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Testing alternative factor models of PTSD and the robustness of the dysphoria factor

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ABSTRACT

Objectives: This study first aimed to examine the structure of self-reported posttraumatic stress disorder (PTSD) symptoms using three different samples. The second aim of the paper was to test the robustness of the factor analytic model when depression scores were controlled for.
Design: Based on previous factor analytic findings and the DSM-IV formulation, six confirmatory factor models were specified and estimated that reflected different symptom clusters. The best fitting model was subsequently re-fitted to the data after including a depression variable.
Methods: The analyses were based on responses from 973 participants across three samples. Sample 1 consisted of 633 parents who were members of 'The National Association of Infant Death' and who had lost a child. Sample 2 consisted of 227 victims of rape, who completed a questionnaire within 4 weeks of the rape. Each respondent had been in contact with the Centre for Rape Victims (CRV) at the Aarhus University Hospital, Denmark. Sample 3 consisted of 113 refugees resident in Denmark. All participants had been referred to a treatment centre which focused on rehabilitating refugees through treatment for psychosocial integration problems (RRCF: Rehabliterings og Revliderings Centre for Flygtninge). In total 500 participants received a diagnosis of PTSD/sub-clinical PTSD (Sample 1, $N = 214$; 2, $N = 176$; 3, $N = 110$).
Results: A correlated four-factor model with re-experiencing, avoidance, dysphoria, and arousal factors provided the best fit to the sample data. The average attenuation in the factor loadings was highest for the dysphoria factor ($M = -.26$, SD = .11) compared to the re-experiencing ($M = -.14$, SD = .18), avoidance ($M = -.10$, SD = .21), and arousal ($M = -.09$, SD = .13) factors.
Conclusions: With regards to the best fitting factor model these results concur with previous research findings using different trauma populations but do not reflect the current DSM-IV symptom groupings. The attenuation of dysphoria factor loadings suggests that dysphoria is a non-specific component of PTSD.

1. Introduction

Posttraumatic stress disorder (PTSD) was first included in the Diagnostic and Statistical Manual of Mental Disorders-III (DSM-III: American Psychiatric Association, 1980) in 1980. The symptom groupings have since undergone a number of changes. The current grouping from the DSM-IV (American Psychiatric Association, 1994) specifies three clusters of symptoms: re-experiencing, avoidance, and arousal. However, support for the DSM-IV structure of symptoms has been limited using factor analytic methods.

Cordova, Studts, Hann, Jacobsen, and Andrykowski (2000) tested a three-factor model with a second-order PTSD factor using confirmatory factor analysis in a sample of breast cancer patients. Their support for the three-factor model was equivocal as post hoc modifications were required in order for the model to adequately fit the data.

King, Leskin, King, and Weathers (1998) used an 'alternative models' approach. They specified four competing models using data from a sample of 524 male military veterans who were interviewed using the Clinician Administered PTSD Scale (CAPS: Blake et al., 1990). The first model was a correlated four-factor model with the factors of re-experiencing, effortful avoidance, emotional numbing, and arousal: this model separated the original avoidance factor into an effortful avoidance (of trauma-specific stimuli) factor (C1, C2) and an emotional numbing factor (C3, C4, C5, C6, C7). The second used the same four factors but included two correlated second-order factors, one factor accounting for the re-experiencing and effortful avoidance symptoms and the other

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accounting for the emotional numbing and arousal symptoms. The third model specified the four first-order factors and a single second-order factor of PTSD. The fourth model specified a single-factor with all the 17 symptoms loading on this PTSD factor. The model that specified a correlated four-factor model was found to be the best representation of the sample data, and interestingly the lowest correlation between the factors was for the effortful avoidance and emotional numbing, which supports the distinction between these symptoms. Support for the King et al. (1998) model has been abundant within the factor analytic literature. Asmundson et al. (2000) tested five alternative models. Results concluded that the King et al. (1998) model provided superior fit to the data comprised from primary care patients experiencing a range of traumatic accidents. This four-factor model has also been found to represent the best fitting model across varying samples (Andrews, Joseph, Shevlin, & Troop, 2006; Asmundson et al., 2002; Asmundson, Wright, McCreary, & Pedlar, 2003; Cox, Mota, Clara, & Asmundson, 2008; DuHamel et al., 2004; Elhai, Gray, Docherty, Kashdan, & Kose, 2007; Elhai, Grubaugh, Kashdan, & Frueh, 2008; Marshall, 2004; McDonald et al., 2008; McWilliams, Cox, & Asmundson, 2005; Palmieri & Fitzgerald, 2005; Palmieri, Marshall, & Schell, 2007b; Saul, Grant, & Carter, 2008; Schinka, Brown, Borenstein, & Mortimer, 2007).

Simms, Watson, and Doebbeling (2002) suggested a four-factor model with re-experiencing, avoidance, dysphoria, and arousal factors. The dysphoria factor was comprised of the emotional numbing symptoms and the irritability/anger, difficulty sleeping, and difficulty concentrating symptoms. The hypervigilance and exaggerated startle response symptoms comprised the arousal factor. The confirmatory factor analyses were based on data from a large sample (N = 3695) of Gulf War veterans and non-deployed controls using the PTSD Checklist - Military Version (PCL-M: Weathers, Huska, & Keane, 1991). Simms et al. (2002) found this model provided the best fit compared to five other models, subsequent studies have replicated these findings across varying samples (Armour & Shevlin, in press; Bashnageal, O'Conner, Colder, & Hawk, 2005; Boelen, van den Hout, & van den Bout, 2008; Elklit & Shevlin, 2007; Krause, Kaltman, Goodman, & Dutton, 2006; Palmieri, Weathers, Difede, & King, 2007a; Olff, Sijbrandij, Opmeer, Carlier & Gersons, 2009).

In response to the inconsistency of conclusions Palmieri et al. (2007a) conducted a confirmatory factor analysis of the PTSD checklist (PCL: Weathers, Litz, Huska, & Keane, 1994) and the structured Clinician-diagnostic interview (CAPS: Blake et al., 1990). Based on data from a sample of individuals exposed to the 9/11 terrorist attacks (N = 2960) they compared CFA results for both diagnostic measures across five models. Results concluded that analysis using the PCL favored the four-factor Simms et al. (2002) model, whereas analysis using CAPS favored the four-factor King et al. (1998) model. However, as fit statistics were only marginally different between models, they conducted analysis on both the CAPS and the PCL combined, and concluded that the Simms et al. (2002) model provided superior fit. This lead the researchers to state "...collectively, the evidence suggests that the four-factor model of correlated re-experiencing, avoidance, dysphoria and arousal symptoms provides the best representation of the latent structure of PTSD." (p. 334).

One common aspect of this particular conceptualization of PTSD symptom clusters is the high association between scores on the dysphoria factor and measures of negative affect. Elklit and Shevlin (2007) reported an attenuation-corrected correlation (zero-order correlation reported in parenthesis) of .88 (.61) and between scores on the dysphoria factor and scores on the depression and anxiety subscales of the Trauma Symptom Checklist (TSC-33: Briere & Runtz, 1989), respectively. Simms et al. (2002) correlated scores on the dysphoria factor based on the PCL and scores on the depression subscale of the Primary Care Evaluation of Mental Disorders scale. The correlations were highest for the sample of deployed Gulf War veterans who met the criteria for PTSD Criterion A (r = .85), but also high for other deployed veterans (r = .80) and non-deployed veterans (r = .72). Palmieri et al. (2007a) calculated scores for the dysphoria factor based on PCL and CAPS and reported correlations of .80 and .70 with scores on the Beck Depression Inventory (BDI: Beck, Steer, & Brown, 1996), respectively.

Simms et al. (2002) interpreted the high correlations between the dysphoria factor and depression to be indicative of the latter being a "non-specific component" (p. 645) of PTSD. Indeed, Palmieri et al. (2007a) questioned, given the non-specific nature of dysphoria, whether it should be included in the diagnosis of PTSD. This raises the question of whether the dysphoria factor would remain psychometrically valid, by its indicators remaining statistically significant, if depression was statistically controlled for. If the factor loadings for the dysphoria factor were to become non-significant after controlling for depression, this would indicate that the dysphoria factor is essentially indistinguishable from depression. However, if the factor loadings for the dysphoria factor were not significantly attenuated it would not support the proposition of its non-specific nature.

This paper has two main aims. The first aim was to test six alternative models of PTSD using confirmatory factor analysis. In order to determine the generalizability of the models across different traumatized groups who experienced different levels of posttraumatic symptoms the analyses were based on a combined sample of participants who were exposed to a range of different traumatic experiences and had full or sub-clinical PTSD. Participants were recruited from groups of bereaved parents, refugees, and rape victims. It was predicted that the model proposed by Simms et al. (2002) would be the best fitting model. The second aim of the paper was to test the robustness of the factor analytic model when depression scores were controlled for. It was predicted that there would be significant decreases in the magnitude of the factor loadings associated with the dysphoria subscale, and that these decreases would be larger than that for the other factors of re-experiencing, avoidance, and arousal. It was also predicted that the inter-factor correlations would significantly decrease.

2. Method

2.1. Participants

A total of 973 participants were recruited across three samples. Participants ranged in age from 12 years to 70 years (M = 32 years; SD = 9.18) with 63.3% of the sample being female. PTSD/sub-clinical PTSD was diagnosed for 500 (50.6%) participants.

2.1.1. Sample 1

The participants within this sample consisted of 633 parents who had lost their child to infant death. Participants ranged in age from 18 years to 62 years (M = 33.9 years, SD = 5.91) with 57.3% of the sample being female. The majority of parents were members of the Danish 'National Association of Infant Death' and had experienced the loss of their child between 5 days and 18 years (M = 3.3 years) from the time of completing both the Harvard Trauma Questionnaire (HTQ: Mollica et al., 1992) and The Trauma Symptom Checklist (TSC-33: Briere & Runtz, 1989). Participants were recruited in two ways: either via a postal questionnaire which they completed and returned (response rate = 46%) or via invitation to participate when attending the maternity ward or neonatal department of two large Danish hospitals. Participation was strictly voluntary within both procedures. PTSD/sub-clinical PTSD diagnosis was given to 214 (33.8%) participants.