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Psychiatric and Self-Injury Profiles of Adolescent Suicide Attempters versus Adolescents Engaged in Nonsuicidal Self-Injury

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Abstract

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To better delineate the unique correlates of self-injurious behaviors (SIB), psychiatric profiles of mutually exclusive groups of adolescents who made a suicide attempt (SA) versus those engaged in nonsuicidal self-injury (NSSI) were examined. Contrary to hypotheses, the NSSI group endorsed earlier onsets of SIB and suicidal ideation (SI), as well as higher rates of depression and anxiety compared with their SA counterparts. Future work is warranted to understand the role of SI, including duration of SI and anxiety in the development of NSSI, and to identify risk and resiliency factors useful in predicting an adolescent's SIB status.

Suicide is the third leading cause of death among 10- to 24-year-olds, and the prevalence of suicide increases sixfold from childhood to the end of adolescence (Centers for Disease Control and Prevention & National Center for Injury Prevention & Control, 2012). However, completed suicide attempts (SA) among adolescents are only the tip of the iceberg. According to the 2011 Youth Risk Behavior Surveillance survey, 16% of high school students seriously contemplated suicide during the past year, while 13% made a suicide plan, 8% attempted suicide, and 2% sought medical attention for their SA (Eaton et al., 2012).

Nonsuicidal self-injury (NSSI), defined as the deliberate destruction of one's body in the absence of intent to die (e.g., cutting, burning, or hitting oneself), is another serious and growing problem among teens with prevalence estimates ranging from 15% to 45% among community and clinical samples (Briere & Gil, 1998; Jacobson, Muehlenkamp, Miller, & Turner, 2008; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). For example, among youths psychiatrically hospitalized following an episode of self-injury, which per the International Classification of Diseases-9-CM includes both SA and NSSI, 4.3% engaged in NSSI in 1990 while 13.2% engaged in NSSI in 2000 (Olson, Gameroff, Marcus, Greenberg, & Shaffer, 2005).

While there is considerable overlap between these forms of self-injurious behavior (SIB; i.e., behaviors that are direct and deliberately cause self-harm), there are important differences between NSSI and SA in prevalence, frequency, and lethality (Hamza, Stewart, & Willoughby, 2012; Klonsky, May, & Glenn, 2013; Nock et al., 2006; Zetterqvist, Lundh, & Svedin, 2013). The primary distinction focuses on an individual's intent when acting; for example, a person taking 10 ibuprofen with at least some desire to die is an SA, while a person self-cutting multiple times to relieve tension would be NSSI (i.e., zero intent to die). As shown by Nock and Kessler's reanalysis of National Comorbidity Study (NCS) data, this distinction matters. When intent to die was required for an event to be classified as an SA, the apparent prevalence of SA decreased from 4.6% to 2.7% (Nock & Kessler, 2006).

Research comparing nonoverlapping samples of adolescents engaged in either SA or NSSI is needed to identify the unique correlates and predictors, as well as potential novel treatment targets, for each SIB. These data are particularly pertinent given the recent inclusion of NSSI disorder and suicidal behavior disorder in the *DSM-5* as separate conditions needing further study (American Psychiatric Association [APA], 2013).

To better characterize NSSI and SA phenomenology, both the overlap and differences, efforts have sought to describe their associated psychiatric profiles. Specifically, prior

studies have reported that adolescents engaged in SA or NSSI are characterized by high rates of major depressive disorder (MDD), anxiety disorders, disruptive behavior disorders, and substance use disorders (Ghaziuddin, King, Naylor, & Ghaziuddin, 2000; Jacobson et al., 2008; Nock et al., 2006). The majority of these studies though are limited because they assessed adolescents with one SIB to those with both SIB (e.g., NSSI only vs. NSSI+SA; Baetens, Claes, Muehlenkamp, Grietens, & Onghena, 2011; Brausch & Gutierrez, 2010; Csorba, Dinya, Plener, Nagy, & Pali, 2009; Dougherty et al., 2009; Guertin, Lloyd-Richardson, Spirito, Donaldson, & Boergers, 2001; Lloyd-Richardson et al., 2007; Ougrin et al., 2012) and thus are unable to identify factors that could differentiate SA and NSSI. To the best of our knowledge, only six currently published studies have compared adolescents engaged in NSSI only to SA only (Asarnow et al., 2011; Jacobson et al., 2008; Larsson & Sund, 2008; Muehlenkamp, Ertelt, Miller, & Claes, 2011; Muehlenkamp & Gutierrez, 2004, 2007). However, these studies are limited by factors including (1) reliance on retrospective chart review, (2) exclusive use of adolescent self-report, (3) assessment of current but not past psychopathology, and (4) inclusion of teens seeking treatment for a specific disorder (e.g., MDD).

To address these limitations and to advance what is known about potential differences in psychopathology and phenomenology between NSSI and SA, we evaluated multi-informant data in two mutually exclusive groups of adolescents receiving care for safety concerns rather than for a particular psychiatric disorder. Specifically, we compared psychiatrically hospitalized adolescents engaged in NSSI without any prior SA to psychiatrically hospitalized adolescents engaged in SA without any prior NSSI. It was hypothesized that the “pure” SA group would demonstrate greater impairment (i.e., higher rates of psychopathology, greater SI) than the “pure” NSSI group. The rationale for this hypothesis was based on the findings of Jacobson et al. (2008) who found higher rates of MDD and posttraumatic stress disorder among those with SA compared with NSSI, and the fact that an SA is life-threatening (i.e., completed with at least some intent to end one’s life) and therefore considered more severe behavior compared with NSSI and potentially associated with greater distress and emotion dysregulation.

METHODS

Participants

All adolescents were recruited from an inpatient psychiatric facility in the Northeast focused on providing short-term stabilization for youth presenting with safety concerns. Only hospitalized youth were included to avoid potential sample bias that might have occurred if adolescents were recruited from two different levels of care (e.g., enrolling SA from inpatient care and NSSI from outpatient care) and to study these teenagers in closest proximity to their SA/NSSI events.

Two mutually exclusive groups of adolescents aged 13–17 years were enrolled. SA participant inclusion criteria were adolescents who made an SA within the past 30 days and had a negative lifetime history of NSSI [62% female, $M_{\text{age}} = 15.3 (1.3)$, 69% Caucasian, 62% non-Hispanic]. An SA was defined as an action, regardless of actual resulting self-injury, completed with some intent to die (Bridge, Goldstein, & Brent, 2006). Intent was

based on the adolescent's self-report and/or inference from the SA lethality (Silverman, Berman, Sanddal, O'Carroll, & Joiner, 2007).

NSSI participant inclusion criteria were adolescents who engaged in NSSI with a minimum of one instance within the past 30 days and had a negative lifetime history of SA [84% female, $M_{\text{age}} = 14.9 (1.3)$, 84% Caucasian, 80% non-Hispanic]. NSSI was defined as the purposeful destruction of one's body tissue without the intent to die (Nock et al., 2006). NSSI participants were required to meet *DSM-5* criteria for NSSI disorder ("a condition for further study") in that they engaged in NSSI on at least 5 days within the past year (APA, 2013).

Adolescents engaged in both NSSI and SA were excluded because we sought to evaluate the unique association of these behaviors with psychopathology. Additional exclusion criteria for both groups were (1) the presence of current psychosis, (2) Wechsler Abbreviated Scale of Intelligence Full Scale IQ < 70 (WASI; Psychological Corporation, 2013), or (3) limited English fluency in the teenage participant, all of which might interfere with participants' understanding of study assessments. Adolescents with an autism spectrum disorder (ASD) were also excluded given literature suggesting SIB in children with an ASD may represent a distinct entity (Duerden et al., 2012).

Comparing demographic factors among SA and NSSI participants, there were no between-group differences in age [$t(88) = -1.48, p = .14$], race ($\chi^2 = 4.66, p = .46$), or ethnicity ($\chi^2 = 3.95, p = .05$). The groups differed by sex, with a significantly greater proportion of females in the NSSI group (84%, 38 females and 7 males) compared with the SA group (62%; 28 females and 17 males) ($\chi^2 = 5.68, p = .02$).

Procedure

Study staff conducted daily chart reviews to identify potential participants from among the adolescent psychiatric inpatients. Staff then met with potential participants and their guardian(s) to describe the study's goal of examining the behavioral/emotional similarities and differences between adolescents engaged in NSSI to those making an SA. Informed consent and assent were obtained from families wishing to enroll. Next, participants were interviewed about their SIB to confirm their SA or NSSI group status. If continuing to meet inclusion criteria, teen participants were administered the WASI and a psychiatric diagnostic interview, as well as completed self-report forms. Parents separately completed report forms regarding their adolescent's functioning. Study participation was separate from their clinical care and was completed during the adolescent's hospitalization. Participants were compensated for their time.

One hundred forty-six adolescents were identified as possible participants through daily chart review and provided information regarding the current study. Of the 147 teens, 19 declined participation and 127 consented (86%). Thirty-seven consenting adolescents were excluded from the current study due to incomplete data ($n = 5, 4\%$), withdrawn consent ($n = 3, 2\%$), comorbid NSSI and SA ($n = 21, 17\%$), not meeting inclusion criteria ($n = 8, 4\%$; e.g., SA was aborted or more than 6 months prior, insufficient NSSI, unclear intent),

resulting in a total sample of 90 participants (45 adolescents with SA, 45 with NSSI). The current study was approved by the hospital institutional review board.

Measures

To characterize the NSSI/SA behavior and psychopathology of participants, multi-informant assessment data were collected.

Self-Injury.—The Self-Injurious Thoughts and Behavior Interview (SITBI) is a 169-question structured assessment commonly used to ascertain the characteristics (i.e., incidence, frequency) of an individual's lifetime SI, suicide plans, suicide gestures, SA, and NSSI (Nock, Holmberg, Photos, & Michel, 2007). This interview was administered to confirm participant self-injury group status by trained, closely supervised bachelor's-level research assistants. The SITBI has shown excellent interrater reliability ($\kappa = .90$) and strong test-retest reliability ($\kappa = .70$ with the exception of $\kappa = .25$ for suicide gestures; Nock et al., 2007). Construct validity was also supported by past findings of positive correlations ($\kappa = .48-.74$) between the SITBI and other measures of self-injury, including items from the Schedule for Affective Disorders and Schizophrenia for School-Age Children – Present and Lifetime version (KSADS-PL; Kaufman et al., 1997) and Beck Scale for Suicide Ideation (BSS; Beck & Steer, 1991).

The BSS is a 19-item self-report measure assessing an individual's current attitudes toward suicide, related behaviors, and plans to commit suicide (Beck & Steer, 1991). Responses are rated from 0 to 2, with higher scores indicating higher levels of suicidality (total scores can range from 0 to 38). There are no official cutoff scores to delineate ideation severity. Findings demonstrate strong internal consistency (coefficient $\alpha = .90$ with adults and $.95$ with adolescents) and construct validity given significant correlations between the BSS and rating forms of depression, hopelessness, and anxiety ($r = .44-.63$; Steer, Kumar, & Beck, 1993). For the current study, the total score was used and Cronbach's alpha was $.92$.

Psychiatric Diagnoses and Symptoms.—The KSADS-PL is a semi-structured diagnostic interview intended to evaluate the current and past episodes of 33 psychiatric disorders as defined by the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV)*; APA, 2000; Kaufman et al., 1997). The KSADS-PL was administered to all adolescents by doctoral-level clinicians with high interrater reliability ($\kappa = .85$) for the current study. Test-retest reliabilities for present and lifetime diagnoses have been found in the good to excellent range ($\kappa = .63-1.00$), with strong interrater agreement on screening items and diagnoses (93%–100%). Adequate concurrent validity was also supported with strong correlations between the KSADS-PL and other rating scales of psychopathology, including the Child Behavior Checklist (CBCL; Achenbach, 1991), Children's Depression Inventory (Kovacs, 1985), and Conners Abbreviated Questionnaire (Conners & Barkley, 1985).

Due to logistical constraints of assessing an inpatient population (e.g., short lengths of stay, relatively limited access to family members), the KSADS-PL was not administered to parents. Instead, parents were asked to provide their report of adolescent functioning via the CBCL (Achenbach, 1991). The CBCL is a 117-item parent-report assessment of multiple

areas of a child's (ages 4–18 years) emotional and behavioral functioning (Achenbach, 1991). For this study, the total, internalizing, externalizing, and narrow-band clinical scales (e.g., anxious/depressed, aggressive behavior) were examined for possible group differences based on parent perception of adolescent functioning. The CBCL has acceptable psychometric properties (Achenbach & Rescorla, 2001). The total problems scale has excellent test–retest reliability ($r = .93$) and fair internal consistency ($\alpha = .68$), as well as excellent internal consistency, test–retest reliability, and cross-informant agreement for *DSM*-oriented scales (Achenbach, Dumenci, & Rescorla, 2003).

Analytic Plan

To address the study's aims, the following analyses were conducted. First, between-group differences on demographic factors were evaluated. Descriptive statistics were used to characterize the SIB for each group (e.g., methods used, frequency), comparing the NSSI and SA groups on shared variables (e.g., age of onset, reasons for acting). Second, between-group differences on measures of psychopathology were tested, including categorical (i.e., self-reported KSADS-PL diagnoses) and continuous (i.e., parent-reported CBCL) measures using chi-square comparisons and multivariate analysis of variance (MANCOVA), respectively. In all analyses comparing the NSSI and SA groups, sex was controlled for considering the significantly larger proportion of females in the former group. Third, a preliminary binary logistic regression to explore the power of the significant group differences found in diagnoses and symptoms was conducted. Specifically, variables indicated in previous analyses as significantly differentiating the NSSI and SA groups were entered as predictors of an adolescent's self-injury group status as either a NSSI or SA participant.

RESULTS

SIB Characteristics

Among SA participants ($N = 45$), the primary mechanism of SA was overdose ($n = 33$). Other methods included hanging ($n = 5$), suffocation ($n = 2$), entering traffic ($n = 2$), and a combination of methods ($n = 3$). SA participants reported a lifetime average of 1.5 ± 0.9 attempts (range = 1–5; 1.3 ± 0.8 attempts in last year), with average age of onset of first SA at 14.8 ± 1.4 years. While most reported that the index SA was their first ($n = 30$, 67%), seven had one prior attempt (16%), and five had more than one prior attempt (11%). Of the remaining three SA participants, data regarding lifetime SA are missing as they denied intent for the index SA. They were included in the study based on the seriousness of their behavior. Based on SITBI responses, reasons for attempting suicide for the index SA were to escape bad feelings or to feel something (75.6%), problems with peers/relationships/school (46.7%), problems with family members (40.0%), to get out of doing something or to get away from others (26.7%), and to get attention (8.9%).

Among adolescents with NSSI ($N = 45$), all engaged in self-cutting as their primary form of NSSI, but 42 (93.3%) endorsed secondary forms including burning or erasing skin, hitting oneself, and wound/skin picking. NSSI participants reported a modal lifetime frequency of 50+ NSSI events (modal frequency in past year = 1–10) with average age of onset of NSSI

at 13.2 ± 1.8 years. Per SITBI responses, reasons for engaging in NSSI were to escape bad feelings or to feel something (97.8%), problems with peers/relationships/school (68.9%), problems with family members (53.3%), to get out of doing something or to get away from others (6.7%), and to get attention (4.4%).

Group Differences in SIB Characteristics and Suicidal Ideation

There were significant differences in age of onset for self-injurious behavior per SITBI responses while controlling for sex, with NSSI participants engaging in NSSI at a younger age than SA participants made their first attempt, $F(1,84) = 15.40$, $p < .01$, *partial* $\eta^2 = .16$. There was no significant main effect for sex, $F(1,84) = 3.19$, $p = .08$, *partial* $\eta^2 = .04$. Reasons for engaging in NSSI/SA behavior also differed significantly, with NSSI participants significantly more likely than SA participants to engage in self-injury to cope with their current emotional state (i.e., to escape bad feelings or to feel something; $\chi^2 = 6.63$, $p = .01$, $\Phi = -.28$). Female participants, regardless of the SIB group, were also significantly more likely than males to endorse engaging in NSSI/SA behavior as means for coping with their current emotional state ($\chi^2 = 6.62$, $p = .01$, $\Phi = -.32$). In contrast, SA participants were significantly more likely to attribute their SIB as a method of escaping someone or something ($\chi^2 = 7.31$, $p = .01$, $\Phi = .29$) regardless of sex. Males, regardless of SIB group, were significantly more likely to endorse engaging in NSSI/SA as means for coping with peer/school problems than females ($\chi^2 = 4.54$, $p = .03$, $\Phi = -.44$). No other significant differences were found on motives for engaging in NSSI versus SA behavior.

There were no significant group differences in current suicidal ideation (SI) as assessed by BSS total scores while controlling for sex, $F(1,85) = 2.17$, $p = .14$, $M_{NSSI} = 13.2 \pm 8.1$, $M_{SA} = 10.7 \pm 7.9$. There was also no main effect for sex in current SI, $F(1,84) = 0.39$, $p = .54$, *partial* $\eta^2 = .01$. However, there was a significant between-group difference in age of onset for SI while controlling for sex, with the NSSI group endorsing earlier lifetime SI on the SITBI compared with the SA group, $F(1,81) = 8.03$, $p < .01$, *partial* $\eta^2 = .09$, $M_{NSSI} = 12.4 \pm 2.3$ years, $M_{SA} = 13.8 \pm 1.8$ years. There was no significant main effect for sex, $F(1,81) = 0.50$, $p = .48$, *partial* $\eta^2 = .01$.

Group Differences in Psychiatric Diagnoses and Symptoms

Given that psychopathology was evaluated using different measures among adolescents (KSADS-PL) and parents (CBCL), we first examined the relationship between adolescent and parent reports of psychopathology. We found significant point biserial correlations between adolescent report of psychiatric diagnoses and parent report of psychiatric symptoms emerged between the KSADS-PL generalized anxiety disorder (GAD) diagnosis and CBCL Anxiety Problems Scale ($r = .22$, $p < .05$); KSADS-PL ADHD diagnosis and CBCL Attention Deficit/Hyperactivity Problems Scale ($r = .26$, $p < .05$); and KSADS-PL ODD diagnosis and CBCL Oppositional Defiant Problems Scale ($r = .38$, $p < .01$). The correlation between the KSADS-PL MDD diagnosis and CBCL Affective Problems Scale approached significance ($r = .21$, $p = .06$).

With respect to between-group differences in adolescent-reported psychiatric diagnoses, NSSI participants were more likely than SA participants to meet KSADS-PL criteria for

current MDD ($\chi^2 = 5.87, p = .02, \Phi = -.26$), panic disorder ($\chi^2 = 5.87, p = .02, \Phi = -.26$), and GAD ($\chi^2 = 4.49, p = .03, \Phi = -.22$). NSSI participants were also more likely than SA participants to meet for past GAD ($\chi^2 = 5.40, p = .02, \Phi = -.25$) (Table 1). There were no other between-group differences in other current or past KSADS-PL diagnoses. Regardless then of SIB group, females were more likely than males to meet KSADS-PL criteria for current MDD ($\chi^2 = 4.76, p = .03, \Phi = -.27$) and panic disorder ($\chi^2 = 4.85, p = .03, \Phi = -.27$), as well as past panic disorder ($\chi^2 = 6.01, p = .01, \Phi = -.30$).

With respect to parent-reported psychiatric problems, a MANCOVA was conducted with parent-informant CBCL broadband and narrow-band scales. The overall model for group was significant, $F(11,75) = 3.03, p < .01$; *partial* $\eta^2 = .31$, while there was no significant main effect for sex, $F(11,75) = 1.06, p = .41$; *partial* $\eta^2 = .14$. Subsequent univariate analyses were consistent with adolescent-informant KSADS analyses. Specifically, the data showed that NSSI participants had greater total problems, greater internalizing problems, anxious/depressed symptoms, and withdrawn/depressed symptoms compared with SA participants. Parents also described NSSI participants as having more thought problems (Table 2).

Prediction of Group Status

Finally, to examine the utility of the variables identified thus far as distinguishing SA from NSSI in predicting SIB group status, an exploratory binary logistic regression analysis was performed with all participants. Group status (NSSI or SA) was the dependent variable and diagnoses (current MDD, current panic, current GAD, past GAD), symptoms (CBCL anxious/depressed, withdrawn/depressed, thought problems), and SIB characteristics (age of onset of SI, engaging in SIB to cope with current emotional state, engaging in SIB to escape) served as the predictor variables. The age of onset for NSSI or SA, although significantly different between groups, was not included in this prediction analysis given the confound with SIB group status. The full model significantly predicted group status [omnibus $\chi^2(df) = 41.57(10), p < .001$], accounting for 40% to 54% of the variance in self-injury group status (76.9% of the adolescents with NSSI and 73.8% of the adolescents with SA successfully predicted). As shown in Table 3, only engaging in SIB to escape reliably predicted group status on its own.

DISCUSSION

In the current study we evaluated the psychiatric profiles (i.e., current and past psychopathology and phenomenology) of mutually exclusive groups of adolescents engaged in either SA or NSSI. Contrary to our hypothesis, NSSI participants had higher levels of depression and anxiety than SA participants, as well as an earlier onset of SIB, earlier onset of SI, and different reasons for engaging in SIB. While we found that these diagnostic and symptom differences can be useful in understanding differences in the presentation of adolescents engaged in NSSI or SA, they are by no means sufficient. A prospective study would be required to differentially predict the onset of NSSI versus SA.

The finding that adolescents engaged in NSSI reported significantly earlier onset of their SIB aligns with several prior studies showing typical onset of NSSI between the ages of 12 to 14 years and of SA in later adolescence (Jacobson & Gould, 2007; Muehlenkamp &

Gutierrez, 2004; Nock & Prinstein, 2004; Ougrin et al., 2012). More-over, this finding is important because it suggests that not only are they at risk for a longer course of NSSI, but also for a future SA. Recently, Guan, Fox, and Prinstein (2012) found that a history of NSSI led to a sevenfold increase in risk for future SA, after controlling for past SA, sex, and depressive symptoms among high school students. Studies have also found that a longer history of NSSI was associated with a higher lifetime rate of SA (Asarnow et al., 2011; Nock et al., 2006). While our data are cross-sectional and cannot speak to causality or prediction, taken together, findings to date suggest a temporal relationship between NSSI and SA. Future research is thus warranted to evaluate an adolescent's trajectory of SIB and not simply their current functioning.

The NSSI group also reported significantly earlier onset of SI compared with the SA group, despite no group difference in current SI. This is similar to Muehlenkamp and Gutierrez (2004), who found comparable levels of current SI among high school students engaged in NSSI or SA. However, we are unaware of other studies attempting to differentiate NSSI from SA on the timing of their SI. Previous work suggests that SI at its worst (i.e., most severe in lifetime) serves as a better predictor of future SA compared with current SI among adults seeking outpatient psychiatric treatment (Beck, Brown, Steer, Dahlsgaard, & Grisham, 1999). While important to acknowledge that SI does not always lead to SA—that thoughts do not necessarily lead to behavior—results suggest that assessment should encompass not only current SI, but its course of development since onset. Data from our sample demonstrating that adolescents engaged in NSSI have suicidal thoughts for a longer duration (earlier life-time onset) than adolescents who attempt suicide raises two important questions for further study. First, what are the predictors that identify which teens engaged in NSSI go on to act on these thoughts of suicide and make an SA? And second, how can such risk/predictive factors be identified and employed by clinicians to ultimately guide treatment decisions, such as the need for specific cognitive approaches directed toward ideation?

Beyond qualitative differences in form (i.e., with or without intent) and quantitative differences in age of onset of self-injury, the findings highlight differences in the function of NSSI and SA. Although coping with negative emotions was the most common motivation for both types of self-injury, a greater proportion of those with NSSI endorsed it, consistent with Nock and Prinstein's (2004) four-factor model that highlights the automatic/intrapersonal functions of NSSI. Other work also discusses relief from negative emotions as the most common reason individuals engage in NSSI (Klonsky & Olino, 2008). In contrast, SA participants were more likely to endorse their attempt as an escape from someone or something (interpersonal/social function) compared with NSSI participants. This is consistent with previous findings that showed adolescents with SA as more likely to make an attempt to stop negative thoughts and to see whether others loved them (Baetens et al., 2011). Klonsky and Olino (2008) found that adults who cut themselves for an automatic/intrapersonal function were characterized by greater SI compared with those cutting for social functions.

In addition to considering behavior motives by SIB group while controlling for sex, the main effects of sex on motives seem equally important to consider. Specifically, there were main

effects of sex such that females regardless of SIB group were more likely than males to endorse their SIB as a method of coping with current emotions. Males then, regardless of SIB group, were more likely to endorse their SIB as a method of coping with peer/school problems. Such understanding of the reasons individuals engage in self-injury should guide more targeted intervention approaches. For example, it may be that SIB interventions (either NSSI or SA) focus more on management of emotional distress with females and more on management of social problems with males. SA interventions then might emphasize skills needed to tolerate distress and curb avoidant behavior with both males and females.

Interestingly, while both groups experienced depression and anxiety, inconsistent with our hypothesis, NSSI participants endorsed significantly more current MDD and panic disorder (PD), as well as current and past GAD, and parents of NSSI participants reported greater global impairment and more anxiety/depressive symptoms. These findings may, in part, be explained by the greater proportion of females represented in the overall sample. Specifically, while there was no main effect of sex on parent symptom ratings, females regardless of SIB group were more often diagnosed than males with current MDD, current PD, and past PD. Prior work has shown an inconsistent relationship between psychopathology and adolescents engaged in either SA or NSSI. For example, Muehlenkamp and Gutierrez (2004) found comparable levels of teen-reported depression and anxiety symptoms among a community sample of adolescents engaged in NSSI only versus SA only. In contrast, other studies have found differences, but these differences were in the opposite direction of those in the current study. For example, Brausch and Gutierrez (2010) found adolescents who had made a SA versus those engaged in NSSI within a community sample to have more depressive symptoms and SI. Jacobson et al. (2008) also found adolescent inpatients who made a SA to have more MDD and PTSD compared with those engaged in NSSI. These diagnostic differences, however, were eliminated after controlling for the characteristics of their self-injurious behavior (e.g., frequency, time since onset). Future efforts to understand the psychiatric profiles of adolescents engaged in NSSI or SA must then consider not only the form of self-injury endorsed but also the function and duration. For the latter, it will be important for researchers to consider time since onset of SIB (either NSSI or SA) as results in the current study may be explained by a NSSI group characterized by longer durations of self-injury and a SA group characterized by few multiple attempters.

The link between anxiety and SIB deserves further probing given findings that both NSSI and SA groups were most characterized by depression and anxiety, but also differentiated by current and past diagnoses of GAD while controlling for sex. Further focus should be given to the relationship between earlier onset of anxiety and earlier onset of SI in the development of NSSI and perhaps future SA. Nock, Hwang, Sampson, and Kessler's (2010) work supports this line of inquiry. In reanalyzing NCS data, findings showed the presence of severe anxiety and poor impulse control best predicted which individuals with SI went on to a SA. Moreover, while Wilkinson, Kelvin, Roberts, Dubicka, and Goodyer (2011) found that both future NSSI and SA were associated with greater baseline NSSI, future NSSI was uniquely associated with the presence of an anxiety disorder, female gender, and younger age (while future SA was uniquely associated with poor family functioning). The finding that past GAD differentiates participants with NSSI versus SA in our sample, along with

their engaging in self-injury earlier and initiating SI at a younger age, suggests greater strides are needed for better, earlier detection. For instance, it may be that future interventions for youth with GAD routinely incorporate psychoeducation and ongoing assessment of SIB.

Finally, with the goal of earlier detection and prevention of NSSI and SA, efforts are needed to understand how group differences can be used in the real world to characterize risk. We predicted the self-injury status for more than 70% of participants (76% NSSI, 73% SA). However, this model only accounted for 40% to 54% of the variance in status, further emphasizing the need to examine comprehensive models beyond mood and anxiety diagnoses or symptoms, and SIB characteristics (e.g., SIB age of onset, SI age of onset, motives). Our findings particularly highlight the potential role of certain self-injury characteristics; namely, engaging in SIB to escape people or activities (vs. to cope with one's current emotions) in predicting risk. Future research should examine how diagnoses, symptoms, and self-injury characteristics (intent, age of onset, SI, reasons for acting) develop over time and interact to increase an individual's risk of NSSI and SA.

Our study has several limitations. First, the data are cross-sectional. Prospective studies are needed to understand how the identified group differences in diagnoses, symptoms, and self-injury characteristics change throughout development and interact to predict NSSI and SA. Second, due to feasibility issues, we used different methods for assessing psychopathology. Doctoral-level clinicians with established interrater reliability completed KSADS-PL interviews with adolescents, while parents completed CBCL. We found significant correlations between these two methods; however, future studies should consider administering the KSADS-PL to both informants. Relatedly, we did not systematically collect the specific reasons for hospitalization beyond knowing that all teens admitted for inpatient psychiatric care presented with safety concerns including self-injurious thoughts and behaviors. Reasons for admission might assist in explaining the unexpected findings that the NSSI group was more impaired (more depression and anxiety, and longer durations of SIB and SI) than the SA group. That is, it may take a lower level of acuity to be admitted for suicidal ideation if an adolescent has a history of a recent suicide attempt than if an ideator has a recent history of NSSI. Future studies assessing details regarding reasons for admission including the medical severity of both NSSI and SA are indicated. Third, there was a greater proportion of females represented in the overall sample, as well as a significant sex difference between the NSSI and SA groups such that there was an even greater proportion of females in the former. Future efforts are warranted to explore the role of sex on SIB with larger samples, particularly with better representation of males. However, important to note is that the current overrepresentation of females in both groups, especially the NSSI group, may best represent (and therefore, generalize) to the adolescents of interest; that is, those engaged in NSSI and those attempting versus completing suicide (Hamza et al., 2012; Spirito & Esposito-Smythers, 2006).

Finally, it is possible that these data are limited by Berkson's (selection) bias. Specifically, Berkson argued that hospital samples are inherently biased as the probability for being hospitalized differs related to an individual's disease (Vineis, 2002). Within the current study, then, it is theoretically possible that SA and NSSI participants were subject to a

between-group bias in criteria for admission. For example, the occurrence of an SA might have been sufficient for admission, whereas more was needed (e.g., greater psychosocial impairment) to admit an NSSI participant, thus biasing the conclusion that NSSI participants had greater psychopathology than SA participants. In contrast, it is possible that Berkson's bias does not apply because all participants were selected equally. That is, they were admitted to the same inpatient psychiatric facility due to safety concerns after an evaluation that deemed their current functioning as seriously impaired, a requirement needed to justify the hospitalization (i.e., GCAS score ≥ 30 ; Schaffer et al., 1983). Furthermore, while Berkson's bias needs consideration, we deliberately enrolled psychiatric inpatients to assess adolescents within temporal proximity to the index SIB event and to avoid the alternative of selection bias inherent in evaluating psychopathology in different levels of care (inpatient SA vs. outpatient NSSI). Additional study is warranted to address this potential bias by comparing adolescents in multiple settings (e.g., adolescents with NSSI and SA from inpatient, outpatient, and primary care). Further study is also warranted to ascertain potential synergistic effects seen in a comparison group engaged in both NSSI and SA.

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TABLE 1

KSADS-PL Diagnoses for the NSSI and SA Groups

Diagnosis Type—Current	NSSI Group (n = 45) n (%)	SA Group (n = 45) n (%)	F value or η^2	p value
Major depression	41 (91)	32 (71)	5.87	.02*
Mania	0 (0)	1 (2)	1.01	.32
Panic	13 (29)	4 (9)	5.87	.02*
Specific phobia	5 (11)	7 (16)	0.39	.53
Separation anxiety	1 (2)	0 (0)	1.01	.32
Obsessive-compulsive	2 (4)	1 (2)	0.35	.56
Posttraumatic stress	5 (11)	6 (13)	0.11	.75
Generalized anxiety	17 (38)	8 (18)	4.49	.03*
Social anxiety	7 (16)	8 (18)	0.08	.78
ADHD inattentive	4 (9)	2 (4)	0.71	.40
ADHD hyperactive	0 (0)	0 (0)	—	—
ADHD combined	1 (2)	2 (4)	0.35	.56
Oppositional defiant	6 (13)	6 (13)	0.00	1.00
Conduct	4 (9)	3 (7)	0.16	.69
Anorexia	3 (7)	0 (0)	3.11	.08
Bulimia	3 (7)	0 (0)	3.11	.08
Alcohol abuse	2 (4)	1 (2)	0.35	.56
Cannabis abuse	6 (13)	2 (4)	2.20	.14
Diagnosis Type—Past				
Major depression	28 (62)	20 (44)	2.86	.09
Mania	1 (2)	2 (4)	0.35	.56
Panic	10 (20)	4 (9)	3.05	.08
Specific phobia	7 (16)	9 (20)	0.30	.58
Separation anxiety	0 (0)	0 (0)	—	—
Obsessive-compulsive	4 (9)	2 (4)	0.71	.40
Posttraumatic stress	3 (7)	4 (9)	0.16	.69
Generalized anxiety	14 (31)	5 (11)	5.40	.02*

	NSSI Group (n = 45)	SA Group (n = 45)	F value or η^2	p value
Social anxiety	6 (13)	8 (18)	0.34	.56
ADHD inattentive	2 (4)	2 (4)	0.00	1.00
ADHD hyperactive	1 (2)	0 (0)	1.01	.32
ADHD combined	1 (2)	2 (4)	0.35	.56
Oppositional defiant	6 (13)	8 (18)	0.34	.56
Conduct	3 (7)	7 (16)	1.80	.18
Anorexia	0 (0)	0 (0)	–	–
Bulimia	1 (2)	1 (2)	0.00	1.00
Alcohol abuse	1 (2)	1 (2)	0.00	1.00
Cannabis abuse	3 (7)	2 (5)	0.21	.65

NSSI, nonsuicidal self-injury; SA, suicide attempt.

* $p < .05$

** $p < .01$.

TABLE 2

CBCL Symptoms for the NSSI and SA Groups

CBCL Clinical Scales ^a	NSSI Group (n = 45) Mean (SD)	SA Group (n = 45) Mean (SD)	F value or χ^2	p value	Partial η^2
Total problems	68.4 (8.2)	63.8 (8.7)	6.41	.01**	.07
Internalizing problems	71.2 (7.1)	65.0 (10.1)	12.98	.00**	.13
Externalizing problems	61.5 (10.8)	61.6 (9.8)	0.01	.91	–
Anxious/depressed	71.6 (10.9)	63.4 (14.4)	10.86	.00**	.11
Withdrawn/depressed	70.5 (8.4)	63.6 (9.7)	14.12	.00**	.14
Somatic complaints	66.9 (10.0)	63.2 (10.2)	2.26	.13	–
Social problems	62.4 (7.9)	59.8 (7.8)	2.03	.15	–
Thought problems	69.6 (7.4)	64.7 (8.0)	9.88	.00**	.10
Attention problems	63.0 (8.4)	61.5 (10.0)	0.30	.58	–
Rule-breaking behavior	63.6 (8.8)	61.9 (8.1)	0.58	.45	–
Aggressive behavior	61.5 (10.9)	62.2 (10.9)	0.13	.71	–

CBCL, child behavior checklist; NSSI, nonsuicidal self-injury; SA, suicide attempt.

* $p < .05$

** $p < .001$.

^aFor the Clinical CBCL Scales, scores: < 65 are normal, 65–70 are borderline, and > 70 are clinical.

TABLE 3

Binary Logistic Regression for Predicting Self-Injury Group Status

	β	Wald	df	p value	Exp(β)	95% CI for Exp(β)	
						Lower	Upper
Predictor variables							
Age of onset SI	0.27	2.23	1	.14	1.31	.92	1.85
Cope with current emotions	-20.20	0.00	1	.99	0.00	.00	-
Escape	2.65	6.02	1	.01*	14.17	1.71	117.77
KSADS-PL							
Current MDD	1.82	2.56	1	.11	6.14	.67	56.63
Current panic	1.48	3.06	1	.79	1.35	.15	12.16
Current GAD	0.30	0.07	1	.64	1.75	.17	18.59
Past GAD	0.46	0.16	1	.69	1.59	.16	15.74
CBCL							
Anxious/depressed	-0.03	0.85	1	.36	0.97	.90	1.04
Withdrawn/depressed	-0.04	0.76	1	.38	0.96	.87	1.06
Thought problems	-0.03	0.25	1	.61	0.97	.88	1.08

SI, self-injury; CBCL, child behavior checklist; GAD, generalized anxiety disorder; MDD, major depressive disorder.