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## ARTICLES

# **The Relationship of Psychological Trauma and Dissociative and Posttraumatic Stress Disorders to Nonsuicidal Self-Injury and Suicidality: A Review**

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*We reviewed research on the relationship between (a) exposure to psychological trauma and (b) nonsuicidal self-injury (NSSI) and suicidality (suicidal ideation [SI] and suicide attempts [SA]) in individuals with dissociative disorders and posttraumatic stress disorder (PTSD). The review provides a context for the special issue of the Journal of Trauma & Dissociation on these topics. Exposure to childhood sexual abuse is the most consistent traumatic antecedent of self-harm, although traumatic violence in childhood (particularly physical abuse) and adulthood (particularly domestic violence) and exposure to multiple types of traumatic stressors also are associated with NSSI and SI/SA. Dissociative disorders and PTSD are consistently associated with increased NSSI and SA/SI. There is preliminary cross-sectional evidence that dissociation and posttraumatic stress disorders may mediate the relationship between psychological trauma and NSSI and SI/SA. Research on emotion dysregulation as a potential cross-cutting mechanism linking dissociation, PTSD, and self-harm is also reviewed. We*

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*conclude with a discussion of implications for clinical practice and future directions for scientific research.*

**KEYWORDS** *trauma, dissociation, suicidality, nonsuicidal self-injury, posttraumatic stress disorder, emotion dysregulation*

In this review, we examine the state of the evidence regarding the relationship between exposure to psychological trauma (hereinafter referred to as *trauma*; e.g., maltreatment, family violence) and dissociative disorders (DDs) and posttraumatic stress disorder (PTSD) and self-harm. Self-harm takes several related but distinct forms, including nonsuicidal self-injury (NSSI), suicidality (e.g., suicidal ideation [SI] and suicide attempts [SA]), and completed suicides. Although completed suicides are of extreme clinical and public health concern, research suggests that they are much rarer than NSSI or suicidality and involve risk or etiological factors distinct from those of NSSI and suicidality. Therefore, in the present review, we focus on NSSI and suicidality while directing readers to other reviews for information on completed suicides (Anglemyer, Horvath, & Rutherford, 2014; Hawton, Casanas, Haw, & Saunders, 2013; Madsen, Agerbo, Mortensen, & Nordentoft, 2012; Serafini, Pompili, Lindqvist, Dwivedi, & Girardi, 2013).

Trauma often precedes the onset of both DDs and PTSD, and there is evidence linking each with NSSI and suicidality. Research from the Adverse Childhood Experiences Study (e.g., Dube et al., 2001) and numerous other studies have linked exposure to psychological trauma with NSSI (e.g., Brodsky, Cloitre, & Dulit, 1995) and PTSD and DDs (e.g., Herman, 1992; Putnam, Guroff, Barban, & Post, 1986; van der Kolk et al., 1996). According to systematic reviews of more than 100 studies, childhood sexual abuse (CSA), other forms of child maltreatment, and severe family dysfunction have been found to be risk factors for both NSSI and suicidality across a range of age groups and populations (Klonsky & Moyer, 2008; Maniglio, 2011). In addition, a meta-analysis of 50 studies determined that PTSD was consistently associated with SA and SI (but not completed suicides) independent of the effects of other psychiatric morbidity, including depression (Krysinska & Lester, 2010). Moreover, dissociation has been shown to potentially serve as a mediator between child maltreatment and both NSSI (Rodriguez-Srednicki, 2001; Swannell et al., 2012; Zoroglu et al., 2003) and SA (Freeman, Keese, Thornton, Gillette, & Young, 1995; Tamar-Gurol, Sar, Karadag, Evren, & Karagoz, 2008; Zoroglu et al., 2003). Therefore, studies of how trauma, PTSD, and DDs contribute to NSSI and suicidality may be of considerable clinical utility.

## THE CURRENT REVIEW

After defining and distinguishing NSSI and suicidality, we review evidence of the role trauma plays in the etiology and course of NSSI and suicidality, including the links of each form of self-harm with DDs and PTSD. We then focus on emotion dysregulation as a possible cross-cutting influence in the phenomenology of NSSI and suicidality. Finally, we suggest future directions for clinical practice and scientific research to systematically address interrelationships of trauma, NSSI, and suicidality with DDs and PTSD.

### NSSI AND SUICIDALITY: DEFINING FEATURES AND RISK FACTORS

Although they are often interrelated, the distinction between NSSI and suicidality is an important one (Nock, 2012; Wilkinson & Goodyer, 2011). NSSI involves intentionally causing physical harm to one's own body without the intent to die. NSSI is distinguished from reckless or careless behavior that may indirectly result in bodily harm (St. Germain & Hooley, 2012). Two key features of NSSI are (a) its association with adolescence and young adulthood and (b) the intended intra- or interpersonal function of the self-injury.

Self-injury is most prevalent among adolescents and young adults, typically involves cutting or carving the skin, and has a consistent presentation cross-nationally. Behavioral, physiological, and self-report data suggest that the behavior serves both an intrapersonal function (e.g., decreases aversive affective/cognitive states or increases desired states) and an interpersonal function (e.g., increases social support or removes undesired social demands). (Nock, 2010, p. 339)

In contrast, suicidality involves both ideation (SI) and behavior (attempts, or SA) specifically aimed at ending one's life (Boldt, 1987). SI and SA can occur at any point in the lifespan from childhood to older adulthood.

NSSI, SI, and SA, although distinct, are highly interrelated. An estimated 6% of adults and 16% to 28% of adolescents engage in NSSI, with the average age of onset in adolescence (age 16; Brunner et al., 2014; Klonsky, 2011; Muehlenkamp, Claes, Havertape, & Plener, 2012; Nock, 2010; Plener, Libal, Keller, Fegert, & Muehlenkamp, 2009). One in 20 (5%) adults (Victor & Klonsky, 2014a) and 4% of adolescents (Nock et al., 2013; Plener et al., 2009) have attempted suicide at some point in their lives, and 12% of adolescents (Nock et al., 2013) and 9% to 14% of adults (Nock et al., 2008, 2014) have experienced SI.

## NSSI

NSSI is a multifaceted and multidetermined clinical phenomenon. Risk factors for NSSI include Cluster B personality disorders (notably the borderline type [BPD]), heightened anxiety, depression, and sensitivity to interpersonal rejection (Klonsky, Oltmanns, & Turkheimer, 2003), but not with other demographic factors, except for marital status (specifically, being unmarried; Klonsky, 2011). NSSI typically involves attempts to cope with or repair emotion dysregulation:

(a) Acute negative affect precedes self-injury, (b) decreased negative affect and relief are present after self-injury, (c) self-injury is most often performed with intent to alleviate negative affect, and (d) negative affect and arousal are reduced by the performance of self-injury proxies in laboratory settings. Studies also provide strong support for a self-punishment function, and modest evidence for anti-dissociation, interpersonal-influence, anti-suicide, sensation-seeking, and interpersonal boundaries functions. (Klonsky, 2007, p. 226)

Although NSSI can take the form of a compulsive behavior involving a craving similar to that involved in addiction, we believe it is better understood as being driven by negative reinforcement through relief from emotion dysregulation (e.g., craving relief from emotional distress) as opposed to an addictive craving for positive reinforcement (Claes, Klonsky, Muehlenkamp, Kuppens, & Vandereycken, 2010; Victor, Glenn, & Klonsky, 2012).

Characteristics of persons engaging in NSSI that have been identified in empirical research include (a) physiological hyperarousal in situations eliciting frustration; (b) attempts to suppress unpleasant thoughts and feelings; (c) low tolerance for and difficulty in recovering from distress; (d) difficulty with interpersonal communication and problem solving; (e) self-deprecation and an intention to self-punish; (f) impulsivity; and (g) heightened tolerance for and diminished sensitivity to physical pain, and a paradoxical analgesic reaction to pain (Andover, Morris, Wren, & Bruzzese, 2012; Lynam, Miller, Miller, Bornovalova, & Lejuez, 2011; Nock, 2010; Taliaferro, Muehlenkamp, Borowsky, McMorris, & Kugler, 2012; Turner, Chapman, & Layden, 2012; Victor & Klonsky, 2014b; Wilcox et al., 2012; Wilkinson, Kelvin, Roberts, Dubicka, & Goodyer, 2011; You & Leung, 2012; Zetterqvist, Lundh, Dahlström, & Svedin, 2013). Persistent NSSI is associated with impulsivity (You & Leung, 2012) and BPD features (Glenn & Klonsky, 2011)—overall BPD symptom burden and one specific dissociative BPD symptom (i.e., unstable self-image; Muehlenkamp, Ertelt, Miller, & Claes, 2011).

NSSI is more prevalent among females than males, and there may be important gender differences in the form and function of NSSI. A study

of college students found evidence of three latent classes (i.e., empirically identified subgroups) that engaged in NSSI (Whitlock, Muehlenkamp, & Eckenrode, 2008). The first subgroup, composed mostly of females, reported using one form of NSSI resulting in superficial tissue damage. The second subgroup, composed mostly of males, engaged in as many as three forms of NSSI, including self-battery, resulting in mild tissue damage. Finally, the third subgroup of females only engaged in the highest severity NSSI with the highest frequency of repetition. Whether these largely gender-specific subgroups can be replicated in adolescent and adult community and clinical populations is a question for further research.

### NSSI and Suicidality

Individuals who engage in NSSI are at particularly high risk for SA/SI (Guan, Fox, & Prinstein, 2012; Taliaferro & Muehlenkamp, 2014). NSSI predicted subsequent SA among youths who did not endorse SI (Tang et al., 2011) and was a stronger risk factor for SA than primary risks, such as depression, impulsivity, distress intolerance, and BPD (Klonsky, May, & Glenn, 2013). NSSI was found to be associated with increased risk of SA among adults with severe psychiatric disorders (O'Hare, Shen, & Sherrer, 2014). Although the strongest correlates of SA are SI and impaired premeditation (Klonsky & May, 2010), NSSI has been shown to be a unique risk factor for SA independent of SI (Klonsky et al., 2013). Although social isolation (Fassberg et al., 2012) and psychiatric morbidity (Cavanagh, Carson, Sharpe, & Lawrie, 2003; Hauser, Galling, & Correll, 2013; Nock et al., 2014; Nordentoft, Mortensen, & Pedersen, 2011) are consistently associated with SI/SA risk, Cluster B personality disorders, including BPD, were found to be the single unique predictor of SA over a 1-year prospective period (Glenn & Klonsky, 2011) and a 10-year prospective period with depressed adults with SI (May, Klonsky, & Klein, 2012). Similarly, persistent and severe SI, depression, hopelessness, and impulsivity were shown to distinguish psychiatric inpatients with both NSSI and SA from those with NSSI only (Dougherty et al., 2009). In an outpatient mental health treatment adolescent sample, two specific BPD symptoms (i.e., unstable sense of self, extremely unstable relationships) were associated with NSSI with or without SA (Muehlenkamp et al., 2011).

### Suicidality

The most consistent correlates of SI are (a) severe emotional distress (e.g., depression, anxiety, fear), (b) hopelessness, (c) substance use disorders, (d) externalizing behavior problems (e.g., aggression, oppositional defiance, attention deficits), (e) social isolation or enmeshment, (f) perceived abandonment, and (g) self-deprecation/shame (Dutra, Callahan, Forman, Mendelsohn, & Herman, 2008; Nock et al., 2013; Nyer et al., 2013; Wedig,

Frankenburg, Bradford Reich, Fitzmaurice, & Zanarini, 2013). Less severe depression and the absence of NSSI also have been shown to differentiate adolescents with SI only from those with both SI and SA (Taliaferro & Muehlenkamp, 2014) and to predict faster recovery from SI among adolescents following inpatient psychiatric treatment (Prinstein et al., 2008). Adolescent psychiatric patients with both SI and NSSI were found to be more likely than those with NSSI only to engage in cutting of the lower leg, to overdose, and to abuse substances (Csorba, Dinya, Plener, Nagy, & Pali, 2009).

Most individuals with NSSI or SI never attempt suicide. Therefore, identifying the factors associated with shifting from SI to the more lethal pathology of SA is crucial to achieving the public health and safety mandates of preventing suicide. Empirically based risk factors for moving from NSSI or SI to SA include acute SI (e.g., within the first year of onset; Borges, Benjet, Medina-Mora, Orozco, & Nock, 2008), dysthymia (Borges, Benjet, Medina-Mora, Orozco, & Nock, 2008), increased elaboration or severity of SI (Prinstein et al., 2008), repeated (e.g., >20) incidents of NSSI (Whitlock et al., 2013), mental health treatment (Whitlock et al., 2013), and the absence of a sense of meaning and close confidants (Whitlock et al., 2013).

Thus, although NSSI, SI, and SA share several clinical features and risk factors, they can be distinguished not only by clinical phenomenology and lethality but also by their etiology and course. NSSI and SI often occur apart from SA but may be involved in the development of SA. Adolescents and adults who are impaired by psychiatric morbidity—notably, affective disorders or BPD, impulsivity involving deficient premeditation or substance abuse, and either volatile or conflicted relationships or social isolation—are at greatest risk for progressing from NSSI or SI to SA. Individuals with the clinical features and risk factors associated with NSSI and SI/SA also are likely to have trauma histories and PTSD or DDs (D’Andrea, Ford, Stolbach, Spinazzola, & van der Kolk, 2012; Ford, 2009b). Therefore, we next examine the empirical evidence of interrelationships of NSSI and SI/SA with dissociative and posttraumatic disorders.

## DISSOCIATION, DDS, AND SELF-HARM

A number of associations have been identified between (a) trauma-related dissociation and DDs and (b) NSSI and SI/SA. For instance, in a retrospective community study of adults, dissociation secondary to traumatic stressor exposure was linked empirically to SI and NSSI, and all three were associated with substance abuse and dysfunctional sexual behaviors in what could be characterized as a multifaceted posttraumatic avoidance syndrome (Briere, Hodges, & Godbout, 2010). In both psychiatric (Bedi, Muller, & Classen, 2014; Zlotnick et al., 1996) and substance abuse treatment (Zlotnick



et al., 1997) samples, elevated severity of dissociative symptoms has been associated with NSSI. Previous SA, emotion dysregulation, and alexithymia were associated with NSSI among psychiatric patients (cumulatively increasing the risk of NSSI by 37 times in a sample of women with child abuse histories; Bedi et al., 2014), and behavioral dysregulation (e.g., impulsivity) was associated with NSSI among substance abuse treatment patients.

Consistent with these findings, adults in psychiatric treatment who engaged in intentional or indirect NSSI experienced higher levels of both dissociation and problems with affect and interpersonal dysregulation than healthy adult controls (St. Germain & Hooley, 2012). In addition, patients who engaged in NSSI with the intention to self-harm reported higher levels of self-criticism and SI than those who engaged in NSSI in an attempt to recover from or cope with distress; dissociation did not distinguish those two subgroups of patients, and in the absence of a psychiatric subgroup with no NSSI, it was not possible to determine whether the elevated levels of dissociation and emotion dysregulation were related to psychiatric status, NSSI, or both. However, a study of adolescent psychiatric inpatients found that dissociation and NSSI were interrelated (Swenson, Spirito, Dyl, Kittler, & Hunt, 2008). In addition, a study of adult psychiatric patients with somatoform (conversion) disorder found that 35% had SA histories, for which risky alcohol use, higher numbers of past hospitalizations, past emotional abuse, and clinically significant dissociative symptoms were independent predictors (Gulec, Ynanc, Yanartathorn, Uzer, & Gulec, 2014). These results suggest that dissociative symptoms specifically, over and above (or in addition to) the effects of psychiatric morbidity in general, may contribute to NSSI and SA.

Though typically undiagnosed clinically, DDs may be particularly relevant to psychiatric patient populations, with as many as 30% of people in outpatient psychiatric treatment having DDs (Foote, Smolin, Kaplan, Legatt, & Lipschitz, 2006; Saxe et al., 1993). Patients with DDs are more likely to engage in NSSI (Foote, Smolin, Neft, & Lipschitz, 2008; Ross, 1991; Saxe, Chawla, & Van der Kolk, 2002), SI (Foote et al., 2008; Ozturk & Sar, 2008; Ross, 1991), and SA (Foote et al., 2008; Ross, 1991; Sar, Akyuz, & Dogan, 2007) than patients with psychiatric disorders other than DDs. Psychiatric patients with DDs, compared to those who do not dissociate, have also been found to more frequently engage in NSSI, use more methods of NSSI, and begin NSSI at an earlier age (Saxe et al., 2002). Thus, dissociation and DDs may be a key factor in NSSI.

## TRAUMA EXPOSURE, POSTTRAUMATIC DISORDERS, AND SELF-HARM

Dissociation and DDs have repeatedly been found to be associated with trauma, often beginning in childhood and involving betrayal of trusted relationships in the form of maltreatment or violence (Foote et al., 2006; Sar et al.,



2007; Saxe et al., 1993). Four potential functions that NSSI and suicidality may play for trauma survivors specifically have been identified (Connors, 1996), including three that are consistent with traumatic stress disorders (reenactments of traumatic experiences, interpersonal communication of distress and needs, and attempts to cope with disturbances in self-organization) and one that is specifically consistent with DDs (attempts to cope with dissociative symptoms). A key question is whether trauma exposure per se, or subsequent dissociative or traumatic stress disorders, or all of the above, is associated with NSSI, SI, and SA.

## NSSI

*Trauma and PTSD.* The authors of a meta-analysis concluded that CSA was only weakly related to NSSI, primarily because of the effects of psychiatric disorders rather than abuse per se (Klonsky & Moyer, 2008). However, another review of research studies concluded that CSA was associated with adolescent NSSI (and SI/SA) and also with alexithymia, hostility, and mixed anxiety and depression (Jacobson & Gould, 2007). A study with urban adult drug abusers found CSA to be uniquely associated with NSSI, whereas childhood physical abuse was not (Bornovalova, Tull, Gratz, Levy, & Lejuez, 2011). In that study, PTSD was associated with a fivefold increase in the risk of NSSI, but neither PTSD nor problematic impulsiveness fully accounted for the relationship between past CSA and NSSI. Similarly, past CSA was associated with NSSI in a sample of adolescents, mediated by the current severity of some (e.g., intrusive reexperiencing and avoidance) but not all PTSD symptoms (Weierich & Nock, 2008). These disparate findings suggest that CSA and PTSD are likely to play a role in the complex array of individual and contextual factors that contribute to the onset and maintenance of NSSI, but these relationships may differ depending on the specific populations, types of NSSI, and PTSD symptoms involved. Moreover, other forms of trauma and psychiatric or behavioral impairment also must be considered potential contributors.

Consistent with this view, although past CSA and current PTSD symptom severity are the most consistent correlates of adolescent and adult NSSI (Lang & Sharma-Patel, 2011; Smith, Kouros, & Meuret, 2014), other forms of childhood adversity (e.g., neglect, physical or emotional abuse) and potentially trauma-related forms of emotion dysregulation (e.g., alexithymia, depression, hostility, shame) may contribute to NSSI. For instance, CSA was related to frequent NSSI, whereas physical abuse was associated with intermittent NSSI, in a study of young adults (Yates, Carlson, & Egeland, 2008). In a study by Weierich and Nock (2008), emotional as well as sexual abuse were associated with NSSI, and shame mediated these relationships (Glassman, Weierich, Hooley, Deliberto, & Nock, 2007). A study of adolescents found that exposure to abuse or violence, and also more severe PTSD and depression symptoms, distinguished youth endorsing NSSI from others; however, this

was primarily the case when NSSI was accompanied by SA (Zetterqvist, Lundh, & Svedin, 2013).

Several studies have involved adults in behavioral health treatment. In a study of male adults in outpatient trauma-focused psychotherapy, only emotional and physical neglect—and not any other forms of maltreatment or interpersonal violence—were associated with a history of NSSI (Dyer, Dorahy, Shannon, & Corry, 2013). In that investigation, self-criticism and shame fully accounted for the neglect–NSSI relationship. Studies with substance dependent women and men identified several correlates of NSSI: (a) childhood neglect, physical and sexual abuse, SA, and alexithymia (Evren & Evren, 2005); (b) CSA, BPD, SA, and comorbid alcohol and opiate dependence (Maloney, Degenhardt, Darke, & Nelson, 2010); and (c) sexual assault in adulthood and alexithymia (Oyefeso, Brown, Chiang, & Clancy, 2008).

Undergraduate samples also have demonstrated links between trauma and NSSI. For instance, a study with female and male undergraduates found that emotional abuse was related to NSSI, with dispositional pessimism as a partial mediator (Buser & Hackney, 2012). In a study with female undergraduates, CSA, physical abuse and neglect, and emotional abuse and neglect all were associated with NSSI, and alexithymia statistically mediated the relationships between physical and emotional (but not sexual) maltreatment and NSSI (Paivio & McCulloch, 2004).

In conclusion, the research consistently reveals associations between a range of traumatic antecedents, PTSD, and emotion dysregulation and NSSI in both community and clinical samples of adolescents and adults. It also appears important to consider suicidality, impulsivity, and addictions as independent (although potentially trauma-related) risks for NSSI, with the paths from trauma to NSSI likely to be complex and multifaceted.

*Dissociation, PTSD, and other potential mediators of the paths from trauma to NSSI.* Several potential mediators of the relationship between trauma and NSSI have been identified in empirical studies: shame (Dyer et al., 2013; Glassman et al., 2007), self-criticism (Dyer et al., 2013), dispositional pessimism (Buser & Hackney, 2012), and alexithymia (Paivio & McCulloch, 2004). These forms of dysregulation in emotions and self-schemas often are reported by individuals with DDs or PTSD. Therefore, in the current section, we focus our attention on empirical evidence that dissociation and PTSD may serve as mediators of the relationship between trauma and NSSI.

A study with women found that those reporting frequent NSSI were distinguished from women who never or infrequently engaged in self-harm by a history of CSA and either severe current dissociation or low self-esteem (Low, Jones, MacLeod, Power, & Duggan, 2000). The statistically strongest path from CSA to NSSI included dissociation as a mediator. In a study with inner city women involved in substance abuse (Bornovalova et al., 2011), CSA (but not childhood physical abuse) was uniquely associated with SI and

SA, and PTSD also was associated with a threefold increase in likelihood of SI and SA. However, PTSD (and one other variable investigated, impulsiveness) could only partially account for the relationship of CSA with subsequent SI or SA. Specificity in PTSD subscales also may be important in understanding these pathways. A study with women with histories of CSA found that those with an early age of onset of sexual abuse were most likely to report NSSI and that PTSD hyperarousal (but not reexperiencing or avoidance) symptoms statistically mediated this relationship (Weaver, Chard, Mechanic, & Etzel, 2004).

Another set of studies involved young adults and adolescents. A prospective study of 26-year-olds who had been followed longitudinally since childhood found that sexual abuse was associated with frequent NSSI and that dissociation mediated this relationship (Yates et al., 2008). Two studies involved preadolescents and adolescents in child protective services (Kisiel & Lyons, 2001), one that included a comparison sample of non-maltreated youth (Shenk, Noll, & Cassarly, 2010). In the former study, a multimethod, multisource assessment including child welfare case records and interviews identified a relationship between sexual abuse and NSSI and SA statistically mediated by the severity of dissociative symptoms. In the latter study, PTSD symptoms statistically mediated a relationship between maltreatment status and NSSI over and above the effects of depression and emotion dysregulation.

However, dissociation and PTSD often co-occur, including in a dissociative subtype of PTSD (Lanius, Vermetten, et al., 2010). Therefore, it is important to examine different combinations of dissociative and PTSD symptoms in relation to NSSI. A recent study with treatment-seeking adults with CSA histories identified a more complex interactive relationship between dissociative and PTSD symptoms and NSSI (Bolen, Winter, & Hodges, 2013). High levels of dissociative or PTSD intrusive reexperiencing symptoms were associated with NSSI. However, when dissociative and intrusive reexperiencing PTSD symptoms were relatively low, NSSI was still likely if PTSD avoidance symptoms were severe. Similar to the other studies reviewed in this section (with the exception of the Yates et al., 2008, prospective investigation), this study relied on cross-sectional, retrospective, and primarily self-report data; included at most a small subgroup of males; and did not assess DDs. However, its results suggest that dissociation and PTSD symptoms may link childhood maltreatment to NSSI and may do so in several ways involving dissociative detachment, posttraumatic avoidance and emotional numbing, or posttraumatic intrusive reexperiencing.

*Gender.* Most studies of NSSI involve few if any male participants, yet males also report NSSI. There may be gender differences in the relationships between trauma, dissociation, emotion dysregulation, and NSSI. Studies with adolescents and with adults highlight this point. A study of adolescent acute

psychiatric hospital admissions found that sexual abuse and cumulative interpersonal adversity were associated with NSSI, but only for girls (Isohookana, Riala, Hakko, & Rasanen, 2013). A retrospective community study of adults found that childhood physical—but not sexual—abuse (and also, for women only, neglect) was associated with NSSI. For men, dissociation—and for women, alexithymia and self-blame—largely accounted for the association of childhood physical abuse and NSSI (Swannell et al., 2012). In psychiatric samples, childhood maltreatment, dissociation, and BPD were related to NSSI in women (Zweig-Frank, Paris, & Guzder, 1994b) but not in men (Zweig-Frank, Paris, & Guzder, 1994a). Although childhood trauma and subsequent problems with dissociation and emotion dysregulation appear likely to be involved in many if not most cases of NSSI, the exact nature of these relationships may differ substantially between genders.

### Adult Suicidality

Negative life events ranging from traumatic stressors to major life changes are consistently associated with SI (Liu & Miller, 2014). This is true for youth as well as adults. Childhood neglect and physical and sexual abuse were each associated with a threefold—and for emotional abuse a sixfold—increased risk of SI (Barbosa et al., 2014). For adolescents in outpatient mental health treatment, PTSD (and depression) symptom severity distinguished NSSI from SA (Jacobson, Muehlenkamp, Miller, & Turner, 2008). For youth in the juvenile justice system, PTSD was associated with SI and statistically mediated the relationship of (a) exposure to interpersonal trauma and (b) depression and SI (Kerig, Ward, Vanderzee, & Arnzen Moeddel, 2009).

The relationship between trauma and suicidality may be even stronger for SA than for SI. A cross-national study involving respondents from 21 Western and developing nations found a consistent pattern of associations between exposure to traumatic interpersonal (including sexual) violence and suicidal behavior. In addition, the cumulative effect of multiple potentially traumatic victimization experiences distinguished individuals with SA histories from those reporting only SI (Stein et al., 2010). A study with women in primary medical care also found that CSA or childhood physical abuse were risk factors for SA (Wiederman, Sansone, & Sansone, 1998). In a sample of women, CSA, emotional abuse, and physical neglect were associated with the presence of a DD, and women with DDs were at risk for past SA (Sar et al., 2007). Adults in substance abuse treatment who had histories of childhood abuse were at risk for both SA and DDs (which also often co-occurred)—and this triple adversity was reported to typically precede the onset of substance abuse (Tamar-Gurol et al., 2008).

Furthermore, adults involved in community correctional programs were found to be at risk for SI or SA if they had histories of childhood trauma independent of other risk factors, including depressive symptoms, anxiety or avoidant personality disorder, or traumatic brain injury (Gunter, Chibnall,

Antoniak, Philibert, & Black, 2013). Over and above the risk of SI and SA conferred by severe psychiatric disorders, past childhood neglect (Sarchiapone, Carli, Cuomo, & Roy, 2007), physical abuse (O'Hare et al., 2014), or a combination of childhood abuse and neglect (Roy, 2005) have been found to further increase psychiatric patients' likelihood of SA. Discriminatory experiences may also contribute to SI and SA. In a study of a population-based sample of Canadian First Nations adults, childhood abuse, negative experiences when placed in a residential school, and an intergenerational history of residential school placement were interrelated and independently associated with SI and SA (Elias et al., 2012). Among adults in substance abuse treatment, over and above the risk due to a family history of suicidal behavior, a childhood trauma history was associated with the likelihood of a past SA—more than 75% of men and 87.5% of women with this combination had a SA history (Roy, 2011; Roy & Janal, 2005). Thus, youth and adults in the community, in medical health care, and in mental health or substance abuse treatment who have trauma histories (especially childhood maltreatment) are at risk for SA (and SI).

*Violent victimization in adulthood.* Intimate partner violence also has been consistently found to be associated with adult SI/SA in a wide range of populations and studies (McLaughlin, O'Carroll, & O'Connor, 2012). Childhood maltreatment places adults at risk for intimate partner violence, and the adverse cumulative impact of the combination of childhood and adult victimization extends to SA. For example, women in a community sample with histories of CSA or childhood emotional abuse were found to be at risk for intimate partner violence and to have an almost eightfold increase in their risk of SA (23% reported SA vs. 3% of women with no exposure to intimate partner violence; Seedat, Stein, & Forde, 2005).

### Child/Adolescent Suicidality

Exposure to or involvement in interpersonal violence also appears to be associated with childhood and adolescent SA. In adolescents, exposure to traumatic events was associated with a 3 to 6 times increased risk of SI or SA, and exposure to multiple traumatic events (typically including events involving interpersonal violence) was associated with a 13.7 times increased risk of SA (Borges, Benjet, Medina-Mora, Orozco, Molnar, et al., 2008). Teens in that study who were either victims of rape or perpetrators of intentional violence often had SA histories (43% and 25%, respectively). Similarly, in another study, exposure to dating violence, unsafe neighborhoods, and conflict with or lack of protection by parents were risk factors for SA (Taliaferro & Muehlenkamp, 2014).

In a large convenience sample of homeless street youths (ages 14 to 26 years old), CSA (26.5%) and childhood physical abuse (40.6%) were often reported, and the risk of SA (reported by 9% of the sample) increased as the

cumulative severity of childhood trauma increased (Hadland et al., 2012). Youth in both a community sample and a child protective services sample who had experienced physical abuse and reported problems with anxiety and dysthymia or insecure attachment to parents were at the highest risk for SA in another study (Salzinger, Rosario, Feldman, & Ng-Mak, 2007). A variety of types of trauma thus may be related to adolescent suicidality, although abuse or intentional violence are the most consistent correlates of adolescent SI and SA.

### Gene × Environment Interactions in Suicidality

A growing body of research suggests that genetic risk due to serotonergic (5-HTTLPR transporter) or glucocorticoid (FKBP5) dysregulation may interact with childhood maltreatment history to increase the risk of SA (Roy, Gorodetsky, Yuan, Goldman, & Enoch, 2010; Roy, Hu, Janal, & Goldman, 2007). A study with adults with SA histories found that childhood abuse was associated with more SA, a high risk of violent SA, and an earlier age of first SA among individuals with a genetic variation related to serotonergic dysregulation (Perroud et al., 2008). Thus, adult survivors of childhood abuse who have a genetically based tendency toward dysphoria and arousal may be vulnerable to SA.

## EMOTION DYSREGULATION AS A CROSS-CUTTING FACTOR IN SELF-HARM

A consistent theme in the research literature on the association of trauma, NSSI, SA, SI, and DDs and PTSD is that the individuals with trauma histories and PTSD or DDs who are at greatest risk for self-harm also report experiencing a variety of forms of emotion dysregulation (e.g., alexithymia, shame, anger). Thus, understanding the potentially far-reaching role that emotion dysregulation plays in self-harm may assist clinicians and researchers in developing approaches to treating and studying the phenomenology of NSSI, SI, and SA.

### NSSI

Coping with emotion dysregulation has been consistently shown to be a common feature of NSSI with adolescents (Zetterqvist, Lundh, Dahlström, et al., 2013) and adults (Claes, Norré, van Assche, & Bijttebier, 2014). Indeed, three of five proposed functions of NSSI—emotion relief, generating feelings secondary to emotional numbing or physical anesthesia, and self-punishment secondary to guilt or shame—specifically involve attempts



to modulate dysregulated emotion states (Turner et al., 2012). The interpersonal stressors (e.g., relational conflict or rejection) that often precede NSSI (Muehlenkamp, Brausch, Quigley, & Whitlock, 2013) are unlikely to lead to self-harm unless they elicit intolerable emotion states that NSSI serves to repair (Cwik et al., 2011; Nock & Prinstein, 2004; Nock, Prinstein, & Sterba, 2009; Peterson, Freedenthal, Sheldon, & Andersen, 2008; Rallis, Deming, Glenn, & Nock, 2012). Restoring emotion regulation or preventing overt emotion dysregulation have been found to be key functions of NSSI cross-culturally, for instance, in China (You, Lin, & Leung, 2013; Yu, Jiang, & Wu, 2011), Singapore (Tan, Rehfuss, Suarez, & Parks-Savage, 2014), and the United States (Dixon-Gordon, Harrison, & Roesch, 2012).

*Self-blame and self-punishment.* NSSI may serve as a strategy for coping with emotion dysregulation in several ways (In-Albon, Bürli, Ruf, & Schmid, 2013; Jacobson & Gould, 2007; Klonsky, 2007, 2009). NSSI may provide either distraction from intrusive disturbing thoughts or ruminations or a way to eliminate such cognitive processes (Najmi, Wegner, & Nock, 2007). NSSI also might serve as a way to express intense hostility, redirecting this from external foci (and potentially reducing or preventing adverse interpersonal outcomes) through self-punitive acts that communicate self-criticism and shame (Dyer et al., 2013; Gilbert et al., 2010). Alternatively, NSSI could represent an attempt at resilient coping by actions intended to initiate cognitive processing and increase internal locus of control and self-efficacy (e.g., being able to develop and act on a self-determined plan; Franklin et al., 2010).

There is evidence suggesting that NSSI is associated with an adverse synergistic combination of intense negative self-perceptions, emotions, and impulses. A study with male psychotherapy patients found that intense self-criticism was the primary correlate of NSSI and that self-criticism typically was accompanied by dysregulated emotions and impulses (Dyer et al., 2009). A study with college students and community adults found that those with NSSI histories reported more thoughts and negative emotion states related to self-dissatisfaction and fewer thoughts and positive emotion states of self-acceptance on a daily basis (Victor & Klonsky, 2014b). Another study with only college students showed that NSSI was associated with emotion dysregulation only among those with severe body dysmorphia—suggesting that NSSI may be an attempt to reduce emotion dysregulation when the distressing emotions are linked to negative self-perceptions (Muehlenkamp, Bagge, Tull, & Gratz, 2013). Further evidence linking NSSI to negative self-perceptions was found in a study with adolescent psychiatric inpatients that also implicated past violence exposure: Those with a history of physical assault and thoughts of extreme self-criticism were at highest risk for NSSI (Weismore & Esposito-Smythers, 2010).

*Self-soothing.* In addition to ameliorating the effects of self-criticism, NSSI may also serve as a means of self-soothing (Cullen, Westlund, LaRiviere,



& Klimes-Dougan, 2013; Russell, Moss, & Miller, 2010), especially following exposure to interpersonal trauma (Gershuny et al., 2006). In a sample of patients in eating disorder treatment, NSSI was reported to provide relief from distressing high-arousal negative affect states and to produce more tolerable low-arousal positive affect states (Claes et al., 2010). The self-soothing function may, however, lead to chronic use of NSSI; for example, self-soothing was found to be associated with more frequent NSSI episodes and with the perception that NSSI served multiple functions (Claes et al., 2010).

*Dissociative and PTSD subtypes?* An intriguing set of neuroimaging findings suggest that NSSI may be associated with emotion dysregulation related to hyperarousal or cortical attempts to modulate emotional states and impulses that are not successful (Dreyfuss et al., 2014), similar to PTSD. Alternatively, attempts to cope with emotion dysregulation through active emotion processing may fail and instead lead to detachment, avoidance, distraction, or self-punishment, which is consistent with DDs.

Emotion dysregulation involving difficulty in recovering from intense distress (Frewen et al., 2010; Hopper, Frewen, van der Kolk, & Lanius, 2007; Lanius, Frewen, Vermetten, & Yehuda, 2010), including in PTSD (Brown et al., 2014; Hopper et al., 2007; Lanius, Frewen, et al., 2010; Rabinak et al., 2011; Shaw et al., 2009; Sripada, King, Garfinkel, et al., 2012; Sripada, King, Welsh, et al., 2012), is associated with alterations in the brain's stress network, including enhanced limbic activity and excitatory connectivity to the medial prefrontal cortex, reduced dorsolateral prefrontal activity, and inhibitory connectivity from the prefrontal cortex to limbic areas. In contrast, DDs (Savoy, Frederick, Keuroghlian, & Wolk, 2012), including the PTSD dissociative subtype (Lanius, Brand, Vermetten, Frewen, & Spiegel, 2012) and dissociative symptoms in PTSD (Felmingham et al., 2008; Hopper et al., 2007; Moser et al., 2013), are associated with decreased limbic activation and increased medial and dorsolateral prefrontal inhibition. Dissociative amnesia also has been shown to involve decreased activation in an area of the prefrontal cortex (the right hemisphere inferolateral area) that has been shown to be associated with retrieval of autobiographical memories and self-referential processing (M. Brand et al., 2009) and increased activation in the left hemisphere parietal lobe (Arzy et al., 2011). These differences in brain activation patterns mirror two pathways to NSSI identified by Bolen et al. (2013) involving either PTSD intrusive reexperiencing-related excitation or dissociative/avoidance-related hypoarousal and numbing.

Consistent with this view, a study with female adolescents who engaged in NSSI found increased amygdala, hippocampal, and anterior cingulate activation in response to negative emotional pictures compared to healthy controls (Plener, Bubalo, Fladung, Ludolph, & Lule, 2012). In addition, viewing pictures suggestive of self-harm led to increased medial/orbitofrontal prefrontal activity only in the NSSI subgroup (Plener et al., 2012). However, women diagnosed with BPD who engaged in NSSI showed the opposite

pattern—*diminished* medial prefrontal and anterior cingulate activity compared to healthy controls—and *increased* dorsolateral prefrontal activity when listening to NSSI vignettes (Kraus et al., 2010). A study of adults diagnosed with BPD engaging in NSSI found higher amygdala, insula, and anterior cingulate cortex activation in response to affectively negative or neutral pictures compared to healthy adult controls (Niedtfeld et al., 2010)—and increased amygdala activation was correlated with heightened emotion dysregulation.

These findings suggest that differences in NSSI-related brain activation that could be due to developmental phase (e.g., adolescence vs. adulthood), psychiatric morbidity (e.g., BPD), the specific challenge (e.g., neutral vs. emotional vs. NSSI stimuli), or other untested factors. The more PTSD-like brain activation patterns associated with NSSI in the adolescent sample could be related to the earlier developing limbic capacities and relatively immature prefrontal capacities documented in teens (Drysdale et al., 2014). In contrast, the more dissociative-like patterns associated with NSSI in the BPD samples may be due to a combination of the dissociative symptoms and emotional dysregulation that are features of that disorder. Studies with NSSI-involved adolescents and adults both with and without BPD that carefully assess PTSD and dissociative symptoms, as well as the potential contributions of traumatic antecedents and psychiatric comorbidities, are needed to accurately characterize the potentially different psychobiological pathways to NSSI.

The possibility of a dissociative subtype also is suggested by a study identifying two subtypes of self-injuring patients with BPD: those who felt pain during NSSI and those who did not (Russ, Shearin, Clarkin, Harrison, & Hull, 1993). In another study, adults who reported NSSI but did not experience subjective pain when exposed to a painful stimulus showed a pattern of reduced amygdala and anterior cingulate activation (Niedtfeld et al., 2010). Connectivity analyses provided further evidence that physically painful stimulation combined with heightened emotional distress led to increased inhibition of amygdala activation by prefrontal activation in individuals who reported NSSI (Niedtfeld et al., 2012). Thus, NSSI may enable some individuals who experience emotion dysregulation to dissociate in order to reduce emotional distress by inflicting (but not feeling) physical pain. These findings raise the possibility that some cases of NSSI may involve intentional physical self-harm in order to dissociatively reduce extreme distress and achieve physical analgesia. Consistent with this view, a study of psychiatric patients diagnosed with Cluster B personality disorders and a history of SA found that a NSSI subsample had lesser basal biological capacity for analgesia (e.g., lower cerebrospinal levels of endogenous opioids) and more severe self-reported depression, hopelessness, and psychopathology than other patients (Stanley et al., 2010).

Another study showed that comorbid BPD and PTSD were associated with amygdala deactivation in response to physical pain stimuli (Kraus et al., 2009), suggesting that the physical stimulation caused by NSSI could diminish the stress-related brain activation associated with both PTSD and BPD. Whether a dissociative subtype of NSSI involving physical analgesia exists, and what its relationship is to PTSD (especially the dissociative subtype; Lanius, Brand, Vermetten, Frewen, & Spiegel, 2012; Lanius, Frewen, et al., 2010) and to BPD, remains to be determined by future research.

### Suicidality

The relationship of emotion dysregulation to SI/SA has been less studied than with NSSI. However, research showing that affective and anxiety disorders (Katz, Yaseen, Mojtabai, Cohen, & Galynker, 2011) and substance use disorders (Bagge et al., 2013) are key risk factors for SI/SA indirectly implicates emotion dysregulation in suicidality. Recent evidence suggests that it may be emotion dysregulation rather than the affective distress involved in these disorders per se that is associated with SI/SA. In a sample of depressed children and adolescents, negative affect was not associated with SI/SA, but maladaptive forms of emotion regulation were related to SA independent of depression severity (Tamas et al., 2007). Along these lines, a study with high school students found that emotion dysregulation and the absence of a trusted adult in the home were associated with risk of SA in the past year independent of depression severity (Pisani et al., 2013).

The interrelationship of NSSI, SI/SA, and emotion dysregulation was highlighted in several recent studies. In a sample of adults in residential treatment for substance use disorders, low tolerance for emotional distress was associated with past SA, mediated by NSSI (Anestis, Pennings, Lavender, Tull, & Gratz, 2013). A study of adolescent psychiatric patients found that NSSI, SI, and SA were interrelated and associated with loneliness and emotion dysregulation (Glenn & Klonsky, 2013a). Although BPD also was associated with NSSI, SI/SA, and emotion dysregulation (Glenn & Klonsky, 2013b), the relationship between NSSI and SI/SA and emotion dysregulation was independent of BPD—suggesting that emotion dysregulation plays a role in NSSI and SI/SA that is distinct from the pathology specific to BPD.

## IMPLICATIONS FOR SCREENING, ASSESSMENT, AND TREATMENT

### Screening and Assessment

In addition to ongoing efforts to develop best practices for *when*, *with whom*, and *how* to screen for risk or assess the nature and severity of NSSI and

SI/SA, this review highlights the need for evidence-based knowledge to guide decisions about *what* to ask when screening for or assessing NSSI and SI/SA. Suicidal intent (Harriss, Hawton, & Zahl, 2005), the lethality of method(s) used, whether steps were taken not to be discovered (Skegg, 2005), and other well-established risk factors for SA are typically included in instruments and practice guidelines for identifying individuals at risk for SA when screening for or assessing NSSI (O'Connor, Gaynes, Burda, Soh, & Whitlock, 2013). However, most clinical (and research) programs and practice guidelines for NSSI and SI/SA screening and assessment utilize single items that are insufficiently behaviorally specific or precise to accurately identify cases and at-risk persons (Muehlenkamp et al., 2012) or to characterize primary targets for prevention or treatment (Cloutier, Martin, Kennedy, Nixon, & Muehlenkamp, 2010; O'Connor et al., 2013; Osman et al., 2004).

The interrelationship of trauma exposure, dissociative and posttraumatic stress disorders, and emotion dysregulation (D'Andrea et al., 2012), and their association with the risk and severity of both NSSI and SI/SA risk, makes these posttraumatic constructs strong candidates for inclusion when clinically screening for or assessing NSSI and SI/SA. Moreover, trauma-related dissociation and emotion dysregulation—although not synonymous—are intimately interconnected as forms of complex self-dysregulation (Ford, 2009a) that may contribute to or exacerbate other NSSI and SI/SA risk factors (e.g., impulsivity, negative self-perceptions, interpersonal isolation or conflict).

Incorporating inquiry about a history of psychological trauma has been called for in NSSI and SI/SA screening and assessment, but this is done infrequently and most often with measures that have not been empirically validated in general or specifically for individuals with or at risk for NSSI and SI/SA (Roos, Sareen, & Bolton, 2013). Research-based screening and assessment instruments for NSSI and SI/SA, such as the Functional Assessment of Self-Mutilation (Claes et al., 2014), the Self-Injurious Thoughts and Behaviors Interview (Nock, Holmberg, Photos, & Michel, 2007), or the Suicide Cognitions Scale (Bryan et al., 2014), might have greater clinical utility if used along with complementary and appropriately validated measures for dissociative pathology (Nijenhuis & van der Hart, 2011), such as the Dissociative Experiences Scale (van Ijzendoorn & Schuengel, 1996), and trauma history and PTSD symptoms (see Frueh, Elhai, Grubaugh, & Ford, 2012).

## Treatment

Treatment and secondary or tertiary prevention of dangerous or developmentally and psychosocially severely impairing NSSI and SI/SA also has not shown consistent outcomes (Brausch & Girresch, 2012; Brent et al., 2013;

O'Connor et al., 2013; Ougrin & Latif, 2011). The most widely used treatment models, dialectical behavior therapy (DBT; Geddes, Dziurawiec, & Lee, 2013; Linehan et al., 2006; Neacsiu, Rizvi, & Linehan, 2010; Tormoen et al., 2014), cognitive behavior therapy for suicide prevention (Stanley et al., 2009), and mentalization-based treatment for adolescents (Rossouw & Fonagy, 2012), address self-harm by building intrapersonal capacities for distress tolerance, emotion regulation, mindful cognitive processing, and secure engagement in supportive interpersonal relationships. Adaptations of these interventions specifically for adolescents and adults with PTSD have shown promise (Bohus et al., 2013; Cloitre, Koenen, Cohen, & Han, 2002; Harned, Jackson, Comtois, & Linehan, 2010; Harned, Korslund, & Linehan, 2014). For instance, Harned and colleagues (2010) found that between 50% and 68% of women diagnosed with comorbid BPD and PTSD who exhibited NSSI or SA were able to reduce self-injurious behavior sufficiently in 1 year of DBT to therefore be considered eligible for PTSD treatment.

Harned and colleagues (2014) further demonstrated that women with comorbid BPD and PTSD who received a DBT-enhanced version of prolonged exposure therapy for PTSD (DBT+PE) were 2.4 times less likely to have a suicide attempt and 1.5 times less likely to engage in NSSI. Participating women who completed DBT+PE also had greater reductions in dissociation, trauma-related guilt cognitions, shame, anxiety, depression, and overall impairment than completers who received only DBT. Thus, a combination of enhanced emotion regulation and reduced avoidance of traumatic memories or reminders may provide a therapeutic basis for reducing both self-harm and trauma-related symptoms that could exacerbate self-harm (e.g., dissociation, depression, guilt/shame).

Notably absent are approaches to treatment for NSSI and SI/SA that draw on evidence-based approaches to the treatment of DDs (B. L. Brand & Stadnik, 2013; Silberg, 2012) or other complex forms posttraumatic emotion dysregulation and dissociation (Dorrepal et al., 2013; Ford, Courtois, Steele, Hart, & Nijenhuis, 2005). Pathological dissociation often co-occurs with the intensely negative self-perceptions and dysregulation of emotion and impulses (Armey & Crowther, 2008; Ford, 2009a; Levin & Spei, 2004) that have been found to be associated with NSSI, particularly when there is a history of interpersonal victimization involving betrayal trauma (Babcock & DePrince, 2012; Swannell et al., 2012). Dissociation also has been shown to be associated with the hopelessness, interpersonal isolation, and substance use problems that are risk factors for SI/SA (Maaranen et al., 2008; Najavits & Walsh, 2012), with survivors of betrayal trauma at high risk for dissociation (Martin, Cromer, DePrince, & Freyd, 2013). Thus, interventions are needed to prevent exposure to betrayal trauma (A. Chu & DePrince, 2006; Freyd, 2013), and needed treatments are those that simultaneously address complex posttraumatic dissociative (International Society for the Study of Trauma and Dissociation, 2011) and dysregulation (Courtois & Ford, 2013) symptoms.

## FUTURE DIRECTIONS FOR RESEARCH

A key research need highlighted by this review is for studies that prospectively document the etiology and course of NSSI and SI/SA, including temporal patterns and gender differences in the interrelationships among childhood betrayal trauma (Babcock & DePrince, 2012), family/parental psychopathology (Borges, Borges, Medina Mora, Benjet, & Nock, 2013; Gureje et al., 2011), depression (Nyer et al., 2013), severe anxiety or panic (Katz et al., 2011), substance abuse or intoxication (Bagge et al., 2013; Barlow et al., 2012), adolescent/adult exposure to assault (Weismore & Esposito-Smythers, 2010), and intimate partner violence (Babcock & DePrince, 2013; Mullany et al., 2009).

Characteristics of psychological trauma (e.g., interpersonal betrayal vs. other forms of traumatic violence, loss, or crises; age of onset; duration; revictimization) and features of dissociation (e.g., somatoform vs. psychoform, positive vs. negative symptoms) that are associated with NSSI, SA, and SI also require systematic investigation. Identifying variants or concomitants of the general risk factors for NSSI and SA that, like distress tolerance, may distinguish individuals at risk for NSSI versus SI versus SA (Andover & Gibb, 2010; Brausch & Gutierrez, 2010; Cloutier et al., 2010; Wichstrom, 2009) is a key step in increasing the precision of assessment and the efficacy of targeted prevention and treatment interventions for these challenging clinical problems.

Because NSSI may serve as a gateway to SI and SA in some cases (Whitlock et al., 2013), a key research question is whether these high-risk individuals can be identified based on exposure to certain types of traumatic interpersonal victimization (including different forms of neglect and abuse and family, peer, and community violence), or traumatic loss (Kaplow, Layne, Saltzman, Cozza, & Pynoos, 2013), or specific dissociative and other posttraumatic symptoms (Stein et al., 2013). This information may be particularly useful given that suicide risk screening tools have at best modest predictive accuracy (Berman & Silverman, 2013; Hughes, 2011; Mulder, 2011; O'Connor et al., 2013; Schechter & Lineberry, 2011).

In addition, NSSI, SI, and SA have been shown to be cross-cultural phenomena (Brausch & Gutierrez, 2010; J. Chu et al., 2013; Klonsky, 2011; Nock et al., 2013) that occur internationally (e.g., Muehlenkamp et al., 2012). Further research is needed to determine whether the relationship of trauma history and posttraumatic dissociation and emotion dysregulation to self-harm varies in its strength or form based on the sociocultural context of the population and the sociocultural background of the individual. For instance, the meaning, expression, and experience of dissociation (Haque & Hasking, 2010; Pope, Poliakoff, Parker, Boynes, & Hudson, 2007; Seligman & Kirmayer, 2008) and psychological trauma and posttraumatic stress (Bryant-Davis, Chung, & Tillman, 2009; Ford, 2012; Gómez, Smith, & Freyd, 2014) have been shown to vary based on cultural, national, and ethnoracial factors.



The role that exposure to psychological trauma and posttraumatic adaptations play in self-harm therefore may also differ in important ways depending on sociocultural background and context.

Several key risk factors for NSSI and SA, including highly unstable interpersonal relationships, social enmeshment and isolation, intense and dysregulated negative affect, and behavioral impulsivity, are common in DDs, chronic PTSD, and Cluster B personality disorders. Furthermore, although empirically understudied in regard to self-harm, complex PTSD (e.g., Herman, 1992, 1997) provides an additional framework for understanding NSSI and SA as they relate to psychological trauma exposure. Therefore, research is needed to determine when and how NSSI and SA occur in each of the aforementioned disorders and whether distinct patterns of emotion dysregulation within or across these and other high-risk disorders (e.g., affective or eating disorders) can be identified that heighten risk of NSSI (Glenn & Klonsky, 2013a) and SA (Klonsky & May, 2014). For example, a study with adults in substance abuse treatment showed that the combination of BPD and *high* tolerance for distress was uniquely associated with chronic and medically serious SA (Anestis, Gratz, Bagge, & Tull, 2012). Research also is needed to determine how the excitatory/underregulated states that are associated with positive symptoms of psychoform dissociation and the inhibitory/overregulated states related to negative symptoms of psychoform dissociation and to somatoform dissociation (van Dijke et al., 2010) contribute to or increase risk for NSSI and for suicidality.

In light of the evidence that NSSI and SI/SA may also serve an interpersonal function (Van Orden et al., 2010), it will be important to empirically determine whether, when, and for whom posttraumatic dissociation and distress contribute to or alter the social meaning and impact of self-harm. For example, NSSI or SI/SA that occur in a dissociative state or in the context of ongoing problems with posttraumatic dissociation may be an interpersonal communication, intentional or unintended, of either seeking or feeling unable to find or experience social support when emotionally dysregulated. NSSI, or SA, for instance, may be a frantic cry for help or an attempt to get others to recognize and share pain and distress; NSSI, SI, or SA could be an attempt to withdraw into isolation or to reinstate a sense of secure attachment by expressing solidarity with others who are traumatized or marginalized (Evren, Sar, Evren, & Dalbudak, 2008; Jacobson & Gould, 2007; Lyons-Ruth, Melnick, Patrick, & Hobson, 2007).

Although clinicians and patients have identified posttraumatic and dissociative features in these and other similar potential interpersonal and intrapersonal functions of self-harm, research aimed at understanding how posttraumatic stress and dissociation are involved in both the interpersonal and intrapersonal functions of NSSI and suicidality is sparse. Achieving a better empirical perspective on how the varied forms of emotion dysregulation



involved in posttraumatic dissociation and PTSD contribute to and potentially alter NSSI and SI/SA is a key clinical and scientific challenge for the field.

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