Journal of Anxiety Disorders 62 (2019) 26–34

Contents lists available at ScienceDirect

Journal of Anxiety Disorders

journal homepage: www.elsevier.com/locate/janxdis

Focus Article

PTSD symptoms are differentially associated with general distress and physiological arousal: Implications for the conceptualization and measurement of PTSD

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ARTICLE INFO

Keywords:
Posttraumatic stress disorder, hierarchical model of mood and anxiety
Mood and anxiety disorders
Covariance structure modeling

ABSTRACT

Background: The primary purpose of this study was to examine the place of posttraumatic stress disorder (PTSD) vis-à-vis the external dimensions of general distress and physiological arousal.
Methods: Using data collected from veterans of the wars in Iraq and Afghanistan (N = 1350), latent variable covariance structure modeling was employed to compare correlations of PTSD symptom clusters and individual PTSD symptoms with general distress and physiological arousal.
Results: Each PTSD symptom cluster, and 17 of 20 individual PTSD symptoms were more strongly associated with general distress than with physiological arousal. However, moderate to strong associations were also found between physiological arousal and both PTSD clusters and symptoms.
Limitations: Findings are based on self-reported data elicited from a single sample of veterans with substantial PTSD symptoms. Replication, particularly by clinician interview, is necessary. Generalizability to other traumatized populations is unknown.
Conclusions: Results offer support, with caveats, for viewing PTSD as a distress disorder. Findings are not consistent with the position that PTSD is a hybrid disorder with some features reflecting hyperarousal and others indicative of general distress. Results have implications for the conceptualization and measurement of PTSD.

1. Introduction

Posttraumatic stress disorder (PTSD) underwent a substantial reformulation in the Diagnostic and Statistical Manual of Mental Disorders—5th edition (*DSM-5*; American Psychiatric Association [APA], 2013). Perhaps most notably, PTSD was removed from the anxiety disorders and reassigned to a newly-created class of disorders precipitated by exposure to stressful or traumatic events. The diagnostic criteria were also expanded to permit greater heterogeneity in PTSD symptom presentation. In fact, reassignment was justified, in part, by the newly-appreciated heterogeneity of PTSD inasmuch as the wider range of symptoms, e.g., externalizing behavior, was seen as incompatible with either a fear-based disorder or a disorder of general distress (Friedman et al., 2011; Miller, Resick, & Keane, 2009; Resick & Miller, 2009).

To accommodate the more varied clinical picture of PTSD, three new symptoms were added as criteria. The latter symptoms reflect "reckless or self-destructive behavior (E2)", "persistent distorted cognitions" (D3), and "persistent negative emotional states (e.g., fear, anger, guilt, shame, sadness)" (D4). Thus, the *DSM-5* PTSD criteria B–E include four symptom clusters represented by a total of 20 PTSD symptoms. As noted in the *DSM-5*, PTSD may now be characterized not only by fear and anxiety but also by anhedonia, negative thoughts and feelings as well as aggression and recklessness (*DSM-5*; American Psychiatric Association, 2013).

Even prior to the final release of the *DSM-5*, concerns were expressed regarding the extent to which the reformulation of PTSD was empirically supported (Zoellner, Rothbaum, & Feeny, 2011), and the

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https://doi.org/10.1016/j.janxdis.2018.10.003
Received 20 August 2017; Received in revised form 14 October 2018; Accepted 17 October 2018
Available online 29 October 2018
0887-6185/

discourse continues between critics (e.g., Hoge et al., 2016; Marshall, Schell, & Miles, 2013; McFarlane, 2014) and advocates (e.g., Friedman, Kilpatrick, Schnurr, & Weathers, 2016; Friedman, 2013). Although the reconceptualization of PTSD may lead to greater understanding of the disorder and might stimulate the development of interventions for persons whose symptom manifestations fall beyond the scope of PTSD as defined in the *DSM-IV* (Resick & Miller, 2009), questions remain regarding the removal of PTSD from the anxiety disorders.

One unresolved question pertains to the placement of PTSD within the overarching structure of mental disorders. Even before its codification in the *DSM-III* (American Psychiatric Association, 1980), PTSD had been conceptualized as a fear disorder in which physiological hyperarousal (i.e., anxious arousal) was a prominent feature (Horowitz, 1976). More recently, PTSD has been variously viewed as a distress disorder (Watson, 2005) as well as a complex disorder with some symptoms reflecting hyperarousal and others indicative of general distress (Simms, Watson, & Doebbeling, 2002). These differing perspectives have yet to be reconciled, and the uncertainty has potentially been amplified by expansion of PTSD symptom criteria in the *DSM-5* to reflect greater presumed heterogeneity.

Conceptual models of the symptom structure of anxiety and depression provide one potential basis for understanding the location of PTSD within broader domains of mental health. L. A. Clark and Watson (1991) proposed that anxiety and depression have both shared and specific components. According to this tripartite model, the shared or non-specific component of anxiety and depression is posited to be largely responsible for the covariation of anxiety and depression (also see the related work of Barlow and colleagues, e.g., Barlow, Chorpita, & Turovsky, 1996; Brown, Chorpita, & Barlow, 1998; Chorpita, Albano, & Barlow, 1998). Often referred to as *general distress*, or negative affectivity, this non-specific component subsumes a range of negative emotional states and cognitions including depressed and anxious mood, shame, and guilt as well as symptoms such as irritability, restlessness, and poor concentration (Watson et al., 1995a). Depressive and anxiety disorders are also characterized by symptoms that are relatively disorder-specific, thus enabling their differentiation. In particular, whereas depression is relatively uniquely associated with low levels of *positive affect* (i.e., the inability to experience positive emotions), anxiety is viewed as uniquely characterized by heightened psychophysiological or *anxious arousal* (e.g., racing heart, shortness of breath), which often accompanies fear (Watson et al., 1995a, 1995b). Although the tripartite model has been revised subsequently to reflect that only certain anxiety disorders (principally panic disorder) are fear disorders and thus associated with anxious arousal (Mineka, Watson, & Clark, 1998), ensuing research had indicated that PTSD is also associated with anxious arousal (Brown & McNiff, 2009).

To this point, empirical research regarding the placement of PTSD with respect to the broader dimensions of fear and general distress has yielded discrepant findings. Factor analytic research conducted at the level of the individual disorder has generally indicated that PTSD is most strongly associated with general distress disorders characterized by pervasive emotional distress (e.g., major depressive disorder, generalized anxiety disorder) rather than fear disorders such as panic disorder and specific phobias which are distinguished by prominent hyperarousal symptoms (Cox, Clara, & Enns, 2002; Miller, Fogler, Wolf, Kaloupek, & Keane, 2008; Slade & Watson, 2006; Watson, 2005). In other words, when diagnostic status has served as the level of analysis, PTSD appears to be a distress disorder. For example, Miller et al. (2008) conducted a confirmatory factor analysis of data from a sample of 1325 Viet Nam veterans, observing that PTSD was the strongest marker of general distress and was unrelated to fear.

Given the well-known multifactorial structure of PTSD symptoms, however, diagnostic-level analyses may mask the true association between PTSD symptom clusters and broader domains of emotional health. In this context, Simms et al. (2002) conducted factor-level analyses of PTSD symptoms, and found that 8 of the 17 *DSM-IV* PTSD symptoms appear to measure non-specific general distress rather than PTSD-specific symptomatology. Kashdan, Elhai, and Frueh, (2006) also conducted a factor analysis to explore relationships between depressive anhedonia and PTSD. Significant overlap was observed between emotional numbing and anhedonia, with greater emotional numbing increasing the likelihood of a diagnosis of major depressive disorder. These findings suggest that PTSD reflects a complex combination of symptoms with some relatively specific to PTSD and other symptoms not specific to PTSD.

Subsequent PTSD factor-level studies have yielded inconsistent findings. Some research is generally consistent with Simms et al. (2002), suggesting that PTSD is a hybrid disorder reflecting both PTSD-specific and nonspecific symptom clusters (Elhai et al., 2015; Forbes et al., 2010, 2011; Grant, Beck, Marques, Palyo, & Clapp, 2008). In particular, this research has suggested that symptoms of re-experiencing, avoidance, and hyperarousal are more strongly associated with fear disorders, whereas symptoms reflecting dysphoria are more strongly related to distress disorders. Yet, other studies have found little or no evidence that PTSD factors or subscales are differentially associated with fear or general distress (Byllesby, Durham, Forbes, Armour, & Elhai, 2016; Forbes et al., 2012; Grös, Magruder, Ruggiero, Shaftman, & Frueh, 2012).

At least two features of these factor- or scale-level studies might explain the discrepant findings. First, a number of these investigations employed either dichotomous indicators of the presence or absence of PTSD symptoms or dichotomous indicators of fear and general distress disorders (e.g., Forbes et al., 2010; Forbes et al., 2012; Grös et al., 2012). Dichotomous indicators are prone to error relative to continuous measures (MacCallum, Zhang, Preacher, & Rucker, 2002). Thus, for example, minor perturbation around diagnostic cut-points can introduce unreliability. Relatedly, the tendency to operationalize broader domains of general distress and fear using dichotomous indicators ignores the heterogeneity of many of these disorders, e.g., obsessive compulsive disorder, major depression, and panic disorder (Krause, Reed, & McArdle, 2010; Mataix-Cols, Rosario-Campos, & Leckman, 2005; Meuret et al., 2006). For this reason, information pertaining to relationships with PTSD is potentially obscured. Moreover, using intact symptom severity measures of depression or anxiety to establish that differentiable PTSD symptom clusters vary in their relationships with the external domains of general distress and fear can be potentially problematic when done without regard to scale content (e.g., Byllesby et al., 2016). Symptoms comprising various anxiety and depression scales are known to measure both general and domain-specific content to differing degrees (D. A. Clark, Steer, & Beck, 1994; Simms, Grös, Watson, & O'Hara, 2008). Thus, a more direct test of the hypothesis that certain PTSD symptoms reflect general distress while others are more strongly linked with physiological arousal would include as external indices of general distress and physiological arousal only symptoms that are relatively unequivocal markers of the latter constructs.

Finally, although factor- or scale-level analyses provide information beyond mere dichotomous indicators of the presence or absence of PTSD, symptom-level analyses offer potentially important additional evidence regarding the extent to which individual PTSD symptoms are associated with broader domains of emotional disorder. In other words, factor- or scale-level analyses, like diagnostic level analyses, may obscure variability in the association of individual PTSD symptoms with broader domains. For example, Marshall, Schell, and Miles (2010) replicated the basic pattern of results observed by Simms et al. (2002) and others when examining PTSD at the subscale level. That is, at the scale-level, one PTSD factor, i.e., dysphoria, was associated more strongly than other factors with the broad domain of general distress. Yet, when no factor structure was imposed on PTSD symptoms and items were examined individually, all 17 *DSM-IV* PTSD symptoms were highly associated with an external measure of general distress (Marshall, Schell, & Miles, 2010). To our knowledge, only the latter study has examined associations between individual PTSD symptoms and broader

emotional domains.

The primary purpose of this study was to examine the place of PTSD with respect to the broader dimensions of general distress and fear as indexed by physiological arousal. In particular, we sought to evaluate empirically the assertion that PTSD symptoms are too heterogeneous to be classified solely with respect to general distress or anxious arousal. To the degree that PTSD symptoms cannot be accounted for by reference to either general distress or physiological arousal, one would anticipate that PTSD symptoms developed expressly to reflect the greater heterogeneity of PTSD would be only negligibly associated with these domains. A second aim was to evaluate, for the first time in the context of the *DSM-5*, two alternative representations of the association of PTSD factors and individual symptoms to general distress and physiological arousal. One depiction holds that PTSD is a hybrid disorder with certain clusters and symptoms more strongly associated with general distress and others more tightly linked to physiological arousal (Simms et al., 2002). A second position holds that PTSD, despite having multiple facets, is best represented as a distress disorder (Watson, 2005, 2009).[1] Notably, the two positions are not necessarily incompatible as Watson (2005) has noted that PTSD may be a relatively weak marker of the distress disorders.

2. Methods

2.1. Participants and procedures

Data were drawn from a longitudinal examination of PTSD among Veterans receiving care from the Veterans Health Administration (VHA). Eligibility for this study, i.e., the Veterans After-Discharge Longitudinal Registry (Project VALOR; Rosen et al., 2012) was limited to veterans of the wars in Iraq and/or Afghanistan who had undergone a mental health evaluation at a VA facility. Veterans with probable PTSD according to VA medical records were oversampled to create a 3:1 (PTSD: No PTSD) ratio. Females were oversampled to yield a roughly equal ratio of males to females. Additional eligibility criteria and other information about the study are discussed elsewhere (Rosen et al., 2012). For the current purpose, data were obtained from 1372 of 1649 Project VALOR participants (i.e., 83%) that completed the second phase of the study. On average, the second assessment was conducted approximately 2.5 years after initial assessments (range: 18.8 to 56.5 months).

With respect to demographic characteristics, the sample averaged 40.68 years of age (*SD* = 9.77). Fifty-six percent had completed an Associate's degree or less, and 50.9% were female. With regard to race/ethnicity, 75.4% were non-Hispanic Caucasian, 16.2% were Black, 12.4% were Hispanic, 2.8% were American Indian or Alaska Native, and the remainder endorsed membership in other groups (5.6%). Informed consent was provided prior to enrollment, and the study was approved by local Institutional Review Boards and the Human Research Protection Office of the US Army Medical Research and Materiel Command. The PTSD module of the Structured Clinical Interview for DSM-5 (SCID-5; First, Williams, Karg, & Spitzer, 2015) was administered as part of the larger Project VALOR study. Rates of participant exposure to Criterion A traumatic events were drawn from the SCID-5 assessment. All symptom severity measures used in the current study were self-administered. Participants were compensated $100 for completing this phase of Project VALOR.

[1] Some might view the placement of PTSD resolved insofar as the developers of the DSM-5 considered dimensional alternatives to traditional taxometric approaches before reassigning PTSD to a new class of disorders. However, progress is being made in developing a robust dimensional alternative to the DSM/ICD for classifying mental disorders (e.g., Kotov et al., 2017). Questions concerning the placement of PTSD with respect to other broad dimensions of emotional disorder remain relevant.

2.2. Measures

2.2.1. PTSD symptom severity

PTSD symptom severity was measured using the PTSD Checklist for *DSM-5* (PCL-5; Weathers et al., 2013). This 20-item, updated version of the widely-used and well-validated PTSD Checklist (Weathers, Litz, Herman, Huska, & Keane, 1993; Wilkins, Lang, & Norman, 2011) has been used with active duty military personal, military veterans, and other populations (Blevins, Weathers, Davis, Witte, & Domino, 2015; Bovin et al., 2016; Keane et al., 2014). The PCL-5 maps directly onto *DSM-5* PTSD criteria for symptoms B–E. Participants rate how much they have been bothered, over the past 2 weeks, by each symptom on a 5-point scale ranging from 0 (*"not at all"*) to 4 (*"extremely"*).

2.2.2. General distress symptom severity

General distress, i.e., dysphoria, symptoms were selected from the Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001). The PHQ-9 assesses symptoms required to meet *DSM-5* diagnostic criteria for major depression. Responses to the PHQ-9 are provided with respect to the frequency with which symptoms were experienced in the past 2 weeks, using a 4-point scale ranging from 0 (*"not at all"*) to 3 (*"nearly every day"*). The PHQ-9 is a well-validated and widely used brief screening measure for major depression (Kroenke et al., 2001; Löwe et al., 2008).

2.2.3. Anxious arousal symptom severity

Symptoms of physiologic or anxious arousal were drawn from the Patient Health Questionnaire-15 (PHQ-15). PHQ-15 was developed to screen for somatization (i.e., medically unexplained symptoms) in primary care (Kroenke, Spitzer, & Williams, 2002). The PHQ-15 consists of fifteen somatic symptoms, with participants rating each symptom with respect to how much they have been bothered over the past four weeks using a 3-point scale ranging from 0 ("*not bothered at all*") to 2 ("*bothered a lot*"). Recent research indicates that the PHQ-15 is best viewed as assessing psychogenic symptoms, as intended, and not merely physical health symptoms (e.g., Jasper, Hiller, Rist, Bailer, & Witthöft, 2012). The PHQ-15 possesses reliability and validity as a measure of somatic symptom severity in various settings (Han et al., 2009; Kroenke, Spitzer, Williams, & Löwe, 2010).

2.3. Item selection for analyses

To identify relatively pure markers of general distress and physiological arousal, we used, as our frame of reference, item pools that were expressly developed to measure diverse aspects of depression and anxiety. In particular, we relied on the dysphoria and panic subscales of the Inventory of Depression and Anxiety Symptoms (IDAS; Watson et al., 2007). Developed and validated across multiple samples, including psychiatric patients, the IDAS consists of ten symptom scales. One of the ten subscales is an 8-item panic scale designed explicitly to measure symptoms characteristic of anxious arousal (i.e., physiological arousal). The IDAS also contains a 10-item dysphoria scale created to assess the broader, non-specific domain of general distress. Thus, by design, the IDAS panic and dysphoria scales are good sources of comparatively unalloyed indices of anxious arousal and general distress, respectively (Watson et al., 2007, 2008; also see Watson, Stanton, & Clark, 2017).

To be selected from the PHQ-15 as an indicator of physiological reactivity or from the PHQ-9 as an index of general distress, we required that each symptom under consideration have a roughly equivalent counterpart on either the IDAS panic or dysphoria scales. Thus, to select items as indices of general distress, the symptom content of the PHQ-9 was matched against the content of the IDAS dysphoria scale. Five PHQ-9 symptoms had comparable IDAS dysphoria items, and were chosen as markers of general distress: "*little interest or pleasure in doing things*", "*feeling down, depressed or hopeless*", "*feeling bad about*

yourself…", "*moving…so slowly or the opposite…being fidgety and restless*", and "*trouble concentrating…*". Similarly, to select PHQ-15 symptoms as indices of physiological arousal, the item content of the PHQ-15 was compared with that of the IDAS panic scale. Five PHQ-15 items had counterparts on the IDAS panic scale and were included as relatively pure markers of anxious arousal: "*chest pain*", "*dizziness*", "*fainting*", "*heart pounding or racing*", and "*shortness of breath*".

2.4. Data analysis

2.4.1. Overview

Covariance structure modeling with latent variables was employed, using the EQS 6.3 software program (Bentler, 2015), with raw data as input. Because self-report symptom severity data are often distributed non-normally, robust maximum likelihood parameter estimation was used (Yuan & Bentler, 2000) in conjunction with the Satorra-Bentler scaled $\chi 2$, which adjusts standard errors for non-normality (Satorra & Bentler, 2001). With one exception, missing data were handled using full information maximum likelihood to ensure unbiased estimates in the presence of data which are either missing at random or missing completely at random: 22 participants were missing either all PCL-5 items or all items measuring general distress and anxious arousal, and thus were omitted from the analytic sample. Eighty eight percent of cases were missing no data. Of the remaining participants, none were missing more than six data points.

To assess overall model fit, we used the Tucker-Lewis index (TLI; Tucker & Lewis, 1973), the confirmatory fit index (CFI; Bentler, 1990), and the root mean square error of approximation (RMSEA; Steiger & Lind, 1980). To determine model acceptability, Hu and Bentler (1999) have suggested use of cutoff values close to 0.95 for the CFI and TLI as well as values close to 0.06 for the RMSEA. However, these recommendations have stimulated cautionary warnings about over-reliance on excessively stringent cutoff values (Marsh, Hau, & Wen, 2004). Model modifications were assessed using robust scaled $\chi 2$ difference tests. Except where specified, factors were identified by fixing variances to 1.0, and were allowed to correlate freely.

3. Results

3.1. Descriptive analyses

For descriptive purposes and to facilitate comparison to other samples, aggregate PTSD symptom severity scores were created by summing across the twenty individual PTSD symptoms. Study participants scored an average of 59.20 (SD = 13.23) on the PCL-5. This mean score suggests that a substantial portion of the sample experienced clinically significant PTSD symptoms. As determined by the PTSD module of the Structured Clinical Interview for DSM-5 (SCID-5; First et al., 2015), 94.7% of participants reported exposure to a Criterion A traumatic event. Of Criterion A trauma experiences reported, 94.9% were military trauma while 5.1% were civilian trauma. 62.7% of participants met full diagnostic criteria for current PTSD. Interrater agreement for the SCID-5 was excellent for PTSD diagnosis (κ = 0.82), using a randomly-selected subset of interviews (N = 100) that were independently reviewed and rated. The mean total score on the PHQ-9 in the sample was 11.66 (SD = 6.70); 57.8% of the sample met screening criteria for probable major depression as defined by a PHQ-9 cut score ≥10. The mean total score for the sample on the PHQ-15 was 11.84 (SD = 5.55), indicative of moderate anxious arousal symptom severity.

3.2. Core analyses

Analyses were conducted in phases.In an initial phase, we evaluated the fit of three potential PTSD symptom structure measurement models: (1) the *DSM-5* model which posits four symptom domains assessing Intrusions, Avoidance, Negative Alterations in Cognitions and Mood, and Alterations in Arousal and Reactivity; (2) the Dysphoric Arousal model in which the Alterations in Arousal and Reactivity domain is split into two separate dimensions reflecting Anxious Arousal (Items E3 – E4) and Dysphoric Arousal (Items E1 – E2, E5 – E6), resulting in five factors (Elhai et al., 2011); and (3) the Externalizing Behavior model in which two Dysphoric Arousal symptoms (Items E1 – E2; Irritability or Aggressive Behavior, and Self-Destructive or Reckless Behavior) are represented as indicators of a sixth factor reflecting Externalizing Behavior (Tsai et al., 2015). Item–dimension alignments for the three alternative models are depicted in Table 1. All three PTSD measurement models provided acceptable representations of the data, as shown in Table 2. However, the six-factor Externalizing Behavior model was retained for further analysis given our interest in the heterogeneity of PTSD symptoms.[2] Factor correlations for the Externalizing Behavior

Table 1
Item Mappings for Three Alternative Models of the Structure of PTSD Symptoms.

DSM-5 symptom number and abbreviated content	Model 1	2	3
B1. Intrusive thoughts	I	I	I
B2. Recurrent dreams	I	I	I
B3. Flashbacks	I	I	I
B4. Emotional reactivity	I	I	I
B5. Physiological reactivity	I	I	I
C1. Avoiding thoughts	A	A	A
C2. Avoiding reminders	A	A	A
D1. Dissociative amnesia	NA	NA	D
D2. Negative beliefs	NA	NA	D
D3. Self-blame	NA	NA	D
D4. Negative emotions	NA	NA	D
D5. Loss of interest	NA	NA	D
D6. Detachment/Estrangement	NA	NA	D
D7. Numbing	NA	NA	D
E1. Irritability/Aggression	H	DA	EB
E2. Self-destructive/Reckless	H	DA	EB
E3. Hypervigilance	H	AA	AA
E4. Exaggerated startle	H	AA	AA
E5. Concentration difficulty	H	DA	DA
E6. Sleep problems	H	DA	DA

Note. PTSD = Posttraumatic stress disorder. Model 1 = *DSM-5*, *DSM-5* = Diagnostic and Statistical Manual of Mental Disorders, 5th Edition; Model 2 = Dysphoric Arousal; Model 3 = Externalizing Behavior. Symptom factors to which items contribute: I = Intrusions; A = Avoidance; NA = Negative Alterations in Cognitions and Mood; H = Alterations in Arousal and Reactivity; DA = Dysphoric Arousal; AA = Anxious Arousal; EB = Externalizing Behavior.

Table 2
Alternative PTSD Measurement Models.

Model	$\chi 2$ (*df*)	RMSEA (CI's)	TLI	CFI
DSM-5 4-factor model	1533.36(164)	.078 (.075, .082)	.938	.947
Dysphoric Arousal 5-factor model	1237.00 (160)	.070 (.067, .074)	.950	.958
Externalizing Behavior 6-factor model	1174.75 (155)	.070 (.066, .074)	.951	.960

Note. N = 1350. *DSM-5* = Diagnostic and Statistical Manual of Mental Disorders, 5th Edition; RMSEA = Root mean square error of approximation; TLI = Tucker-Lewis fit index. CFI = Comparative fit index.

[2] Subsequent analyses revealed that the basic pattern of findings did not vary as a function of the choice of PTSD measurement model.

Table 3
Factor Correlations: PTSD Externalizing Behavior Model, General Distress, and Physiological Arousal.

Latent Constructs	1	2	3	4	5	6	7	8
1. Intrusions	1.00							
2. Avoidance	.83	1.00						
3. Negative Alterations	.81	.74	1.00					
4. Dysphoric Arousal	.84	.73	.86	1.00				
5. Anxious Arousal	.80	.70	.72	.84	1.00			
6. Externalizing Behavior	.81	.68	.92	.87	.79	1.00		
7. General Distress	.71[a]	.61[b]	.86[c]	.81[d]	.61[e]	.78[f]	1.00	
8. Physiological Arousal	.63[a]	.47[b]	.56[c]	.64[d]	.53[e]	.61[f]	.61	1.00

Note. N = 1350. All correlations are significant at p < .001. Pairs of correlations denoted with superscript letters "a – d", and "f" differ in magnitude at $p < 0.001$; correlations denoted with superscript "e" differ at $p < .01$.

Table 4
Standardized Factor Loadings for Final Eight-Factor Model.

	Factors							
Factor Labels and Abbreviated Item Content	1	2	3	4	5	6	7	8
1. Intrusion								
B1. Intrusive thoughts	.86							
B2. Recurrent dreams	.82							
B3. Flashbacks	.81							
B4. Emotional reactivity	.86							
B5. Physiological reactivity	.85							
2. Avoidance								
C1. Avoiding thoughts		.92						
C2. Avoiding reminders		.92						
3. Negative Alterations								
D1. Dissociative amnesia			.52					
D2. Negative beliefs			.76					
D3. Self-blame			.74					
D4. Negative emotions			.84					
D5. Loss of interest			.85					
D6. Detach/Estrangement			.84					
D7. Numbing			.83					
4. Externalizing Behavior								
E1. Irritability or Aggression				.84				
E2. Self-destructive/Reckless				.68				
5. Anxious Arousal								
E3. Hypervigilance					.88			
E4. Exaggerated startle					.89			
6. Dysphoric Arousal								
E5. Concentration Difficulty						.79		
E6. Sleep Problems						.66		
7. Physiological Arousal								
Chest pain							.61	
Dizziness							.65	
Fainting spells							.44	
Heart pounding							.68	
Shortness of breath							.67	
8. General Distress								
Little interest or pleasure								.84
Feeling down, hopeless								.85
Feeling bad								.75
Trouble concentrating								.71
Psychomotor symptoms								.62

Note. N = 1,350. All factor loadings are significant at $p < .001$. Negative Alterations = Negative Alterations in Cognitions and Mood.

model are displayed in Table 3.[3]

In the next phase, we first evaluated a two-factor measurement model for the five General Distress and five Physiological Arousal symptoms, and then tested a model in which an eight-factor model (i.e., the six PTSD factors, General Distress, and Physiological Arousal) was fitted simultaneously. The two-factor model for General Distress and Arousal provided a satisfactory fit to the data, robust scaled $\chi 2$ (df = 34) = 315.06, $p < .001$; TLI = .918, CFI = .938, RMSEA = .078 (CI's: .070, .086). Similarly, the eight-factor model (i.e., the six-factor PTSD model, with General Distress and Fear) provided an acceptable fit to the data, robust scaled $\chi 2$ difference test = 2417.38 (df = 377), $p < .001$; TLI = .930, CFI = .939, RMSEA = .063 (CI's: .060, .065). Standardized factor loadings for the eight-factor model are shown in Table 4. As a final step in this series of analyses, we examined the tenability of the hypothesis that the correlation between each PTSD symptom cluster and General Distress equaled the correlation between the corresponding PTSD symptom cluster and Physiological Arousal. In no instance was that hypothesis warranted, as determined by robust $\chi 2$ difference tests with 1 ° of freedom. As shown in Table 3, correlations between all six PTSD symptom factors and General Distress were significantly stronger than the corresponding correlations involving Physiological Arousal.

In the following analytic phase, relationships involving General Distress and Physiological Arousal with *individual* PTSD symptoms were examined. All PTSD symptoms were standardized to have an SD = 1 prior to analysis. Individual PTSD symptoms and both General Distress and Physiological Arousal were allowed to correlate freely. This model provided a good fit to data, robust scaled $\chi 2$ = 1067.46 (df = 194), $p < .001$, TLI = .949, CFI = .978, RMSEA = .057 (CIs: .054, .061). Moreover, as shown in Table 5, all PTSD symptoms save one, i.e., dissociative amnesia, were correlated $r > 0.50$ with General Distress. Furthermore, subsequent $\chi 2$ difference tests on 1 ° of freedom revealed that 17 of 20 PTSD symptoms were more strongly correlated with General Distress than with Physiological Arousal. The sole exceptions to this pattern were PCL-5 items B5 (i.e., physiological reactivity to event reminders), D1 (i.e., dissociative amnesia) and E4 (i.e., exaggerated startle response).

As a final step, we computed the mean correlation of the seventeen PTSD symptoms carried over from the *DSM-IV* with General Distress

Table 5
Correlations Involving Physiological Arousal, General Distress, and Individual PTSD Symptoms.

PCL-5 Item	Item Description	PA	GD	p
1. B1	Intrusive thoughts	.54	.64	< .001
2. B2	Recurrent dreams	.52	.57	< .05
3. B3	Flashbacks	.54	.60	< .05
4. B4	Emotional reactivity	.48	.62	< .001
5. B5	Physiological Reactivity	.58	.57	*ns*
6. C1	Avoiding thoughts	.44	.56	< *.001*
7. C2	Avoiding reminders	.44	.56	< .001
8. D1	Dissociative amnesia	.37	.41	*ns*
9. D2	Negative beliefs	.39	.63	< .001
10. D3	Self-blame	.46	.60	< .001
11. D4	Negative emotions	.48	.70	< .001
12. D5	Loss of interest	.47	.77	< .001
13. D6	Detachment/estrangement	.44	.71	< .001
14. D7	Constricted affect	.46	.73	< .001
15. E1	Irritability/aggression	.41	.62	< .001
16. E2	Reckless/self-destructive behavior	.40	.53	< .001
17. E3	Hypervigilance	.45	.55	< .001
18. E4	Exaggerated startle	.49	.53	*ns*
19. E5	Concentration difficulty	.53	.69	< .001
20. E6	Sleep problems	.44	.52	< .01

Note. N = 1350. All correlations are significantly different from zero at $p < .001$; PTSD = Posttraumatic Stress Disorder. PCL-5 = PTSD Symptom Checklist for DSM-5; Item numbers refer to the order of presentation in the PCL-5. B1 – E6 correspond to symptoms as found in the DSM-5. PA = Physiological Arousal. GD = General Distress. p-values are derived from robust scaled $\chi 2$ difference tests.

[3] As has been shown in prior factor analysis of the Externalizing Behavior model, factor intercorrelations are quite large (e.g., Tsai et al., 2015), thus raising questions about potential factor redundancy.

and Physiological Arousal. These correlations averaged $r = .60$ for General Distress, and $r = .47$ for Physiological Arousal. We then calculated the mean correlation of the three PTSD symptoms newly drafted for the *DSM-5*: (items D3—D4, E2) with both General Distress and Physiological Arousal. The latter correlations averaged $r = 0.61$ for General Distress, and $r = .45$ for Physiological Arousal. Thus, relative to the seventeen retained PTSD symptoms, the three new *DSM-5* symptoms were similarly associated with both General Distress and Physiological Arousal.

4. Discussion

This study evaluated one of several justifications used by proponents to support the removal of PTSD from its traditional grouping as a fear-based disorder.[4] In particular, we tested the claim that classification of PTSD as a disorder of general distress or fear is insufficiently narrow to fully reflect the newly-recognized heterogeneity of PTSD (Friedman et al., 2011; Miller, Wolf, & Keane, 2014). A related aim was to assess, for the first time in the context of the *DSM-5*, the viability of two alternative characterizations of the place of PTSD vis-à-vis broader domains underlying common emotional disorders. One position holds that PTSD is a hybrid disorder with certain subscales more strongly associated with general distress and others more tightly linked to fear (Simms et al., 2002). A second conceptualization posits that PTSD, despite having multiple facets, is best depicted as disorder of general distress (Watson, 2005, 2009).

With respect to the first claim, all six PTSD factors were more strongly associated with general distress than with physiological arousal. The same pattern held true for nearly all individual PTSD symptoms. That is, whether PTSD symptoms were imported from the *DSM-IV* or newly-developed explicitly to reflect greater heterogeneity for the *DSM-5*, virtually all PTSD symptoms were strongly associated with general distress. In addition, each individual PTSD symptom, with the sole exceptions of items B5 (i.e., physiological reactivity to reminders), D1 (i.e., dissociative amnesia), and E4 (i.e., exaggerated startle response), was significantly more strongly associated with general distress than with physiological arousal. Moreover, when the average correlation with general distress and physiological arousal for the seventeen symptoms retained from the *DSM-IV* were compared with those for the three newly-developed symptoms, the latter set was equally well characterized by general distress and physiological arousal. Insofar as PTSD symptoms are heterogeneous,[5] one might expect that new symptoms designed expressly to reflect this heterogeneity would be explained less well by the disorders of general distress and fear. Yet, this was not the case.

As to whether PTSD is best regarded as a general distress disorder (Cox et al., 2002; Slade & Watson, 2006; Watson, 2005) or as a hybrid disorder with certain clusters or symptoms reflective of non-specific distress and others characteristic of PTSD (Forbes et al., 2010; Simms et al., 2002), our results are in accord with the position that PTSD is a general distress disorder, with one notable caveat. PTSD appears to have features of both fear and distress disorders. At first glance, the observation that PTSD has strong secondary associations with physiological arousal seems consistent with the observation than PTSD is simply less robust than other disorders (e.g., major depression) as an indicator of distress disorders (cf. Watson, 2005). However, these results appear at odds with the usual interpretation that the comparatively weaker association of PTSD with general distress disorders is due to the heterogeneity of PTSD symptoms. Specifically, unlike earlier studies (e.g., Forbes et al., 2010; Simms et al., 2002), we did not observe a pattern in which certain clusters or symptoms (i.e., dysphoria) were predictably more strongly linked with general distress, whereas others (i.e., hyperarousal, avoidance, intrusions) were more robustly associated with hyperarousal. Instead, as noted above, all PTSD symptom clusters, and virtually all individual symptoms, were fairly strongly associated with both physiological arousal and general distress (cf. Byllesby et al., 2016; Forbes et al., 2012; Grös et al., 2012).

The current data suggest that PTSD can be viewed primarily as a disorder of general distress. All PTSD symptom clusters and virtually all individual symptoms appear strongly associated with general distress. However, marked secondary associations with arousal were also identified, and this overlap is not fully understood. The possibility exists that the boundary between fear and distress disorders is somewhat fuzzy, and that PTSD lies nearer than other distress disorders to this border. Further research is needed to determine whether PTSD is best viewed as a disorder of general distress (Watson, 2005, 2009), as some combination of general distress and fear, or whether it belongs in a separate category of disorders precipitated by exposure to stressful or traumatic events.

These findings have implications for the measurement of PTSD. Specifically, results bear on the disparate approaches taken by developers of the *DSM-5* and *ICD-11* in updating the definition of PTSD. The purpose of the *DSM-5* reconceptualization was, in part, to allow for more heterogeneous PTSD presentations. Yet, these results indicate that the reformulation may have succeeded primarily in augmenting the *DSM-IV* symptom criteria with conceptually duplicative symptoms which can be understood, at a broader level of analysis, as largely reflecting general distress and secondarily assessing anxious arousal. Whatever the potential benefits of this strategy, they will likely come at the expense of decreasing diagnostic specificity. This reduced specificity has important ramifications. For example, to the degree that treatment outcome research must now include patients with greater symptom heterogeneity, it may well be harder to determine which treatments are effective for PTSD. Given the relatively limited palette of effective treatments for veterans with PTSD (Steenkamp, 2016), the stakes in this regard are particularly high.

In contrast, the *ICD-11* strategy for updating the symptom definition of PTSD—based on concerns regarding conceptual and empirical overlap with other conditions (Brewin, Lanius, Novac, Schnyder, & Galea, 2009; Maercker et al., 2013; Spitzer, First, & Wakefield, 2007)—is to emphasize specificity. Specifically, the *ICD-11* strategy, in contrast to the *DSM-5* approach, is to include only those symptoms regarded as relatively unique to PTSD eliminating, for example, symptoms that overlap with depression (Maercker et al., 2013). Our findings imply that it would be difficult to identify PTSD symptoms that are both unique to PTSD and that have little or no association with general distress. That is, although the content of some PTSD symptoms may seem conceptually more specific to PTSD, such symptoms appear empirically to be no less associated than other PTSD symptoms with

[4] A complete evaluation of all justifications for creating a new category of disorders to accommodate PTSD is beyond the scope of this paper. However, other justifications also warrant further examination. For example, Miller et al. (2009) cited evidence from retrospective studies indicating that new-onset post-trauma depression seldom precedes or emerges in the absence of PTSD. They claim that this pattern is indicative of the causal influence of PTSD on post-trauma depression, and is inconsistent with the possibility that PTSD is a disorder of general distress. Yet, this conclusion should be interpreted in light of seemingly incompatible research findings not addressed by Miller et al. (2009). Specifically, studies of physical trauma survivors begun shortly after injury indicate that depression commonly precedes, or occurs in the absence of, PTSD (Mayou & Bryant, 2001; O'Donnell et al., 2008; Schnyder, Moergeli, Trentz, Klaghofer, & Buddeberg, 2001; Shalev et al., 1998).

[5] Galatzer-Levy and Bryant (2013) have determined that diagnostic criteria for PTSD can be met by experiencing any of more than 600,000 unique symptom patterns. In this sense, PTSD is a disorder of considerable heterogeneity. Yet, this heterogeneity is the byproduct of decision rules adopted to distill a large amount of dimensional data into a single piece of diagnostic information and is not necessarily inherent to PTSD. Our use of the term heterogeneity refers to the extent to which individual PTSD symptoms are essentially interchangeable exemplars of a single broad underlying dimension, or a small set of unifying dimensions, which can account for covariation among observed indicators of PTSD.

external measures of general distress. Thus, reducing the core set of PTSD symptoms would appear unlikely to have the desired impact of reducing comorbidity with disorders such as major depression. Consistent with our findings, an initial empirical evaluation has indicated that reducing comorbidity with PTSD is not achieved by eliminating PTSD symptoms indicative of general distress (Wisco et al., 2016).

4.1. Limitations

Certain limitations of the current investigation must be borne in mind when considering these findings. First, the investigation focused on a single sample of veterans with substantial symptoms of PTSD, depression, and somatization.[6] Thus, the generalizability of these findings to other trauma-exposed populations, e.g., civilians exposed to single incident trauma, and less symptomatic populations is unknown. Indeed, extended combat deployment as well as certain characteristics of combat exposure may make veteran samples unique. Some research suggests, for example, that deployment to a combat zone predicts hypervigilant behavior independently of PTSD (Kimble, Fleming, & Bennion, 2013). In addition, military members have higher rates of adverse childhood experiences than those with no history of military service (Bloshnich, Dichter, Cerulli, Batten, & Bossarte, 2014). To explore the possibility that the association among symptoms may differ as a function of type of trauma exposure, future studies might compare symptoms in trauma-exposed veteran and community samples. Second, this study relied on self-reported symptom severity measures. We note that previous work has demonstrated that total PCL scores correlate highly with those from the Clinician Administered PTSD Scale (CAPS), a well-established interview-based PTSD assessment, as well as total scores of other measures of PTSD (Keen, Kutter, Niles, & Krinsley, 2008; Weathers et al., 1993). Nonetheless, further research using clinician interviews would aid in establishing that symptoms ostensibly ascribed to PTSD using the PCL-5 can be directly anchored to a traumatic event. Given that self-report measures of somatization cannot rule out the possibility that symptoms have a physical basis, clinical interviews could also assist in determining that symptoms of physiological arousal are best attributed to anxious arousal and not to a physical cause or to anxiety-related general distress.[7] Third, as currently defined in the DSM-5 and measured by the PCL-5, certain PTSD symptoms overlap with those of general distress as operationalized in the PHQ-9 depression screener. Hence, the possibility exists that inclusion of manifestly overlapping symptoms artificially inflated the associations between certain PTSD symptom clusters and general distress. Notably, however, general distress was strongly associated with PTSD symptoms even for symptom clusters that do not measure overlapping symptoms. Similarly, strong correlations were also observed at the level of the individual PTSD symptom. That is, the observed association held even for PTSD symptom clusters and individual symptoms that are generally regarded as relatively specific to PTSD (e.g., hypervigilance). Thus, although the general pattern of findings does not appear explained solely as a measurement artifact, additional research that operationalizes general distress without items that overlap with PTSD would be instructive.[8,9]

Finally, some research has suggested that certain persons manifest a type of PTSD characterized by the tendency to externalize distress as exemplified by angry, self-destructive, and reckless behavior (Miller & Resick, 2007; Miller, Greif, & Smith, 2003; Miller, Kaloupek, Dillon, & Keane, 2004; Sellbom & Bagby, 2009). Insofar as the current study did not assess externalization of distress as a broad domain of emotional health, we are not positioned to detect the extent to which PTSD symptoms might be shaped by the tendency toward distress externalization. Although further investigation on this topic is needed, it is notable that prior latent variable covariance structure modeling has found that PTSD either does not reflect the inclination to externalize distress (Miller et al., 2008) or is only a weak marker of this tendency (Wolf et al., 2010).

5. Conclusions

Despite the foregoing limitations, these findings have important conceptual and clinical implications for the measurement of PTSD and are offered in the spirit of furthering the intent of the *DSM-5* to serve as a "living document" to be adapted incrementally to reflect the accrual of relevant knowledge (American Psychiatric Association, 2013, p. 13).

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[6] In a certain respect, this feature can also be regarded as a strength of the study insofar as much of the research on this topic is based on samples with low levels of PTSD, in particular, and distress, in general.

[7] Some might wonder whether somatic arousal, as measured by the PHQ-15, actually reflects anxiety-related general distress rather than anxious arousal per se. This possibility runs counter to the manner in which both generalized anxiety and panic symptoms are currently conceptualized. As characterized in the DSM-5, the somatic symptoms of generalized anxiety disorder do not include physiological arousal. Instead, these somatic symptoms of generalized distress are diffuse and non-specific, e.g., restlessness, being easily fatigued, muscle tension, and sleep disturbance. By contrast, the cardinal symptoms of panic are precisely those measured by the anxious arousal items in the PHQ-15 (e.g., chest pain, dizziness, heart pounding, shortness of breath). In research on medically unexplained symptoms, these specific PHQ-15 symptoms are regarded as measuring anxious arousal (e.g., Robbins, Kirmayer, & Hemami, 1997). Finally, the notion that PHQ-15 indices of physiologic arousal actually reflect anxiety-related general distress conflicts with existing data. In particular, factor analytic research on the tripartite model has revealed that symptoms which appear on their face to assess non-specific anxiety-related distress (e.g., lump in throat, nausea) may actually function as markers of anxious arousal rather than the reverse (Marshall, Sherbourne, Meredith, Camp, & Hays, 2003; Watson et al., 1995).

[8] Within the tripartite model, general distress is viewed as a broad, but unidimensional, construct comprised of various facets. Using the PHQ-9 as our sources of items, we measured most, but not all, facets of general distress as conceptualized in the model. Although it is sometimes claimed that measurement of all facets of a unidimensional construct is essential to ensure construct validity, this is not the case as long as a sufficient number of indicators are modeled with each being at least moderately associated with the underlying construct of interest (Bollen & Lennox, 1991).

[9] Project VALOR was supported by the Department of Defense, Congressionally Directed Medical Research Program under designations W81XWH-08-2-0100/W81XWH-08-2-0102 and W81XWH-12-2-0117/W81XWH-12-2-0121. The preparation of this manuscript was supported by a Department of Defense Deployment Related Medical Research Program award (W81XWH-09-2-0079). The sponsors had no role in study design; in the collection, analysis and interpretation of data; in the writing of the report; or in the decision to submit the manuscript for publication. The views expressed in this manuscript are those of the authors and do not necessarily represent the views of the RAND Corporation, the Department of Veterans Affairs, the Department of Defense, or any other U.S. government agency. We thank Erika J. Wolf for her comments on a previous draft of this manuscript.

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