, Heaton, Lehman et al., 1980; Romine, Lee, Wolfe et al., 2004; Tsuchiya, Oki, Yahara et al., 2005), and the raw perseverative error scores—which were used in the present study as a measure of cognitive inflexibility—have been found to show good stability in clinical and non-clinical samples (Greve, Love, Sherwin et al., 2002; Tan, Zou, Ou et al., 2002). Further, perseverative errors have been found to predict suicidal ideation over time (Miranda, Gallagher, Bauchner et al., 2012; Miranda, Valderrama, Tsypes et al., 2013).

#### Procedure

Participants completed study measures during two sessions. In the first session, they completed a packet of self-report

questionnaires that included demographic information and the RSQ. In the second session, which took place within 2–4 weeks of the first session, participants completed the WCST, C-DISC, and the SHBQ. Participants received either monetary compensation (\$25 for the first session and \$50 for the second session) or research credit toward their Introduction to Psychology course research requirement for each session. After each session, research assistants completed a risk assessment procedure before participants were debriefed. Individuals who reported a SA within the previous two weeks or current suicidal ideation with a plan were interviewed by a licensed clinician, and they were escorted to the counseling center on campus for further assessment, if needed, or provided with an outside referral (if not a student at the college where the study was conducted). All participants were provided with a list of local treatment referrals at the conclusion of each session. The study received full-board approval by an Institutional Review Board, and informed consent was obtained from each participant.

#### Data Analysis

Chi-square analyses were conducted to examine differences in self-harm history by gender, race/ethnicity, and immigration status (US-born versus non-US-born). Differences in brooding, reflection, distraction, and cognitive inflexibility by self-harm history were examined via a one-way ANOVA, with post hoc t-tests conducted using Bonferroni corrections to correct for multiple comparisons. Subsequently, univariate and multivariate logistic regression models were constructed to further examine the unique relations between cognitive response styles (i.e., brooding, reflection, distraction), cognitive inflexibility, and self-harm behaviors, adjusting for gender and depression. Whereas no

self-harm history was entered as the reference group in the first model to differentiate between individuals with and without history of self-harm, NSSI-only was entered as the reference group for the second model to further differentiate between different types of self-harm history.

screened positive for depression than would be expected by chance, ( $Z_{adj} = 4.8$ ) and ( $Z_{adj} = 3.4$ ), a lower proportion of individuals with no self-harm history screened positive for depression than would be expected by chance ( $Z_{adj} = 6.2$ ). For more details, see Table 1.

## RESULTS

### Group Differences in Demographic Variables and Self-Harm History

Thirty-seven percent of participants ( $N = 131$ ) reported a history of self-injurious behaviors, with 5% ( $N = 17$ ) endorsing a history of SAs with no history of NSSI, 18% ( $N = 62$ ) endorsing a history of NSSI with no SA history, and 15% ( $N = 52$ ) endorsing a history of both NSSI and SAs. The age range for the most recent SA was 8–25 years ( $M = 15.7$  years;  $SD = 2.7$ ). The method most often reported was ingestion (e.g., overdose on pills) accounting for 51% of the SA methods reported. Meanwhile, the age range for most recent NSSI was 12–25 years ( $M = 17.1$ ;  $SD = 2.3$ ), and the method most often reported was cutting/carving, accounting for 42% of the methods reported for NSSI. Chi-square tests were conducted to examine differences in self-harm history by gender, race/ethnicity, and immigration status (i.e., U.S.-born v. non-U.S.-born). There were no significant differences by race/ethnicity,  $\chi^2 = 17.15$ ,  $p = .14$ , or immigration status,  $\chi^2 = 3.31$ ,  $p = .35$ . However, there was a significant difference by gender,  $\chi^2 = 8.90$ ,  $p < .05$ , with a higher proportion of males endorsing SA-only history ( $Z_{adj} = 2.1$ ). There was also a significant difference across the self-harm groups in whether they met criteria for major depression in the previous year,  $\chi^2 = 42.54$ ,  $p < .01$ . While a higher proportion of individuals with NSSI-only history and history of both NSSI and SA respectively,

### Cognitive Vulnerability for Non-Suicidal Self-Injury versus Suicide Attempts

Differences in brooding, reflection, distraction, and cognitive inflexibility by self-harm history were examined via a one-way Analysis of Variance (ANOVA), with post hoc t-tests conducted using Bonferroni corrections to correct for multiple comparisons. The self-harm groups (i.e., NSSI-only, SA-only, Both) differed in brooding,  $F(3, 353) = 13.30$ ,  $p < .01$ ; reflection  $F(3, 353) = 8.35$ ,  $p < .01$ ; and distraction  $F(3, 353) = 4.41$ ,  $p < .01$ , but not in cognitive inflexibility  $F(3, 353) = 0.50$ ,  $p = 0.68$ , compared to the no-self-harm group. Individuals with a history of NSSI-only ( $M = 2.54$ ,  $SD = 0.69$ ),  $t(350) = 3.41$ ,  $p < .01$ , SA-only ( $M = 3.01$ ,  $SD = 0.74$ ),  $t(350) = 4.58$ ,  $p < .01$ , and both NSSI and SA ( $M = 2.66$ ,  $SD = 0.74$ ),  $t(350) = 4.27$ ,  $p < .01$ , reported higher levels of brooding, compared to individuals with no self-harm history ( $M = 2.19$ ,  $SD = 0.71$ ). Group differences in reflection also emerged, with the NSSI-only group ( $M = 2.37$ ,  $SD = 0.77$ ),  $t(350) = 3.12$ ,  $p < .05$ , and those with a history of both NSSI and SA ( $M = 2.52$ ,  $SD = 0.70$ ),  $t(350) = 4.25$ ,  $p < .01$ , reporting higher levels of reflection than individuals with no self-harm history ( $M = 2.05$ ,  $SD = 0.72$ ). Finally, group differences also emerged in distraction, with individuals with a history of both NSSI and SA ( $M = 2.30$ ,  $SD = 0.59$ ) reporting lower levels than individuals with no self-harm history ( $M = 2.56$ ,  $SD = 0.55$ ),  $t(350) = 2.90$ ,  $p < .05$ . There were no significant differences in brooding, reflection, distraction,



TABLE 1. Sample Characteristics, Means, and Standard Deviations by Self-Harm History

|                         | Total       | No self-harm <sup>a</sup> | SA only                    | NSSI only                  | NSSI + SA                  |
|-------------------------|-------------|---------------------------|----------------------------|----------------------------|----------------------------|
| N (%) / M (SD)          | 354 (100%)  | 227 (64%)                 | 17 (5%)                    | 63 (18%)                   | 47 (13%)                   |
| Male*                   | 91 (26%)    | 62 (27%)                  | 8 (47%)*                   | 14 (22%)                   | 7 (15%)                    |
| Female*                 | 263 (74%)   | 165 (73%)                 | 9 (53%)*                   | 49 (78%)                   | 40 (85%)                   |
| US-Born                 | 229 (65%)   | 141 (62%)                 | 12 (71%)                   | 40 (64%)                   | 35 (75%)                   |
| Non US-Born             | 125 (35%)   | 86 (38%)                  | 5 (29%)                    | 23 (36%)                   | 12 (25%)                   |
| White                   | 106 (30%)   | 68 (30%)                  | 3 (18%)                    | 22 (35%)                   | 13 (27%)                   |
| Asian                   | 114 (32%)   | 69 (30%)                  | 8 (47%)                    | 24 (38%)                   | 13 (28%)                   |
| Latino                  | 66 (19%)    | 45 (20%)                  | 2 (12%)                    | 9 (14%)                    | 10 (21%)                   |
| Black                   | 38 (11%)    | 29 (13%)                  | 3 (18%)                    | 2 (3%)                     | 5 (11%)                    |
| Other                   | 30 (8%)     | 16 (7%)                   | 1 (6%)                     | 6 (10%)                    | 6 (13%)                    |
| Depression*             | 65 (18%)    | 20 (9%)**                 | 3 (18%)                    | 25 (40%)**                 | 17 (36%)**                 |
| Brooding*               | 2.36 (0.75) | 2.20 (0.71)               | 3.00 (0.89) <sup>a**</sup> | 2.56 (0.67) <sup>a**</sup> | 2.67 (0.71) <sup>a**</sup> |
| Reflection*             | 2.19 (0.74) | 2.06 (0.72)               | 2.36 (0.66)                | 2.35 (0.79) <sup>a**</sup> | 2.55 (0.65) <sup>a**</sup> |
| Distraction*            | 2.47 (0.58) | 2.55 (0.55)               | 2.40 (0.50)                | 2.36 (0.67)                | 2.27 (0.58) <sup>a**</sup> |
| Cognitive inflexibility | 9.34 (8.13) | 9.65 (8.56)               | 9.76 (6.82)                | 8.13 (5.43)                | 9.34 (9.39)                |

Note. NSSI = non-suicidal self-injury, SA = suicide attempt. Differences in gender, immigration status, race/ethnicity, and major depression diagnosis across self-harm groups were examined via Chi-square. Differences in cognitive response styles (brooding, reflection, distraction) and cognitive inflexibility were examined using t-tests with Bonferroni corrections for multiple comparisons. Differences from the reference group (no self-harm) on continuous variables are indicated with a superscripted (a). \* $p < .05$ , \*\* $p < .01$ .

or cognitive inflexibility among the Attempt-only, NSSI-only, and Both-NSSI + SA groups.

Pearson correlations were calculated to examine the bivariate associations among the cognitive response styles and depression. Brooding and reflection were both positively correlated, whereas distraction was negatively correlated, with screening positive for major depressive disorder in

the past year. Distraction was also negatively correlated with brooding, but positively correlated with cognitive inflexibility and reflection. Finally, brooding was positively correlated with reflection. Correlations are presented in Table 2.

A multinomial logistic regression analysis was conducted to examine whether cognitive response styles would differentially predict self-harm history, adjusting for

TABLE 2. Correlations among Cognitive Response Styles, Cognitive Inflexibility, and Major Depression

|                            | 1 | 2     | 3     | 4      | 5     |
|----------------------------|---|-------|-------|--------|-------|
| 1. Major depression Dx     | – | .30** | .17** | –.13** | –.03  |
| 2. Brooding                |   | –     | .35** | –.11** | .03   |
| 3. Reflection              |   |       | –     | .15**  | .00   |
| 4. Distraction             |   |       |       | –      | .14** |
| 5. Cognitive inflexibility |   |       |       |        | –     |

Note. \*\* $p < .01$ .

**TABLE 3. Odds Ratios for Self-Harm History by Cognitive Response Style, Adjusting for Gender and Major Depression Diagnosis**

|                         | Unadjusted odds ratio (95% CI) |                            |                           |
|-------------------------|--------------------------------|----------------------------|---------------------------|
|                         | NSSI only                      | SA only                    | Both (NSSI + SA)          |
| Reflection              | <b>1.57 (1.04–2.38)*</b>       | 1.71 (0.88–3.33)           | <b>2.33 (1.47–3.70)**</b> |
| Brooding                | 1.52 (1.00–2.32)               | <b>5.56 (2.49–12.43)**</b> | <b>1.94 (1.22–3.08)**</b> |
| Distraction             | 0.61 (0.37–1.02)               | 0.64 (0.26–1.58)           | <b>0.47 (0.26–0.84)**</b> |
| Cognitive inflexibility | 0.97 (0.93–1.02)               | 1.00 (0.95–1.06)           | 1.00 (0.96–1.04)          |

*Note.* NSSI = non-suicidal self-injury, SA = suicide attempt. No self-harm history was entered as the reference group for the outcome variable. Male was entered as the reference group for gender, and no major depression disorder in the past year was entered as the reference group for Major Depression diagnosis. \* $p < .05$ , \*\* $p < .01$ . Items in bold signify statistically significant values at  $p < .05$  or  $p < .01$ .

gender and for the presence of a major depressive disorder diagnosis in the previous year in both univariate (i.e., each cognitive variable was entered into its own separate analysis) and multivariate (i.e., all cognitive variables were entered simultaneously) models. After adjusting for other cognitive response styles in the multivariate models, many of the findings remained from the univariate models (see Tables 3 and 4). Each average unit increase in brooding was associated with over 5 times higher odds of endorsing history of SA-only ( $OR = 5.20$ , 95%  $CI = 2.23–12.11$ ), compared to individuals with no history of self-harm. Reflection, distraction, and cognitive inflexibility

were not statistically significant predictors of SA history. Each average unit increase in reflection was associated with higher odds of reporting a history of NSSI-only ( $OR = 1.61$ , 95%  $CI = 1.03–2.50$ ), and also a history of both NSSI and SA ( $OR = 2.53$ , 95%  $CI = 1.52–4.20$ ). Brooding and cognitive inflexibility were not statistically significant predictors of NSSI history. Finally, a higher level of distraction was associated with lower odds of reporting a history of NSSI-only ( $OR = 0.57$ , 95%  $CI = 0.33–0.98$ ) and a history of both NSSI/SA ( $OR = 0.38$ , 95%  $CI = 0.21–0.70$ ). In sum, brooding was uniquely associated with SA history, whereas reflection was uniquely

**TABLE 4. Multivariate Analyses for Self-Harm History by Cognitive Response Style, Adjusting for Gender and Major Depression Diagnosis**

|                         | Adjusted odds ratio (95% CI) |                            |                           |
|-------------------------|------------------------------|----------------------------|---------------------------|
|                         | NSSI only                    | SA only                    | Both (NSSI + SA)          |
| Female                  | 1.24 (0.61–2.52)             | <b>0.27 (0.09–0.82)*</b>   | 1.99 (0.80–4.95)          |
| Major depression        | <b>5.02 (2.43–10.38)**</b>   | 0.90 (0.21–3.79)           | <b>3.62 (1.60–8.17)**</b> |
| Reflection              | <b>1.61 (1.03–2.50)*</b>     | 1.24 (0.57–2.70)           | <b>2.53 (1.52–4.20)**</b> |
| Brooding                | 1.29 (0.82–2.02)             | <b>5.20 (2.23–12.11)**</b> | 1.45 (0.88–2.40)          |
| Distraction             | <b>0.57 (0.33–0.98)*</b>     | 0.59 (0.23–1.50)           | <b>0.38 (0.21–0.70)**</b> |
| Cognitive inflexibility | 0.97 (0.93–1.02)             | 1.00 (0.94–1.07)           | 1.00 (0.96–1.05)          |

*Note.* NSSI = non-suicidal self-injury, SA = suicide attempt. No self-harm history was entered as the reference group for the outcome variable. Male was entered as the reference group for gender, and no major depression disorder in the past year was entered as the reference group for Major Depression diagnosis. \* $p < .05$ , \*\* $p < .01$ . Items in bold signify statistically significant values at  $p < .05$  or  $p < .01$ .

associated with history of NSSI. Cognitive inflexibility, however, was not significantly associated with self-harm history.

## DISCUSSION

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The present study sought to investigate whether cognitive response styles (i.e., brooding, reflection, distraction) and cognitive inflexibility would distinguish individuals with and without a history of self-harm—more specifically, whether these cognitive characteristics would be differentially associated with specific types of self-harm history (i.e., NSSI only, SA only, or NSSI and SA). Contrary to predictions, cognitive inflexibility was not significantly associated with self-harm history. One possible explanation is that cognitive inflexibility is triggered as a state response to distress. Perhaps, as it relates to self-harm, cognitive inflexibility is not a static cognitive characteristic, but rather a temporary state marked by mental rigidity that reduces inhibitions against engaging in self-harm behaviors during a crisis. This notion would be consistent with a previous finding that among individuals who attempted suicide, those assessed immediately after their attempt exhibited more cognitive inflexibility than those assessed within 12 months of their most recent attempt (Perrah & Wichman, 1987). Since the present study assessed for lifetime history of self-harm behaviors and not recent history, we were unable to examine this possibility. Another possible explanation is that cognitive inflexibility may contribute to vulnerability to self-harm behavior, particularly SAs, among individuals at high risk. For instance, one study found no difference in cognitive inflexibility between young adults with and without a SA history, but found that cognitive inflexibility prospectively predicted suicidal ideation among young adults with a SA history, though not among those without a history

of SAs (Miranda, Gallagher, Bauchner et al., 2012). Future research should examine the ability of cognitive inflexibility to distinguish between NSSI and SAs over time.

As hypothesized, there were differences in cognitive response styles between young adults with and without a history of self-harm, as individuals reporting any history of self-harm reported higher levels of brooding, reflection, and lower levels of distraction. Further, as expected, brooding emerged as a more robust predictor of SAs than of NSSI. These findings are consistent with previous research suggesting that brooding is more strongly associated with a history of SAs in depressed patients than is reflection (Crane, Barnhofer, & Williams, 2007; Grassia & Gibb, 2009) and extend them to a nonclinical sample of young adults. Perhaps brooding engenders a complete resignation to distress by exacerbating the detrimental effects of unwanted negative thoughts and/or mood. In other words, brooding may foster distorted thinking that the negative affect is immutable and that no other resolution exists besides suicide. This idea is consistent with previous findings reporting that hopelessness mediated the relation between rumination and suicidal ideation (Miranda, Valderrama, Tsytses et al., 2013; Smith, Alloy, & Abramson, 2006), suggesting that rumination may increase risk for suicidality to the degree that it increases hopelessness. Additionally, Muehlenkamp and Gutierrez (2004) found that high school students with a history of SAs, independent of NSSI history, reported more negative attitudes toward life than students with a history of only NSSI. As proposed by Baumeister (1990), the finality of suicide may be perceived as the most appealing option to alleviate unwavering negative affect. Thus, the brooding form of rumination may be a more reliable risk factor for SAs than for NSSI among young adults.

As expected, reflective rumination emerged as a unique predictor of history of NSSI-only. This finding parallels that

of Hoff and Muehlenkamp (2009), who found that reflection, but not brooding, statistically predicted NSSI history after adjusting for depressive and anxiety symptoms. Unlike young adults who attempt suicide as a way to permanently escape a feeling of endless despair, individuals who engage in NSSI may, instead, be seeking an immediate resolution to address a negative mood or thought that is perceived as transient or temporary. Perhaps the tendency to seek a cause for one's depressed or negative mood may lead individuals to utilize NSSI as a problem-solving strategy, albeit destructive and maladaptive, to address unwanted thoughts or feelings (Nock & Prinstein, 2004; Nock, Prinstein, & Sterba, 2009). Thus, reflection may be a more reliable risk factor for NSSI than for SAs among young adults.<sup>1</sup>

It was also hypothesized that the inability to distract oneself with positive thoughts and behaviors would predict a history of self-harm, and this hypothesis was partially supported. Distraction was associated with lower odds of endorsing a history of NSSI-only and of endorsing a history of both NSSI and SA. However, distraction was not a significant predictor of SA history. Previous research suggests that NSSI may function to distract individuals from unwanted negative moods and thoughts (Najmi, Wegner, & Nock, 2007; Nock, Prinstein, & Sterba, 2009; Selby, Franklin, Carson-Wong et al., 2013) and that the ability to effectively distract is instrumental in thwarting NSSI (Nock, Prinstein, & Sterba, 2009). The present study expands on previous research by demonstrating that the tendency to distract with positive thoughts and/or behaviors is associated with lowered risk for having a history not only of NSSI-only but also of both NSSI and SAs. Though speculative, one possible explanation for this finding is that individuals who initially engage in NSSI as a form of distraction may, over time, become resigned to their negative

mood and seek escape by attempting suicide. This would be consistent with models of suicide that implicate NSSI as one possible way people acquire the ability to engage in suicidal behavior (Joiner, 2005).

#### Strengths, Limitations, and Future Directions

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Previous studies have found an association between the ruminative subtypes and self-harm behaviors—more specifically, brooding with SAs (Crane, Barnhofer, & Williams, 2007; Grassia & Gibb, 2009), and reflection with NSSI (Hoff & Muehlenkamp, 2009; Selby, Connell, & Joiner, 2010). However, no studies to date have investigated the subtypes of rumination jointly with NSSI and SAs. This study is the first of which we are aware to demonstrate that brooding is uniquely related to suicide attempts, while reflection is unique to NSSI, after adjusting for gender and major depression diagnosis. Additionally, this research lends support to previous findings that there may be circumstances under which reflection, typically considered a more adaptive form of rumination (Burwell & Shirk, 2007; Treynor, Gonzalez, & Nolen-Hoeksema, 2003), may not be adaptive (Miranda & Nolen-Hoeksema, 2007; Surrence, Miranda, Marroquín et al., 2009). This study also demonstrates differences between individuals who engage in both (SA and NSSI) and in individuals who engage in NSSI-only or SA-only. This distinction is critical to understanding self-harm and supports previous studies that have highlighted differences in risk factors associated with SAs, NSSI, and both (Andover, Morris, Wren et al., 2012; Taliaferro, Muehlenkamp, Borowsky et al., 2012). This study is also the first to date to empirically investigate the association between adaptive strategies of distraction and self-harm behaviors. Prior research

has suggested that individuals may engage in self-harm because they are unable to distract from their negative mood (Najmi, Wegner, & Nock, 2007; Nock, Prinstein, & Sterba, 2009). This study supports this idea by providing evidence that among young adults, distraction may be protective, specifically against engaging in both NSSI and SAs. Finally, another strength of this study is the ethnic diversity of the sample, allowing for a greater representation of racial/ethnic minority individuals, who are often underrepresented in research that examines risk for self-harm.

Despite these strengths, there are some limitations that should be noted. For instance, this study is cross-sectional, which does not allow for causal inference. Thus, it is unclear whether cognitive response styles influence self-harm behaviors, or inversely, whether self-harm behaviors influence response styles. Furthermore, examination of lifetime history of self-harm may be limited by biased recollections inherent in retrospective measurement. Longitudinal studies are warranted to determine the direction of the relation between cognitive response styles and self-harm behaviors. Future research should investigate the role that cognitive inflexibility plays in this relation, for instance, to determine whether a temporary state of cognitive rigidity differentially moderates the relation between cognitive response styles and self-harm behaviors (Baumeister, 1990). Another limitation of the study is an assessment of NSSI that did not inquire about intent to die, which makes it less clear whether participants who endorsed a history of NSSI may have actually made SAs, instead. To address this limitation, the methods listed for NSSI and SAs were cross-referenced, to eliminate any possible overlap. Finally, the disproportionate representation of female (74%) college students in the current sample may decrease the ability to generalize findings from this study to males and also to the general population

of young adults. Future research should examine whether other cognitive risk factors for self-harm, such as negative attributional style (see Guerry & Prinstein, 2010) and hopelessness (Taliaferro, Muehlenkamp, Borowsky et al., 2012), are unique in their associations with NSSI compared to SAs. Such cognitive characteristics may play an important role in the etiology of self-harm behaviors, and they thus warrant further attention. Finally, despite the racial/ethnic diversity of the present sample, between-group differences were not examined. Future research should examine whether the relation between cognitive response styles and self-harm would vary across racial/ethnic groups.

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### Concluding Comments

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This study expands our understanding of the cognitive characteristics that distinguish self-harm behaviors by demonstrating that brooding is uniquely associated with SAs, whereas reflection is uniquely associated with NSSI. Further, the ability to effectively distract from a negative mood may protect against engaging in NSSI, or both NSSI and SAs. This information expands our understanding of the cognitive response styles that are differentially associated with self-harm behaviors, which may inform prevention and intervention efforts to reduce risk of self-harm behaviors in young adults. Clinicians, for instance, might better identify young adults at risk for NSSI by assessing reflection and the ability to engage in adaptive distraction. Meanwhile, assessing for brooding may facilitate the identification of young adults at risk for suicide attempts.

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### NOTES

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1. One unexpected finding was that the odds of having a history of SA-only were lower among females than among males, adjusting for other variables. Given that this study oversampled individuals with a suicide attempt history, males included in the sample might be at higher risk for

engaging in suicide attempts than in the general population, thus explaining this finding.

## AUTHOR NOTES

Lillian Polanco-Roman, The Graduate Center, City University of New York, New York, USA.

Justyna Jurska and Victoria Quiñones, Hunter College, City University of New York, New York, USA.

Regina Miranda, Hunter College and The Graduate Center, City University of New York, New York, USA.

The authors declare there are no conflicts of interest to disclose.

Correspondence concerning this article should be addressed to Regina Miranda, Associate Professor, Department of Psychology, Hunter College, City University of New York, 695 Park Avenue, Room 611HN, New York, NY 10065. E-mail: regina.miranda@hunter.cuny.edu

## FUNDING

This research was funded by NIH Grant 5SC1 MH 091873 to Regina Miranda and by MBRS-RISE Grant GM060665. Thanks to Alyssa Wheeler, Valerie Khait, Soumia Cheref, Kaerensa Craft, Dalia Gefen, Nargus Harounzadeh, Matthew Kaplowitz, Amy Kephart, Giulia Landi, Robert Lane, Wendy Linda, Russell Marks, Jessica Silver, Lauren Uss, and Jorge Valderrama for their assistance with data collection.

## REFERENCES

- American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders*. 4th ed. Washington, DC: Author.
- Andover, M. S., Morris, B. W., Wren, A., & Bruzese, M. E. (2012). The co-occurrence of non-suicidal self-injury and attempted suicide among adolescents: Distinguishing risk factors and psychosocial correlates. *Child and Adolescent Psychiatry and Mental Health*, 6, 1–7.
- Bartfai, A., Winborg, I. M., Nordstrom, P., & Asberg, M. (1990). Suicidal behavior and cognitive flexibility: Design and verbal fluency after attempted suicide. *Suicide and Life-Threatening Behavior*, 20, 254–266.
- Baumeister, R. F. (1990). Suicide as escape from self. *Psychological Review*, 97, 90–113.
- Brausch, A. M., & Gutierrez, P. M. (2010). Differences in non-suicidal self-injury and suicide attempts in adolescents. *Journal of Youth and Adolescence*, 39, 233–242.
- Brown, M. Z., Comtois, K. A., & Linehan, M. M. (2002). Reasons for suicide attempts and non-suicidal self-injury in women with borderline personality disorder. *Journal of Abnormal Psychology*, 111, 198–202.
- Burwell, R., & Shirk, S. (2007). Subtypes of rumination in adolescence: Associations among brooding, reflection, depressive symptoms, and coping. *Journal of Clinical Child and Adolescent Psychology*, 36, 56–65.
- Chan, S., Miranda, R., & Surrence, K. (2009). Subtypes of rumination in the relationship between negative life events and suicidal ideation. *Archives of Suicide Research*, 13, 123–135.
- Chapman, A. L., Gratz, K. L., & Brown, M. Z. (2006). Solving the puzzle of deliberate self-harm: The experiential avoidance model. *Behaviour Research and Therapy*, 44, 371–394.
- Crane, C., Barnhofer, T., & Williams, J. M. G. (2007). Reflection, brooding, and suicidality: A preliminary study of different types of rumination in individuals with a history of major depression. *British Journal of Clinical Psychology*, 46, 497–504.
- Davis, R. N., & Nolen-Hoeksema, S. (2000). Cognitive inflexibility among ruminators and nonruminators. *Cognitive Therapy and Research*, 24, 699–711.
- Ellis, T. E., Berg, R. A., & Franzen, M. D. (1992). Neuropsychological performance and suicidal behavior in adult psychiatric inpatients. *Perceptual and Motor Skills*, 75, 639–647.
- Grassia, M., & Gibb, B. E. (2009). Rumination and lifetime history of suicide attempts. *International Journal of Cognitive Therapy*, 2, 400–406.
- Greve, K. W., Love, J. M., Sherwin, E., Mathias, C. W., Houston, R. J., & Brennan, A. (2002). Temporal stability of the Wisconsin Card Sorting Test in a chronic traumatic brain injury sample. *Assessment*, 9, 271–277.
- 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 & Adolescent Psychology*, 39, 77–89.
- Gutierrez, P. M., Osman, A., Barrios, F. X., & Kopper, B. A. (2001). Development and initial validation of the Self-Harm Behavior Questionnaire. *Journal of Personality and Assessment*, 77, 475–490.
- Heaton, R. K., Chelune, G. J., Talley, J. L., Kay, G. G., & Curtiss, G. (1993). *Wisconsin card sorting test manual: Revised and expanded*. Odessa, FL: Psychological Assessment Resources.
- 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.
- Joiner, T. (2005). *Why people die by suicide*. Cambridge, MA, US: Harvard University Press.
- Keilp, J. G., Gorlyn, M., Russell, M., Oquendo, M. A., Burke, A. K., Harkavy-Friedman, J., & Mann, J. J. (2013). Neuropsychological function and suicidal behavior: Attention control, memory and executive dysfunction in suicide attempt. *Psychological Medicine*, 43, 539–551.
- Kessler, R. C., Berglund, P., Borges, G., Nock, M., & Wang, P. S. (2005). Trends in suicide ideation, plans, gestures, and attempts in the United States, 1990–1992 to 2001–2003. *Journal of the American Medical Association*, 293, 2487–2495.
- Klonsky, E. D. (2007). The function of deliberate self-injury: A review of the evidence. *Clinical Psychology Review*, 27, 226–239.
- 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.
- Knowles, R., Tai, S., Christensen, I., & Bentall, R. (2005). Coping with depression and vulnerability to mania: A factor analytic study of the Nolen-Hoeksema (1991) Response Styles Questionnaire. *British Journal of Clinical Psychology*, 44, 99–112.
- Lezak, M. D., Howieson, D. B., Bigler, E. D., & Tranel, D. (2012). *Neuropsychological assessment* (5th edition). New York, NY: Oxford University Press.
- Martin, D. J., Oren, Z., & Boone, K. (1991). Major depressives' and dysthymics' performance on the Wisconsin Card Sorting Test. *Journal of Clinical Psychology*, 47, 684–690.
- Marzuk, P. M., Hartwell, N., Leon, A. C., & Portera, L. (2005). Executive functioning in depressed patients with suicidal ideation. *Acta Psychiatrica Scandinavica*, 112, 294–301.
- Miranda, R., Gallagher, M., Bauchner, B., Vaysman, R., & Marroquín, B. (2012). Cognitive inflexibility as a prospective predictor of suicidal ideation among young adults with a suicide attempt history. *Depression and Anxiety*, 29, 180–186.
- Miranda, R., & Nolen-Hoeksema, S. (2007). Brooding and reflection: Rumination predicts suicidal ideation at one-year follow up in a community sample. *Behaviour Research & Therapy*, 45, 3088–3095.
- Miranda, R., Valderrama, J., Tsypes, A., Gadol, E., & Gallagher, M. (2013). Cognitive inflexibility and suicidal ideation: Mediating role of brooding and hopelessness. *Psychiatry Research*, 201, 174–181.
- Moberly, N. J., & Watkins, E. R. (2008). Ruminative self-focus, negative life events, and negative affect. *Behaviour Research and Therapy*, 45, 1034–1039.
- Morrison, R., & O'Connor, R. C. (2008). A systematic review of the relationship between rumination and suicidality. *Suicide and Life-Threatening Behavior*, 38, 523–538.
- Muehlenkamp, J. J., & Gutierrez, P. M. (2004). An investigation of differences between self-injurious behavior and suicide attempts in a sample of adolescents. *Suicide and Life-Threatening Behavior*, 34, 12–23.
- 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, 1–14.
- Najmi, S., Wegner, D. M., & Nock, M. K. (2007). Thought suppression and self-injurious thoughts and behaviors. *Behaviour Research and Therapy*, 45, 1957–1965.
- Nock, M. K., Joiner, T. E. Jr., Gordon, K. H., Lloyd-Richardson, E., & Prinstein, M. J. (2006). Non-suicidal self-injury among adolescents: Diagnostic correlates and relation to suicide attempts. *Psychiatry Research*, 144, 65–72.
- Nock, M. K., & Kessler, R. C. (2006). Prevalence of and risk factors for suicide attempts versus suicide gestures: Analysis of the National Comorbidity Survey. *Journal of Abnormal Psychology*, 115, 616–623.
- 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., & Sterba, S. K. (2009). Revealing the form and function of self-injurious thoughts and behaviors: A real-time ecological

- assessment study among adolescents and young adults. *Journal of Abnormal Psychology*, *118*, 816–827.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*, *100*, 569–582.
- Nolen-Hoeksema, S., Larson, J., & Grayson, C. (1999). Explaining the gender difference in depressive symptoms. *Journal of Personality and Social Psychology*, *77*, 1061–1072.
- Nolen-Hoeksema, S., & Morrow, J. (1993). Effects of rumination and distraction on naturally occurring depressed mood. *Cognition and Emotion*, *7*, 561–570.
- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science*, *3*, 400–421.
- Patsiokas, A. T., Clum, G. A., & Luscomb, R. L. (1979). Cognitive characteristics of suicide attempters. *Journal of Consulting and Clinical Psychology*, *47*, 478–484.
- Perrah, M., & Wichman, H. (1987). Cognitive rigidity in suicide attempters. *Suicide and Life-Threatening Behavior*, *17*, 251–255.
- Prinstein, M. J. (2008). Introduction to the special section on suicide and nonsuicidal self-injury: A review of unique challenges and important directions for self-injury science. *Journal of Consulting and Clinical Psychology*, *76*, 1–8.
- Robinson, A. L., Heaton, R. K., Lehman, R. A., & Stilson, D. W. (1980). The utility of the Wisconsin Card Sorting Test in detecting and localizing frontal lobe lesions. *Journal of Consulting and Clinical Psychology*, *48*, 605–614. doi:10.1037/0022-006X.48.5.605
- Romine, C. B., Lee, D., Wolfe, M. E., Homack, S., George, C., & Riccio, C. A. (2004). Wisconsin Card Sorting Test with children: A meta-analytic study of sensitivity and specificity. *Archives of Clinical Neuropsychology*, *19*, 1027–1041.
- Schotte, D. E., & Clum, G. A. (1982). Suicide in a college population: A test of a model. *Journal of Consulting and Clinical Psychology*, *50*, 690–696.
- Schotte, D. E., & Clum, G. A. (1987). Problem-solving skills in suicidal psychiatric patients. *Journal of Consulting and Clinical Psychology*, *55*, 49–54.
- Schotte, D. E., Cools, J., & Payvar, S. (1990). Problem-solving deficits in suicidal patients: Trait vulnerability or state phenomenon? *Journal of Consulting and Clinical Psychology*, *58*, 562–564.
- Selby, E. A., Connell, L. D., & Joiner, T. E. (2010). The pernicious blend of rumination and fearlessness in non-suicidal self-injury. *Cognitive Therapy and Research*, *34*, 421–428.
- 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.
- 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*, 119–128.
- Shaffer, D., Fisher, P., Lucas, C., Dulcan, M., & Schwab-Stone, M. (2000). NIMH Diagnostic Interview Schedule for Children Version IV (NIMH DISC-IV): Description, differences from previous versions, and reliability of some common diagnoses. *Journal of the American Academy of Child & Adolescent Psychiatry*, *39*, 28–38.
- Smith, J. M., Alloy, L. B., & Abramson, L. Y. (2006). Cognitive vulnerability to depression, rumination, hopelessness, and suicidal ideation: Multiple pathways to self-injurious thinking. *Suicide and Life-Threatening Behavior*, *36*, 443–454.
- Surrence, K., Miranda, R., Marroquín, B., & Chan, S. (2009). Brooding and reflective rumination among suicide attempters: Cognitive vulnerability to suicidal ideation. *Behaviour Research and Therapy*, *47*, 803–808.
- Taliaferro, L. A., Muehlenkamp, J. J., Borowsky, I. W., McMorris, B. J., & Kugler, K. C. (2012). Factors distinguishing youth who report self-injurious behavior: A population-based sample. *Academic Pediatrics*, *12*, 205–213.
- Tan, Y., Zou, Y. Z., Qu, Y., & Guo, X. F. (2002). Stability of commonly used measures in the Wisconsin Card Sorting Test. *Chinese Mental Health Journal*, *16*, 831–833.
- Treynor, W., Gonzalez, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research*, *27*, 247–259.
- Tsuchiya, E., Oki, J., Yahara, N., & Fujieda, K. (2005). Computerized version of the Wisconsin Card Sorting Test in children with high-functioning autistic disorder or attention-deficit/hyperactivity disorder. *Brain and Development*, *27*, 233–236.
- Whitlock, J., Eckenrode, J., & Silverman, D. (2006). Self-injurious behavior in a college population. *Pediatrics*, *117*, 1939–1948.
- Whitlock, J., & Knox, K. L. (2007). The relationship between self-injurious behavior and suicide in a young adult population. *Archives of Pediatric and Adolescent Medicine*, *161*, 634–640.