



Research paper

Hardiness and sensation seeking as potential predictors of former prisoners of wars' posttraumatic stress symptoms trajectories over a 17-year period



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ABSTRACT

Objective: Little is known about trajectories of posttraumatic stress symptoms (PTSS) among former prisoners of war (ex-POWs) and the predictors of those trajectories. This study aimed to assess long-term PTSS trajectories among ex-POWs and comparable veterans and the role of hardiness and sensation seeking in predicting PTSS trajectory.

Method: A sample of 189 Israeli ex-POWs and 160 comparable combatants participated in a 17 year longitudinal study with three waves of measurements following the 1973 Yom Kippur War (T1: 1991, T2: 2003, T3: 2008). Participants completed validated self-report measures.

Results: Latent growth mixture modeling (LGMM) identified four longitudinal PTSS trajectories. Among ex-POWs, the majority of participants were classified in trajectories with "low-increasing" or "medium-increasing" levels of PTSS. Among the comparable veterans, however, the majority of participants were classified in a trajectory with "low" levels of PTSS. Ex-POWs with high levels of hardiness were less likely to belong to the "high" or "medium-increasing" PTSS trajectories, compared to the low-fluctuating trajectory.

Conclusions: The long-term course of PTSS is heterogeneous among both veterans and ex-POWs, with chronic and increasing symptom patterns being more prevalent amongst ex-POWs. Ex-POWs should be considered an at-risk population for exacerbated PTSS trajectories that is related to hardiness personality construct.

1. Introduction

War captivity is one of the most brutal man-made traumas. Beyond the significant risks of war, prisoners of war (POWs) endure deliberate, repeated, prolonged and inter-personal human cruelty (Herman, 1992). The harsh stressors of captivity are recognized as potent pathogenic agents to long-term mental health disorders, of which the most commonly recognized is posttraumatic stress disorder (PTSD; e.g., Meziab et al., 2014). A considerable body of research, conducted in various armies around the globe, following numerous wars, has consistently documented elevated rates of PTSD among ex-POWs in comparison to war veterans (Engdahl et al., 1998). Some studies have indicated that up to 88% of ex-POWs reported substantial PTSD symptoms as many as five decades after homecoming (e.g., Rintamaki et al., 2009). While the immediate adverse effects of combat and captivity are well-documented, there is a profound lack of knowledge about the long-term course of PTSD among ex-POWs and war veterans over the life-cycle. The present study aims to fill this gap by exploring

PTSD symptom (PTSS) trajectories over 17 years among ex-POWs and comparable veterans and to assess the role of personality resources in predicting long-term PTSS trajectories.

Both the *Diagnostic and Statistical Manual of Mental Disorders-5th edition* (DSM-5; American Psychiatric Association, 2013) and theoretical formulations (e.g., Blank, 1993), point to a heterogeneous and fluctuating course of PTSS over a veterans' lifespan. Unfortunately, most studies of the course of veterans' PTSS either used a retrospective design (e.g., Port et al., 2001) or covered a short period of time post deployment (e.g. Boks et al., 2015). Only few long-term prospective studies have examined the course of PTSS over decades (e.g., Koenen et al., 2003; Solomon and Mikulincer, 2006). To date, there is conflicting empirical evidence regarding the course of combat-induced PTSS. Some prospective (e.g., Zerach et al., 2013) and retrospective (e.g., Zeiss and Dickman, 1989) studies among war veterans point to a general gradual decrease in PTSS. However, other studies have observed heterogeneous trajectories of PTSD with symptoms increasing and decreasing over time (e.g., Solomon and Mikulincer, 2006).

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Indeed, most of the recent long-term studies among veterans have found several distinct PTSS trajectories, with a predominant trajectory of resilience. For example, [Bonanno et al. \(2012\)](#) found that among US military service members, 83.1% with a single deployment and 84.9% with multiple deployments could be classified as having a trajectory of resilience. In addition to the resilient trajectory, patterns of recovery, delayed onset, and chronicity have also commonly been found (e.g., [Karstoft et al., 2013](#)). For example, [Magruder et al. \(2016\)](#) examined PTSD among Vietnam veterans over 20-year period and found five trajectories; the majority of theater service veterans remained unaffected by PTSD (79.05%), hence resilient, while other identified PTSD trajectories were early recovery or late recovery (10.45%), late onset (6.55%), and chronicity (3.95%).

Concerning ex-POWs, a recent study by our team showed that over a 17-year period, compared to war veterans, 67% of ex-POWs were classified as suffering from 'delayed PTSD', 26.6% were classified as 'resilient', only 1.3% had recovered from PTSD, and 5.1% had 'chronic PTSD' ([Solomon et al., 2012](#)). Although providing important insight regarding veterans' and ex-POWs' long-term course of PTSD, both [Solomon et al. \(2012\)](#) and [Magruder et al. \(2016\)](#) have classified individuals using dichotomous PTSD diagnostic categories. Over the recent decades, a number of statistical methods such as Latent Growth Mixture Modeling (LGMM; [Muthen, 2004](#)) and other data-driven approaches have gained popularity as a means for investigating individual trajectories of PTSS. In LGMM and related approaches, individuals are grouped together in multiple trajectories of change over time under the assumption that multiple distributions exist within the sample. By estimating a previously explored sample of veterans' and ex-POWs' PTSS trajectories using a more sophisticated analysis we will be able to gain further insight into the individual variability of PTSS over the years and to also identify predictors of this variability.

Identification of psychological markers for risk and resiliency over a veteran's life-cycle is an important task, as the markers might identify those in need for early interventions ([Karstoft Armour et al., 2013](#)). While much empirical effort has been invested in the study of risk or vulnerability predictors of PTSD (e.g., [Ozer Best et al., 2003](#)), fewer research efforts have examined resilience factors that may protect trauma-exposed individuals from developing PTSD and, specifically, to maintain their psychological and mental health over the years (e.g., [Eisen et al., 2014](#)). In this study, we aim to examine the association of two personality characteristics – hardiness and sensation seeking – with long-term PTSS trajectories.

Hardiness is defined as a stable personality construct that encompasses three basic components: commitment, control and challenge. Commitment is described as the belief in the value and meaningfulness of one's activities; control is the feeling that life experiences are predictable and controllable; and challenge is the willingness to accept changes in life as challenges and opportunities for growth ([Kobasa, 1979](#)). It comes as no surprise that hardiness has been found to help individuals adapt successfully to a variety of potentially stressful events, including the military arena (e.g., [Maddi, 2007](#)). Empirical studies have suggested that hardy individuals are more confident, appraise stressful conditions as less threatening and more manageable and use more effective coping skills than their less hardy peers (e.g. [Williams et al., 1992](#)). Indeed, some scholars have referred to hardiness as "dispositional resilience" ([Bartone, 2007](#)).

The effects of hardiness on mental health in general (e.g., [Pietrzak et al., 2009](#)), and particularly PTSD (e.g., [King et al., 1999](#)), have been examined in a limited number of military samples. To date, most studies have found hardiness to be a significant negative predictor of PTSS among Vietnam veterans ([King et al., 1998](#)), Persian Gulf War combatants ([Sutker et al., 1995](#)), American military personnel recruited from various locations ([Escolas et al., 2013](#)), and Australian army reservists ([Orme and Kehoe, 2014](#)). Specifically among ex-POWs, hardiness has also been found to be inversely related to PTSD and psychiatric symptomatology ([Zakin et al., 2003](#)). An exception to this

pattern is a prospective study among Operation Enduring Freedom/Operation Iraqi Freedom returnees which found that hardiness did not predict subsequent PTSS in the year post deployment ([Eisen et al., 2014](#)).

One additional personality resource that may predict veterans' PTSS trajectories is sensation seeking. Sensation seeking is defined as a personality characteristic that entails looking for "... varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experiences" ([Zuckerman, 1994](#), p. 27). Thus, people with high levels of sensation seeking need more stimulation and perform better under high levels of arousal ([Cloninger and Svrakic, 1997](#)). Naturally, sensation seeking is manifested in various kinds of risk-taking behaviors such as risky driving (e.g., [Schwebel et al., 2006](#)), or shoplifting ([Hansen and Breivik, 2001](#)). Those with high sensation seeking tendencies have been found to experience lower levels of anxiety ([Zuckerman, 1994](#)), to perceive the world as less threatening and to have experiences that are less likely to lead to negative outcomes as compared to low-sensation seekers ([Franken et al., 1992](#)). The exploration of sensation seeking in the military setting, which is abundant with high levels of stress and arousal, and its role in the long-term adaptation to posttraumatic residues, is only requested.

The empirical and theoretical relation between sensation seeking and PTSS has been inconsistent (e.g., [Weiss et al., 2013](#)). On the one hand, PTSD has been found to be positively associated with sensation seeking ([Wang et al., 1997](#)). Specifically, among nonclinical subjects with a trauma history, PTSS clusters of alterations in arousal and mood/cognition were found to be mostly related to the tendency of impulsivity in sensation seeking ([Contractor et al., 2016](#)). On the other hand, a number of studies among substance user patients ([Weiss et al., 2013](#)), war veterans ([Neria et al., 2000](#)), and ex-POWs ([Solomon et al., 1995](#)) found a negative association between sensation seeking and PTSD. The latter studies' results suggest that individuals high in sensation seeking are better able to adjust to stressful situations and, in the long run, report lower levels of PTSD. It is important to note that it is still unclear as to whether sensation seeking was elevated prior to traumatization or whether it became elevated as a consequence of traumatization, or both.

The above mentioned literature points to a number of gaps in knowledge. First, much more information is needed regarding long-term PTSS trajectories of veterans and, especially, highly exposed groups such as ex-POWs. Moreover, while most research focuses on risk/vulnerability predictors of PTSS, there is a dire need for research that explores the predictive value of resilience factors in PTSS trajectories. Last, the few studies that examined hardiness and sensation seeking were cross sectional or short-term longitudinal and, thus, do not allow for a full understanding of their roles as predictors of PTSS over extensive periods of time.

The current study attempts to fill the gaps in the literature by investigating the relations between hardiness, sensation seeking and long-term trajectories of PTSS among ex-POWs and a comparable group of veterans. We capitalize on a 17-year longitudinal study of Israeli veterans ([Solomon et al., 2012](#)) and aim to: (a) identify the long-term PTSS trajectories differences between groups by application of Latent Growth Mixture Modeling, and (b) investigate the roles of personality resources – hardiness and sensation seeking – in predicting PTSS trajectory.

2. Methods

2.1. Participants

The present study uses data from a longitudinal study on the psychological implications of war (please see [Dekel et al., 2012](#) for full details). A cohort of Israeli veterans who participated in the 1973 Yom Kippur War was followed over 17 years with assessments at three time

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