

Posttraumatic Stress Disorder's Underlying Dimensions and Their Relation With Impulsivity Facets

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Abstract: Research indicates a significant relationship between posttraumatic stress disorder (PTSD) and impulsivity (Kotler, Julian, Efront, and Amir, *J Nerv Ment Dis* 189:162–167, 2001; Ledgerwood and Petry, *J Trauma Stress* 19:411–416, 2006). The present study assessed relations between PTSD symptom clusters and impulsivity subscales in an effort to assess the specific impulsivity component most related to PTSD's alterations in arousal/reactivity and alterations in mood/cognitions symptoms. In the current study, the PTSD Checklist for *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition*, and the UPPS Impulsivity Scale were administered to a sample of 412 nonclinical subjects with a trauma history. Results indicated that PTSD's alterations in arousal/reactivity and mood/cognition factors were most related to impulsivity's sensation-seeking tendency compared with other impulsivity components. Results highlight the importance of assessing and addressing (1) sensation-seeking tendencies and (2) urges to act impulsively when experiencing negative affect in trauma treatment. Furthermore, it is possible that sensation-seeking tendencies are primarily driving the comorbidity between PTSD and certain impulsive behaviors.

Key Words: PTSD, impulsivity, sensation-seeking tendencies, alteration in arousal/reactivity, negative alteration in mood and cognitions

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There is a well-established empirical and theoretical relation between posttraumatic stress disorder (PTSD) and impulsivity (Kotler et al., 2001; Ledgerwood and Petry, 2006; Van der Kolk et al., 1985; Weiss et al., 2013). Given the inclusion of the “reckless and self-destructive behaviors” symptom criterion in *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5)* PTSD (American Psychiatric Association, 2013) and the multifactorial nature of impulsivity (Berg et al., 2015; Evenden, 1999; Oas, 1985), it would be relevant to assess the relations of *DSM-5* PTSD symptom clusters with impulsivity facets; this is the focus of the current study. Results have potential implications in outlining comorbidity mechanisms and guiding trauma-based treatment.

Facets of Impulsivity

Impulsivity is defined as a predisposition toward unplanned action without consideration of negative consequences to oneself and/or others (reviewed in Moeller et al., 2001). Although there could be similar behavioral manifestations of impulsivity, there may be different etiologies and personality pathways underlying impulsive behaviors

(Whiteside and Lynam, 2001). Impulsivity is widely considered as a multidimensional construct (Berg et al., 2015). Indeed, one of the most widely researched instruments measuring impulsivity as a multidimensional construct is the UPPS Impulsivity Scale. The UPPS identifies four factors of impulsivity (Whiteside and Lynam, 2001) based on the personality framework of the Five Factor model (McCrae and Costa, 1990): lack of premeditation, negative urgency, sensation seeking, and lack of perseverance. Lack of premeditation indicates a tendency to act without careful thought and relates to the conscientiousness personality trait. Negative urgency, which relates to the personality dimension of neuroticism, refers to a tendency to engage in immediate rash actions when experiencing negative affect. Sensation seeking indicates a tendency to seek excitement and openness to experiences that may or may not be dangerous; this is most related to the extraversion personality trait. Lastly, lack of perseverance, which relates to the conscientiousness personality trait, refers to difficulty completing a task and tendency to be bored easily (Whiteside and Lynam, 2001).

An ongoing critical area of research focuses on the relation between these impulsivity subcomponents and psychopathology. A recent meta-analysis by Berg et al. (2015) indicates that negative urgency relates to most psychopathology including suicidality, aggression, borderline personality disorder (BPD) traits, depression, substance use, and disordered eating; the strongest association is with BPD traits and weakest with suicidality. Sensation seeking strongly relates to substance use, suicidality, and aggression; the strongest relation is with substance use. Both lack of premeditation and lack of perseverance have a significant association with substance use, BPD traits, depression, and suicidality; lack of perseverance further relates to disordered eating. Whereas lack of premeditation most strongly relates to substance use and weakly relates to anxiety symptoms, lack of perseverance most strongly relates to BPD traits and weakly relates to disordered eating. Thus, impulsivity-based pathways seem to be implicated in most psychopathology. No study to our knowledge has assessed the relation between these impulsivity facets and PTSD latent factors.

PTSD and Impulsivity

PTSD in *DSM-5* comprises four symptom clusters. Intrusion symptoms reference ways of reexperiencing the traumatic event (e.g., nightmares and flashbacks). Avoidance symptoms relate to the avoidance of internal and external reminders of the traumatic event. Negative alterations in mood/cognitions (NAMC) represent maladaptive thoughts and emotional reactions to traumatic event exposure. As an example, NAMC symptoms include development or worsening of dysfunctional beliefs about oneself or others and persistent uncomfortable feelings after traumatic event exposure. Lastly, alterations in arousal and reactivity (AAR) symptoms represent physiological arousal and reactivity that may have developed or worsened after exposure to traumatic events. Examples include startled responses and engagement in reckless behaviors (American Psychiatric Association, 2013). There is support in the literature for this four-factor *DSM-5* PTSD conceptualization (Contractor et al., 2014).

PTSD has a well-established theoretical and empirical relation with impulsivity (Kotler et al., 2001; Ledgerwood and Petry, 2006; Weiss et al., 2012). Several explanations describe the PTSD-impulsivity mechanism. One viewpoint references “emotional dysregulation” as associated with impulsivity (Weiss et al., 2013, 2012). After

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traumatic event exposure, people may experience distress associated with subsequent negative emotions (Marshall-Berenz et al., 2011; O'Hare et al., 2009) and physiological reactivity to trauma cues (Van der Kolk et al., 1985) and may perceive themselves to be unable to tolerate this distress (Marshall-Berenz et al., 2011). Consequently, they may engage in impulsive behaviors when experiencing these negative uncomfortable emotional states (James et al., 2014; Weiss et al., 2013), the aim possibly being to decrease negative emotions or increase positive emotions (Marshall-Berenz et al., 2011). Impulsivity in this manner may be conceptually similar to the *negative urgency* facet. For example, one may consume alcohol to cope with negative emotional states (Marshall-Berenz et al., 2011; O'Hare et al., 2009) and engage in self-mutilative behaviors to obtain relief from negative emotions (Sacks et al., 2008).

Another viewpoint is the compulsive reexposure hypothesis (Joseph, 1997; Van der Kolk et al., 1985). People with PTSD symptoms may seek experiences to mimic the biological arousal and nervous excitement that they experienced during traumatic event exposure (Van der Kolk et al., 1985); this may be possible through sensation-seeking experiences, which may or may not have detrimental consequences (Whiteside and Lynam, 2001). Engagement in sensation-seeking behaviors to obtain nervous arousal may reduce the distress associated with PTSD symptoms as represented by PTSD's NAMC symptoms. Impulsivity in line with this particular explanation may be conceptually similar to the *sensation-seeking* facet.

The disinhibition view of impulsivity states that individuals with PTSD symptoms struggle to inhibit behaviors when perceiving rewarding distress-reducing situations; they may consequently engage in impulsive behaviors (Casada and Roache, 2005), possibly without consideration of the consequences. Impulsivity in this manner may be conceptually similar to the *lack of premeditation* facet. Joseph (1997) found that individuals with severe PTSD symptoms are less likely to be aware of the consequences of their behaviors, and Kotler et al. (2001) found that people with a PTSD diagnosis are more likely to act on spur-of-the-moment behaviors impatiently.

Current Study

The current study focuses on PTSD's AAR and NAMC symptoms for two reasons. First, impulsivity empirically relates to risky and dysfunctional behaviors (O'Connon, 2009), which is now included as a PTSD arousal criterion in *DSM-5* (American Psychiatric Association, 2013). Risky and self-destructive behaviors could possibly manifest as different actions, such as substance use and self- and other-harm behaviors (also captured by PTSD's aggression/irritability item). Evidence indicates that distress associated with risky behaviors predicted PTSD's arousal symptom severity (O'Hare et al., 2009). Second, people experiencing distress associated with physiological arousal to trauma cues (similar to AAR symptom; Van der Kolk et al., 1985) or negative emotions (NAMC symptoms) may engage in impulsive maladaptive behaviors to cope (Marshall-Berenz et al., 2011). Evidence suggests that impulsivity may play a functional role in dealing with anger in people experiencing PTSD's AAR and NAMC symptoms (Contractor et al., 2015).

Using a sample of trauma-exposed college students, we aimed to assess the impulsivity facet most related to *DSM-5* PTSD's symptom clusters of AAR and NAMC. We hypothesized that impulsivity's facets of negative urgency and sensation seeking would be most related to PTSD's AAR and NAMC factors compared with other impulsivity facets. We expected that AAR and NAMC factors would have a significant relation with negative urgency based on previous research and the emotional dysregulation theory of impulsivity (James et al., 2014; Weiss et al., 2013, 2012). Furthermore, we expected PTSD's AAR and NAMC factors to correlate with sensation seeking based on previous research and the compulsive reexposure hypothesis (Joseph, 1997;

Van der Kolk et al., 1985). Research has shown that sensation-seeking tendencies may represent positive coping in dealing with traumatic experiences (Solomon et al., 1995).

METHODS

Participants and Procedure

The sample consisted of 911 psychology undergraduates from a Midwestern university recruited from 2011 through 2013. Recruitment occurred through a password-protected, closed Web site. Measures relevant to the current study were administered after assent via an online informed consent statement. The current study received approval from the university's institutional review board. Subjects received course credit for study participation.

Assessments

Demographic Information

Information on sex, age, education, employment status, relationship status, ethnic and racial background, and socioeconomic status was obtained.

Stressful Life Events Screening Questionnaire

The Stressful Life Events Screening Questionnaire, a 13-item self-report questionnaire assesses traumatic event exposure according to Criterion A1 event of the *DSM-IV* PTSD diagnostic criteria. As an example, it assesses for exposure to potentially traumatic events such as physical assault; sexual assault; being threatened with a knife; loss of a family member, romantic partner, or close friend; and experience of a life-threatening accident. It has a good 2-week item-level test-retest reliability ranging from 0.31 to 1.00 for the 11 *DSM-IV*-based traumatic events, an overall test-retest reliability of 0.89 between events, and good concurrent and convergent validity (Goodman et al., 1998). A question asking participants to indicate their most distressing event (if they endorsed more than one event) and provide details on that event was added. Subsequently, participants were instructed to reference the indicated (or most distressing if more than one) traumatic event while rating PTSD symptoms.

PTSD Checklist for *DSM-5*

The original PTSD Checklist for *DSM* (PCL) assesses the 17 *DSM-IV* PTSD items using distress ratings for each symptom on a 5-point Likert-type scale ranging from 1 = "not at all" to 5 = "extremely" (Weathers et al., 1993). It assesses for the four symptom clusters of intrusions (five items), avoidance (two items), NAMC (seven items), and AAR (six items). For the current study, the PCL-5 assessing *DSM-5* PTSD symptoms was administered (Weathers et al., 2013). The PCL-5 uses a 0 to 4 response scaling instead. The PCL-5 has high internal consistency (0.94 and 0.95), with 0.95 in the current study (Contractor et al., 2015; Ruggiero et al., 2003), good 1-week test-retest reliability (0.88), good convergent validity (>0.75 correlations with other PTSD measures), and good discriminant validity (Ruggiero et al., 2003).

UPPS Impulsivity Scale

The UPPS Impulsivity Scale is a 45-item self-report measure using a 4-point Likert-type scale responses ranging from 1 ("agree strongly") to 4 ("disagree strongly"). Items represent the four impulsivity facets: lack of premeditation (11 items), urgency (12 items), sensation seeking (12 items), and lack of perseverance (10 items). Higher scores indicate more impulsivity. This scale has good internal consistency coefficients, specifically 0.91, 0.86, 0.90, and 0.82 for lack of premeditation, urgency, sensation seeking, and lack of perseverance scales, respectively (Whiteside and Lynam, 2001). The overall internal

consistency coefficient in the current study was 0.80. It has good convergent and divergent validity (Smith et al., 2007; Whiteside and Lynam, 2001; Whiteside et al., 2005). We used a past-month timeline of inquiry for consistency with PTSD ratings.

Exclusions and Treatment of Missing Data

Of 911 participants, 427 subjects endorsed at least one event they referenced to be traumatic and nominated one event as their index traumatic event. Of the 427 participants, we excluded 15 participants who were missing more than 30% of items on the PCL-5 (<6 items) or UPPS scale (<14 items); the final sample size included 412 participants. Missing values for the remaining items were estimated using maximum likelihood procedures.

Effective Sample Characteristics

The effective sample of 412 participants had a mean (SD) age of 20.06 (4.42) years, with most being female ($n = 278$, 74.5%). Most were single ($n = 331$, 80.3%) or living with a significant other ($n = 58$, 14.1%). Most respondents were unemployed as students ($n = 166$, 40.4%) or worked part-time ($n = 198$, 48.2%). The mean (SD) years of schooling was 12.79 (1.3). Most participants identified themselves as Caucasian ($n = 297$, 72.1%) or African American ($n = 106$, 25.7%). Few participants identified their ethnicity as Hispanic/Latino ($n = 19$, 4.7%). In terms of income distribution, a large majority reported their income as less than \$15,000 ($n = 141$, 34.9%); the remaining reported their income as \$15,000 to \$24,999 ($n = 44$, 10.9%) and above \$80,000 ($n = 69$, 17.11%). The most prevalent worst traumatic events (upon which PTSD ratings were assigned) were unexpected death of a family member/peer ($n = 187$, 45.4%), childhood sexual molestation ($n = 40$, 9.7%), and life-threatening accident ($n = 31$, 7.5%).

Data Analysis

Primary analyses conducted with Mplus 7 software entailed two steps. First, confirmatory factor analyses (CFA) estimated the fit of the *DSM-5* PTSD model using the PCL-5 items. Factor variances and error terms were scaled to 1; alpha was set to 0.05 and we used two-tailed tests. Given that the PCL-5 has five response options, they were treated as ordinal data; thus, we used a polychoric covariance matrix, robust weighted least squares estimation with a mean- and variance-adjusted chi-square, and probit regression coefficients (Flora and Curran, 2004). A well-fitting (adequate) model would have a comparative fit

index (CFI) and Tucker Lewis Index (TLI) values of 0.95 or higher (0.90–0.94) and root mean-square-error of approximation (RMSEA) value of 0.06 or lower (0.07–0.08) (Hu and Bentler, 1999). For the UPPS scale, we treated the four subscales of lack of premeditation, urgency, sensation seeking, and perseverance as observed variables by summing items for each subscale. The four-factor impulsivity factor model did not have adequate fit: robust $\chi^2(939, N = 412) = 4866.65, p < 0.001, CFI = 0.61, TLI = 0.59, RMSEA = 0.10$.

The second step entailed computing Wald chi-square tests of parameter constraints to test hypothesized relations between *DSM-5* PTSD factors and UPPS subscales. This test assesses the null hypothesis that the difference between two correlation paths is 0, using an alpha of 0.05. Specifically, Wald tests assessed if PTSD's AAR and NAMC factors were most related to the UPPS negative urgency and sensation seeking subscales compared with other UPPS subscales.

RESULTS

Based on benchmarks of skewness greater than 2 and kurtosis greater than 7 (Curran et al., 1996), item-level PTSD and UPPS scores were normally distributed. In the current sample, total PCL-5 scores averaged 21.63 (SD = 16.86), and UPPS Impulsivity Scale scores averaged 104.4 (SD = 14.67). Furthermore, 6.8% of trauma-exposed participants ($n = 28$) would have a possible diagnosis of PTSD from *DSM-5* criteria (at least one reexperiencing symptom, one avoidance symptom, two NAMC symptoms, and two AAR symptoms) using an item cutoff of 3 or higher (Cook et al., 2003). We adapted the *DSM-IV* PTSD diagnostic algorithm for *DSM-5*.

CFA indicated an adequately fitting *DSM-5* PTSD model according to most of the fit indices, robust $\chi^2(164, N = 412) = 693.16, p < 0.001, CFI = 0.96, TLI = 0.96, RMSEA = 0.09$. Table 1 presents the correlations between PTSD factors and UPPS subscales and their means and standard deviations. The UPPS negative urgency subscale correlated significantly and positively with all PTSD factors, excluding avoidance, and the UPPS sensation seeking scale correlated significantly and positively with all PTSD factors. Furthermore, the UPPS lack of premeditation subscale did not significantly correlate with any PTSD factor, and the UPPS lack of perseverance subscale had a significant negative correlation with PTSD's intrusion factor.

Tables 2 and 3 present results of Wald tests of parameter constraints focusing on PTSD's AAR and NAMC factors, respectively. PTSD's NAMC factor was more related to the UPPS sensation seeking subscale than to the UPPS lack of premeditation, lack of perseverance, and negative urgency subscales. PTSD's NAMC factor was more

TABLE 1. Correlations Between *DSM-5* PTSD Factors and UPPS Subscales and Means and Standard Deviations of the *DSM-5* PTSD Factors and UPPS Subscales

	1	2	3	4	5	6	7	8
1. Reexperiencing	—							
2. Avoidance	0.86**	—						
3. NAMC	0.76**	0.76**	—					
4. AAR	0.75**	0.68**	0.88**	—				
5. UPPS lack of premeditation	0.10	0.05	0.10	0.07	—			
6. UPPS urgency	0.13**	0.08	0.12*	0.17**	0.16*	—		
7. UPPS sensation seeking	0.20**	0.20**	0.31**	0.36**	0.07	0.08	—	
8. UPPS lack of perseverance	−0.11*	−0.07	−0.05	−0.001	0.53**	0.33**	0.30**	—
Mean	5.67	2.79	7.25	5.95	21.45	30.37	33.04	19.66
SD	4.62	2.41	6.43	5.72	5.27	7.36	7.33	4.98

Note: PTSD subscales are modeled as latent factors and UPPS subscales are modeled as observed scores.

* $p < 0.05$.

** $p < 0.01$.

TABLE 2. Results of the Wald Tests of Parameter Constraints Focusing on PTSD's NAMC Factor for 412 Participants

Path	<i>r</i> (<i>p</i>)	Path	<i>r</i> (<i>p</i>)	Wald Test (<i>df</i>)	Wald Test <i>p</i>
NAMC with premed	0.10 (0.09)	NAMC with urgency	0.12 (0.02)**	0.05 (1)	0.82
NAMC with premed	0.10 (0.09)	NAMC with sensation	0.31 (<0.001)*	4.76 (1)	0.03**
NAMC with premed	0.10 (0.09)	NAMC with perser	-0.05 (0.33)	2.58 (1)	0.11
NAMC with urgency	0.12 (0.02)**	NAMC with sensation	0.31 (<0.001)*	12.42 (1)	<0.001*
NAMC with urgency	0.12 (0.02)**	NAMC with perser	-0.05 (0.33)	4.17 (1)	0.04**
NAMC with sensation	0.31 (<0.001)*	NAMC with perser	-0.05 (0.33)	24.89 (1)	<0.001*

Note: Premed is UPPS lack of premeditation subscale; sensation is UPPS sensation seeking subscale; perser is UPPS lack of perseverance subscale; urgency is UPPS negative urgency subscale.

**p* < 0.01.

***p* < 0.05.

related to the UPPS urgency subscale than to the lack of perseverance subscale. Furthermore, PTSD's AAR factor was more related to the UPPS sensation seeking subscale than to the UPPS lack of premeditation, lack of perseverance, and negative urgency subscales.

DISCUSSION

Using a sample of students with trauma exposure, we assessed the relation between the DSM-5 PTSD NAMC and AAR factors and impulsivity facets. The research questions follow a well-established theoretical and empirical relationship between PTSD and impulsivity (Kotler et al., 2001; Ledgerwood and Petry, 2006; Van der Kolk et al., 1985; Weiss et al., 2013). Results indicated that PTSD's AAR and NAMC factors were most related to impulsivity's sensation-seeking facet compared with most other impulsivity facets.

Of relevance are findings that PTSD's NAMC and AAR factors most significantly relate to impulsivity's sensation-seeking facet compared with other impulsivity components. Sensation seeking underlies a tendency to seek excitement and openness to try activities with possible detrimental consequences (Whiteside and Lynam, 2001) and correlates with a high fear threshold (Netter et al., 1993). The stimulation and arousal obtained by engagement in such activities may be positively reinforcing. The results of the current study seem to possibly align with the compulsive reexposure hypothesis stating that people with traumatic event exposure may look for similar nervous stimulation to mimic what they experienced during the traumatic event (Joseph, 1997; Van der Kolk et al., 1985); this may result in detrimental impulsive actions such as self-harm or in positive coping (Solomon et al., 1995).

In addition, both PTSD's NAMC and AAR factors had a significant relation with the tendency to act impulsively when experiencing negative affect (James et al., 2014). When experiencing distressing

emotions as represented by NAMC or AAR symptoms, people may engage in irrational and impulsive behaviors with a possible aim to alleviate this distress; this is consistent with emotional dysregulation associated with impulsivity (Weiss et al., 2013, 2012). In fact, a recent meta-analysis indicates that affect-driven impulsivity either as negative or positive urgency predominantly relates to psychopathology (Berg et al., 2015).

The results of the current study raise further questions regarding the role of sensation seeking and negative urgency in PTSD's symptomatology, especially NAMC and AAR symptoms. It is possible that sensation seeking and negative urgency may have additive or interactive effects in their influence on these PTSD symptoms. Both these impulsivity facets may act together to influence NAMC and AAR symptom severity; clarifying the nature of their relationship could be a future research question. Alternatively, people with prominent sensation-seeking tendencies may have a different cooccurring symptom pattern possibly similar to an externalizing personality typology (Miller et al., 2004) compared with people with who act impulsively mainly when experiencing negative affect. One can speculate that a tendency to act impulsively when experiencing uncomfortable emotions may drive PTSD's cooccurrence primarily with BPD traits (Berg et al., 2015; Peters et al., 2013). On the other hand, sensation-seeking tendencies may account for PTSD's cooccurrence primarily with substance use disorders (Berg et al., 2015).

The impulsivity facet of acting without careful thought did not correlate significantly with any of the PTSD factors consistent with some previous research (Weiss et al., 2013) and not others (Kotler et al., 2001). It is possible that lack of premeditation primarily relates with other conditions such as antisocial personality disorder (Whiteside et al., 2005), aggression (Derefinko et al., 2011; Miller et al., 2003), substance usage, and criminal behavior (Miller et al., 2003) rather than

TABLE 3. Results of the Wald Tests of Parameter Constraints Focusing on PTSD's AAR Factor for 412 Participants

Path	<i>r</i> (<i>p</i>)	Path	<i>r</i> (<i>p</i>)	Wald Test (<i>df</i>)	Wald Test <i>p</i>
AAR with premed	0.07 (0.18)	AAR with urgency	0.17 (0.001)*	0.82 (1)	0.37
AAR with premed	0.07 (0.18)	AAR with sensation	0.36 (<0.001)*	9.86 (1)	0.002*
AAR with premed	0.07 (0.18)	AAR with perser	-0.001 (0.99)	0.63 (1)	0.43
AAR with urgency	0.17 (0.001)*	AAR with sensation	0.36 (<0.001)*	11.22 (1)	<0.001*
AAR with urgency	0.17 (0.001)*	AAR with perser	-0.001 (0.99)	2.97 (1)	0.08
AAR with sensation	0.36 (<0.001)*	AAR with perser	-0.001 (0.99)	23.35 (1)	<0.001*

Note: Premed is UPPS lack of premeditation subscale; sensation is UPPS sensation seeking subscale; perser is UPPS lack of perseverance subscale; urgency is UPPS negative urgency subscale.

**p* < 0.01.

***p* < 0.05.

predominantly PTSD. In fact, a recent meta-analysis by Berg et al. (2015) did indicate that lack of premeditation did not relate to anxiety; PTSD has been conceptualized to be an anxiety- and fear-based disorder (Brewin and Holmes, 2003). Another possibility is that there may be a tendency to discount negative consequences before acting on a thought when particularly experiencing negative affect (Weiss et al., 2013); this interaction effect with other impulsivity facets could be further tested.

Furthermore, the ability to persevere on a goal-directed task until completion despite boredom correlated significantly with only the PTSD factor of reexperiencing, and in a negative direction. Thus, people with more severe reexperiencing symptoms were more likely to persevere on a task until completion. It is possible that people with more severe reexperiencing symptoms of PTSD may be using a task-focused and problem-focused coping style. Alternatively, an interaction effect with other affect-based impulsivity facets may possibly shed more light on the nature of this relationship.

Implications

Results have implications for PTSD's psychological treatment and assessment. First, results highlight the importance of diagnostically assessing for sensation-seeking tendencies and tendencies to act impulsively when experiencing negative affect among those with significant NAMC and AAR symptoms. This may be particularly important in people who display greater reckless and self-harm behaviors. Second, tendencies of sensation seeking and acting impulsively when experiencing negative affect may be driving the concurrence between PTSD symptoms and impulsive behaviors.

Third, results indicate the possible importance of addressing sensation-seeking tendencies in trauma treatment for people with cooccurring impulsive tendencies. Indeed, the current study results highlight that people in trauma treatment, particularly those with externalizing impulsive behaviors, may benefit from finding ways to a) mimic their tendency to seek nervous arousal in healthy ways or b) reduce sensation-seeking tendencies. Such treatment focus may reduce impulsive behaviors in people with significant PTSD symptoms; the importance of addressing harm-reduction behaviors has been emphasized in the literature (Drescher et al., 2003). In addition, the results contribute to the focus on addressing interventions related to bodily functioning and sensations in trauma treatment (Gordon et al., 2008). Lastly, results add to the established emphasis on addressing emotional regulation skills among people with prominent AAR and NAMC symptoms in clinical intervention (Linehan, 1993).

Limitations and Future Research

The study has some limitations. First, the nature of assessments was self-report; hence, there is a possibility of response bias and social desirability influencing the results. Second, the sample was restricted to nonclinical college students, limiting generalizability. Future studies need to test the study's research questions in other trauma-exposed clinical populations and in different cultural groups to assess the generalizability of the results. Third, the positive urgency facet, which refers to the tendency to act rashly in response to positive mood states, was not assessed for the current study. It is a newer addition to the UPPS measure and has been correlated with behaviors such as problematic gambling and problematic drinking (Cyders et al., 2007). Assessing the relation of the positive urgency facet with PTSD factors could be an avenue for future research. Fourth, future research could further assess the transitional nature of impulsivity facets in a within-person framework rather than a between-person framework study.

Lastly, we did not assess the mediating and moderating roles of other latent constructs (e.g., diagnostic symptoms) to outline the complex relation between PTSD and impulsivity. Future research can extend the current study aims by using a mediation model wherein sensation-seeking tendencies or tendencies to act impulsively when

experiencing negative affect may mediate the relation between PTSD's factors and impulse-based behaviors such as substance usage, suicidal ideation, and aggressive acts. Complicating this further is the ongoing debate if impulsiveness is a consequence of exposure to a potentially traumatic event; or if, as a personality trait, it predisposes people to develop PTSD symptoms (Marshall-Berenz et al., 2011; Stephen et al., 1997); or whether impulsivity helps maintain PTSD symptoms (Marshall-Berenz et al., 2011). Assessing the PTSD symptoms–sensation-seeking/urgency facet relationship longitudinally could highlight specific causation pathways.

Despite these limitations, several strengths such as a large sample size and sophisticated statistical analyses are notable. In addition, keeping in line with the National Institute of Mental Health's Research Domain Criteria, the current study did not focus on diagnostic categories rather considered PTSD symptoms dimensionally and a construct and/or mechanism such as impulsivity that transcends *DSM*-defined diagnostic categories (Cuthbert and Insel, 2013). In conclusion, sensation-seeking tendencies and tendencies to act impulsively when experiencing negative affect are most related to PTSD symptoms of NAMC and AAR compared with other impulsivity facets; this has significant implications for assessment and treatment of people with exposure to a potentially traumatic event.

DISCLOSURE

The authors declare no conflict of interest.

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