



Posttraumatic stress and marijuana use coping motives: The mediating role of distress tolerance

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ABSTRACT

The present investigation examined the explanatory (i.e., mediating) role of distress tolerance (DT) in the relation between posttraumatic stress (PTS) symptom severity and marijuana use coping motives. The sample consisted of 142 adults (46.5% women; $M_{age} = 22.18$, $SD = 7.22$, range = 18–55), who endorsed exposure to at least one Criterion A traumatic life event (DSM-IV-TR, 2000) and reported marijuana use within the past 30 days. As predicted, results demonstrated that DT partially mediated the relation between PTS symptom severity and coping-oriented marijuana use. These preliminary results suggest that DT may be an important cognitive-affective mechanism underlying the PTS-marijuana use coping motives association. Theoretically, trauma-exposed marijuana users with greater PTS symptom severity may use marijuana to cope with negative mood states, at least partially because of a lower perceived capacity to withstand emotional distress.

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Significant associations between posttraumatic stress (PTS; diagnostic sub-threshold symptoms) as well as posttraumatic stress disorder (PTSD) and marijuana use are well-documented (Kilpatrick et al., 2000; Lipschitz et al., 2003; Rohrbach, Grana, Verberg, Sussman, & Sun, 2009; Vlahov et al., 2002). Here, trauma exposure and PTS symptom severity have been associated with increased levels of marijuana use, both cross-sectionally and prospectively (Bonn-Miller, Vujanovic, & Drescher, in press; Bremner, Southwick, Darnell, & Charney, 1996; Kilpatrick et al., 2000; Lipschitz et al., 2003; Rohrbach et al., 2009; Vlahov et al., 2002).

The examination of motivations for marijuana use is one promising method for better understanding the mechanisms underlying the association between PTS symptom severity and marijuana use. Although associations between trauma exposure and coping-oriented alcohol use (Dixon, Leen-Feldner, Ham, Feldner, & Lewis, 2009; Stewart, Conrod, Samoluk, Pihl, & Dongier,

2000; Stewart, Mitchell, Wright, & Loba, 2004; Ullman, Filipas, Townsend, & Starzynski, 2006) and nicotine use (Beckham et al., 1995, 1997; Feldner, Babson, & Zvolensky, 2007; Feldner, Babson, Zvolensky, Vujanovic, et al., 2007) have been well documented, only three studies have examined the association between PTS or PTSD and marijuana use motives (Bremner et al., 1996; Bonn-Miller, Vujanovic, Feldner, Bernstein, & Zvolensky, 2007; Bonn-Miller, Babson, Vujanovic, & Feldner, 2010). First, Bremner et al. (1996) conducted a retrospective, cross-sectional investigation among Vietnam veterans with PTSD, documenting that these veterans reported: (a) associations between marijuana use and alleviation of PTSD symptoms, and (b) marijuana use to cope specifically with PTSD-related symptoms of hyperarousal. More recently, among a non-clinical community sample of trauma-exposed marijuana users examined cross-sectionally, higher levels of PTS symptom severity were significantly related to increased coping-oriented marijuana use motives (e.g., “to forget my worries,” “to cheer me up when I am in a bad mood,” Bonn-Miller et al., 2007). Finally, in a sample of marijuana users with PTSD ($n = 20$), although no main effect between PTSD symptom severity and marijuana use coping motives was observed, PTSD symptom severity significantly interacted with sleep problems to predict coping-oriented marijuana use (Bonn-Miller et al., 2010). Results from these three studies suggest that trauma-exposed individuals seem especially likely

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to use marijuana for coping reasons, specifically, as compared to other motives for use. Yet, the mediating – or explanatory – factors underlying *why* individuals with greater PTS symptom severity are more likely to report elevated marijuana use coping motives remain unclear.

Distress tolerance (DT), often conceptualized as the perceived or actual ability to withstand aversive physical or emotional stimuli (Brown, Lejuez, Kahler, Strong, & Zvolensky, 2005; Simons & Gaher, 2005), offers one promising explanatory factor for the association between PTS symptom severity and marijuana use coping motives. DT is a theoretically malleable factor (e.g., Linehan, 1993) that has been related to both PTS symptom severity (Marshall, Vujanovic, Bonn-Miller, Bernstein, & Zvolensky, *in press*; Vujanovic, Bonn-Miller, Potter, Marshall, & Zvolensky, *in press*; Vujanovic, Bernstein, & Litz, 2010) and marijuana use motives (Simons & Gaher, 2005; Zvolensky et al., 2009). Although there is a dearth of literature examining the relation between DT and PTS (Vujanovic et al., 2010), emerging cross-sectional empirical work among trauma-exposed community samples suggests significant (inverse) associations between DT and PTS symptom severity, such that higher levels of DT co-occur with lower levels of PTS symptom severity (Marshall-Berenz et al., 2010; Vujanovic, Bonn-Miller, et al., *in press*). More specifically, the *perceived* ability to withstand emotional distress, as measured by the Distress Tolerance Scale (DTS; Simons & Gaher, 2005), may be especially relevant to PTS symptom severity, more so than behavioral indices of the construct (Marshall-Berenz et al., 2010).

DT has also emerged as a cognitive-affective mechanism for better understanding substance use development and relapse (Richards, Daughters, Bornovalova, Brown, & Lejuez, 2010), generally, and problematic marijuana use, more specifically (Buckner, Keough, & Schmidt, 2007; Simons & Gaher, 2005; Zvolensky et al., 2009). For example, DT has demonstrated negative associations with substance use and positive associations with abstinence duration (Richards et al., 2010), examined among individuals using alcohol (e.g., Daughters et al., 2009), nicotine (e.g., Brandon et al., 2003; Brown, Lejuez, Kahler, & Strong, 2002), and other illicit substances (e.g., Daughters, Lejuez, Kahler, Strong, & Brown, 2005; O'Leirigh, Ironson, & Smits, 2007). Furthermore, DT has demonstrated negative associations with motivation to use these substances (Simons & Gaher, 2005; Vujanovic, Marshall-Berenz, & Zvolensky, *in press*).

Consistent with these observations among other substances, the observed association between DT and problematic marijuana use suggests that individuals with lower levels of tolerance for withstanding distress may be especially likely to use marijuana to regulate their emotions (Buckner et al., 2007). Indeed, the only consistent finding in previous studies on DT and marijuana use motives has been that DT is significantly related to coping-oriented marijuana use motives (Simons and Gaher, 2005; Zvolensky et al., 2009). Theoretically, individuals with lower levels of DT may be especially likely to use marijuana to cope with emotional distress due to their tendencies to perceive their abilities to tolerate emotional distress as compromised.

To date, no studies have examined: (1) the unique associations between DT and marijuana use motives among *trauma-exposed* marijuana users; or (2) the theoretical role of DT in the established association between PTS symptom severity and marijuana use coping motives. There is great potential clinical utility in examining these associations in order to determine whether it would be fruitful to target DT via intervention to reduce coping-oriented marijuana use among trauma-exposed populations. Taken together, the extant literature suggests: (a) PTS symptom severity is positively associated with higher levels of marijuana use coping motives (Bonn-Miller et al., 2007); (b) DT is inversely associated with PTS symptom severity (Marshall-Berenz et al., 2010; Vujanovic, Bonn-

Miller, et al., *in press*); and (c) DT is inversely associated with levels of marijuana use coping motives, specifically (Simons & Gaher, 2005; Zvolensky et al., 2009). Thus, DT may help explain (i.e., mediate) the association between higher levels of PTS symptom severity and greater levels of coping-oriented marijuana use among trauma-exposed marijuana users. That is, a lower perceived capacity to withstand emotional distress, including PTS symptoms, may help explain the tendency for individuals with higher levels of PTS symptoms to use marijuana to cope with emotional distress.

In the present investigation, we sought to address these gaps in the literature by examining the potential mediating role of DT in the relation between PTS symptom severity and marijuana use coping motives among a community-recruited sample of trauma-exposed individuals reporting marijuana use within the past 30 days. Consistent with a formal test of mediation, three hypotheses were conceptualized. First, it was hypothesized that higher levels of PTS symptom severity would be significantly associated with greater levels of marijuana use coping motives, beyond the variance contributed by marijuana use frequency and non-criterion marijuana use motives (i.e., enhancement, conformity, expansion, and social motives). Second, higher levels of PTS symptom severity would be significantly associated with lower levels of DT, beyond the variance contributed by marijuana use frequency. Finally, lower levels of DT would mediate the relation between higher levels of PTS symptom severity and greater levels of marijuana use coping motives, beyond the variance contributed by marijuana use frequency and non-criterion marijuana use motives, such that the association between PTS symptom severity and marijuana use coping motives would be eliminated with the inclusion of DT in the model (please see Fig. 1).

1. Method

1.1. Participants

The sample was comprised of 142 adults (46.5% women; $M_{\text{age}} = 22.18$, $SD = 7.22$, range = 18–55) recruited from the greater Burlington, Vermont, community. The racial/ethnic composition of the sample was generally consistent with that of the State of Vermont (State of Vermont, Department of Health 2009): approximately 95.8% of participants identified as white/Caucasian, 0.7% identified as Asian, 0.7% identified as Hispanic/Latino, and 1.4% identified as “other.”

The current study data were yielded from a larger database focused on emotional vulnerability. Approximately 47.2% ($n = 67$) of participants who comprise the present sample were recruited for studies that excluded for current (past month) axis I disorders; and approximately 52.8% ($n = 75$) of participants who comprise the present sample were recruited for studies that did not exclude for current (past month) axis I disorders. Exclusionary criteria across studies included: (a) limited mental competency and/or the inability to provide informed, written consent, (b) psychotic-spectrum psychopathology, (c) current suicidal ideation, (d) current or past chronic cardiopulmonary illness (e.g., chronic obstructive pulmonary disease), (e) current respiratory illness (e.g., bronchitis), seizure disorder, cardiac dysfunction, or other serious medical illness, and (f) pregnancy. Inclusionary criteria were comprised of: (a) being an adult over the age of 18; (b) endorsing exposure to a PTSD Criterion A life traumatic event¹; and (c) reporting marijuana use within the past 30 days.

¹ A traumatic event was defined according to DSM-IV-TR PTSD Criterion A. According to Criterion A, a traumatic event is defined as one in which an individual “experienced, witnessed, or was confronted with an event...that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others” and the individual’s response “involved intense fear, helplessness, or hor-

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