



# The moderating role of dysphoria in the relationship between intrusions and alcohol use<sup>☆</sup>



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## HIGHLIGHTS

- We examined dysphoria's moderating role between intrusions and alcohol use.
- Sample was 127 trauma-exposed Veterans following deployment to Iraq or Afghanistan.
- Assessments were conducted at baseline, 6 months, and 12 months post-deployment.
- Dysphoria moderated relations between intrusions and total/heavy drinking days.
- Dysphoria did not moderate relations between intrusions and drinks per drinking day.
- Significant moderating results were obtained only at one month post-deployment.
- Intrusions predict alcohol use at higher levels of dysphoria.

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## ABSTRACT

Posttraumatic Stress Disorder (PTSD) is frequently comorbid with alcohol use disorders (AUD; Calabrese et al., 2011; McFall, Mackay, & Donovan, 1992). Among several explanations for this comorbidity, the most empirically supported is the self-medication theory which postulates that substances are used to medicate PTSD-related distress (Keane & Wolfe, 1990; Khantzian, 1985; Stewart, 1996). The current study examines the effects of trauma-related distress on alcohol use (total drinking days, drinks per drinking day, heavy drinking days) in a sample of 127 trauma-exposed Veterans following deployment to Iraq or Afghanistan. The dysphoria symptoms of PTSD were used as an indicator of distress, and examined as a moderator in the relationship between intrusion symptoms of PTSD and alcohol use. The proposed moderation model was tested using cross-sectional data from the first month following return from deployment, and at 6 months and at 12 months post-deployment. Results showed that dysphoria symptoms significantly moderated relations between intrusions and total drinking days and heavy drinking days at one month post-deployment; however, a significant pattern was not demonstrated at 6 months and 12 months. Further, dysphoria did not moderate the relation between intrusion symptoms and drinks per drinking day at the three time points. Theoretical and clinical implications are subsequently discussed.

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## 1. Introduction

Posttraumatic stress disorder (PTSD) is often comorbid with substance use disorders (SUD; McCauley, Killeen, Gros, Brady, & Back,

2012; Read, Brown, & Kahler, 2004) including alcohol use disorders (AUD; Calabrese et al., 2011; Jacobson et al., 2008; McFall, Mackay, & Donovan, 1992). One study found that 6% of Operation Enduring Freedom and Operation Iraqi Freedom (OEF/OIF) National Guard Veterans had comorbid alcohol use disorders and PTSD (Erbes, Westermeyer, Engdahl, & Johnsen, 2007). Furthermore, another study indicated that Veterans with comorbid PTSD and SUD symptoms are more likely to have depressive symptoms, and engage in physical violence compared to those with only PTSD or SUD (Owens et al., 2014).

Research has demonstrated that individuals with PTSD and SUD are more likely to experience functional impairment, additional psychiatric comorbidities (Read et al., 2004), poorer treatment outcomes (reviewed

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in McCauley et al., 2012), and emotion dysregulation (Weiss, Tull, Anestis, & Gratz, 2013). Moreover, unremitted PTSD is a prognostic indicator for less improvement in SUD treatment outcome (Read et al., 2004) and unremitted SUD is associated with poor clinical outcomes in persons with comorbid PTSD-SUD (Najt, Fusar-Poli, & Brambilla, 2011). While several studies have assessed the relationship between PTSD and SUD, rarely has alcohol use been studied in relation to specific PTSD symptom clusters. The current study seeks to address this gap in the literature by examining dysphoria symptoms as moderators of the relation between intrusion symptoms and alcohol use.

### 1.1. Models of PTSD symptoms

The DSM-IV PTSD model (American Psychiatric Association, 1994) of re-experiencing, avoidance/numbing, and arousal symptoms does not have strong empirical support (reviewed in Elhai & Palmieri, 2011; Yufik & Simms, 2010). Thus, alternate four- and five-factor PTSD models were developed. See Table 1 for item mappings for the PTSD models. One such empirically supported four-factor model is the *Dysphoria model* (Simms, Watson, & Doebbeling, 2002), which conceptualizes the four PTSD symptom clusters as re-experiencing, avoidance, dysphoria [which combines several arousal (D1–D3) and numbing symptoms (C3–C7)], and arousal. The dysphoria factor was conceptualized to be representative of distress inherent and non-specific to PTSD. Studies have indicated that compared to other PTSD symptom clusters, the dysphoria factor has the strongest relation to symptom dimensions of internalizing conditions such as depression (Contractor et al., 2014; Elhai et al., 2015) and generalized anxiety disorder (Durham et al., 2015). Thus, dysphoria as representative of general distress may account for PTSD's comorbidity with other disorders (Forbes et al., 2011; Gootzeit & Markon, 2011; Miller et al., 2010; Simms et al., 2002).

We elected to use the Dysphoria model in the current study primarily due to (1) a slightly better fit compared to other PTSD models (reviewed in Yufik & Simms, 2010) and (2) relevance to the study's research question. Specifically, in the current study we focus on distress (Watson, 2009), mainly represented by the dysphoria factor (Contractor et al., 2014; Forbes et al., 2011), in relation to PTSD symptoms of intrusions and alcohol use. Intrusion symptoms are conceptualized as one of the symptom clusters specific to PTSD (Gootzeit & Markon, 2011; Simms et al., 2002) and most PTSD theories emphasize intrusions as a central component of PTSD (reviewed in Brewin & Holmes, 2003).

### 1.2. Relation between PTSD symptoms and alcohol use

Among various models of the relationship between PTSD symptoms and alcohol use, there is most support for *Precipitation models*, which

suggest that problematic alcohol use follows traumatic exposure (McFarlane, 1998) or, more specifically, follows the development of PTSD after traumatic exposure (Keane & Wolfe, 1990; McFarlane, 1998). One such precipitation model is the self-medication theory. Khantzian (1975, 1985), who conceptualized the self-medication theory from a psychoanalytical perspective, indicated that use of heroin followed difficulties in coping with anger and aggression and use of cocaine followed difficulties in coping with depression. This idea was later generalized to include use of substances to cope with psychiatric problems and uncomfortable emotional states. Approaching the self-medication theory from a behavioral perspective, Duncan (1974) emphasized the positive (e.g., euphoria) and negative (e.g., avoidance) reinforcing effects of drug use as a factor in drug dependence. The self-medication theory thus outlines possible mechanisms underlying the relation between co-occurring psychiatric conditions. For example, it has been found there as an increased risk of alcohol and drug dependence longitudinally among individuals with anxiety disorder symptoms who were using substance to cope with fear and avoidance of a feared stimulus (Robinson, Sareen, Cox, & Bolton, 2011).

Several studies support the self-medication theory in relation to PTSD symptoms (Chilcoat & Breslau, 1998; reviewed in McCauley et al., 2012; Stewart, Mitchell, Wright, & Loba, 2004). Individuals may use substances to medicate PTSD-related distress, psychiatric problems, and painful emotional states (Keane & Wolfe, 1990; Khantzian, 1985; Stewart, 1996) and the short-term relief strengthens continued substance use (Khantzian, 1985). Empirically, it has been found that individuals with PTSD are more likely to use substances when experiencing physical and emotional discomfort than those without PTSD (Waldrop, Back, Verduin, & Brady, 2007), and drinking with the intent to cope mediates the relation between trauma symptoms and heavy episodic drinking (Kaysen et al., 2007). In fact, it has been shown that increased impulsivity post-trauma can increase the likelihood of using alcohol to alleviate emotional distress perceived as intolerable (Marshall-Berenz, Vujanovic, & MacPherson, 2011). A recent longitudinal study by Haller and Chassin (2014) showed that PTSD symptoms predicted alcohol and drug problems after accounting for the influences of pre-trauma family risk factors, pre-trauma substance use problems, trauma exposure, and demographic variables. Further, different substances may be used to self-medicate different PTSD symptoms (Stewart, Conrod, Pihl, & Dongier, 1999). For example, people with sleep difficulties and irritability as prominent PTSD symptoms may resort to sedating substances such as alcohol whereas people with prominent PTSD avoidance symptoms may use stimulants (Brown & Wolfe, 1994).

Despite the support for the self-medication hypothesis in relation to PTSD symptoms, this model would be strengthened by a more specific understanding of how it operates. There is a large body of empirical literature indicating that intrusive symptoms play a key role in the relationship between trauma and alcohol use (Capone, McGrath, Reddy, & Shea, 2013; Simons, Gaher, Jacobs, Meyer, & Johnson-Jimenez, 2005; Stewart, Pihl, Conrod, & Dongier, 1998; Stewart et al., 2004). Indeed, research indicates those with AUD have more PTSD intrusion symptoms compared to those without AUD (Read et al., 2004). An earlier report using data from the current study (Capone et al., 2013) found that among other PTSD symptom clusters intrusion symptoms were the only significant predictor of post-deployment problem drinking, a finding also reported by Maguen, Stalnakier, McCaslin, and Litz (2009).

A further question is whether individuals who use alcohol to cope with intrusion symptoms (Kaysen et al., 2007; Simons et al., 2005; Stewart, 1996) may do so to cope with the associated distress (i.e., represented by dysphoria symptoms). Not addressed in previous studies is whether the relationship between intrusion symptoms and alcohol use does in fact depend upon the presence of distress (dysphoria), as would be predicted by the self-medication model. That is, alcohol may be used as a means of coping with intrusive recollections of the

**Table 1**  
PTSD factor-structure models.

PTSD symptoms	DSM-IV	Dysphoria model
B1. Intrusive thoughts	R	R
B2. Nightmares	R	R
B3. Reliving traumas	R	R
B4. Emotional cue reactivity	R	R
B5. Physiological cue reactivity	R	R
C1. Avoidance of thoughts	A/N	A
C2. Avoidance of reminders	A/N	A
C3. Amnesia for traumatic event	A/N	D
C4. Loss of interest	A/N	D
C5. Detachment	A/N	D
C6. Restricted affect	A/N	D
C7. Hopelessness	A/N	D
D1. Sleeping difficulties	H	D
D2. Irritability/anger	H	D
D3. Concentration difficulties	H	D
D4. Hypervigilance	H	H
D5. Startled easily	H	H

Note. R, reexperiencing; A, avoidance; N, numbing; H, hyperarousal; D, dysphoria.

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