Psychological Trauma: Theory, Research, Practice, and Policy
2016, Vol. 8, No. 5, 618–625

1942-9681/16/$12.00 http://dx.doi.org/10.1037/tra0000139

Compensatory Self-Injury: Posttraumatic Stress, Depression, and the Role of Dissociation

John Briere
University of Southern California

Erin M. Eadie
Hospital for Sick Children, Toronto, Ontario, Canada

Objective: Despite a number of studies, the reasons for self-injurious behavior (SIB) have yet to be clearly specified. Using path analysis, we sought to test the hypothesis that exposure to adverse events produces depression and posttraumatic stress, which in turn motivate dissociation that, when at high levels, supports the use of SIB. ***Method:*** A sample of 679 adults (54% female, mean age = 53 years) were recruited from the general population by a national survey company, and administered measures evaluating posttraumatic stress, depression, dissociation, and SIB. ***Results:*** A total of 4.3% of participants reported some level of SIB within the prior 6 months. Younger age, exposure to adverse events, posttraumatic stress, depression, and dissociation were all related to SIB by univariate analyses. Path analyses revealed that although adverse events predicted posttraumatic stress and depression, which were then associated with SIB, these paths to SIB were no longer significant once dissociation was entered into the model, indicating full mediation. ***Conclusion:*** Rather than arising directly from posttraumatic stress or depression, SIB may occur most proximally in response to dissociation, with the pain associated with SIB potentially serving to interrupt or titrate unwanted hypoarousal and numbing. Clinicians should consider specifically targeting dissociation and its adversity-related antecedents when treating SIB.

Keywords: self-injury, self-mutilation, dissociation, posttraumatic stress, depression

Self-injurious behavior (SIB) can be defined as self-focused bodily harm that is not suicidal in nature and is not directly related to social or cultural phenomena (see Connors, 1996; Nock & Favazza, 2009; and Yates, 2004; for related definitions). The lifetime prevalence of at least one episode of SIB is thought to range from 5% to 15% in the general population (see reviews by N. B. Smith, Kouros, & Meuret, 2014; and Yates, 2004), with considerably higher rates among adolescents and young adults, as well as in clinical groups (e.g., Dixon-Gordon, Tull, & Gratz, 2014; Hilt, Cha, & Nolen-Hoeksema, 2008).

A review of the literature indicates that most clinical or empirical explanations for SIB tend to revolve around three types of motivations: *compensatory*, involving SIB to reduce emotional distress through activities that distract from or terminate negative internal states (e.g., Brown, Comtois, & Linehan, 2002; Osuch, Noll, & Putnam, 1999); *interpersonal*, involving the use of SIB to control others, gain attention, or communicate suffering (e.g., Hilt et al., 2008; Klonsky & Glenn, 2008); and *biological*, reflecting attempts to normalize altered neurobiology, for example self-injury in autism spectrum disorders or to stimulate endogenous opioids or increase levels of serotonin (e.g., Simeon et al., 1992; Van der Kolk, 1989). Because SIB is probably multiply determined, however, these three categories likely overlap (Yates, 2004).

Of these, the most common form of self-injury appears to be compensatory SIB (Chapman, Gratz, & Brown, 2006; Connors, 1996; Simeon & Favazza, 2001; N. B. Smith et al., 2014), defined for the purposes of this article as self-injurious behavior, often involving self-cutting, self-burning, or self-hitting, that is specifically invoked to reduce—or distract from—painful internal states or triggered distress. In one example, Briere and Gil (1998) found in a sample of chronically self-injuring participants that 77% reported a desired reduction in negative emotional states, including fear, emptiness, loneliness, and sadness following SIB, and an increase in relief and shame. Similarly, in a number of other studies, individuals report using SIB as a way to reduce emotional distress (e.g., Brown et al., 2002; Ford & Gómez, 2015; Klonsky & Glenn, 2008). In fact, even biological or social/behavioral explanations for SIB may sometimes involve distress reduction. For example, the reported goals of SIB in many of these instances, whether normalizing sensory aberrations in autism, increasing dysphoria-reducing neurochemistry, or addressing loneliness or alienation, may be compensatory to the extent that they involve attempts to alter or reduce negative states. Nevertheless, given the complexity of self-injury, and the range of definitions and (overlapping) motivations ascribed to it in the literature, we have chosen to refer to the broad phenomenon as SIB, per se, when reviewing the literature, since it is difficult to separate different types of

This article was published Online First April 14, 2016.

John Briere, Department of Psychiatry and Behavioral Sciences and Department of Psychology, Keck School of Medicine, University of Southern California; Erin M. Eadie, Suspected Child Abuse and Neglect Program and Department of Psychology, Hospital for Sick Children, Toronto, Ontario, Canada.

John Briere receives royalties from the Trauma Symptom Inventory—2 used in this study.

Correspondence concerning this article should be addressed to Erin M. Eadie, Department of Psychology, Hospital for Sick Children, 555 University Avenue, Toronto, Ontario, M5G 1X8 Canada. E-mail: drerineadie@gmail.com

motivations based on published reports. On the other hand, because we were interested in compensatory SIB, the study reported here focused specifically on this form of self-harm.

Across definitions of SIB, the most cited environmental risk factor is exposure to trauma (e.g., Ford & Gomez, 2015; Gratz, Conrad, & Roemer, 2002), especially child abuse (Glassman, Weierich, Hooley, Deliberto, & Nock, 2007; Kaess et al., 2013), although other adverse experiences also have been linked to SIB, including parent–child attachment disturbance (Lyons-Ruth, Bureau, Holmes, Easterbrooks, & Brooks, 2013), childhood emotional neglect (Dubo, Zanarini, Lewis, & Williams, 1997), psychological maltreatment (Glassman et al., 2007), and perceived family or peer invalidation (Yen et al., 2015). In addition, a number of potentially aversive states or disorders have been linked to SIB, including autistic spectrum disorders (Minshawi et al., 2014), borderline personality disorder (Brodsky, Cloitre, & Dulit, 1995), and depression in some studies (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006; Webermann, Myrick, Taylor, Chasson, & Brand, 2015) but not in others (e.g., Crowell et al., 2012). Especially highlighted in this literature, however, is the potential role of posttraumatic stress and trauma-related dissociation, which have been regularly linked to SIB (Briere & Gil, 1998; Dixon-Gordon et al., 2014; Ford & Gómez, 2015; N. B. Smith et al., 2014; Webermann et al., 2015; Zlotnick, Donaldson, Spirito, & Pearlstein, 1997).

The connection between adverse experiences, current psychological distress, and compensatory SIB is hypothesized by some to reflect the extent to which the former lead to emotional suffering that, when overwhelming, must be reduced or distracted from (Briere & Scott, 2014; Ford & Gomez, 2015; Klonsky, 2007). As a result, the association between adverse experiences and SIB may be mediated by negative emotions or symptomatology (Connors, 1996; N. B. Smith et al., 2014), since not all of those who are exposed to adverse events experience significant negative outcomes (Agaibi & Wilson, 2005). In support of this notion, for example, Shenk, Noll, and Cassarly (2010) found that posttraumatic stress symptoms mediated the relationship between childhood maltreatment and SIB, indicating that it was the extent to which maltreatment produced distress, not some aspect of the maltreatment itself, that resulted in SIB.

Interestingly, there is accumulating evidence that those who engage in SIB endorse more dissociative symptoms (often depersonalization and derealization) than those without SIB (Connors, 1996; Ford & Gómez, 2015; N. B. Smith et al., 2014; Zlotnick et al., 1997). At first glance, this may appear counterintuitive, since dissociation itself is often described as a mechanism for decreasing awareness of painful internal states (Dorahy & van der Hart, 2015; Lanius, Brand, Vermetten, Frewen, & Spiegel, 2012). Yet other research and anecdotal reports suggest that dissociation also can be an aversive experience (Chapman et al., 2006; N. B. Smith et al., 2014), one that may motivate subsequent self-injury (Briere & Gil, 1998; Connors, 1996; Klonsky, 2007). In this context, we hypothesized that SIB might represent the use of pain-inducing activities by the individual to reorient or "wake up" from the unwanted effects of numbing, depersonalization, or derealization. In fact, the effectiveness of SIB-related pain as a way of altering such experiences is described in various self-injury support websites (e.g., http://www.lifesigns.org.uk), and implied in popular songs, with lyrics such as "I hurt myself today, to see if I still feel. I focus on the pain, the only thing that's real" (*Hurt*; Reznor, 1994).

In partial support of this hypothesis, Franzke, Wabnitz, and Catani (2015) found that dissociation, but not posttraumatic stress or depression, mediated the relationship between a history of child maltreatment and lifetime history of SIB in 87 women in a psychiatric hospital. Although the outcome variable in this study was lifetime—as opposed to recent—self-injury (the mean age of participants with a history of SIB was 38.8 years, and the mean age at last SIB was 24.8 years), these findings suggest that there may be something specific about dissociation, above and beyond other symptoms, that is uniquely associated with SIB. However, because potential causal paths from posttraumatic stress and depression to dissociation were not evaluated, these findings do not inform our hypothesis that dissociation might arise in response to posttraumatic stress and depression, as opposed to occurring simultaneously.

To the extent that dissociation addresses negative emotional states, it likely occurs at a later temporal point than the onset of adversity-related distress, and logically antedates the use of SIB to reduce its effects. Based on the studies described previously, as well as clinical experience, we hypothesized that the etiology of SIB might involve a relatively complex relationship between initiating events (e.g., adverse experiences of various types), immediate outcomes (e.g., depression, early posttraumatic stress), and coping responses that, nevertheless, have their own aversive consequences (e.g., dissociation). However, robust statistical analysis of the relationship between these antecedent variables and low-frequency events such as SIB seemingly demands multivariate methodologies such as path analysis, and samples larger than those typically found in the SIB literature. In addition, research on the relationship between current symptoms and SIB requires study of relatively recent self-harm, that is, behavior occurring within the same general time frame as those symptoms posited to be etiologically related. Yet this condition is frequently not met; studies often assess for a lifetime history of SIB and then correlate it with current symptomatology, an approach that discourages causal interpretations.

Finally, although the study of self-injury in clinical samples has the advantage of higher SIB prevalence, and sometimes more direct relevance to clinicians working with this phenomenon, clinical studies often involve a sampling bias toward variables more commonly seen in help-seeking populations (Cohen & Cohen, 1984; Schuster & Powers, 2005), including exposure to adverse events and comorbidity with various psychological disorders. These phenomena may influence the results of SIB studies in various undetermined ways, as may other unmonitored variables that determine who does and does not become a mental health client.

Given these concerns, the present study used an existing, relatively large sample of participants from the general population, for whom there were data on SIB that had occurred within the prior 6 months, past exposure to adverse events, and current reports of posttraumatic stress, depression, and dissociation. We hypothesized a causal model in which, although younger age, exposure to an adverse event, posttraumatic stress, depression, and dissociation would be univariately related to SIB, adverse experience would not be associated with SIB once depression and posttraumatic stress were taken into account, and depression and posttraumatic stress,

in turn, would not be related to SIB once dissociation was included in the model. Dissociation, however, would continue to be linked to SIB.

Method

The current study was conducted with archival data from the Trauma Symptom Inventory—2 (TSI-2; Briere, 2011) normative sample, with permission from the test publisher, Psychological Assessment Resources (PAR). This sample was stratified by PAR to represent the U.S. general population for individuals between 18 and 90 years, as defined by the 2007 U.S. Census for age, gender, race/ethnicity, educational attainment, and geographic region.

Demographics, the Posttraumatic Stress Disorder (PTSD) Checklist (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993), a question on exposure to adverse events, and responses to the TSI-2 were collected via the world wide web. Respondents were anonymously recruited through a national survey sampling company employed by PAR. Individuals were excluded from the standardization sample if they were currently (a) incarcerated, (b) residing in an inpatient medical or psychiatric facility, (c) undergoing psychiatric care for schizophrenia or some other psychotic disorder, or (d) unable to comprehend English or read at the third-grade level. PAR did not have access to names or other identifying information and the survey company did not have access to the responses. All responses were kept anonymous and confidential. The first 720 individuals who were not subject to exclusion criteria participated in the standardization process. Of these, 679 had nonmissing data on all study variables and constituted the current sample. The specific number of individuals who were aware of the study through the World Wide Web but did not choose to participate is unknown to the test publisher, and thus the response rate cannot be calculated. The University of Southern California Institutional Review Board approved the analysis of the deidentified data from the TSI-2 normative sample.

Participants

The modal gender of this sample was female (54%), and the mean age was 53.4 years ($SD = 18.3$). Most participants defined themselves as non-Hispanic Caucasian (73%), followed by Black/African American (11%), Hispanic (9%), and Asian and other (7%). The majority graduated from high school (32%), with the rest completing less than high school (15%), some college (27%), or college or beyond (26%). Nineteen percent reported being single/never married, 55% were either married or cohabiting with their romantic partner, 13% were divorced or separated, and 13% were widowed.

Measures

The TSI-2 (Briere, 2011) is a revised version of the Trauma Symptom Inventory (TSI; Briere, 1995), a commonly used, standardized self-report measure of trauma-related symptoms and behaviors (Elhai, Gray, Kashdan, & Franklin, 2005). The TSI-2 consists of 12 clinical scales, each composed of 10 items. Responses reflect the frequency of self-reported symptoms over the previous 6 months, rated on a scale of 0 (*never*) to 3 (*often*). It assesses a variety of symptom clusters, ranging from anxiety, depression, and posttraumatic stress to dissociation and dysfunctional behavior, and demonstrates test–retest reliability, internal consistency, and various forms of validity (Briere, 2011). The TSI-2 Depression scale was used to tap depressive symptoms, such as negative mood and associated cognitions, in the present study, whereas the Dissociation scale was used to measure dissociative phenomena such as depersonalization and derealization, which can be defined as separation or estrangement from self, and from reality, respectively (e.g., Briere & Scott, 2014). In the TSI-2 standardization sample, and hence the current one, the Depression and Dissociation scales were internally consistent, with alpha coefficients of .94 and .86, respectively. Compensatory SIB was assessed based on a TSI-2 item which asks respondents to indicate how often over the prior six months they had engaged in "Intentionally hurting yourself (for example, by scratching, cutting, or burning) as a way to stop upsetting thoughts or feelings," using a 4-point scale ranging from 0 (*never*) to 3 (*often*). Exposure to an adverse event was broadly measured by participants' yes/no response to the question "At any time in your life, have you experienced a trauma or a very upsetting event?" appended to the end of the TSI-2 items. Participants were not asked to indicate the specific events to which they had been exposed.

The PCL is a commonly used 17-item self-report measure of posttraumatic stress. Respondents indicate on a scale ranging from 1 (*not at all*) to 5 (*extremely*) how much they have been bothered by a symptom over the past month, based on their exposure to an unspecified traumatic event. The psychometric qualities of the PCL total score has been investigated in many studies, and has been shown to be reliable (alphas typically above .75) and predictive of *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) PTSD (Wilkins, Lang, & Norman, 2011). In the current analysis, the PCL total score was used to index posttraumatic stress, and had an alpha reliability of .93.

Statistical Analyses

Analyses were conducted in three steps. First, simple correlations were obtained for all study variables, in order to determine their univariate interrelationship. Second, a robust path analysis, using Amos 21.0 (IBM Corp., 2012), was run to test the hypothesis that exposure to a trauma or very upsetting event would not predict SIB once depression and posttraumatic stress were controlled for, but that age, posttraumatic stress, and depression would continue to be predictive. We further hypothesized correlated error terms between posttraumatic stress and depression, in order to account for the significant comorbidity between these two variables in the clinical literature (e.g., Brady, Killeen, Brewerton, & Lucerini, 2000). A final path analysis was then conducted to determine whether, as hypothesized, dissociation mediated the direct effects of depression and posttraumatic stress on SIB. See Figure 1 for the integrated conceptual model tested by these analyses.

Path analysis estimates simultaneous relationships among study variables to determine the extent to which the hypothesized model fits the observed data. Because the variables in the present study were either dichotomous (gender, exposure to adverse events) or otherwise not normally distributed (age, posttraumatic stress, depression, dissociation, and SIB), the Bollen-Stine method was used. This method involves the use of bootstrapping to calculate an adjusted p value for the chi-square test statistic when nonnormal

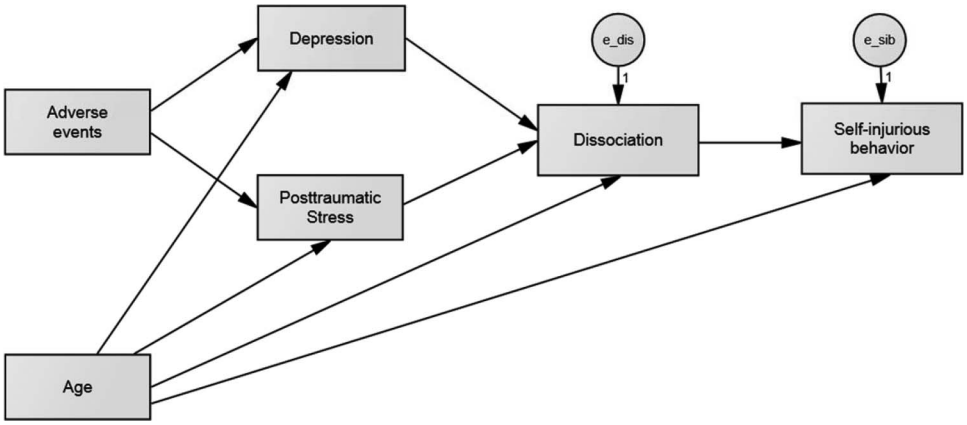

Figure 1. Integrated conceptual model of the relationship among demographics, exposure to trauma/very upsetting event, posttraumatic stress, depression, dissociation, and self-injurious behavior.

data are used (Bollen & Stine, 1992). Several indices were used to assess whether the hypothesized models fit the observed data: good fit is indicated by a nonsignificant chi-square value (Hoyle, 1995), a chi-square to degrees of freedom ratio (χ^2/df; Bollen, 1989) of less than 3.0, a comparative fit index (CFI; Bentler, 1990) of .95 or higher, and a root-mean-square error of approximation (RMSEA; Steiger, 1990) value of less than .06.

Results

Overall, 220 participants (32.4%) indicated that they had been exposed to a trauma or a very upsetting event at some point in their lives. A total of 4.3% of participants ($n = 23$) reported having engaged in compensatory SIB in the prior 6 months.

As indicated in Table 1, simple correlation analysis revealed that SIB, participant age, exposure to an adverse event, posttraumatic stress, depression, and dissociation were all significantly related. Participant gender, however, was related only to depression. Cross-tabulation analysis indicated that SIB varied as a function of age, $\chi^2(3) = 30.68$, $p < .001$, Cramer's $V = .21$, with SIB reported by 16% of 18–21 year olds, 13.8% of 22–30 year olds, 5.2% of 31–50 year olds, and 1.5% of those older than age 50. Post hoc analyses indicated no differences in SIB rates between the first two age groups, but significant ($p < .05$) differences between 18- and 30-year-olds, 31- to 50-year-olds, and those ages 50 years or older.

Table 1
Correlations Between Predictor Variables and Self-Injurious Behavior

Variable	1	2	3	4	5	6	7
1. Age	—	.04	−.07	−.22**	−.27**	−.25**	−.21**
2. Gender		—	.04	.04	−.05	.12**	.04
3. Trauma/upsetting event			—	.33**	.23**	.25**	.10*
4. Posttraumatic stress				—	.75**	.80**	.27**
5. Dissociation					—	.75**	.30**
6. Depression						—	.26**
7. Self-injurious behavior							—

* $p < .05$ (two-tailed). ** $p < .01$ (two-tailed).

The first path analysis evaluated the hypothesis that younger age and exposure to a trauma or a very upsetting event would predict posttraumatic stress and depression, and that posttraumatic stress and depression, with correlated error terms, would be associated with SIB. This model yielded an excellent fit to the data, $\chi^2(2, N = 679) = 3.51$ $p = .173$, $\chi^2/df = 1.76$, CFI = .99, RMSEA = .03, 90% confidence interval [CI] [.00, .09], Bollen-Stein $p = .160$, and explained 10% of the variance in SIB. As hypothesized, there were significant paths from adverse events to posttraumatic stress and depression, and the error terms for these two variables was significantly related ($p < .001$). However, although the path from posttraumatic stress to SIB was significant, this was not true for depression, which was multivariately unrelated to SIB. In addition, age was significantly related to posttraumatic stress, depression, and SIB (see Figure 2).

The second path analysis examined the same variables as did the first analysis, except that dissociation was added as a potential mediator. This mediation model was an excellent fit to the data, $\chi^2(3, N = 679) = 6.30$ $p = .285$, $\chi^2/df = 1.26$, CFI = .99, RMSEA = .02, 90% CI [.00, .07], Bollen-Stein $p = .297$, explaining 11% of the variance in SIB. Significant paths were found from adverse events to both posttraumatic stress and depression, from posttraumatic stress and depression to dissociation, and from dissociation to SIB. However, the path from posttraumatic stress to SIB identified in the first path analysis was no longer significant once dissociation was included in the model ($\beta = .07$, $p = .28$), indicating full mediation. Younger age predicted posttraumatic stress, depression, dissociation, and SIB, even when all variables were considered simultaneously. See Figure 3 for this integrated model.

Discussion

The current study sought to address a number of challenges in the existing self-injury literature by examining recent SIB in a relatively large sample of nonclinical participants, using both univariate and multivariate procedures. Univariate correlation analyses indicated that younger age and exposure to an adverse event are associated with posttraumatic stress, depression, and dissociation; depression is also associated with gender; and expo-

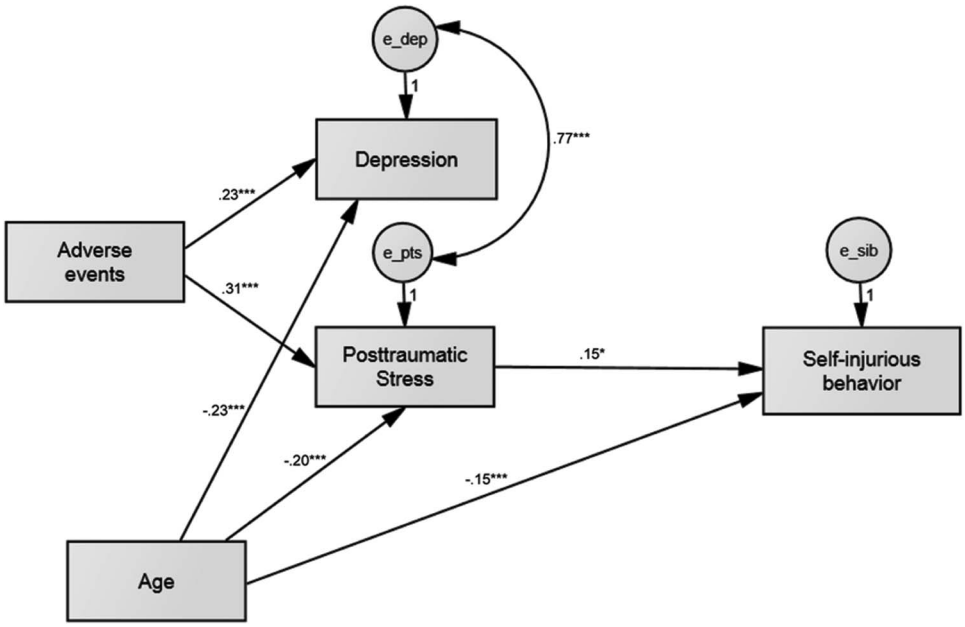

Figure 2. Path model of the relationships among demographics, exposure to trauma/very upsetting event, posttraumatic stress (e_pts), depression (e_dep), and self-injurious behavior (e_sib) (nonsignificant paths deleted from figure but not from analysis). * $p < .05$. *** $p < .001$.

sure to adverse events, posttraumatic stress, dissociation, depression, and younger age are related to SIB. These findings generally agree with the previously reviewed literature on the potential effects of adverse events, as well as with studies on the antecedents to SIB.

Initial path analysis supported our hypothesis that younger age and posttraumatic stress would have direct effects on SIB at the multivariate level, although it did not find the hypothesized link between depression and SIB. The full mediational analysis, however, revealed direct paths from both posttraumatic stress and depression to dissociation, and indicated that neither posttraumatic stress nor depression was related to SIB once dissociation was taken into account. Together, these findings suggest that adverse events may lead to both posttraumatic stress and depression, which, in turn, may have indirect effects on SIB through their shared association with dissociation. Because there was no direct path from depression to SIB in the first path analysis, it could not be mediated by dissociation in the second analysis. Nevertheless,

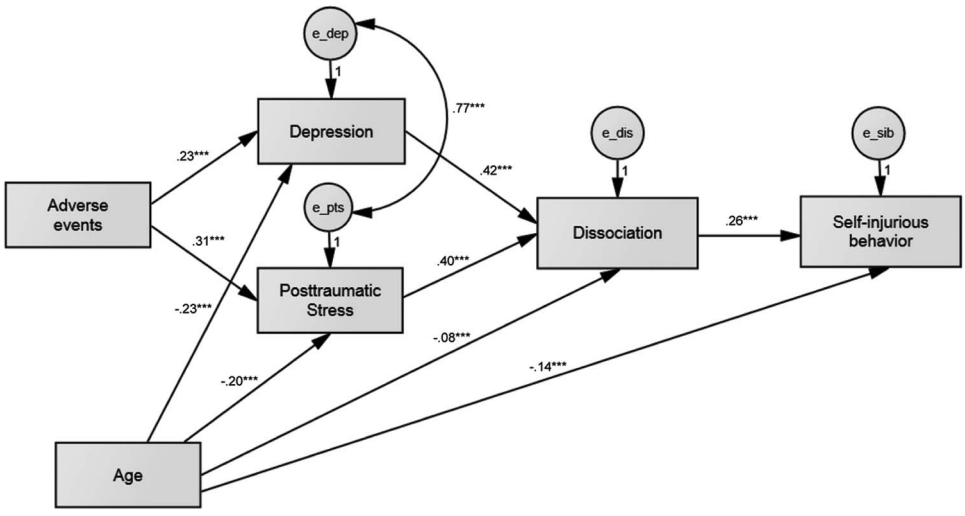

Figure 3. Final path model of the relationships among demographics, exposure to trauma/very upsetting event, posttraumatic stress (e_pts), depression (e_dep), dissociation (e_dis), and self-injurious behavior (e_sib) (nonsignificant paths deleted from figure but not analysis). *** $p < .001$.

the significant paths in the mediation model from both posttraumatic stress and depression to dissociation, and from dissociation to SIB indicate indirect effects of both depression and posttraumatic stress on SIB (see Mathieu & Taylor, 2006, for a discussion of indirect effects in the absence of mediation). Although not proving causality, these findings suggest that the mixed results of previous studies evaluating depression and SIB may be due, in part, to the complexity of these relationships: depression does not appear to directly lead to SIB, yet it may increase the probability of self-injury by motivating dissociation, which is related to SIB.

Although it appears that dissociation may reduce posttraumatic stress and depression, it, itself, can be distressing, potentially leading to feelings of loss of control, anxiety associated with depersonalization and estrangement from reality, and unwanted experiences of numbness or deadened feelings (Briere & Gil, 1998; Klonsky, 2007). We speculate that the negative side effects of dissociation may then be compensated or titrated by an additional avoidance strategy, namely SIB. By inducing physical pain, self-injury may serve to upregulate excessive hypoarousal; reorient the individual to the current environment and thus away from overwhelming feelings of depersonalization or derealization; and generate a sense of control and agency by virtue of having successfully used an avoidance strategy. Notably, however, clinical experience suggests that a minority of those engaging in SIB report an absence of physical pain during self-injury. It is possible that such occasions reflect the especially powerful effects of severe dissociation, such that actions that would normally be experienced as painful (e.g., cutting, burning) are not perceived as such. Unfortunately, when pain is the desired goal of SIB, it is possible, although not empirically documented, that an absence of pain during SIB might motivate even more intense self-injury.

The finding that posttraumatic stress is linked to SIB through its relationship to dissociation may be relevant to the recently introduced *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM–5*) diagnosis of PTSD with dissociative symptoms (American Psychiatric Association, 2013). This PTSD subtype has been shown to be associated with greater symptom complexity and, possibly, a more difficult clinical course (Dorahy & van der Hart, 2015; Lanius et al., 2012). Given the apparent role of dissociation in self-injury, one aspect of this increased complexity may be a greater likelihood of comorbid SIB. Perhaps apropos of this, the *DSM–5* now notes that the diagnostic features of PTSD include "self-injurious or suicidal behavior" (American Psychiatric Association, 2013, p. 276) as part of the hyperarousal criterion.

Although modern compensatory models of SIB implicate negative emotionality in the genesis of SIB, they do not specify posttraumatic stress, depression, or dissociation as the only relevant forms of distress. Other phenomena not evaluated in this study also might motivate SIB, such as shame, the dysregulated neurobiology of autism spectrum disorders, early attachment insecurity effects on the need for proximity and attention, or insufficient serotonin levels, as cited earlier. Whether these states, too, would be mediated by dissociation is unknown. It is possible that any aversive internal state, if sufficiently overwhelming, might result in SIB, possibly irrespective of the presence or absence of co-occurring dissociation. One hypothesis, as yet untested, is that adversity-related symptoms (e.g., posttraumatic stress and depression, in the present study) can have indirect effects on SIB through their relationship with dissociation, whereas potentially less trauma-specific reactions (e.g., insecure attachment-related emptiness or need for relational validation) might involve pathways that do not necessarily include dissociation.

Limitations

Because the sampling approach used by the test publisher involved the common practice of terminating data collection once all demographic groups approximate general population proportions, the actual response rate of participants of this study is unknown. Although the sample was stratified to match the demographics of the general population, a lower participation rate may have resulted in sample bias associated with one or more unmonitored variables. As well, the retrospective, cross-sectional nature of this study increases the possibility that participants' reports of exposure to a trauma or a very upsetting life event were influenced or distorted by the passage of time. It also precludes definitive conclusions about the direction or form of causality in this study, since path analyses only test the extent to which the data fit a priori hypotheses about cause, effect, and mediation. Finally, the SIB variable used in the present research consisted of a single, albeit detailed, item. Future research should use a more comprehensive, multi-item assessment of SIB, including the various methods of self-injury used and their frequency.

Importantly, participants in the present study were asked about exposure to an undefined trauma or some other very upsetting event. This item potentially included adverse events not considered traumatic in *DSM–5* (American Psychiatric Association, 2013), and required the respondent to subjectively define "trauma" and a "very upsetting" event. Given that participants in the present study reported a 32% prevalence of adverse events, as opposed to studies indicating a rate greater than 50% for *DSM*-defined trauma exposure (e.g., Kessler et al., 1995; Norris, 1992), it appears that at least some individuals did not consider all *DSM–5* traumas to be, in fact, traumatic or "very upsetting." Although not a limitation in the study of self-reported adverse event effects, the findings of this study should not be interpreted as necessarily generalizable to the specific effects of *DSM*-level traumas.

Clinical Implications

These findings have several implications for the treatment of SIB. First, they suggest that self-injury should be investigated in those who report significant posttraumatic stress, depressive, or dissociative symptoms. Second, it appears that dissociation may be a critical downstream target in the remediation of SIB. This does not mean that those with SIB should not be treated for comorbid posttraumatic stress or depression, or for life-threatening correlates such as suicidality, only that interventions for compensatory SIB may be especially helpful to the extent that they also target dissociation when it is present.

These results suggest that compensatory self-injury may be addressed by interventions that supplant or reduce the client's need to interrupt unwanted dissociation with SIB. These include emotion regulation interventions, such as relaxation training, mindfulness skills development, grounding activities, and trigger management, all of which have been suggested for the treatment of dissociation, SIB, or both (e.g., Briere & Scott, 2014; Brown et al., 2002; Klonsky, 2007; Linehan, 1993). In such instances, an im-

proved affect regulation repertoire might significantly lessen the client's adversity-related dysphoria, and thus the need to invoke dissociation and other avoidance responses (Ford & Gómez, 2015; Linehan, 1993).

Finally, by reducing posttraumatic stress and depression, psychological interventions such as exposure therapy (Foa, Hembree, & Rothbaum, 2007), cognitive processing (Resick & Schnicke, 1993), and interpersonal therapy (Markowitz et al., 2015) might interrupt or diminish the cascade of responses that potentially lead to SIB (N. B. Smith et al., 2014). In fact, several studies suggest that emotional or cognitive processing of posttraumatic stress or depression can be helpful in the treatment of SIB (e.g., Brown et al., 2002; Slee, Garnefski, van der Leeden, Arensman, & Spinhoven, 2008), and some clinicians recommend medications that target posttraumatic stress and depression in the treatment of self-injury (e.g., B. D. Smith, 2005).

Notably, the possibility that some individuals employ both dissociation and SIB as ways to manage distress suggests the possibility of a homeostatic dynamic, whereby dissociation is first invoked to reduce adversity-related distress, and SIB is used to titrate dissociation to the point that it is tolerable, yet still effective. This possibility suggests that treatment approaches to SIB should not just reduce dissociation, which, if effective, might result in an upsurge of (suddenly unregulated) distress, but should process the antecedents of dissociative phenomena, as well.

References

Agaibi, C. E., & Wilson, J. P. (2005). Trauma, PTSD, and resilience: A review of the literature. *Trauma, Violence, & Abuse, 6,* 195–216. http://dx.doi.org/10.1177/1524838005277438

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107,* 238–246. http://dx.doi.org/10.1037/0033-2909.107.2.238

Bollen, K. A. (1989). *Structural equations with latent variables*. Oxford, UK: Wiley. http://dx.doi.org/10.1002/9781118619179

Bollen, K. A., & Stine, R. A. (1992). Bootstrapping goodness-of-fit measures in structural equation models. *Sociological Methods & Research, 21,* 205–229. http://dx.doi.org/10.1177/0049124192021002004

Brady, K. T., Killeen, T. K., Brewerton, T., & Lucerini, S. (2000). Comorbidity of psychiatric disorders and posttraumatic stress disorder. *Journal of Clinical Psychiatry, 61* (Suppl. 7), 22–32.

Briere, J. (1995). *Trauma Symptom Inventory (TSI)*. Odessa, FL: Psychological Assessment Resources.

Briere, J. (2011). *Trauma Symptom Inventory—2 (TSI-2)*. Odessa, FL: Psychological Assessment Resources.

Briere, J., & Gil, E. (1998). Self-mutilation in clinical and general population samples: Prevalence, correlates, and functions. *American Journal of Orthopsychiatry, 68,* 609–620. http://dx.doi.org/10.1037/h0080369

Briere, J., & Scott, C. (2014). *Principles of trauma therapy: A guide to symptoms, evaluation, and treatment* (2nd ed., DSM–5 update). Thousand Oaks, CA: Sage.

Brodsky, B. S., Cloitre, M., & Dulit, R. A. (1995). Relationship of dissociation to self-mutilation and childhood abuse in borderline personality disorder. *American Journal of Psychiatry, 152,* 1788–1792. http://dx.doi.org/10.1176/ajp.152.12.1788

Brown, M. Z., Comtois, K. A., & Linehan, M. M. (2002). Reasons for suicide attempts and nonsuicidal self-injury in women with borderline personality disorder. *Journal of Abnormal Psychology, 111,* 198–202. http://dx.doi.org/10.1037/0021-843X.111.1.198

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. http://dx.doi.org/10.1016/j.brat.2005.03.005

Cohen, P., & Cohen, J. (1984). The clinician's illusion. *Archives of General Psychiatry, 41,* 1178–1182. http://dx.doi.org/10.1001/archpsyc.1984.01790230064010

Connors, R. (1996). Self-injury in trauma survivors: 1. Functions and meanings. *American Journal of Orthopsychiatry, 66,* 197–206. http://dx.doi.org/10.1037/h0080171

Crowell, S. E., Beauchaine, T. P., Hsiao, R. C., Vasilev, C. A., Yaptangco, M., Linehan, M. M., & McCauley, E. (2012). Differentiating adolescent self-injury from adolescent depression: Possible implications for borderline personality development. *Journal of Abnormal Child Psychology, 40,* 45–57. http://dx.doi.org/10.1007/s10802-011-9578-3

Dixon-Gordon, K. L., Tull, M. T., & Gratz, K. L. (2014). Self-injurious behaviors in posttraumatic stress disorder: An examination of potential moderators. *Journal of Affective Disorders, 166,* 359–367. http://dx.doi.org/10.1016/j.jad.2014.05.033

Dorahy, M. J., & van der Hart, O. (2015). *DSM–5*'s posttraumatic stress disorder with dissociative symptoms: Challenges and future directions. *Journal of Trauma & Dissociation, 16,* 7–28. http://dx.doi.org/10.1080/15299732.2014.908806

Dubo, E. D., Zanarini, M. C., Lewis, R. E., & Williams, A. A. (1997). Childhood antecedents of self-destructiveness in borderline personality disorder. *Canadian Journal of Psychiatry, 42,* 63–69.

Elhai, J. D., Gray, M. J., Kashdan, T. B., & Franklin, C. L. (2005). Which instruments are most commonly used to assess traumatic event exposure and posttraumatic effects? A survey of traumatic stress professionals. *Journal of Traumatic Stress, 18,* 541–545. http://dx.doi.org/10.1002/jts.20062

Foa, E. B., Hembree, E. A., & Rothbaum, B. O. (2007). *Prolonged exposure therapy for PTSD: Emotional processing of traumatic experiences: Therapist guide*. New York, NY: Oxford University Press. http://dx.doi.org/10.1093/med:psych/9780195308501.001.0001

Ford, J. D., & Gómez, J. M. (2015). The relationship of psychological trauma and dissociative and posttraumatic stress disorders to nonsuicidal self-injury and suicidality: A review. *Journal of Trauma & Dissociation, 16,* 232–271. http://dx.doi.org/10.1080/15299732.2015.989563

Franzke, I., Wabnitz, P., & Catani, C. (2015). Dissociation as a mediator of the relationship between childhood trauma and nonsuicidal self-injury in females: A path analytic approach. *Journal of Trauma & Dissociation, 16,* 286–302. http://dx.doi.org/10.1080/15299732.2015.989646

Glassman, L. H., Weierich, M. R., Hooley, J. M., Deliberto, T. L., & Nock, M. K. (2007). Child maltreatment, non-suicidal self-injury, and the mediating role of self-criticism. *Behaviour Research and Therapy, 45,* 2483–2490. http://dx.doi.org/10.1016/j.brat.2007.04.002

Gratz, K. L., Conrad, S. D., & Roemer, L. (2002). Risk factors for deliberate self-harm among college students. *American Journal of Orthopsychiatry, 72,* 128–140. http://dx.doi.org/10.1037/0002-9432.72.1.128

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. http://dx.doi.org/10.1037/0022-006X.76.1.63

Hoyle, R. H. (1995). *Structural equation modeling: Concepts, issues, and applications*. Thousand Oaks, CA: Sage.

IBM Corp. (2012). IBM SPSS Amos for Windows (Version 21.0) [Computer software]. Meadville, PA: Author.

Kaess, M., Parzer, P., Mattern, M., Plener, P. L., Bifulco, A., Resch, F., & Brunner, R. (2013). Adverse childhood experiences and their impact on frequency, severity, and the individual function of nonsuicidal self-injury in youth. *Psychiatry Research, 206,* 265–272. http://dx.doi.org/10.1016/j.psychres.2012.10.012

Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry, 52,* 1048–1060. http://dx.doi.org/10.1001/archpsyc.1995.03950240066012

Klonsky, E. D. (2007). The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review, 27,* 226–239. http://dx.doi.org/10.1016/j.cpr.2006.08.002

Klonsky, E. D., & Glenn, C. R. (2008). Psychosocial risk and protective factors. In M. K. Nixon & N. Heath (Eds.), *Self-injury in youth: The essential guide to assessment and intervention* (pp. 45–58). New York, NY: Routledge.

Lanius, R. A., Brand, B., Vermetten, E., Frewen, P. A., & Spiegel, D. (2012). The dissociative subtype of posttraumatic stress disorder: Rationale, clinical and neurobiological evidence, and implications. *Depression and Anxiety, 29,* 701–708. http://dx.doi.org/10.1002/da.21889

Linehan, M. M. (1993). *Cognitive–behavioral treatment of borderline personality disorder*. New York, NY: Guilford Press.

Lyons-Ruth, K., Bureau, J. F., Holmes, B., Easterbrooks, A., & Brooks, N. H. (2013). Borderline symptoms and suicidality/self-injury in late adolescence: Prospectively observed relationship correlates in infancy and childhood. *Psychiatry Research, 206,* 273–281. http://dx.doi.org/10.1016/j.psychres.2012.09.030

Markowitz, J. C., Petkova, E., Neria, Y., Van Meter, P. E., Zhao, Y., Hembree, E., . . . Marshall, R. D. (2015). Is exposure necessary? A randomized clinical trial of interpersonal psychotherapy for PTSD. *American Journal of Psychiatry, 172,* 430–440. http://dx.doi.org/10.1176/appi.ajp.2014.14070908

Mathieu, J. E., & Taylor, S. R. (2006). Clarifying conditions and decision points for mediational type inferences in organizational behavior. *Journal of Organizational Behavior, 27,* 1031–1056. http://dx.doi.org/10.1002/job.406

Minshawi, N. F., Hurwitz, S., Fodstad, J. C., Biebl, S., Morris, D. H., & McDougle, C. J. (2014). The association between self-injurious behaviors and autism spectrum disorders. *Psychology Research and Behavior Management, 7,* 125–136. http://dx.doi.org/10.2147/PRBM.S44635

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

Nock, M. K., 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. http://dx.doi.org/10.1016/j.psychres.2006.05.010

Norris, F. H. (1992). Epidemiology of trauma: Frequency and impact of different potentially traumatic events on different demographic groups. *Journal of Consulting and Clinical Psychology, 60,* 409–418. http://dx.doi.org/10.1037/0022-006X.60.3.409

Osuch, E. A., Noll, J. G., & Putnam, F. W. (1999). The motivations for self-injury in psychiatric inpatients. *Psychiatry, 62,* 334–346.

Resick, P. A., & Schnicke, M. K. (1993). *Cognitive processing therapy for rape victims: A treatment manual*. Newbury Park, CA: Sage.

Reznor, T. (1994). Hurt [Recorded by Nine Inch Nails]. On The Downward Spiral [mp3 file]. Los Angeles, CA: Nothing/Interscope.

Schuster, D. P., & Powers, W. J. (2005). *Translational and experimental clinical research*. Philadelphia, PA: Lippincott Williams & Wilkins.

Shenk, C. E., Noll, J. G., & Cassarly, J. A. (2010). A multiple mediational test of the relationship between childhood maltreatment and non-suicidal self-injury. *Journal of Youth and Adolescence, 39,* 335–342. http://dx.doi.org/10.1007/s10964-009-9456-2

Simeon, D., & Favazza, A. R. (2001). Self-injurious behaviors: Phenomenology and assessment. In D. Simeon & E. Hollander (Eds.), *Self-injurious behaviors: Assessment and treatment* (pp. 1–28). Washington, DC: American Psychiatric Association.

Simeon, D., Stanley, B., Frances, A., Mann, J. J., Winchel, R., & Stanley, M. (1992). Self-mutilation in personality disorders: Psychological and biological correlates. *American Journal of Psychiatry, 149,* 221–226. http://dx.doi.org/10.1176/ajp.149.2.221

Slee, N., Garnefski, N., van der Leeden, R., Arensman, E., & Spinhoven, P. (2008). Cognitive–behavioural intervention for self-harm: Randomised controlled trial. *British Journal of Psychiatry, 192,* 202–211. http://dx.doi.org/10.1192/bjp.bp.107.037564

Smith, B. D. (2005). Self-mutilation and pharmacotherapy. *Psychiatry, 2,* 28–37.

Smith, N. B., Kouros, C. D., & Meuret, A. E. (2014). The role of trauma symptoms in nonsuicidal self-injury. *Trauma, Violence, & Abuse, 15,* 41–56. http://dx.doi.org/10.1177/1524838013496332

Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach. *Multivariate Behavioral Research, 25,* 173–180. http://dx.doi.org/10.1207/s15327906mbr2502_4

Van der Kolk, B. A. (1989). The compulsion to repeat the trauma. Re-enactment, revictimization, and masochism. *Psychiatric Clinics of North America, 12,* 389–411.

Weathers, F. W., Litz, B. T., Herman, D. S., Huska, J. A., & Keane, T. M. (1993, October). *The PTSD Checklist (PCL): Reliability, validity, and diagnostic utility*. Paper presented at the Annual Meeting of the International Society for Traumatic Stress Studies, San Antonio, Texas.

Webermann, A. R., Myrick, A. C., Taylor, C. L., Chasson, G. S., & Brand, B. L. (2015). Dissociative, depressive, and PTSD symptom severity as correlates of nonsuicidal self-injury and suicidality in dissociative disorder patients. *Journal of Trauma & Dissociation, 17,* 67–80. http://dx.doi.org/10.1080/15299732.2015.1067941

Wilkins, K. C., Lang, A. J., & Norman, S. B. (2011). Synthesis of the psychometric properties of the PTSD checklist (PCL) military, civilian, and specific versions. *Depression and Anxiety, 28,* 596–606. http://dx.doi.org/10.1002/da.20837

Yates, T. M. (2004). The developmental psychopathology of self-injurious behavior: Compensatory regulation in posttraumatic adaptation. *Clinical Psychology Review, 24,* 35–74. http://dx.doi.org/10.1016/j.cpr.2003.10.001

Yen, S., Kuehn, K., Tezanos, K., Weinstock, L. M., Solomon, J., & Spirito, A. (2015). Perceived family and peer invalidation as predictors of adolescent suicidal behaviors and self-mutilation. *Journal of Child and Adolescent Psychopharmacology, 25,* 124–130. http://dx.doi.org/10.1089/cap.2013.0132

Zlotnick, C., Donaldson, D., Spirito, A., & Pearlstein, T. (1997). Affect regulation and suicide attempts in adolescent inpatients. *Journal of the American Academy of Child & Adolescent Psychiatry, 36,* 793–798. http://dx.doi.org/10.1097/00004583-199706000-00016

Received October 6, 2015
Revision received December 23, 2015
Accepted March 7, 2016 ■