



Examination of the heterogeneity in PTSD and impulsivity facets: A latent profile analysis[☆]

Ateka A. Contractor^{a,*}, Stephanie Caldas^a, Nicole H. Weiss^b, Cherie Armour^c

^a Department of Psychology, University of North Texas, Denton, TX, USA

^b Department of Psychiatry, Yale University School of Medicine, New Haven, CT, USA

^c Psychology Research Institute, Ulster University, Coleraine, Northern Ireland, United Kingdom

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ABSTRACT

The experience of traumatizing events and resulting posttraumatic stress disorder (PTSD) symptomology relates to a range of impulsive behaviors. While both PTSD and impulsivity are heterogeneous and multidimensional constructs, no research has used person-centered approaches to examine subgroups of individuals based on these response endorsements. Hence, our study examined PTSD-impulsivity typologies and their construct validity in two samples: university students ($n = 412$) and community participants recruited through Amazon's MTurk ($n = 346$). Measures included the Stressful Life Events Screening Questionnaire (PTEs), PTSD Checklist for DSM-5 (PTSD severity), UPPS Impulsive Behavior Scale (negative urgency, lack of premeditation, lack of perseverance, sensation seeking), Dimensions of Anger Reaction Scale (anger), and the Patient Health Questionnaire-9 (depression). For both samples, results of latent profile analyses indicated a best-fitting 3-class solution: High, Moderate, and Low PTSD-Negative Urgency. Negative urgency was the most distinguishing impulsivity facet. Anger and depression severity significantly predicted membership in the more severe symptomatology classes. Thus, individuals can be meaningfully categorized into three subgroups based on PTSD and impulsivity item endorsements. We provide some preliminary evidence for a *negative urgency* subtype of PTSD characterized by greater depression and anger regulation difficulties; and underscore addressing emotional regulation skills for these subgroup members.

1. Introduction

The experience of potentially traumatizing events (PTEs) is associated with several health and behavioral problems including Posttraumatic Stress Disorder (PTSD) and pathological impulsive behaviors including substance use (Breslau, 2009), suicidal attempts (Belik, Stein, Asmundson, & Sareen, 2009), sexual risk taking behavior (Cavanaugh, Hansen, & Sullivan, 2010), and aggressive acts (Orth & Wieland, 2006). PTSD and impulsivity are both heterogeneous and multidimensional constructs (Armour, Mullerova, & Elhai, 2016; Berg, Latzman, Bliwise, & Lilienfeld, 2015). While extensive evidence has linked PTSD severity to impulsivity (Jakšić, Brajković, Ivezić, Topić, & Jakovljević, 2012), no study to our knowledge has used person-centered approaches to examine subgroups of people based on their endorsement of PTSD and impulsivity items. Thus, our study examined PTSD-impulsivity typologies (latent subgroups of individuals based on endorsement patterns), and their construct validity in two distinct samples: university students and a community sample.

PTSD is a multidimensional constellation of four symptom clusters: intrusions, avoidance of internal and external trauma reminders, negative alternations in cognitions and mood (NACM), and alternations in arousal and reactivity (AAR) following the experience of a PTE (American Psychiatric Association, 2013). This is not surprising given the heterogeneous nature of PTSD (Galatzer-Levy & Bryant, 2013) and its high comorbidity with psychopathology (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Examples of PTSD subtypes include subgroups of individuals characterized by predominant dissociative symptoms (dissociative subtype; Müllerová, Hansen, Contractor, Elhai, & Armour, 2016; Wolf, Miller, Reardon, Ryabchenko, Castillo et al., 2012), and predominant depression symptoms (depression subtype; Armour et al., 2015; Contractor, Roley-Roberts, Langdon, & Armour, 2017). Such subgroupings have construct validity and are distinct in terms of psychopathology covariates (Contractor et al., 2017; Miller & Resick, 2007).

We were most interested in the interaction of the personality trait of impulsivity and PTSD symptoms in defining PTSD subgroupings

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* Corresponding author at: University of North Texas, Department of Psychology, 369 Terrill Hall, Denton, TX 76203, USA.

E-mail address: ateka.contractor@unt.edu (A.A. Contractor).

(possibly an impulsive subtype of PTSD). We consider impulsivity as multidimensional, most widely assessed by the UPPS Impulsive Behavior Scale (Whiteside & Lynam, 2001). The assessed four facets of impulsivity include lack of premeditation (tendency to act without careful thought), negative urgency (tendency to engage in impulsive behaviors in the context of intense negative emotions), sensation seeking (tendency to seek excitement), and lack of perseverance (difficulty completing tasks and a tendency for boredom). The UPPS conceptualization of impulsivity offers a pragmatic lens to understanding impulsivity as it relates to different symptoms (e.g., of PTSD) in forming heterogeneous subgroups. From a UPPS perspective, while the overt behavior of impulsivity may appear the same, the underlying mechanisms for this behavior may be different (Whiteside & Lynam, 2001); possibly depending on PTSD symptoms. Our study, thus, examined how impulsivity and PTSD facets might group together among people who have experienced PTEs for the following reasons.

First, substantial evidence supports an externalizing subtype of PTSD characterized by high negative emotionality and low constraint (impulsivity), as distinct from the internalizing subtype of PTSD characterized by low positive emotionality and high negative emotionality (Carleton, Mulvogue, & Duranceau, 2015; Miller, 2003; Wolf, Miller, & Harrington, 2012). Externalizing class members are more likely to demonstrate aggression and substance use, while internalizing class members are more likely to experience depression and anxiety (Castillo et al., 2014; Forbes, Elhai, Miller, & Creamer, 2010; M. W. Miller, 2003). Thus, evidence indicates that impulsivity plays a role in defining PTSD subtypes, specifically the externalizing subtype of PTSD.

Second, there is a strong empirical and theoretical relation between PTSD severity and impulsivity (Contractor, Armour, Forbes, & Elhai, 2016; Jakšić et al., 2012). According to a disinhibition perspective, PTSD severity may interfere with one's ability to inhibit behaviors when perceiving rewarding situations (Casada & Roache, 2005). This perspective aligns with UPPS's lack of premeditation facet, which strongly relates to PTSD's NACM severity (Roley, Contractor, Weiss, Armour, & Elhai, 2017). From an emotional regulation perspective, engagement in impulsive behaviors may functionally help to reduce PTSD's negative affect (Marshall-Berenz, Vujanovic, & MacPherson, 2011; Weiss, Tull, Sullivan, Dixon-Gordon, & Gratz, 2015). This perspective aligns with UPPS's negative urgency facet, which strongly relates to PTSD severity (mainly NACM and AAR; Contractor, Armour, Forbes et al., 2016; Roley et al., 2017). Further, the compulsive re-exposure theory posits that people with PTSD severity engage in sensation-seeking activities (UPPS's sensation seeking facet) to mimic the biological arousal experienced during a PTE (Joseph, Dalgleish, Thrasher, & Yule, 1997). Research indicates that sensation seeking predicts all PTSD clusters' severity (mainly NACM and AAR; Contractor, Armour, Forbes et al., 2016; Roley et al., 2017). Lastly, a cognitive explanation (Ben-Zur & Zeidner, 2009) highlights attentional difficulties (attributed to intrusive thoughts), and a restriction in information processing capacity following trauma. Consequently, one may behave impulsively to redirect attention, or distract from intrusive thoughts (UPPS lack of perseverance; Billieux, 2012; Roberts, Pullig, & Manolis, 2015; Wu, Cheung, Ku, & Hung, 2013). Lack of perseverance predicts PTSD's intrusion severity (Roley et al., 2017).

Despite the aforementioned, there is little understanding of how the different PTSD and impulsivity facets interact in creating subgroups. Person-centered approaches of latent class (LCA) and latent profile (LPA) analyses can extend this line of research on PTSD subtypes by identifying latent subgroupings of people based on endorsed response patterns. LCA assesses categorical symptom indicators while LPA assesses continuous indicators; the obtained subgroups are compared qualitatively and quantitatively (Kline, 2011; McCutcheon, 1987). Using two different samples, our current study examined the best-fitting latent class solution in categorizing participants based on PTSD and impulsivity endorsements, and the construct validity of the optimal class-solution. Drawing from prior research on latent subgroups based

on posttraumatic responses (PTSD and other co-occurring symptoms), we hypothesized finding an optimal three- or four- class solution (Armour et al., 2015; Contractor et al., 2017; Contractor, Armour, Shea, Mota, & Pietrzak, 2016).

We examined the covariates of gender and age in predicting latent class membership in both samples. Consistently, evidence indicates that females have greater PTSD severity (Tolin & Foa, 2006); however, there are mixed findings regarding the relation between age and PTSD severity (Green et al., 1991; Norris, Kaniasty, Conrad, Inman, & Murphy, 2002). Regarding impulsivity's multidimensional construct, Cross, Copping, and Campbell (2011) concluded through a meta-analysis that gender differences were contingent on the type of measure used to assess impulsivity and the theory underlying the impulsivity construct. This meta-analysis reflected more sensation seeking in males, more negative urgency in females, and no gender differences in the lack of perseverance and lack of premeditation facets of impulsivity. While some evidence indicates a decline in impulsivity with age (Steinberg, 2010; Steinberg et al., 2008), sensation seeking has a curvilinear relation with age (strongest relation between ages 10 and 15; Steinberg et al., 2008). Thus, we hypothesized that being female would increase the chance of being in a subgroup characterized by higher PTSD severity, but did not hypothesize how gender would relate to impulsivity facets. Further, we explored the relationship between age and latent class membership.

We further examined the covariates of anger and depression (each variable available in one sample) in establishing the construct validity of the optimal class solution. Evidence indicates PTSD's co-occurrence with depression (Rytwinski, Scur, Feeny, & Youngstrom, 2013) and difficulties in regulating anger (Orth & Wieland, 2006). Further, impulsivity is highly related to depression (Swann, Steinberg, Lijffijt, & Moeller, 2008) and difficulties in regulating anger (Contractor, Armour, Wang, Forbes, & Elhai, 2015). Thus, we hypothesized that a subgroup characterized by higher impulsivity and PTSD severity would have greater depression and anger severity compared to other subgroups.

2. Methods

2.1. Participants and procedure

2.1.1. University sample

A university's Institutional Review Board approved all procedures. The sample included 911 undergraduates recruited from 2011 through 2013. Self-report measures were administered on Psychdata.com following informed consent. Participants were provided course credit for study participation. Of 911 participants, we excluded participants not endorsing at least one PTE. Of the remaining 427 participants, we further excluded 15 participants missing > 30% of items on the PTSD Checklist for DSM-5 (PCL-5; ≥ 6 ; Weathers et al., 2013), the UPPS Impulsive Behavior Scale (UPPS; ≥ 13 items; Whiteside & Lynam, 2001), or the Dimensions of Anger Reaction Scale-5 (DARS-5; > 2 items; Forbes et al., 2004). In the final sample of 412 participants, 27 participants were missing between 1 and 2 PCL-5 items; 79 participants were missing between 1 and 4 UPPS items; and 12 participants were missing one DARS-5 item. The sample of 412 participants had a mean age of 20.06 years ($SD = 4.42$), with the majority being female ($n = 278, 74.50\%$). Table 1 has detailed descriptive information.

2.1.2. MTurk sample

A university's Institutional Review Board approved all procedures. The original sample included 499 participants recruited through Amazon's Mechanical Turk (MTurk) platform (Buhrmester, Kwang, & Gosling, 2011). Participants 18 years and older were screened on four inclusionary criteria, including experiencing a PTE. Participants completed the survey hosted on Psychdata.com following informed consent, and were compensated 75 cents for study participation. Among the 499 respondents who completed the survey, 19 participants attempted the

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