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The moderating role of distress tolerance in the relationship between posttraumatic stress disorder symptom clusters and suicidal behavior among trauma-exposed substance users in residential treatment

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Abstract

The co-occurrence of posttraumatic stress disorder (PTSD) and substance use disorders (SUDs) is associated with greater risk for suicidal behavior than either disorder alone. Research highlights the relevance of PTSD symptoms in particular to suicide risk within this population. Research has also provided support for an association between distress tolerance (DT) and both PTSD symptoms and suicidal behavior. This study examined the role of DT in the relationship between PTSD symptom severity and suicidal behavior in a sample of 164 SUD inpatients with a history of Criterion A traumatic exposure. Results indicated that DT moderated the relationship between PTSD symptoms (overall, re-experiencing, and hyperarousal) and medically-attended suicide attempts, with the magnitude of the relationship increasing at higher levels of DT.

1. Introduction

Posttraumatic stress disorder (PTSD) is characterized by the development and persistence of re-experiencing (e.g., intrusive thoughts), avoidance (e.g., avoiding thinking about the traumatic event), emotional numbing (e.g., restricted range of emotions), and hyperarousal (e.g., hypervigilance) symptoms following exposure to an event during which an individual experiences fear, helplessness, and/or horror, as well as actual or threatened death or serious injury (American Psychiatric Association, 2000; Asmundson, Stapleton, & Taylor, 2004). The lifetime prevalence of PTSD in the general population is 6.8% (Kessler et al., 2005); however, higher rates have been found among individuals with other psychiatric disorders, especially substance use disorders (SUDs; Brady, Back, & Coffey, 2004). Specifically, research demonstrates that as many as 25-55% of treatment-seeking individuals diagnosed with a SUD also meet criteria for PTSD (Brady, Killeen, Saladin, Dansky, & Becker, 1994), and there is evidence to suggest that this co-occurrence is clinically-relevant, associated with heightened levels of numerous self-destructive behaviors. . Of particular clinical importance, evidence suggests heightened rates of suicide attempts among PTSD-SUD patients (compared to patients with either disorder alone; Harned et al., 2006) – a notable finding given rates of suicide attempts as high as 45% among both PTSD (Ferrada-Noli et al., 1998) and SUD (Anderson et al., 1995) populations. However, research is needed to examine the factors that may confer risk for suicide attempts among SUD patients exposed to a traumatic event.

²Because past research has often considered DSH continuously, we re-ran our analyses utilizing lifetime frequency of DSH as a covariate rather than dichotomous DSH status. The results remained essentially unchanged, with the significance and direction of effects identical to the original analyses.

One factor that warrants consideration is the presence of PTSD symptoms themselves. There is evidence that the experience of PTSD symptoms may confer risk for suicidal behavior in general (Fordwood, Asarnow, Huizar, & Reise, 2007) and within SUD populations specifically (Bornovalova et al., in press). Despite supporting an association between overall PTSD symptom severity and suicidal behavior, however, these results do not speak to the role of specific PTSD symptom clusters in suicide risk among trauma-exposed SUD patients. Recently, researchers have examined the contributions of specific symptom clusters to the prediction of various components of suicidality, finding preliminary support for the relevance of re-experiencing symptoms in particular (Bell & Nye, 2007). One reason for this may be the overlap between re-experiencing symptoms and the mental rehearsal of painful and provocative experiences (considered to play a key role in the acquired capability for suicide; Joiner et al., 2005). In support of this possibility, Selby, Anestis, and Joiner (2007) found that violent daydreaming (which also involves the mental rehearsal of violent imagery) significantly predicted overall suicidality (including ideation, plans, and attempts). These authors theorized that violent mental imagery may serve as a form of exposure to painful and/or provocative events, thereby increasing an individual's capability for suicide (which is comprised of habituation to physiological pain and the fear of death (Joiner, 2005)). Although the mental rehearsal of painful and provocative events would not necessarily be expected to influence an individual's ability to tolerate physical pain, it could influence their fear of death (increasing their habituation to thoughts and images of death through repeated imaginal exposure to such stimuli). In support of this interpretation, Bryan and Anestis (2011) found that PTSD re-experiencing symptoms among military personnel serving in Operation Iraqi Freedom demonstrated only an indirect link to suicidal desire, but a robust and direct association with the acquired capability for suicide.

Although PTSD symptoms may play a role in suicidal behaviors among trauma-exposed SUD patients, other factors likely influence the strength of this association. One factor worth considering is distress tolerance (DT), defined here as the ability to withstand aversive emotional and/or physical states (Simons & Gaher, 2005). Indeed, low DT has been found to be associated with both SUDs (Buckner, Keough, & Schmidt, 2007) and PTSD symptom severity (Marshall-Berenz et al., 2010), as well as suicidal desire (Anestis, Bagge, Tull, & Joiner, 2011). Conversely, high DT has been found to be associated with the acquired capability for suicide (e.g., Anestis et al., 2011). Together, these findings suggest that although SUD patients with low DT may have more severe PTSD symptoms and a greater desire for suicide, they may be less inherently capable of enacting potentially lethal self-injury. Conversely, high levels of DT may be necessary to persist in the face of innately distressing stimuli (e.g., physical pain, risk of death) and enact more lethal self-injury. As such, the greatest risk for suicide attempts among trauma-exposed SUD patient populations would be expected to be found within the subset of patients with both severe PTSD symptoms and high DT.

The present study examined whether DT moderates the relationship between PTSD symptom severity (in general and across different symptom clusters) and suicide attempts among SUD patients with Criterion A traumatic exposure. This study extends extant research by examining these associations in clinical sample, considering the moderating role of DT in the association between PTSD symptoms and suicide attempts, and examining both total number of suicide attempts and medically-attended suicide attempts (a proxy for the medical seriousness of the attempt).

Given findings of a significant association between overall PTSD symptom severity and previous suicide attempts (Bornovalova et al., in press), as well as evidence that PTSD re-experiencing symptoms may be particularly relevant to suicidal behavior (Bryan & Anestis, 2011), we hypothesized that DT would moderate the relationships between both overall

PTSD symptom severity and PTSD re-experiencing symptoms and suicidal behavior (in particular, medically-attended attempts). Specifically, we hypothesized that the association between PTSD symptom severity and medically-attended attempts would be significant only for those patients with high DT. Given the paucity of research examining associations between other PTSD symptom clusters and suicidal behavior, we did not make any *a priori* hypotheses regarding the remaining PTSD symptom clusters.

2. Method

2.1. Participants

Participants were 164 patients with SUDs who reported a history of Criterion A traumatic exposure on a PTSD interview (see below). All participants were receiving treatment at a residential SUD treatment facility in the Jackson, Mississippi area. Participants ranged in age from 18 to 61 (mean = 35.51 ± 10.03). See Table 1 for complete data on the demographic and clinical characteristics of this sample.

2.2. Materials

2.2.1. Clinical Interviews—All participants were assessed using the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1990). The CAPS is a structured PTSD diagnostic interview that assesses the frequency and intensity of the 17 *DSM-IV* PTSD symptoms (plus eight associated symptoms). Frequency items are rated from 0 (*never or none/not at all*) to 4 (*daily or almost every day or more than 80%*). Intensity items are rated from 0 (*none*) to 4 (*extreme*). The CAPS has adequate interrater reliability (.92-.99), internal consistency (.73-.85), and convergent validity with established measures of PTSD (Weathers, Keane, & Davidson, 2001). Frequency and intensity ratings are summed for an overall PTSD severity score, and can be used to assess the severity of PTSD symptom clusters (across re-experiencing, hyperarousal, avoidance, and emotional numbing) as well (Forbes, et al., 2011; Weathers, Ruscio, & Keane, 1999). Given evidence that PTSD is best represented as a dimensional construct (e.g., Broman-Fulks et al., 2006), we utilized overall CAPS severity scores as well as severity scores for the four symptom clusters as independent variables.

The Structured Clinical Interview for DSM-IV Axis I disorders (SCID-IV; First et al., 1996) was used to assess for lifetime Axis I disorders, and the borderline personality disorder (BPD) module of the Diagnostic Interview for DSM-IV Personality Disorders (DIPD-IV; Zanarini, Frankenburg, Sickel, & Young, 1996) was used to assess for the presence of BPD. Interviews were conducted by bachelors- or masters-level clinical assessors trained to reliability by the Principal Investigator (MTT) and Co-Investigator (KLG). All interviews were reviewed by a PhD-level psychologist (MTT), with diagnoses confirmed in consensus meetings.

The Lifetime Parasuicide Count (LPC; Linehan & Comtois, 1996) was used to assess lifetime history of suicidal behaviors. The LPC is a structured interview designed to assess lifetime frequency of suicidal and self-harm behaviors across severity and intent. Behaviors are categorized as suicide attempts if participants endorse any intent to die (either ambivalent or clear; e.g., Muehlenkamp & Gutierrez, 2007). Consistent with past research (e.g., Chapman & Dixon-Gordon, 2007), both the total number of lifetime suicide attempts and the number of attempts requiring medical attention were utilized as outcome variables. Prior work examining differences between suicide attempts of varying levels of severity have also utilized medical attention as a proxy measure, thereby offering precedent for this approach (e.g., Connor et al., 2006).

2.2.2. Laboratory Task—The Paced Auditory Serial Addition Task – Computerized Version (PASAT-C; Lejuez, Kahler, & Brown, 2003) was used to assess DT. During this task, numbers are sequentially flashed on a computer screen, and participants are instructed to sum the most recent number with the previous number. After providing each sum, the participant must ignore the sum and add the following number to the most recently presented number. When a correct answer is provided, a point is obtained. If an incorrect answer is provided, or if the participant fails to provide an answer before the next number is presented, an “explosion” sound is played and the score does not change.

The version of the PASAT-C used in this study consisted of 3 levels with increasingly shorter latencies between number presentations (i.e., 3 sec for Level 1, 2 sec for Level 2, and 1 sec for Level 3). Because the correct answer must be provided before the presentation of the next number to obtain a point, difficulty increases as latencies decrease. Level 1 (lasted 3 minutes, Level 2 lasted 5 minutes, and Level 3 lasted 7 minutes and included an option to terminate the task at any time. Consistent with prior studies (e.g., Gratz et al., 2007) DT was indexed as latency to quit the task in seconds, with longer persistence indicative of greater DT.

To ensure that the task induces emotional distress, participants rate their level of anxiety, frustration, and irritation both before the task (pre-task) and immediately prior to receiving the option to terminate the task (post-task). Each item is rated from 0 to 100, with the average rating across all forms of distress used to examine changes in distress in response to the task (see Manipulation Check).

In support of the construct validity of the PASAT-C, this task has been shown to induce emotional distress in the form of anxiety, anger, frustration, and irritability among clinical and nonclinical samples (e.g., Bornovalova et al., 2008; Gratz et al., 2010), and to be significantly correlated with self-report measures of the unwillingness to experience emotional distress (Gratz et al., 2006).

2.2.3. Self-report Questionnaires—Within the context of Joiner’s (2005) IPTS, deliberate self-harm (the deliberate destruction of body tissue without suicidal intent; Gratz, 2001) is considered to be a painful and provocative event associated with the acquired capability for suicide (Van Orden et al., 2010). Deliberate self-harm (DSH) has also been found to be associated with increased risk for suicidal behavior (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). Thus, the Deliberate Self-Harm Inventory (DSHI; Gratz, 2001) was used to assess lifetime history of DSH, and included as a covariate to ensure that any observed relations were not accounted for by participants’ history of painful and provocative events. The DSHI is a self-report questionnaire that asks participants whether and how often they have engaged in a variety of DSH behaviors “intentionally (i.e., on purpose)”. The DSHI has been found to have adequate test-retest reliability and construct, discriminant, and convergent validity among diverse college student and patient samples (Fliege et al., 2006; Gratz, 2001), including SUD patients (Gratz & Tull, 2010). Internal consistency in this sample was adequate ($\alpha = .62$). Consistent with past research (see Gratz & Tull, 2010), a dichotomous DSH variable was created by assigning a score of “1” to participants who reported having engaged in DSH, and a score of “0” to participants who did not report having engaged in any of the behaviors on the DSHI.

2.3. Procedure

All procedures were approved by the institution’s Institutional Review Board. Data were collected as part of a larger study examining emotion-related factors associated with premature dropout from residential SUD treatment. Interested participants provided written informed consent prior to participation. Inclusion criteria included a Mini-Mental Status

Exam (Folstein, Folstein, & McHugh, 1975) score of at least 24 and the absence of psychotic symptoms. In an effort to reduce the potential impact of withdrawal symptoms on performance, eligible participants were recruited no sooner than 72 hours from treatment entry.

The study protocol was administered across two sessions. During the initial session, participants completed the diagnostic interviews. During the second session (scheduled approximately four days after the initial session), participants completed questionnaires and the PASAT-C. Participants were paid \$15 for each session.

3. Results

Twenty-one percent of participants reported a suicide attempt in their lifetime, with 13% reporting at least one medically-attended suicide attempt. Two-thirds of the sample (67.1%) evidenced low DT, as indexed by quitting the PASAT-C during the final level. Average latency in seconds to task termination was 180.71 ± 183.60 .

Both suicide-related variables evidenced substantial skew and kurtosis (skewness > 4.36 , kurtosis > 20.55); thus, a rank transformation was performed on each variable, following which their skew (< 2.43) and kurtosis (< 4.55) fell within acceptable levels (Kline, 1998). For ease of presentation and interpretation, the original means and standard deviations of these variables prior to transformation are presented in Table 2; however, all analyses utilized the transformed scores. No other variables evidenced notable skew or kurtosis. Descriptive data and inter-correlations for all variables utilized in primary analyses are shown in Table 2.

3.1. Selection of Covariates

A series of correlation analyses were conducted to explore associations between our independent and dependent variables and demographic factors in order to identify potential covariates. DT was significantly negatively associated with age, and both PTSD symptom severity (in total and across all symptom clusters) and frequency of suicide attempts (across both suicide outcomes) differed significantly as a function of gender (with women reporting greater PTSD symptom severity and more frequent suicide attempts; see Table 2). No other correlations were significant ($ps > .10$).

We also examined associations between our independent and dependent variables and lifetime history of Axis I psychiatric disorders and current BPD using a series of analyses of variance (ANOVAs). Results revealed more severe PTSD symptoms (overall and across each symptom cluster) and more frequent suicide attempts across both suicide outcomes among participants meeting criteria for a mood disorder ($F_s [1, 162] > 5.52, ps < .05$) or BPD ($F_s [1, 162] > 18.82, ps < .001$). Those meeting criteria for an anxiety disorder reported more severe PTSD symptoms (total and across symptom clusters), $F_s (1, 162) > 19.33, ps < .001$, and those meeting criteria for cocaine dependence exhibited greater DT ($F[1, 162] = 10.96, p < .001$). Finally, participants with a history of DSH reported more severe PTSD symptoms (total and across each symptom cluster) and more frequent total suicide attempts ($F_s [1, 162] > 4.27, ps < .05$).

Based on these results, age, gender, BPD, DSH, and lifetime diagnoses of a mood disorder, anxiety disorder, and cocaine dependence were included as covariates in primary analyses.

3.2. PASAT-C Manipulation Check

Providing support for the use of persistence during the PASAT-C as a measure of the ability to tolerate distress, results of a repeated measures ANOVA for the composite measure of

emotional distress revealed a significant main effect of time, $F(1, 159) = 115.30$, $\eta_p^2 = 0.42$, $p < .001$), with participants reporting an increase in emotional distress in response to the PASAT-C. Furthermore, neither level of distress in response to the task nor change in distress from pre- to post-task was significantly associated with latency to quit the task ($r_s < .07$, $p_s > .10$), indicating that task persistence was not simply a function of task-induced distress.

3.3. Primary Analyses

To test our hypothesis that DT would moderate the relationship between PTSD symptoms (and symptom clusters) and suicide attempts, a series of hierarchical multiple regression analyses were conducted with covariates entered in the first step, the main effects of DT and PTSD symptoms (or the relevant PTSD symptom cluster) entered in the second step, and the product of DT and PTSD symptoms (or the relevant symptom cluster) entered in the final step. Total number of suicide attempts and medically-attended attempts served as dependent variables.

With regard to the role of overall PTSD symptom severity in suicide attempts, the overall model predicting medically-attended attempts was significant ($F[10, 151] = 2.66$, $p < .01$) and the inclusion of the DT $\times$ PTSD symptom interaction term significantly improved the model ($\Delta R^2 = .03$, $p < .05$, $f^2 = .03$; see Table 3). Examination of the simple slopes revealed a significant association between PTSD symptom severity and medically-attended attempts only among patients with high DT ($b = .005$, $t = 2.21$, $p < .05$); no significant association was found among individuals with mean-level ($b = .002$, $p > .10$) or low DT ($b = -.001$, $p > .10$). The DT $\times$ PTSD symptom severity interaction for total suicide attempts was not significant (see Table 4).

With regard to the role of PTSD re-experiencing symptom severity in suicide attempts, the overall models predicting both total suicide attempts ($F[10, 151] = 2.59$, $p < .01$)¹ and medically-attended attempts ($F[10, 151] = 2.59$, $p < .01$) were significant. Furthermore, the inclusion of the interaction term in both of these analyses significantly improved the models ($\Delta R^2s > .02$, $p_s < .05$, $f^2s > .03$; Table 3,4). Further probing of these interactions revealed that, among individuals with high DT, there was a trend-level association between re-experiencing symptoms and total suicide attempts ($b = .013$, $t = 1.82$, $p < .07$), whereas no such association was observed among individuals with mean-level ($b = .003$, $p > .10$) or low ($b = -.007$, $p > .10$) DT. Additionally, although no significant association was found between re-experiencing symptoms and medically-attended attempts at any level of DT, the magnitude of the association did increase from low ($b = -.007$, $p > .10$) and mean ($b = .002$, $p > .10$) to high ($b = .01$, $p < .11$) levels of DT.

Analyses examining the role of avoidance and emotional numbing symptom severity in suicidal behavior revealed no significant interactions between these symptom clusters and DT on either suicide outcome (see Tables 3 and 4). However, the overall model examining the role of hyperarousal symptom severity in medically-attended attempts was significant ($F[10, 151] = 2.55$, $p < .01$), and the inclusion of the DT $\times$ hyperarousal symptom interaction term significantly improved the model ($\Delta R^2 = .03$, $p < .05$, $f^2 = .03$; Table 4). Examination of the simple slopes revealed a significant association between PTSD hyperarousal symptom severity and medically-attended attempts only among patients with high DT ($b = .014$, $t = 1.99$, $p < .05$); no significant association was found among individuals with mean-level (b

¹When negative affect induced during the PASAT was added as a covariate, this particular finding was rendered non-significant; however, all other significant associations remained significant when controlling for task-induced distress.

= .005, $p > .10$) or low ($b = -.004$, $p > .10$) DT. The DT $\times$ PTSD hyperarousal symptom interaction for total suicide attempts was not significant (see Table 3).

4. Discussion

The primary aim of this study was to examine the moderating role of DT in the associations between PTSD symptom severity (overall and across symptom clusters) and suicide attempts in a sample of trauma-exposed SUD patients. Overall, results revealed relatively consistent support for DT as a moderator of the association between PTSD symptom severity (overall and across re-experiencing and hyperarousal symptom clusters) and medically-attended suicide attempts, such that the relationship between PTSD symptom severity and number of medically-attended suicide attempts increased in magnitude for patients with high (vs. low) DT. These findings suggest that PTSD symptom severity (and particularly, the severity of re-experiencing and hyperarousal) may increase the risk for more severe suicidal behavior only among individuals capable of tolerating distress. This pattern of findings is consistent with Joiner's (2005) IPTS, which posits that only those with elevations in both the desire and capability for suicide are likely to engage in serious or lethal suicidal behavior. Thus, whereas low DT may increase the desire for suicide and the risk for low-lethality maladaptive behaviors that function to avoid emotional distress, it may protect against more lethal suicidal behaviors associated with fear, pain, and general discomfort. Individuals with high DT, on the other hand, may be more capable of tolerating the discomfort associated with serious suicidal behavior and, in the presence of severe psychopathology (e.g., PTSD symptoms), may be able to engage in behaviors that would otherwise seem too painful or frightening. Indeed, findings that DT did not remain a significant moderator of the relationship between PTSD re-experiencing symptoms and overall suicide attempts when distress induced by the PASAT was included in the model as a covariate suggest that the moderating role of DT in the association between PTSD symptoms and suicide attempts may be relevant only to more severe suicidal behavior (i.e., medically-attended suicide attempts).

Findings with regard to the relevance of PTSD re-experiencing symptoms in particular to suicide attempts are consistent with Selby and colleagues' (2007) theory that mental rehearsal of painful and provocative experiences may increase an individual's capacity for engaging in lethal self-injury. In other words, intrusive thoughts, nightmares, and flashbacks might serve as additional exposures to pain and provocation even though the individual experiencing such symptoms is not actually encountering the event. Nonetheless, it also warrants mention that DT moderated the relationship between the severity of hyperarousal symptoms and medically-attended suicide attempts. It is possible that the constant presence of elevated arousal may serve as a repeated exposure to emotional and physical discomfort, increasing an individual's ability to eventually engage in lethal self-harm. Indeed, research has demonstrated that hyperarousal symptoms of PTSD increase the extent with which individuals detect physical pain (Asmundson, Wright, McCreary, & Pedlar, 2003). Of course, it is also possible that hyperarousal symptoms were serving as a proxy for re-experiencing symptoms, as the experience of more severe intrusive thoughts and memories would be expected to result in greater hyperarousal (consistent with our finding of a high correlation between these symptom clusters).

Although our results are generally consistent with hypotheses, they must be considered in light of the study's limitations. First, the cross-sectional nature of our data precludes determination of the precise nature and direction of the relationships of interest. As such, it is unclear to what extent high DT is a stable (long-standing) trait that facilitates engagement in more lethal self-injurious behaviors, or a consequence of trauma-exposure or PTSD symptoms (either of which could theoretically influence an individual's level of DT through

habituation). Additionally, although our focus on trauma-exposed SUD patients is arguably a strength of this study, the extent to which these findings generalize to trauma-exposed individuals without a SUD remains unclear. Also, although the use of a behavioral measure of DT circumvents the limitations associated with self-report measures, recent research has indicated that behavioral and self-report measures of DT are often not significantly inter-correlated (Anestis et al., in press). Thus, the extent to which our findings correspond to those of past studies that examined the relationship between suicidality and DT using self-report measures remains unclear. Furthermore, the PASAT-C is a general stressor and, thus, may not induce distress comparable to that experienced in real-world contexts. Future research utilizing multi-method assessments of DT (e.g., concurrent administration of self-report and behavioral measures) and emotion-specific DT tasks may allow for a more refined understanding of the specific forms of DT most relevant to severe suicidal behavior. Finally, our measure of suicide attempt severity focused on only one dimension of medical severity (i.e., medical attention) and, thus, precludes examination of the degree of severity of particular attempts.

Despite limitations, findings from the present study have a number of clinical implications. Extending prior work suggesting the relevance of PTSD symptoms to suicidality, these findings highlight the importance of assessing for the presence and severity of PTSD symptoms when assessing suicide risk among SUD patients with traumatic exposure. Additionally, these findings highlight the importance of carefully assessing and monitoring patients' levels of DT within the context of PTSD treatments, as a heightened capacity to tolerate distress (when paired with the presence of severe PTSD symptoms), could potentially serve as a marker of increased risk for suicidal behaviors. In this sense, the value of efforts to increase DT levels in trauma-exposed SUD patients might depend upon the severity of their PTSD symptoms at that time.

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Table 1
Demographic and Clinical Data for Participants (N = 164)

Variable	Percentage
<i>Demographic Data</i>	
Gender	
Male	55.5%
Female	44.5%
Racial/Ethnic Background	
White	57.9%
Black/African American	33.5%
Native American	5.5%
Other	3.0%
Highest Level of Education	
12 th Grade or Less	25.0%
High School Graduate	32.9%
Some College	32.3%
College Graduate	4.9%
Some Graduate School	2.4%
Annual Income	
Less than \$10,000	48.2%
\$10,000-\$49,000	41.3%
\$50,000-\$99,999	6.6%
\$100,000 or more	1.8%
Marital Status	
Single	75.0%
Married	25.0%
<i>Clinical and Diagnostic Data^a</i>	
History of Deliberate Self-Harm	34.1%
Current Borderline Personality Disorder	34.8%
Disorder	
Current Mood Disorder	56.7%
Current Anxiety Disorder (non-PTSD)	53.0%
Current Posttraumatic Stress Disorder	36.6%
Current Alcohol Dependence	62.2%
Current Cocaine Dependence	50.0%
Current Opioid Dependence	22.0%
Suicidal Behavior	
Any Attempt	21.3%
Any Medically Serious Attempt	13.4%

^aPercentages presented reflect the presence of the disorder or behavior.

Table 2
Descriptive data and intercorrelations for variables utilized in primary analyses

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Gender ^a	---	.04	-	-	-.09	-	-	-.26**	-.21**	-	-	-.21**	.12	-	-
2. Age			.13	.38**		.26**	.28**		.29**	.24**			.34**	.23**	
3. DSH ^b															
4. BPD ^b															
5. Cocaine Dependence ^b															
6. Mood Disorder ^b															
7. Anxiety Disorder ^b															
8. PTSD Severity															
9. Re-experiencing															
10. Avoidance															
11. Emotional Numbing															
12. Hyperarousal															
13. Distress Tolerance															
14. Total Suicide															
15. Medical Suicide															
<i>Mean</i>	---	35.51	---	---	---	---	---	38.96	11.45	8.49	7.10	11.92	180.71	0.95 ^c	0.46 ^c
<i>SD</i>	---	10.03	---	---	---	---	---	35.70	11.32	8.44	7.73	11.40	183.60	3.24	1.57

Note.

^aVariable scored where 1 = male and 0 = female.

^bVariables scored where 1 = presence and 0 = absence.

^cNon-transformed means presented. DSH = deliberate self-harm; BPD = borderline personality disorder; PTSD Severity = overall severity of PTSD symptoms; Re-experiencing = severity of re-experiencing symptoms; Avoidance = severity of avoidance symptoms; Emotional Numbing = severity of emotional numbing symptoms; Hyperarousal = severity of hyperarousal symptoms; Total Suicide = lifetime number of suicide attempts overall; Medical Suicide = lifetime number of medically-attended suicide attempts.

* $p < .05$.

** $p < .01$.

Table 3
Hierarchical regression analyses examining the moderating role of distress tolerance on the relationships between PTSD symptom severity (overall and across clusters) and total suicide attempts

	<i>Total PTSD</i>			<i>Re-Experiencing</i>			<i>Avoidance</i>			<i>Numbing</i>			<i>Hyperarousal</i>		
	<i>R</i> ²	ΔR^2	β	<i>R</i> ²	ΔR^2	β	<i>R</i> ²	ΔR^2	β	<i>R</i> ²	ΔR^2	β	<i>R</i> ²	ΔR^2	β
Step 1	.24	.24		.24	.24		.24	.24		.24	.24		.24	.24	
Gender ^a			**			**			**			**			**
Age			.20			.20			.20			.20			.20
Deliberate Self-Harm ^b			-.10			-.09			-.09			-.09			-.09
Mood Disorder ^b			.16			.16			.16			.16			.16
Anxiety Disorder ^b			.02			.02			.02			.02			.02
Cocaine Dependence ^b			-.08			-.08			-.08			-.08			-.08
BPD ^b			.06			.06			.06			.06			.06
			**			**			**			**			**
			.30			.30			.30			.30			.30
Step 2 ^c	.24	.00		.24	.00		.26	.02		.25	.01		.24	.00	
Distress Tolerance			-.04			-.04			-.04			-.04			-.04
PTSD Symptom Cluster			.08			.03			.16			.09			.04
Step 3 ^c	.26	.02		.26	.02		.27	.01		.25	.00		.25	.01	
DT X PTSD Symptom			.13			*.16			.13			.09			.08
Cluster															

Note.

^aVariable scored where 1 = male and 0 = female.

^bVariables scored where 1 = presence and 0 = absence.

^cOnly variables unique to each step in the model are presented. BPD = borderline personality disorder; SE = standard error; DT = distress tolerance; DT X PTSD = distress tolerance by PTSD symptom severity interaction.

* $p < .05$.

** $p < .01$.

Table 4
Hierarchical regression analyses examining the moderating role of distress tolerance on the relationships between PTSD symptom severity (overall and across clusters) and medically-attended attempts

	<u>Total PTSD</u>			<u>Re-Experiencing</u>			<u>Avoidance</u>			<u>Numbing</u>			<u>Hyperarousal</u>		
	<i>R</i> ²	ΔR^2	β	<i>R</i> ²	ΔR^2	β	<i>R</i> ²	ΔR^2	β	<i>R</i> ²	ΔR^2	β	<i>R</i> ²	ΔR^2	β
Step 1	.12	.12		.12	.12		.12	.12		.12	.12		.12	.12	
Gender ^a			-.11			-.11			-.11			-.11			-.11
Age			-.03			-.03			-.03			-.03			-.03
Deliberate Self-Harm ^b			.07			.07			.07			.07			.07
Mood Disorder ^b			.06			.06			.06			.06			.06
Anxiety Disorder ^b			-.07			-.07			-.07			-.07			-.07
Cocaine Dependence ^b			.04			.04			.04			.04			.04
BPD ^b			**.2			**.24			**.24			**.24			**.24
			4												
Step 2 ^c	.12	.00		.12	.00		.13	.01		.13	.01		.12	.00	
Distress Tolerance			-.03			-.03			-.03			-.02			-.03
PTSD Symptom Cluster			.09			.02			.15			.13			.05
Step 3 ^c	.15	.03		.15	.03		.15	.02		.14	.01		.15	.03	
DT X PTSD Symptom Cluster			*.17			*.18			.15			.12			*.17

Note.

^aVariable scored where 1 = male and 0 = female.

^bVariables scored where 1 = presence and 0 = absence.

^cOnly variables unique to each step in the model are presented. BPD = borderline personality disorder; SE = standard error; DT = distress tolerance; DT X PTSD = distress tolerance by PTSD symptom severity interaction.

* $p < .05$.

** $p < .01$.