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Positive Emotion Dysregulation Identifies Trauma-exposed Community Individuals at Risk for Suicide and Nonsuicidal Self-Injury

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Abstract

Emotion dysregulation is associated with increased risk for suicidal thoughts and behaviors (STBs) and nonsuicidal self-injury (NSSI). However, research in this area has focused almost exclusively on dysregulation stemming from negative emotions. The present study aimed to address this gap in the literature by examining the associations between the specific domains of positive emotion dysregulation and both STBs and NSSI. Participants included 397 trauma-exposed community adults (M_{age} = 35.95; 57.7% female; 76.8% white). Results demonstrated significant associations between positive emotion dysregulation and both STBs and NSSI. In particular, higher levels of nonacceptance of positive emotions were found to be significantly related to risk for STBs (versus no risk), higher severity of STBs, and history of NSSI (versus no history). Findings suggest positive emotion dysregulation may play an important role in the etiology and treatment of both STBs and NSSI among trauma-exposed individuals.

Keywords

suicidal thoughts and behaviors; nonsuicidal self-injury; deliberate self-harm; difficulties regulating positive emotions; positive emotion dysregulation

Suicide is a major public health crisis in the United States. In 2017 alone, there were approximately 47,000 deaths by suicide, a rate equivalent to one death every 11 minutes (Centers for Disease Control [CDC], 2018). Adults are at highest risk for suicide mortality, specifically among women aged 45–54 (9.7 per 100,000 females) and men aged 45–64 (30.1

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Conflicts of Interest

The authors declare no conflicts of interest.

per 100,000 males; CDC, 2018). Despite marked increases in research and prevention efforts, suicide rates continue to rise, having accumulated by 33% from 1999 through 2017 (from 10.5 to 14.0 per 100,000 people; CDC, 2018). Suicidality has been described as a continuum of suicidal thoughts and behaviors (STBs; Kachur et al., 1995). Individuals with a history of trauma have been found to be at elevated risk for STBs, even when accounting for relevant demographic and clinical correlates (Beristianos et al., 2016; Zatti et al., 2017). Taken together, these trends highlight the urgent need for a more nuanced understanding of STBs and related factors that may inform the detection and intervention of STBs among populations characterized by trauma exposure.

One important factor relevant to suicide is nonsuicidal self-injury (NSSI). NSSI refers to the direct, intentional harming of one's own body tissue without suicidal intent and for reasons not socially sanctioned (Nock & Favazza, 2009). Converging evidence demonstrates that NSSI confers risk for various STBs, including suicidal ideation, planning, and attempts (Andover et al., 2012; Klonsky et al., 2013; Nock et al., 2006). Although STBs and NSSI are distinguished in terms of function and intent, they have been found to co-occur at high rates (Andover & Gibb, 2010; Klonsky et al., 2013), including among trauma-exposed individuals (Spink et al., 2017). Nonetheless, extant research on STBs and NSSI is limited in its understanding of factors that may be unique or shared (Kranzler, Fehling, Anestis, & Selby, 2016). One potential shared factor that has been well-documented in the literature is emotion dysregulation, a multifaceted construct involving maladaptive ways of responding to emotions, regardless of their intensity or reactivity, including: (a) a lack of awareness, understanding, and acceptance of emotions; (b) the inability to control behaviors in the context of emotions; (c) a lack of access to situationally appropriate strategies for modulating the duration and/or intensity of emotional responses in order to meet individual goals and situational demands; and (d) an unwillingness to experience emotions as part of pursuing meaningful activities in life (Gratz & Roemer, 2004). Linehan (1993) first proposed that emotion dysregulation – which stems from an interaction between individual biological vulnerability (e.g., high emotional reactivity and sensitivity) and an invalidating environment (e.g., one that negates, rejects, or dismisses an individual's behaviors) – underlies STBs and NSSI. Consistent with this theory, subsequent investigations have found emotion dysregulation to be associated with high risk for STBs and NSSI (Brausch & Woods, 2018; Rajappa et al., 2012). In fact, emotion dysregulation is consistently found to be the most common self-reported function of NSSI, particularly as a means of escaping from or relieving negative emotions (Chapman et al., 2006; Klonsky, 2011; Nock & Prinstein, 2004), and similar findings have been detected for STBs (Anestis et al., 2013; Brausch & Woods, 2018).

While research examining emotion dysregulation in the context of STBs and NSSI has provided valuable insights, this line of research has been limited through its almost exclusive focus on the dysregulation of negative emotions, despite evidence for positive emotion dysregulation (Cyders & Smith, 2007; Weiss et al., 2015). Examination of positive emotion dysregulation is crucial given the positive association between positive emotions and both STBs (Seidlitz et al., 2001) and NSSI (Jenkins & Schmitz, 2012). Moreover, considering evidence for distinct neurocognitive systems underlying negative and positive emotion dysregulation (Mak et al., 2009), there is a need for studies exploring the unique

contributions of positive emotion dysregulation to STBs and NSSI. It is possible that individuals with elevated positive emotion dysregulation may engage in dampening of positive emotions, or the negative appraisal and active dismissal of a positive emotional state (e.g., "I don't deserve to be happy;" Feldman et al., 2008; Gilbert et al., 2013). Consequently, dampening may lead to secondary negative emotions (e.g., guilt or shame) that increase the likelihood of engagement in both STBs (Nock & Prinstein, 2004) and NSSI (Muehlenkamp & Kerr, 2010). This pattern of responding could be particularly relevant for trauma-exposed individuals, who may be more likely to negatively evaluate positive emotions due to the heightened physiological arousal (Litz et al., 2000) and negative cognitive and/or affective responses (Frewen, Dean, & Lanius, 2012; Frewen et al., 2012) they elicit that overlaps with trauma-related symptomology (APA, 2013). Alternatively, positive emotion dysregulation may result in behavioral dyscontrol, such as through heightened distractibility (Dreisbach & Goschke, 2004) or impaired decision-making (Slovic et al., 2004) in the context of positive emotions. For example, individuals may excessively ruminate about their positive emotional state (Feldman et al., 2008), which, in turn, can interfere with the ability to engage in goal-directed behaviors. Further, impulsivity in the context of positive emotions has been found to relate to both STBs (Anestis et al., 2014) and NSSI (Claes & Muehlenkamp, 2013; Weiss et al., 2018).

Yet, despite evidence to suggest that maladaptive responses to positive emotions may underlie engagement in risky and impulsive behaviors, no studies have examined the role of positive emotion dysregulation in STBs and NSSI. The current study aimed to address this critical gap in the literature by examining the associations of positive emotion dysregulation to STBs and NSSI among trauma-exposed community individuals. Examination of these relations in a sample of trauma-exposed individuals is of clinical significance given their heightened levels of emotion dysregulation (Ehring & Quack, 2010), STBs (Krysinska & Lester, 2010), and NSSI (Fliege at al., 2009). Specifically, we assessed positive emotion dysregulation across three domains: (1) nonacceptance of positive emotions (e.g., "When I'm happy, I become scared and fearful of those feelings"), (2) difficulties controlling impulsive behaviors when experiencing positive emotions (e.g., "When I'm happy, I have difficulty controlling my behaviors"), and (3) difficulties engaging in goal-directed behaviors in the context of positive emotions (e.g., "When I'm happy, I have difficulty focusing on other things;" Weiss et al., 2015). We hypothesized that the dimensions of positive emotion dysregulation would be significantly positively related to STBs, such that individuals identified as at risk (vs. not at risk) for suicide and with greater severity of suicide risk would exhibit higher levels of positive emotion dysregulation. Similarly, we also hypothesized that the dimensions of positive emotion dysregulation would be significantly related to NSSI, with higher levels of positive emotion dysregulation among individuals who reported any NSSI (vs. no NSSI) and greater severity and versatility of NSSI.

Materials and Methods

Procedure/Participants

Participants were recruited from Amazon's Mechanical Turk (MTurk) platform. Beyond generating reliable data (Buhrmester et al., 2011; Shapiro et al., 2013), MTurk's subject pool

is diverse (Buhrmester et al., 2011) and represents the general population in terms of demographics (Mischra & Carleton, 2017) and prevalence of mental health problems (Shapiro et al., 2013). Inclusionary criteria entailed (1) being 18 years of age or older; (2) living in North America; (3) working knowledge of the English language; and (4) endorsing experience of a traumatic event on Item 1 of the Criterion A question of the Primary Care PTSD Screen (Prins et al., 2015). Eligible participants provided informed consent and completed the survey on Qualtrics (data collection platform). Participants were provided monetary compensation for study participation. All procedures were approved by the Institutional Review Board at [redacted].

Exclusions and Missing Data

Of the obtained 891 responses, multiple (e.g., duplicate/triplicate) responses were excluded for 18 participants (47 responses; effective $n = 844$). We then excluded 150 participants not meeting one or more inclusionary criteria (effective $n = 694$), 122 participants (effective $n = 572$) who failed to pass any of four validity checks interspersed in the study to ensure attentive responding (three items; e.g., participants were asked to rate "I have never brushed my teeth" on a 6-point scale ranging from "strongly disagree" to "strongly agree") and comprehension (one item; participants were asked to click on a little blue circle rather than on the scale with items labelled from 1 to 5; Meade & Craig, 2012; Thomas & Clifford, 2017), and 97 participants for missing data on all measures (effective $n = 475$). Using data obtained from the Life Event Checklist for DSM-5 (LEC-5; Weathers et al., 2013), we excluded 11 participants who did not endorse a traumatic event (effective $n = 464$). Finally, we excluded 67 participants missing more than 30% item-level data on any variable of interest (see Measures).

The final MTurk sample included 397 participants. The average age of participants was 35.95 ($SD = 11.26$), with a range from 18 to 72 years. The majority of participants identified as female (57.7%; $n = 229$) and white (76.8%; $n = 305$). Additional information on demographics is indicated in Table 1.

Measures

***Life Events Checklist for DSM-5* (LEC-5; Weathers et al., 2013).—**The LEC-5 is a 17-item self-report measure of lifetime trauma. Participants indicate their exposure to each event on a 6-point scale: happened to me, witnessed it, learned about it, part of my job, not sure, and does not apply. Trauma exposure – consistent with the DSM-5 Criterion A – was based on the endorsement of any of the first four response options (American Psychiatric Association [APA], 2013). The number of traumatic events endorsed were summed, with higher scores indicating greater trauma severity. The LEC has demonstrated strong convergent validity with measures assessing traumatic exposure and psychopathology known to relate to traumatic exposure (Gray, Litz, Hsu, & Lombardo, 2004). Table 2 details the prevalence rates of traumatic events.

***Difficulties in Emotion Regulation Scale – Positive* (DERS-P; Weiss et al., 2015).—**The DERS-P is a 13-item self-report measure that assesses positive emotion dysregulation on three domains: Accept, Impulse, and Goals. Higher scores indicate greater

positive emotion dysregulation. Participants rate each item using a 5-point Likert-type scale (1 = *almost never*, 5 = *almost always*). The subscales of the DERS-P have good psychometric properties (Weiss et al., 2015; Weiss et al., 2019). Internal consistency in the current sample was excellent for the DERS-P Accept, DERS-P Impulse, and DERS-P Goals, (Cronbach's αs = .93, .95, and .88, respectively).

Suicide Behaviors Questionnaire-Revised **(SBQ-R; Osman et al., 2001).—**The SBQ-R is a 4-item self-report measure assessing the frequency of lifetime and past year suicide ideation, threats of suicide, and self-reported suicide likelihood. Items were summed to create a total score ranging from 3 to 18, with higher scores indicating greater severity of suicide risk. Further, a clinical cutoff was applied to differentiate between participants in the present study that were *nonsuicidal* (total score < 8) and *suicide-risk* (total score ≥ 8). A cutoff score of 8 has been shown to demonstrate acceptable sensitivity (80%) and specificity (91%) in identifying adults in the general population who are nonsuicidal versus at significant risk for suicidal behavior (Osman et al., 2001). Internal consistency for the SBQ-R has been found to be good in clinical (Cronbach's α = .88) and non-clinical (Cronbach's α = .87; Osman, et al., 2001) samples. Similarly, in the current study, the SBQ-R demonstrated good internal consistency (Cronbach's α = .84).

Inventory of Statements About Self-injury **(ISAS; Klonsky & Olino, 2008).—**The ISAS was used to assesses lifetime frequency of 12 NSSI behaviors: banging/hitting self, biting, burning, carving, cutting, wound picking, needle-sticking, pinching, hair pulling, rubbing skin against rough surfaces, severe scratching, and swallowing chemicals. Participants were asked to estimate the number of times in their life that they intentionally performed each behavior. In the current study, three NSSI variables were computed: NSSI history (present/absent), NSSI frequency, and NSSI versatility index. The dichotomous NSSI history variable was created by assigning a score of "1" to participants who reported having engaged in NSSI on the ISAS, and a score of "0" to participants who did not report having engaged in any of the behaviors on the ISAS. A NSSI frequency variable was computed by summing the total number of NSSI episodes reported on the ISAS. A NSSI versatility index was computed by summing the number of unique types of NSSI behaviors (e.g., cutting, burning) endorsed on the ISAS. The ISAS has demonstrated good reliability and validity (Klonsky and Olino, 2008). Cronbach's α in the current sample was .55, which is consistent with prior studies (Muehlenkamp & Kerr, 2010; Walsh, 2006).

Demographic information.—Information regarding age, gender, ethnicity, race, income, educational level, employment status, ethnicity, and relationship status was obtained.

Data Analysis

Analyses were conducted using SPSS 24. Data were examined for extreme outliers and assumptions of non-normality. Descriptive data on the primary study variables were presented, including frequencies for the outcomes of NSSI and STBs. Following this, to investigate differences in NSSI and STBs as a function of the dimensions of positive emotion dysregulation, a hierarchal (for the continuous outcomes of suicide risk severity) and logistic (for the dichotomous outcomes of suicide-risk and NSSI history) regression

analyses were conducted. Furthermore, we examined how the dimensions of positive emotion dysregulation related to NSSI frequency and NSSI versatility among a subset of the sample who reported a history of NSSI. In doing so, we first examined the mean and standard deviations of these variables to check for over-dispersion; models were over-dispersed for both NSSI frequency (mean/*SD* = 6.33) and versatility (mean/*SD* = 1.22). As such, negative binomial regressions were conducted. Given well-established differences in both STBs and NSSI by gender (e.g., Bresin & Schoenleber, 2015; Callanan & Davis, 2012) and age (e.g., Conwell et al., 1998; Klonsky, 2011), we included these factors as covariates in order to better clarify the effects of positive emotion dysregulation domains. Given the influence of trauma exposure on both STBs and NSSI (Ford & Gómez, 2015), we also included as a covariate the number of traumas (trauma load) that were endorsed on the LEC-5.

Results

Preliminary Analyses

Variables were within range for a normal distribution (skewness < 2 and kurtosis < 7; Curran et al., 1996), with the exception of the NSSI frequency variable, which evidenced a positive skew; a negative binomial regression can account for this non-normal distribution (Cameron, & Trivedi, 2013). Intercorrelations and descriptive data for the primary study variables are presented in Table 3. Significant positive associations were detected among positive emotion dysregulation domains and NSSI history. Further, positive emotion dysregulation domains were generally associated with gender, age, and trauma load. Scores on the SBQ-R ranged from 3 to 29 (*M* = 4.97, *SD* = 3.41), with 116 participants (29.2%) exceeding the SBQ-R cutoff score of eight, indicating suicide risk. Nearly half of the participants reported a lifetime history of NSSI (46.6%; *n* = 185). Among those with a history of NSSI, most participants (*n* = 145; 90.1%) endorsed using more than one NSSI behavior. The most frequent method of NSSI was interfering with wound healing (20.65%; *n* = 82), followed by cutting (19.40%; *n* = 77), banging or hitting oneself (17.38%; *n* = 69), severe scratching (14.68%; *n* = 59), hair pulling (14.36%; *n* = 54), pinching (11.83%; *n* = 47), biting (9.82%; *n* = 39), burning (7.81%; *n* = 31), swallowing dangerous substances (5.54%; *n* = 22), sticking oneself with needles (5.04%; *n* = 20), rubbing one's skin against a rough surface (4.79%; *n* = 19), and carving (4.03%; *n* = 16). With regards to gender, for men, 39.9% (*n* = 65) reported a history of STBs and 40.5% (*n* = 66) reported a history of NSSI, whereas for women, 53.7% (*n* = 123) reported a history of STBs and 49.8% (*n* = 114) reported a history of NSSI.

Primary Analyses

STBs.—A logistic regression was conducted to assess the roles of dimensions of positive emotion dysregulation in suicide risk (suicide-risk vs. nonsuicidal), adjusting for gender, age, and trauma load (see Table 4). The overall model was significant, $\chi 2$ (6) = 28.35, p < .001, and correctly classified 71.9% of participants. DERS-P Accept (β = .18, *SE* = .09, OR = 1.20, Wald = 4.50, p = .03), DERS-P Impulse (β = −.17, *SE* = .09, OR = 0.84, Wald = 4.12, p = .04), and gender (β = .83, *SE* = .24, OR = 2.29, Wald = 12.09, p = .001), emerged as reliable predictors of suicide risk, accounting for unique variance in suicide risk above and beyond that associated with age (β = −.02, *SE* = .01, OR = 0.98, Wald = 2.25, p = .13),

trauma load (β = .05, *SE* = .03, OR = 1.05, Wald = 3.39, p = .07), and DERS-P Goals (β = .02, *SE* = .07, OR = 1.02, Wald = 0.13, p = .72). Next, a hierarchal linear regression was conducted to assess the roles of dimensions of positive emotion dysregulation in suicide risk severity, adjusting for gender, age, and trauma load (see Table 5). The overall model was significant, $F(3, 374) = 5.83$, p = .001. DERS-P Accept (β = 0.47, *SE* = .13, t = 4.07, p < .001), DERS-P Impulse (β = −0.40, *SE* = .12, t = −3.04, p = .003), and gender (β = 0.17, *SE* = .33, t = 3.39, p = .001), emerged as reliable predictors of suicide risk severity, accounting for unique variance in suicide risk severity above and beyond that associated with age (β = −0.08, *SE* = .02, t = −1.50, p = .14), trauma load (β = 0.07, *SE* = .04, t = 1.37, p = .17), and DERS-P Goals (β = −0.08, *SE* = .11, t = −0.88, p = .38).

NSSI.—A logistic regression was conducted to assess the roles of dimensions of positive emotion dysregulation in NSSI history (present vs. absent), adjusting for gender, age, and trauma load (see Table 4). The overall model was significant, $\chi 2$ (6) = 34.47, p < .001, and correctly classified 66.1% of participants. DERS-P Accept (β = .20, *SE* = .08, OR = 1.22, Wald = 5.62, p = .02), gender (β = .61, *SE* = .21, OR = 1.84, Wald = 8.23, p = .004), and trauma load (β = .06, *SE* = .02, OR = 1.06, Wald = 5.87, p = .02) emerged as reliable predictors of NSSI history, accounting for unique variance in NSSI history above and beyond that associated with age (β = −.01, *SE* = .01, OR = 0.99, Wald = 1.11, p = .29), DERS-P Goals (β = .09, *SE* = .06, OR = 1.09, Wald = 2.11, p = .15), and DERS-P Impulse (β = −.15, *SE* = .08, OR = 0.86, Wald = 3.48, p = .06). Next, among a subset of the sample who reported a history of NSSI (n = 161), a negative binomial regression was conducted to assess the roles of dimensions of positive emotion dysregulation in NSSI frequency, adjusting for gender, age, and trauma load (see Table 6). The overall model was not significant, $\chi 2$ (6) = 9.30, p = .16. None of the variables emerged as reliable predictors of NSSI frequency, gender (β = −.07, *SE* = .20, Wald = 0.11, p = .74), age (β = .02, *SE* = .01, Wald = 2.16, p = .14), trauma load (β = −.001, *SE* = .02, Wald = 0.002, p = .96), DERS-P Accept (β = −.01, *SE* = .07, Wald = 0.03, p = .86), DERS-P Goals (β = −.12, *SE* = .07, Wald = 3.29, p = .07), and DERS-P Impulse (β = .04, *SE* = .08, Wald = 0.29, p = .59). Finally, among a subset of the sample who reported a history of NSSI (n = 161), a negative binomial regression was conducted to assess the roles of dimensions of positive emotion dysregulation in NSSI versatility, adjusting for gender, age, and trauma load (see Table 6). The overall model was significant, $\chi 2$ (6) = 20.98, p = .002. Age (β = −.02, *SE* = .01, Wald = 9.54, p = .002) and trauma load (β = .04, *SE* = .01, Wald = 8.99, p = .003) emerged as a reliable predictor of NSSI versatility, accounting for unique variance in NSSI versatility above and beyond that associated with gender (β = .05, *SE* = .09, Wald = 0.29, p = .59), DERS-P Accept (β = .03, *SE* = .03, Wald = 0.69, p = .41), DERS-P Goals (β = −.01, *SE* = .03, Wald = 0.06, p = .81), and DERS-P Impulse (β = −.03, *SE* = .03, Wald = 0.88, p = .35).

Discussion

Extensive research highlights the role of emotion dysregulation in risk for both STBs and NSSI (Anestis et al., 2013; Brausch & Woods, 2018; Chapman et al., 2006; Nock & Prinstein, 2004; Rajappa et al., 2012). This study adds to the current body of literature by exploring the roles of specific dimensions of positive emotion dysregulation in both STBs

and NSSI among a community sample of trauma-exposed individuals. Partially consistent with expectations, our results indicate significant relations between specific domains of positive emotion dysregulation and both STBs and NSSI. These findings improve our understanding of vulnerability for both STBs and NSSI in this high-risk population. Moreover, results underscore areas for future research and practice aimed at STBs and NSSI.

In partial support of our hypotheses, we found that the nonacceptance dimension of positive emotion dysregulation was significantly positively related to STBs and NSSI when controlling for relevant demographic variables and trauma load. Specifically, participants who were identified as at risk for STBs (versus those not at risk) and who had greater severity of STBs exhibited higher levels of nonacceptance of positive emotions. Further, participants who indicated a history of NSSI (versus no history of NSSI) exhibited higher levels of nonacceptance of positive emotions. These findings are consistent with prior theory linking this emotion dysregulation dimension to STBs and NSSI (Chapman, Gratz, & Brown, 2006). Non-acceptance of positive emotions may lead to secondary negative emotions (e.g., guilt or shame) that increase distress and related efforts to avoid positive emotions (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996) which, in turn, may elevate risk for maladaptive emotion regulation strategies (e.g., Chapman et al., 2006; Gratz & Tull, 2010) that may include STBs (Nock & Prinstein, 2004) and NSSI (Muehlenkamp & Kerr, 2010). In particular, individuals with (versus without) a history of trauma may be more likely to negatively evaluate positive emotions due to the overlap between the experience of positive emotions and trauma-related symptomology (APA, 2013), including an increase in physiological arousal (Litz et al., 2000) and negative cognitive and/or affective responses (Frewen, Dean, & Lanius, 2012; Frewen et al., 2012). Additionally, non-acceptance of positive emotions may lead to avoidance behaviors more broadly (Taylor, Laposa, & Alden, 2004), which have been linked to both STBs (e.g., Zvolensky, Jardin, Garey, Robles, & Sharp, 2016) and NSSI (e.g., Howe-Martin, Murrell, & Guarnaccia, 2012). Indeed, research suggests that trauma-exposed individuals may engage in STBs and NSSI to reduce negative affect broadly (Klonsky, 2011; Nock & Prinstein, 2004) and posttraumatic stress disorder symptoms in particular (Weiss, Dixon-Gordon, Duke, & Sullivan, 2015). However, findings of the present study did not identify a significant role of positive emotion dysregulation in NSSI frequency or versatility. It may be that positive emotion dysregulation is more relevant to initially turning to NSSI and as a means of coping rather than the continued, high frequency or varied method engagement in NSSI. Further work is needed to better understand how positive emotion dysregulation, specifically non-acceptance of positive emotions, may increase risk for STBs and NSSI among individuals with a history of trauma.

Conversely, our findings suggest that STBs and NSSI are not associated with impulse control difficulties or difficulties engaging in goal-directed behavior when experiencing positive emotions, with the exception that STBs were negatively associated with impulse control difficulties, when controlling for relevant demographic variables and trauma load. These results are in contrast to prior studies linking impulsivity in the context of positive emotions to STBs (Anestis et al., 2014) and NSSI (Claes & Muehlenkamp, 2013). Yet, some research has found mixed findings on the association between impulsivity and suicidal behavior (Klonsky & May, 2010), with no studies specifically examining impulse control difficulties in the context of positive emotions among trauma-exposed individuals. One

explanation for these findings is that behavioral dyscontrol is a consequence of high intensity positive emotions (Cyders & Smith, 2007; 2008), and levels of positive affect among individuals at risk for STBs and NSSI may not be intense enough to elicit difficulties with impulse control or goal-directed behavior; this aligns with studies demonstrating that individuals with versus without STBs (Seidlitz et al., 2001) or NSSI (Bresin, 2014) report lower intensity of positive emotion. This may be true of individuals with a history of trauma and experiencing trauma-related deficits in positive affect (APA, 2013). Alternatively, it may be that cognitive processes characteristic of behavioral dyscontrol – such as narrowing of attention (Gable & Harmon-Jones, 2008), increased distractibility (Dreisbach & Goschke, 2004), and less discriminative use of information (Forgas, 1992) – are less salient factors to STBs and NSSI for individuals with a history of trauma. Additional studies are warranted to disentangle the differential relations between positive emotion dysregulation domains and aspects of STBs and NSSI among trauma-exposed samples, particularly while controlling for intensity of positive affect.

It warrants mention that gender was a significant predictor of STBs and NSSI, such that women were significantly more likely to report these behaviors. These results are consistent with prior research indicating that women are more likely than men to attempt suicide (CDC, 2018) and engage in NSSI (for a review, see Bresin & Schoenleber, 2015). Higher rates of STBs and NSSI among women may be due to gender-related vulnerability to psychopathology (Beautrais, 2006) or other shared risk factors for STBs such as emotion-focused coping (Edwards & Holden, 2001). Future investigations are warranted to examine whether underlying factors and functions vary as a function of gender. Such findings may identify gender-sensitive recommendations for the assessment and treatment of STBs and NSSI, including in those with a history of trauma.

These results may have important clinical implications. Broadly, these findings may be used to provide insight into the factors underlying the development and maintenance of STBs and NSSI among trauma-exposed individuals. Current treatments for STBs and NSSI that target emotion dysregulation (e.g., dialectical behavior therapy [Linehan, 1993], emotion regulation group therapy [Gratz, Levy, & Tull, 2012]) might benefit from an increased focus on the dysregulation of positive emotions, which is often overlooked in clinical settings. For instance, trauma-exposed individuals with high positive emotion dysregulation may benefit from an acceptance-based approach to positive emotions such as mindfulness-based exercises and techniques (Gilbert et al., 2013). This may be relevant in the context of emerging trauma-focused treatments that emphasize the importance of skills training in negative emotion dysregulation among trauma-exposed individuals, yet neglect positive emotion dysregulation (Cloitre, Koenen, Cohen, & Han, 2002). Moreover, the assessment of positive emotion dysregulation may serve as a means to identify individuals at risk for STBs and NSSI. This study also provides support for practices to take into account gender differences when assessing risk for STBs and NSSI. Future research is needed to better understand the utility of addressing positive emotion dysregulation, particularly the acceptance of positive emotions, in the assessment and treatment of STBs and NSSI among trauma-exposed individuals.

There are several limitations of the present study that must be considered. The study was cross-sectional and correlational in design. Future research should employ a longitudinal approach to investigate the nature and direction of the associations among positive emotion dysregulation and both STBs and NSSI. Ideally, studies can incorporate an ideation-to-action framework (Klonsky & May, 2015), given that the current suicide literature is limited in its understanding of the transition from suicidal ideation to suicide attempts, making it difficult to accurately predict suicide risk. Indeed, elevated emotion dysregulation may cause individuals to avoid aversive emotional states, thus acting as a barrier to the capability for suicide (Law et al., 2015). Yet, emotion dysregulation has been found to relate to suicidal thinking, and may be a driving force in the transition from ideation to suicide attempt via NSSI; NSSI can increase an individual's capability for suicide through exposure to painful experiences that, over time, enable one to overcome an innate instinct of self-preservation (Law et al., 2015). Further research clarifying the relations among positive emotion dysregulation, STBs, and NSSI within the ideation-to-action framework is essential for advancing prevention and intervention efforts.

Furthermore, generalizability of these findings remains unclear. Considering that participants were predominantly white and non-Hispanic, future research should replicate findings in more diverse samples. Moreover, this study examined the relationship between positive emotion dysregulation and STBs and NSSI among trauma-exposed individuals, a sample at risk for elevated emotion dysregulation (Ehring & Quack, 2010). Further work should replicate findings among other samples that are characterized by heightened positive emotion dysregulation (e.g., individuals with major depression or bipolar disorder; Ehring et al., 2010; Linehan, 1993; Shearin & Linehan, 1994). In particular, given that trauma load was a significant predictor of NSSI history, further work should explore these relations among individuals experiencing symptoms of posttraumatic stress disorder, which was not assessed as part of this study. It is also important to note that effect sizes were in the small range (determined using odds ratios; Chen et al., 2010), urging caution when interpreting results. Lastly, reliance on self-report measures is not ideal. Although this problem is common in suicide research, it is important to note that self-reported frequency of STBs and NSSI may lead to overestimation of thoughts or behaviors (Muehlenkamp & Kerr, 2010). Subsequent work should also include clinical interviews to attain a thorough trauma history. Future research should utilize ecological momentary assessment methods when possible. Assessment of STBs and NSSI in real-time not only increases the accuracy of reports, but also has the potential to provide valuable insight into the emotional states that occur before and after the thoughts/behaviors.

Despite these limitations, the current study sheds light on the nuanced relation between positive emotion dysregulation and STBs and NSSI, warranting further research. Findings offer preliminary support for the role of positive emotion dysregulation, specifically as it relates to the non-acceptance of positive emotions, in both STBs and NSSI among trauma-exposed individuals. Given the high risks associated with STBs and NSSI (e.g., severe injury requiring medical attention, accidental/intended death), this study takes an important initial step towards identifying positive emotion dysregulation as a potential underlying factor that could help inform the development and refinement of effective interventions.

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Table 1

Sample Characteristics and Sociodemographic Data

		n	%	*M (SD)*
Gender	Male	163	41.1%	
	Female	229	57.7%	
	Other	5	1.3%	
Employment Status	Part time	63	15.9%	
	Full time	280	70.5%	
	Retired	13	3.3%	
	Unemployed	33	8.3%	
	Unemployed Student	8	2.0%	
Income	Less than $15,000	35	9.1%	
	$15,000 to $24,999	52	13.4%	
	$25,000 to $34,999	60	15.4%	
	$35,000 to $49,999	53	13.4%	
	$50,000 to $64,999	73	18.9%	
	$65,000 to $79,999	34	9.3%	
	$80,000 or higher	79	20.7%	
Race *	White	305	76.8%	
	African American	38	9.6%	
	Asian	44	11.1%	
	American Indian/Alaskan Native	18	4.5%	
	Native Hawaii/Pacific Islander	3	0.8%	
	Unknown	6	1.5%	
Ethnicity	Hispanic or Latino/a	53	13.4%	
	Not Hispanic or Latino/a	338	85.1%	
	Unknown	6	1.5%	
Suicide Risk	Nonsuicidal	281	70.8%	
	Suicide-risk	116	29.2%	
Suicide Severity				6.63 (3.95)
NSSI History	NSSI absent	212	53.4%	
	NSSI present	185	46.6%	
NSSI Frequency				113.96 (466.08)
NSSI Versatility				3.04 (2.49)

Note. NSSI = Non-suicidal self-injury.

* May select multiple racial categories.

Table 2.

List of Traumas Endorsed on the Life Events Checklist for the DSM-5

Potentially Traumatic Events	***n* (%)**
Sudden accidental death	165 (41.6%)
Assault with a weapon (e.g., being shot, stabbed, threatened with a knife, gun, bomb)	149 (37.5%)
Transportation accident (e.g., car accident, boat accident, train wreck, plane crash)	310 (78.0%)
Life-threatening illness or injury	201 (50.6%)
Physical assault (e.g., being attacked, hit, slapped, kicked, beaten up)	223 (56.2%)
Natural disaster (e.g., flood, hurricane, tornado, earthquake)	260 (65.5%)
Captivity (e.g., being kidnapped, abducted, held hostage, prisoner of war)	67 (16.9%)
Other unwanted or uncomfortable sexual experience	193 (48.6%)
Serious injury, harm, or death you caused to someone else	67 (16.9%)
Exposure to toxic substance (e.g., dangerous chemicals, radiation)	98 (24.7%)
Serious accident at work, home, or during recreational activity	177 (44.6%)
Sexual assault (e.g., rape, attempted rape, made to perform any type of sexual act through force or threat of harm)	181 (45.6%)
Any other very stressful event or experience	162 (40.8%)
Fire or explosion	206 (51.9%)
Combat or exposure to a war-zone (i.e., in the military or as a civilian)	105 (26.4%)
Severe human suffering	127 (32.0%)
Sudden violent death (e.g., homicide, suicide)	162 (40.8%)
	M (SD)
Trauma Load	7.20 (4.65)

Table 3.

Descriptive statistics and zero-order correlations for variables of interest

	M	*SD*	1	2	3	4	5	6	7	8	9
1. Gender	1.62	0.60	—	—	—	—	—	—	—	—	—
2. Age	35.95	11.26	.02	—	—	—	—	—	—	—	—
3. Trauma Load	7.20	4.65	.02	−.06	—	—	—	—	—	—	—
4. DERS-P Accept	5.97	3.68	−.14**	−.29**	−21**	—	—	—	—	—	—
5. DERS-P Goals	6.38	3.43	−.10	−.29**	0.15**	.78**	—	—	—	—	—
6. DERS-P Impulse	7.35	4.40	−.18**	−.31**	.17**	.91**	.83**	—	—	—	—
7. Suicide Risk	0.29	0.46	.20**	−.08	.09	−.01	.02	−.03	—	—	—
8. NSSI History	0.47	0.50	.14**	−.11*	.15**	.18**	.17**	.14**	.46**	—	—
9. Suicide Risk Severity	6.63	3.95	.19**	−.08	.07	.03	−.02	−.02	.85**	.47**	—

Note. NSSI = Non-suicidal self-injury. DERS-P = Difficulties in Emotion Regulation Scale – Positive. DERS-P Accept = Nonacceptance of positive emotions. DERS-P Goals = Difficulties engaging in goal-directed behavior when experiencing positive emotions. DERS-P Impulse = Difficulties controlling impulsive behaviors when experiencing positive emotions.

* $p < .05$.

** $p < .01$.

Table 4

Logistic Regression Analyses Examining the Contributions of Dimensions of Positive Emotion Dysregulation to Suicide Risk and NSSI History

	B	*SE*	Wald	Odds Ratio	95% *CI*	Nagelkerke R^2	Model χ^2
Suicide Risk							
Step 1						.08	22.99***
Gender	.83***	.23	13.45	2.28	[1.47, 3.55]		
Age	−.02	.01	2.39	0.98	[0.96, 1.00]		
Trauma Load	.05	.03	3.77	1.05	[1.00, 1.10]		
Step 2						.10	28.35***
Gender	.83***	.24	12.09	2.29	[1.44, 3.64]		
Age	−.02	.01	2.25	0.98	[0.96, 1.01]		
Trauma Load	.05	.03	3.39	1.05	[1.00, 1.10]		
DERS-P Accept	.18**	.09	4.50	1.20	[1.01, 1.43]		
DERS-P Goals	.02	.07	0.13	1.02	[0.90, 1.16]		
DERS-P Impulse	−.17*	.09	4.12	0.84	[0.71, 0.99]		
NSSI History							
Step 1						.07	21.49***
Gender	.51**	.20	6.76	1.66	[1.13, 2.44]		
Age	−.02	.01	3.81	0.98	[0.96, 1.00]		
Trauma Load	.07**	.02	9.23	1.07	[1.03, 1.12]		
Step 2						.12	34.47***
Gender	.61**	.21	8.23	1.84	[1.21, 2.78]		
Age	−.01	.01	1.11	0.99	[0.97, 1.01]		
Trauma Load	.06*	.02	5.87	1.06	[1.01, 1.11]		
DERS-P Accept	.20*	.08	5.62	1.22	[1.04, 1.44]		
DERS-P Goals	.09	.06	2.11	1.09	[0.97, 1.23]		
DERS-P Impulse	−.15	.08	3.48	0.86	[0.74, 1.01]		

Note. NSSI = Non-suicidal self-injury. DERS-P = Difficulties in Emotion Regulation Scale – Positive. DERS-P Accept = Nonacceptance of positive emotions. DERS-P Goals = Difficulties engaging in goal-directed behavior when experiencing positive emotions. DERS-P Impulse = Difficulties controlling impulsive behaviors when experiencing positive emotions. The 95% confidence intervals for the odds ratio are provided.

* $p \leq .05$.

** $p \leq .01$.

*** $p \leq .001$.

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Table 5

Hierarchal Linear Regression Analyses Examining the Roles of Dimensions of Positive Emotion Dysregulation to Suicide Risk Severity

	F	*Adjusted* R^2	ΔR^2	β	*SE*	*t*	sr^2
Suicide Risk Severity							
Step 1	6.26^{***}	.04	.05				
Gender				0.19	0.33	3.73^{***}	.19
Age				−0.08	0.02	−1.49	−.08
Trauma Load				0.08	0.04	1.63	.08
Step 2	6.17^{***}	.08	.04				
Gender				0.17	0.33	3.39^{***}	.17
Age				−0.08	0.02	−1.50	−.08
Trauma Load				0.07	0.04	1.37	.07
DERS-P Accept				0.47	0.13	4.07^{***}	.21
DERS-P Goals				−0.08	0.11	−0.88	−.05
DERS-P Impulse				−0.40	0.12	-3.04^{**}	−.16

Note. NSSI = Non-suicidal self-injury. DERS-P = Difficulties in Emotion Regulation Scale – Positive. DERS-P Accept = Nonacceptance of positive emotions. DERS-P Goals = Difficulties engaging in goal-directed behavior when experiencing positive emotions. DERS-P Impulse = Difficulties controlling impulsive behaviors when experiencing positive emotions.

$^{*}p \leq .05$.

$^{**}p \leq .01$.

$^{***}p \leq .001$.

Table 6

Negative Binomial Regression Analyses Examining the Contributions of Dimensions of Positive Emotion Dysregulation to NSSI Frequency and Versatility

	B	*SE*	Wald	95% *CI*	Model χ^2
NSSI Frequency					
					9.30
Gender	−.07	.20	0.11	[−0.45, 0.32]	
Age	.02	.01	2.16	[−0.01, 0.05]	
Trauma Load	−.001	.03	0.002	[−0.06, 0.06]	
DERS-P Accept	−.01	.07	0.03	[−0.15, 0.13]	
DERS-P Goals	−.12	.07	3.29	[−0.26, 0.01]	
DERS-P Impulse	.04	.08	0.29	[−0.11, 0.19]	
NSSI Versatility					
					20.98
Gender	.05	.09	0.29	[−0.13, 0.22]	
Age	−.02**	.01	9.54	[−0.03, −0.01]	
Trauma Load	.04**	.01	8.99	[0.01, 0.07]	
DERS-P Accept	.03	.03	0.69	[−0.03, 0.09]	
DERS-P Goals	−.01	.03	0.06	[−0.06, 0.06]	
DERS-P Impulse	−.03	.03	0.88	[−0.09, 0.03]	

Note. NSSI = Non-suicidal self-injury. DERS-P = Difficulties in Emotion Regulation Scale – Positive. DERS-P Accept = Nonacceptance of positive emotions. DERS-P Goals = Difficulties engaging in goal-directed behavior when experiencing positive emotions. DERS-P Impulse = Difficulties controlling impulsive behaviors when experiencing positive emotions. The 95% confidence intervals for the odds ratio are provided.

* $p \leq .05$.

** $p \leq .01$.

*** $p \leq .001$.