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# The traumatized body: Long-term PTSD and its implications for the orientation towards bodily signals

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ABSTRACT

Orientation to bodily signals is defined as the way somatic sensations are attended, perceived and interpreted. Research suggests that trauma exposure, particularly the pathological reaction to trauma (i.e., PTSD), is associated with catastrophic and frightful orientation to bodily signals. However, little is known regarding the long-term ramifications of trauma exposure and PTSD for orientation to bodily signals. Less is known regarding which PTSD symptom cluster manifests in the 'somatic route' through which orientation to bodily signals is altered. The current study examined the long-term implications of trauma and PTSD trajectories on orientation to bodily signals. Fifty-nine ex-prisoners of war (ex-POWs) and 44 controls were assessed for PTSD along three time-points (18, 30 and 35 years post-war). Orientation to bodily signals (pain catastrophizing and anxiety sensitivity—physical concerns) was assessed at T3. Participants with a chronic PTSD trajectory had higher pain catastrophizing compared to participants with no PTSD. PTSD symptom severity at T2 and T3 mediated the association between captivity and orientation. Among PTSD symptom clusters, hyperarousal at two time-points and intrusion at three time-point mediated the association between captivity and orientation. These findings allude to the cardinal role of long-term PTSD in the subjective experience of the body following trauma.

## 1. Introduction

War captivity is a severe man-made trauma, which often involves harsh and recurring pain and suffering that is personally and purposefully inflicted upon the individual. Torture methods include, but are not limited to, severe beatings, penetrating injuries, suspension, positional torture, electric shocks, burns, and systematic deprivation of food and water. Psychological torture may include various forms of oppression and humiliation, including denial to use the toilet, verbal abuse such as curses and threats, demoralizing misinformation about their loved ones and mock executions. Unsurprisingly, war captivity has been shown to leave its marks on psychological (Herman, 1992; Solomon and Mikulincer, 2006) and somatic (Krause et al., 2004; Benyamini et al., 2009; Afari et al., 2014) experience and functioning.

Within the essence of the subjective experience of the body is the orientation towards bodily signals, which reflects the ways in which somatic signals are being acknowledged, perceived, sensed, and "lived with" by the individual (Mehling et al., 2009; Shahar and Lerman, 2013; Sullivan et al., 1995). For example, when experiencing a headache, some people may react with fear or anxiety, interpreting it as a signal of a life-threatening problem (Norton and Asmundson, 2004; Reiss et al., 1986; Taylor, 2002). Further ruminating over this sensation, and its possible dreadful consequences, may magnify the pain (Barsky, 1990; Schmidt et al., 1997), and lead to a feeling of fear and helplessness (Peterson and Heilbronner, 1987; Sullivan et al., 1995). Such orientation towards bodily signals has been conceptualized through *catastrophic* orientation towards pain (Sullivan et al., 1995) and other bodily signals (Flink et al., 2013). Within anxiety literature, including PTSD, this orientation has also been referred to as a frightful orientation towards anxiety-related bodily signals, i.e. anxiety sensitivity – physical concerns (Reiss et al., 1986). These somewhat similar, yet not identical (Drahovzal et al., 2006; Vancleef and Peters, 2006) orientations have been suggested to overlap in the domain of fearing bodily catastrophe (Drahovzal et al., 2006). Together, these two types of orientations to bodily signals will be referred to here as catastrophic (i.e., pain catastrophizing) and frightful (i.e., anxiety sensitivity – physical) orientation to bodily signals.

Humanistic perspectives (Rogers, 1961; Winnicott, 1954) stress the significance of orientation to bodily signals for mental and physical health. According to this perspective, humans, like animals, are born

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with an innate ability to use somatic information to promote survival and enhance well-being. The body is experienced as an integral part of the self, and referred to as a valuable source of information in promoting self-knowledge (Rogers, 1961; Mehling et al., 2009, 2012). This capacity is endorsed within the human insula, and is subjected to an evolutionary pressure to optimize homeostatic efficiency through achieving the integration of bodily, environmental, and neural systems (Craig, 2003, 2009). Traumatic experiences, especially when involving physical pain and suffering, such as in war captivity, may undermine the experience of the body as a safe entity. The body becomes a source of suffering, while the inner somatic and emotional experiences are ignored or detached in order to survive (Herman, 1992). A question then arises as to whether, and how, orientation to bodily signals is affected by exposure to trauma, such as in torture that is inflicted upon POWs during captivity. While examinations of the association between exposure to trauma and orientation to bodily signals are scarce, research has shown that emotional and physical abuse during childhood is associated with a more catastrophic orientation to bodily signals (e.g., Pieritz et al., 2015). Furthermore, some studies have pointed to an altered perception of somatic experiences among ex-POWs, such as frequent reports of somatic symptoms (Sutker et al., 1986; Lahav et al., 2015), and poorer self-rated health (Benyamini et al., 2009). Although reports of somatic symptoms (or somatization) may be related to orientation to bodily signals (Vervoort et al., 2005; Tsao et al., 2009), to our knowledge, orientation towards bodily signals among ex-POWs has not been previously examined. The first aim of this study is to test whether ex-POWs exhibit a more catastrophic and frightful orientation to bodily signals, compared to controls.

It has also been postulated that orientation to bodily signals is affected not by exposure to trauma in and of itself, but by one of its most conspicuous ramifications, i.e., Posttraumatic Stress Disorder (PTSD). According to Rothschild (2003), PTSD symptoms represent the implicit memory of the traumatic event, which has not been properly linked to an explicit narrative, and therefore is manifested in the re-experiencing of somatic instances that correspond to the traumatic memory. Van der Kolk (1994, 2014) further articulates these somatic manifestations as the 'somatic memory' of trauma, suggesting that it may contribute to distrust in one's own subjective somatic experiences. It is thus postulated that in PTSD, especially following extensive somatic suffering such as in war captivity, the body becomes a juncture for reliving and experiencing the trauma. Somatic information may be perceived as an agonizing entity, resembling the traumatic memory. Thus, it is hypothesized that traumatized individuals may develop a catastrophic and frightful orientation towards bodily signals.

A significant body of research supports this line of thought, demonstrating an association between PTSD and catastrophic orientation (e.g., Kleiman et al., 2011; López-Martínez et al., 2014; Andersen, Karstoft et al., 2016; Viana et al., 2016), as well as anxiety sensitivity (e.g., Naragon-gainey, 2010; Kleiman et al., 2011; López-Martínez et al., 2014; Defrin et al., 2015; Mahaffey et al., 2017). However, very little is known regarding the nature of these associations over time. For instance, some suggest that heightened anxiety sensitivity predisposes individuals to PTSD (Fedoroff et al., 2000; Taylor, 2002), while others suggest the opposite, with PTSD leading to anxiety sensitivity (Simpson et al., 2006). The long-term implications of PTSD regarding a catastrophic orientation are less studied (Horsham and Chung, 2013). However, a study of National Guard troops demonstrated that while pain catastrophizing and PTSD were correlated concurrently, pain catastrophizing did not predict PTSD prospectively (Ciccone and Kline, 2012).

Furthermore, longitudinal examinations of PTSD have indicated that it is highly heterogeneous and labile, with symptoms waxing and waning over time (Blank, 1993). Specifically, a number of characteristic PTSD trajectories following exposure to trauma have been identified, namely; chronic, delayed, recovered and resilient (Bonanno and Mancini, 2012; Solomon et al., 2012). Since orientation to bodily signals is mainly considered a stable tendency (Keefe et al., 1989; Sullivan et al., 1995), and is deeply rooted in the basic sense of self (Rogers, 1961), it is suggested that alterations in this attribute result either from extreme experiences, such as trauma, or persistent progressions, such as long-term PTSD. Therefore, a longer duration of PTSD and symptom severity over time will lead to a higher impairment of the orientation to the body. Since the majority of the above-mentioned findings are based on cross-sectional or short-term prospective examinations, the ability to reveal the implications of long-term PTSD for orientation to bodily signals has not been conquered. Moreover, to the best of our knowledge, the implications of long term PTSD trajectories for orientation towards bodily signals has never been examined. Therefore, the second aim of this study is to examine whether PTSD trajectories are implicated in orientation towards bodily signals, and whether long-term PTSD mediates the association between captivity and orientation.

Additionally, PTSD consists of several symptom clusters, with the most recent classification including intrusive thoughts, avoidance of trauma related reminders, hyperarousal, and experiencing negative thoughts and feelings (American Psychiatric Association, 2013). Van Der Kolk (2014) postulates that symptoms of hyperarousal are inherently involved in the process by which a person's own bodily signals lose their role as a valuable source for self-knowledge. Hyperarousal symptoms commonly include hypervigilance and exaggerated startle response in the face of non-dangerous signals (American Psychiatric Association, 2013). When such symptoms occur often, and for a long period of time, the individual may learn that somatic signals are not trustworthy, as they do not detect environmental signals accurately. Consequently, a process of estrangement from ones' own body may occur, with bodily signals being perceived as frightening (Van Der Kolk, 2014). Therefore, the longer the experience of hyperarousal symptoms, the more it is expected to scar one's orientation to bodily signals, leading to a catastrophic and frightful experience of the body. While some evidence has revealed a concurrent correlation between anxiety sensitivity and all PTSD symptom clusters (López-Martínez et al., 2014; Mahaffey et al., 2017), to the best of our knowledge, the association between catastrophic orientation and PTSD symptoms clusters has not been examined before. Furthermore, these previously mentioned findings are unable to reveal the long-term implications of these symptom clusters for catastrophic and frightful orientation. Thus, the third aim of this study is to examine which of the PTSD clusters manifests as part of the long-term "somatic route", and is therefore implicated in the orientation towards bodily signals.

Ex-POWs and ex-combatants who fought in the same fronts were assessed for PTSD at 18 years post-war, 30 years post-war, and 35 years after the war. This study examines whether: 1) ex-POWs demonstrate higher levels of catastrophic and frightful orientation towards bodily signals (i.e., pain catastrophizing and anxiety sensitivity – physical). Furthermore, it is hypothesized that: 2) distinctive PTSD trajectories will be implicated in different orientations towards bodily signals; and that 3) the association between captivity and orientation will be mediated by long term PTSD symptom severity, as demonstrated in a serial mediation of PTSD symptoms along three time points. Finally, this study will examine: 4) which of the long-term PTSD clusters, along three time-points, mediates this association.

## 2. Methods

### 2.1. Participants

This study is part of a large-scale longitudinal study on war captivity (for full details, see Solomon et al., 2012). The current study included combat veterans from the 1973 War between Israel and numerous Arab states (known as the Day of Atonement ["Yom-Kippur"] War or October War). A total of fifty-nine participants were ex-POWs who underwent severe torture, and 44 participants comprised the control group. Of