



## Dimensional structure of DSM-5 posttraumatic stress symptoms: Support for a hybrid Anhedonia and Externalizing Behaviors model



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### ARTICLE INFO

#### Article history:

Received 23 July 2014

Received in revised form

1 October 2014

Accepted 30 October 2014

#### Keywords:

Posttraumatic stress disorder  
DSM-5

7-Factor hybrid model

Confirmatory factor analysis

Latent structure

### ABSTRACT

Several revisions to the symptom clusters of posttraumatic stress disorder (PTSD) have been made in the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Central to the focus of this study was the revision of PTSD's tripartite structure in DSM-IV into four symptom clusters in DSM-5. Emerging confirmatory factor analytic (CFA) studies have suggested that DSM-5 PTSD symptoms may be best represented by one of two 6-factor models: (1) an Externalizing Behaviors model characterized by a factor which combines the irritability/anger and self-destructive/reckless behavior items; and (2) an Anhedonia model characterized by items of loss of interest, detachment, and restricted affect. The current study conducted CFAs of DSM-5 PTSD symptoms assessed using the PTSD Checklist for DSM-5 (PCL-5) in two independent and diverse trauma-exposed samples of a nationally representative sample of 1484 U.S. veterans and a sample of 497 Midwestern U.S. university undergraduate students. Relative fits of the DSM-5 model, the DSM-5 Dysphoria model, the DSM-5 Dysphoric Arousal model, the two 6-factor models, and a newly proposed 7-factor Hybrid model, which consolidates the two 6-factor models, were evaluated. Results revealed that, in both samples, both 6-factor models provided significantly better fit than the 4-factor DSM-5 model, the DSM-5 Dysphoria model and the DSM-5 Dysphoric Arousal model. Further, the 7-factor Hybrid model, which incorporates key features of both 6-factor models and is comprised of re-experiencing, avoidance, negative affect, anhedonia, externalizing behaviors, and anxious and dysphoric arousal symptom clusters, provided superior fit to the data in both samples. Results are discussed in light of theoretical and empirical support for the latent structure of DSM-5 PTSD symptoms.

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## 1. Introduction

There has been longstanding debate within the academic literature with regard to the underlying dimensionality of Posttraumatic Stress Disorder (PTSD) (cf. Yufik and Simms, 2010). The

most recent, 5th edition of the DSM (*DSM-5*; American Psychiatric Association, 2014), characterizes PTSD as a heterogeneous disorder comprised of four symptom clusters which supersedes the tripartite model utilized by the DSM from 1980 to 2013. A body of confirmatory factor analytic (CFA) studies found that the dimensional structure of DSM-based PTSD symptoms, as represented in the DSM-IV (APA, 1994) through to the *DSM-IV-TR* (APA, 2000), are best represented by four rather than three symptom clusters (King et al., 1998; Simms et al., 2002). Indeed, two four-factor models of PTSD—the Emotional Numbing model and the Dysphoria model—have been proposed and supported across a variety of trauma-

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exposed populations from a variety of cultural backgrounds and utilizing different assessment instruments (Elhai and Palmieri, 2011; Gootzeit and Markon, 2011; Yufik and Simms, 2010). The recent proposal of two 6-factor DSM-5 models—the Anhedonia model and the Externalizing Behavior model (Liu et al., 2014; Tsai et al., in press, respectively)—is reminiscent of earlier debates surrounding the two 4-factor DSM-IV/DSM-IV-TR models. The current study focuses on the assessment of these models in comparison to a 7-factor Hybrid model, which combines key features of both 6-factor models, in order to determine which model better represents the latent structure of DSM-5 PTSD symptoms. This is an important line of research, as it can help shed light on diagnosis, treatment planning, and elucidating the underlying nature of PTSD.

The debate surrounding which one of the two 4-factor DSM-IV-TR models—the Emotional Numbing model (King et al., 1998; re-experiencing, avoidance, numbing, hyperarousal) or the Dysphoria model (Simms et al., 2002; re-experiencing, avoidance, dysphoria, hyperarousal)—best represented the dimensional structure of PTSD was never fully resolved. The Emotional Numbing model was conceived from theoretical and empirical support that Numbing and Avoidance were two distinct factors (Asmundson, Stapleton, & Taylor, 2004), whereas the Dysphoria model was conceived on proposals that certain PTSD items, the dysphoric items, were less specific to the overall PTSD construct (cf. Watson, 2009). Of note, a meta-analytic review of 40 CFA studies concluded that the Dysphoria model provided modestly better fit to the pooled data compared to the Emotional Numbing model (Yufik and Simms, 2010). Given marginal differences in fit, however, it is entirely plausible that a different selection of PTSD studies could have resulted in better fit being demonstrated by the Emotional Numbing model. Ultimately, the two four-factor models differed in their assignment of three PTSD symptoms—sleep difficulties, anger/irritability, and difficulty concentrating, which may not be unique indicators of specific factors (Shevlin et al., 2009).

The most recent development in the study of the dimensional structure of DSM-IV-TR PTSD symptoms (APA, 2000) was the proposal of the Dysphoric Arousal model, which posits a 5-factor model of re-experiencing, avoidance, numbing, dysphoric arousal, and anxious arousal symptoms (Elhai et al., 2011). The key difference from preceding four-factor models was the separation of hyperarousal into two distinct clusters of dysphoric arousal and anxious arousal. This was based on Watson's (2005) proposal that items representing sleep disturbance, irritability, and difficulty concentrating involve general distress and/or dysphoria which is characteristic of depressive disorders, whereas remaining hyperarousal items of hypervigilance and exaggerated startle are conceptually different and more characteristic of fear-based disorders (Elhai et al., 2011). This model quickly gathered empirical support across a variety of samples, which differed with respect to trauma exposure, life stage (adolescence or adulthood), culture, and PTSD assessment instrument (Armour et al., 2013a, 2013b, 2012.; Contractor et al., 2013; Pietrzak et al., 2012; Reddy et al., 2013; Wang et al., 2013). The five factors that comprise the Dysphoric Arousal model have additionally been shown to differentially relate to health and neurobiological variables (Harpaz-Rotem et al., 2014; Pietrzak et al., 2013a, 2013b).

The proposal and developing evidence base of the Dysphoric Arousal model coincided with the release of DSM-5 (APA, 2014). Given that the DSM-5 was published in May 2013, it was preceded by the wealth of empirical evidence supporting either the Emotional Numbing model or the Dysphoria model. The Dysphoric Arousal model had likely not gained sufficient momentum to be considered for DSM-5. Thus, it was no surprise that the DSM-5 criteria for PTSD included a 4-factor PTSD model. In this model, however, a number of the existing symptoms were revised and

three additional symptoms were added. Therefore, the 4-factor model of PTSD in the DSM-5 is not a direct replication of the Emotional Numbing or Dysphoria model. Of note, this model most closely resembles the Emotional Numbing model. Specifically, the DSM-5 model of PTSD includes re-experiencing (RE), avoidance (AV), negative alterations in cognitions and mood (NACM; similar to the numbing model's numbing factor), and alterations in arousal and reactivity (AR; similar to the numbing model's hyperarousal factor) symptom clusters (Friedman et al., 2011).

Since the publication of the DSM-5, several researchers have investigated the fit of the DSM-5 4-factor model in data gleaned from a national sample of U.S. adults, a clinical sample of U.S. veterans, undergraduate psychology students, and primary care patients (Armour et al., 2014; Biehn et al., 2013; Contractor et al., 2014; Elhai et al., 2012; Miller et al., 2013). The general trend in these studies has been to compare the DSM-5 model to a modified DSM-5 model, which more closely represents the DSM-IV-TR Dysphoria model. To date, the DSM-5 model has received the most support; however, Miller et al. (2013) found support for a DSM-5 Dysphoria model in their national sample of U.S. adults and clinical sample of veterans. Thus, these findings mirror those of the two DSM-IV-TR 4-factor models in that neither model is conclusively preferential.

Recently, two separate research teams simultaneously published new DSM-5 PTSD models comprised of 6-factors (Liu et al., 2014; Tsai et al., in press). Liu et al. (2014) assessed PTSD's latent structure using data from Chinese earthquake survivors ( $N = 1196$ ) who were assessed for PTSD using the PTSD checklist for DSM-5 (PCL-5). In total, six competing DSM-5 models were assessed, including the DSM-5 four-factor model, a Dysphoria version of this model, a Dysphoric Arousal version of the DSM-5 model, and a newly proposed 6-factor Anhedonia model. The latter model incorporated both the separation of hyperarousal as per the Dysphoric Arousal model, as well as the separation of the new NACM factor into two distinct constructs of 'negative alterations in cognitions and mood' and 'anhedonia'; representing positive and negative affect (Watson, 2005, 2009; Watson et al., 2011). The 6-factor Anhedonia model was found to better fit these data compared to all assessed alternative models.

Tsai et al. (in press), assessed PTSD's latent structure using PCL-5 data from a nationally representative sample of U.S. veterans ( $N = 1484$ ). Once again, these researchers aimed to build on the Dysphoric Arousal model by incorporating dysphoric arousal and anxious arousal factors whilst further evaluating the addition of a new "externalizing behaviors" factor comprised of irritable or aggressive behavior and self-destructive or reckless behavior (a new symptom added to PTSD's Criterion E in DSM-5). The symptoms in this factor are deemed externalizing given they assess self-initiating aggressive behaviors which are thought to represent deficits in emotion regulation and impulse control (Friedman, 2013; Robertson et al., 2012). These are distinct from other symptoms located in the E criterion which measure thoughts, feelings, and passive experiences. Three competing models were tested in this study: the DSM-5 model, the DSM-5 Dysphoria model, and a newly proposed 6-factor 'Externalizing Behaviors' model, and assessed in the total sample, a subsample of female veterans only, and a subsample of veterans with lifetime PTSD. Results revealed that the 6-factor Externalizing Behaviors model provided a better fit to the data compared to the two alternative models across all three samples. Symptom mappings of the DSM-5 (APA, 2014), Anhedonia (Liu et al., 2014), and Externalizing Behaviors (Tsai et al., in press) models are shown in Table 1.

The two 6-factors models are similar in that both group the same items together to represent re-experiencing, avoidance, and anxious arousal symptoms. However, whereas the Externalizing

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