

# The Relations Between Posttraumatic Stress Disorder and Persistent Dissociation Among Ex-Prisoners of War: A Longitudinal Study

Gadi Zerach  
Ariel University Center of Samaria

Talya Greene, Karni Ginzburg, and Zahava Solomon  
Tel Aviv University

To date, there are no empirical studies assessing the impact of war captivity on persistent dissociation (PD) and the longitudinal relations between captivity stressors, posttraumatic stress disorder (PTSD), and PD. The current study included two groups of male Israeli veterans from the 1973 Yom Kippur War: ex-prisoners of war (ex-POWs) and comparable veterans who were not taken captive. Both groups were assessed via self-report measures at three time points: T1 18 (1991), T2 30 (2003), and T3 35 (2008) years after the war. Results show that ex-POWs with PTSD reported higher levels of PD compared with ex-POWs and comparison non-POW veterans without PTSD at T3. Furthermore, PTSD symptoms at T1, T2, and T3 mediated the association between captivity and PD at T3. Loss of emotional control and detachment reactions to captivity, as well as posttraumatic intrusion symptoms, were associated with PD. Theoretical and clinical implications of these results are discussed.

*Keywords:* posttraumatic stress disorder, persistent dissociation, dissociative tendencies, prisoners of war, mental defeat

War captivity is one of the most severe human-inflicted traumatic experiences and is recognized as a potent pathogen for psychiatric illness, the most common of which is posttraumatic stress disorder (PTSD; e.g., Dekel, Ein-Dor, & Solomon, 2012). Over the years, a number of studies have indicated that trauma-exposed individuals are prone to dissociative tendencies that can manifest as disruptions in the perception of time, physical sensation, memory, and personal identity (Koopman, Classen, Cardena, & Spiegel, 1995). However, apart from clinical case studies and theoretical conceptualizations (e.g., Herman, 1992), there are no empirical studies that have assessed the impact of war captivity on persistent dissociation (PD). The examination of this unique group can increase our knowledge regarding the impact of severe, continuous, and interpersonal trauma on the survivors' lives after the war. Furthermore, there have been no previous longitudinal studies on the relations between trauma, PTSD, and PD among ex-prisoners of war (ex-POWs). This longitudinal study aims to fill this void by examining the long-term relations between trauma, PTSD symptoms and PD of Israeli ex-POWs from the 1973 Yom Kippur War.

## Persistent Dissociation

Dissociation can be defined as a variety of responses to a traumatic incident which disrupt the usually integrated functions of

consciousness, memory, identity, or perception of the environment (APA, 2000). These responses include derealization, depersonalization, dissociative amnesia, decreased awareness of the environment, disruption in perception of time, identity confusion, and alteration of states of consciousness (e.g., Steinberg, 1994).

Various studies have indicated that peritraumatic and acute dissociation (i.e., dissociative symptoms) experienced during and immediately after a traumatic or highly stressful experience (e.g., Marmar, Weiss, Schlenger, & Fairbank, 1994) are extremely common. As many as 75–90% of survivors of traumatic events report at least one peritraumatic dissociation symptom (e.g., Ursano et al., 1999). However, only a minority of the survivors experience frequent dissociative episodes long after the traumatic event and are thus described as having dissociative tendencies or PD (Kihlstrom, Glisky, & Angiulo, 1994).

Trauma exposure, particularly when it is severe and repeated, increases the tendency for dissociation (Mulder, Beautrais, Joyce, & Fergusson, 1998). Furthermore, research strongly suggests that PD is more prevalent in response to interpersonal traumas (e.g., sexual abuse, combat trauma) as opposed to noninterpersonal traumas (e.g., natural disasters, car accidents; Briere & Godbout, 2011). In this study we address war captivity as a unique form of continuous, severe, and interpersonal trauma that might be related to PD.

## Captivity

Participation in war entails highly traumatogenic experiences (e.g., Nazarian, Kimerling, & Frayne, 2012). Combatants often face exposure to physical injury and potential loss of life. Combatants who are captured by the enemy experience additional stressors of extreme nature (Rintamaki, Weaver, Elbaum, Klama, & Miskevics, 2009). Specifically, captivity trauma occurs in circumstances under which a victim cannot escape and is deliberately

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Gadi Zerach, Department of Behavioral Sciences, Ariel University Center of Samaria, Ariel, Israel; Talya Greene, Karni Ginzburg, and Zahava Solomon, Bob Shapell School of Social Work, Tel Aviv University, Tel Aviv, Israel.

Correspondence concerning this article should be addressed to Dr. Gadi Zerach, Department of Behavioral Sciences, Ariel University Center of Samaria, Ariel 40700, Israel. E-mail: [gadize@ariel.ac.il](mailto:gadize@ariel.ac.il)

traumatized and controlled by a captor (Engdahl, Harkness, Eberly, Page, & Bielinski, 1993). Moreover, unlike many other traumatic events, the extreme experiences of war captivity are recurrent, often persist for a long time, and are of an interpersonal nature. The use of psychological tactics aimed at breaking and altering the prisoner's psyche is common, resulting in a deep and complex relationship with the captive and the transformation of the captor perception into a benevolent–malevolent powerful source (Herman, 1992).

The specific characteristics of war captivity have been hypothesized to render the ex-POW particularly vulnerable, among other things, to PD. In the absence of other means to escape prison, POWs often use dissociation as a coping mechanism to alter their perception of their reality, employing denial, thought suppression, and minimization (Herman, 1992). Furthermore, during extended periods of stimulus deprivation, captives may turn to dissociation to create alternative reality, hallucinations, and even generate an altered persona or a pseudoidentity (West & Martin, 1996). In addition, former POWs frequently report having experienced alterations in time perception (Tennant, Goulston, & Dent, 1986).

The captor also uses methods of establishing control that are more likely to give rise to dissociative symptoms. The systematic and repetitive infliction of psychological trauma destroys the victim's sense of self, and control of the captive's body and bodily functions is intended to destroy their sense of autonomy (Herman, 1992). The undermining of the captive's sense of self and autonomy may be related to depersonalization as they feel they are no longer in control of their actions, thoughts or feelings. The effects of captivity trauma can sometimes be so severe that former captives have reported feeling as though they have been reduced to a nonhuman life form (Timerman, 2002).

It was proposed that dissociation, like other posttraumatic symptoms, may initially serve as a defense mechanism for trauma survivors, altering their perception and experience of traumatic incidents. However, dissociative experiences may become embedded in mental processes and become a habitual response in the form of PD (Classen, Koopman, & Spiegel, 1993). This can have a severe impact on the sufferer's wellbeing and limits their functioning in their daily life. This proposed mechanism is supported by studies on combat veterans and sexual abuse survivors that found that dissociative tendencies are related to the intensity of the traumatic events to which the victim was exposed, even many years after the trauma (e.g., Maercker, Beauducel, & Schützwohl, 2000).

Surprisingly, there is little empirical research on the direct relationship between war captivity and PD, and specifically between forms of peritraumatic dissociation as a reaction to captivity and long-term PD. Evidence suggests that severe PTSD is associated with even greater dissociative reactivity. For example, Vietnam veterans with PTSD who retrospectively reported substantial peritraumatic dissociation during their combat experiences tended to react with dissociative symptoms to postmilitary traumatic events, compared with veterans without PTSD (Bremner & Brett, 1997). Hence, another way that captivity can be related to PD is indirectly through its relations with PTSD.

## Posttraumatic Stress Disorder

The empirical literature has documented many long-term negative consequences of war captivity, the most common of which is posttraumatic stress disorder (PTSD) (Solomon & Dekel, 2005). PTSD is a highly debilitating anxiety disorder that can consolidate into a chronic disorder that negatively impacts on the individual's wellbeing and functioning (Walser, Tran, & Cook, 2012). According to the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition, text revision (*DSM-IV-TR*) (APA, 2000), PTSD is characterized by reexperiencing the traumatic event, avoidance of stimuli associated with the trauma and numbing of general responsiveness, and symptoms of hyper-arousal.

Research on adaptation after war captivity has found ex-POWs to be a subgroup at long-term risk for elevated psychological distress, most commonly, PTSD (Solomon, Horesh, Ein-Dor, & Ohry, 2012). High rates of PTSD, ranging from 16% to 88%, were observed in ex-POWs samples (e.g., Rintamaki et al., 2009). Among Israeli veterans of the 1973 Yom-Kippur War, 23.2% of ex-POWs and only 4.3% of the matched group (i.e., veterans who participated in the same war and were not held captive) met PTSD criteria assessed 30 years after the war (Solomon & Dekel, 2007).

Various studies found significant relationships between war-related PTSD and dissociation. The tendency for posttraumatic dissociation among combat veterans is stronger for those with PTSD compared with those without (e.g., Branscomb, 1991), and the intensity of the dissociation is associated with the severity of the PTSD (Bremner et al., 1992). Interestingly, the association between dissociation and PTSD remains significant even after controlling for severity of trauma (O'Toole, Marshall, Schureck, & Dobson, 1999).

There is also evidence of a heightened dissociative reactivity among individuals suffering from PTSD. Some individuals with PTSD react with intense dissociative symptoms to reminders of previous traumatic experiences, new traumatic stressors, and even minor life stresses. For example, Koopman and colleagues (2001) examined the prevalence of five dissociative reactions to daily stresses in Vietnam veterans with PTSD (i.e., emotional numbing, derealization, depersonalization, amnesia for everyday events, and lack of awareness of surroundings). Eighty percent had experienced all five symptoms in response to a recent stressor; only 1% reported none of the symptoms.

Another body of knowledge indicates that the specific PTSD symptoms clusters may serve as possible risk factors for PD or even dissociative phenomena in themselves. The intrusive memories and flashbacks are fragments of the traumatic event that were dissociated and break through into consciousness as isolated units, accompanied by the sensations and emotions experienced during the traumatic event. Similarly, avoidance PTSD symptoms, such as amnesia for central aspects of the trauma, diminished interest in significant activities, detachment from others, and a restricted range of affect, may be classified as dissociative. Finally, hyper-arousal PTSD symptoms (i.e., hyper-vigilance) may reflect the anxiety attached to the dissociated memories (Butler, Duran, Jasiukaitis, & Koopman, 1996). However, although the findings regarding the relations between PTSD and dissociation are relatively consistent, the evidence for the relationship between PTSD symptom clusters and dissociation is mixed. There are some studies that stress the role of the arousal cluster in predicting dissociation.

ation (Tampke & Irwin, 1999), others that point to the significance of avoidance symptoms (Tichenor, Marmar, Weiss, Metzler, & Ronfeldt, 1996), and others that demonstrate that each of the three PTSD symptoms clusters is associated with PD (Koopman et al., 2002).

Some scholars have suggested that the relations between exposure to trauma, PTSD, and PD function such that PTSD precedes dissociation and may mediate the relations between trauma exposure and PD. This view is supported by a study by Carlier et al. (1996), demonstrating that PTSD three months after a traumatic event predicts the level of dissociation nine months later, but level of dissociation three months postevent does not predict later PTSD. A few studies have found that PTSD mediates the relations between trauma exposure and physical health outcomes (Weierich & Nock, 2008). However, to our knowledge no other study has examined the longitudinal mediation role of PTSD on the relations between captivity and PD.

Given the theoretical perspective on the relations between captivity trauma, PTSD, and PD, this study addresses three main hypotheses: (1) Ex-POWs with PTSD will report higher levels of PD at Time 3 (T3, 2008) than ex-POWs and controls without PTSD. (2) War and captivity stressors and reactions and posttraumatic symptom clusters will positively contribute to PD at T3; the higher the levels of negative reactions to captivity and the higher the number of PTSD symptom clusters, the higher the levels of PD. (3) War captivity will relate to PD (T3) through its relation to PTSD at each measurement point (T1, 1991; T2, 2003 and T3). Furthermore, a serial multiple mediation model is predicted such that reports of PTSD at each measurement point will relate to the subsequent measurement of PTSD and finally to PD at T3.

## Method

### Participants

The present study uses data from a longitudinal study on the psychological implications of war (see Dekel et al., 2012) for full details. A cohort of Israeli veterans who participated in the October 1973 Yom Kippur War were followed over 17 years with assessment at three time points: 1991 (T1), 2003 (T2), and 2008 (T3). According to Israel's Ministry of Defense, 240 soldiers from the Israeli Army land forces were captured during the war (ex-POWs group). POWs were subjected to intense isolation and systemic tortures, consisting of the infliction of severe physical pain and great mental pressure. One hundred sixty-four participated in the first assessment, 144 participated in the second (10 could not be located/refused, 4 had died, and 6 could not participate as a result of mental deterioration), and 183 took part in the third (29 could not be located/refused, 20 had died, and 6 could not participate as a result of mental deterioration).

In addition, 280 veterans were sampled from Israel Defense Forces (IDF) computerized data banks (control group; Solomon, Neria, Ohry, Waysman, & Ginzburg, 1994). The control group was selected to specify the unique implications of war captivity in PD beyond the impact of the war exposure variables. The control group veterans were drawn from a pool of combat soldiers who fought in the same units as the ex-POWs. They constituted land-forces combat veterans exposed to battlefield stressors including encounters with injured people and dead bodies, active fighting,

and exposure to life-threatening events. The two groups were matched on military background and sociodemographic status. Although it is difficult to control for the subjective stressfulness of any combat experience, the sampling procedure used here ensured that soldiers in both groups were exposed to a similar level and type of objective battlefield stress. Among the control veterans, 185 participated at T1, 143 participated at T2 (41 could not be located and 1 had died), and 118 took part at T3 (20 could not be located/refused and 5 had died).

All participants in this study were male. At T3, the two groups did not differ on sociodemographic variables such as age ( $M = 57.90$  years,  $SD = 3.55$ ), length of marriage ( $M = 27.48$  years,  $SD = 6.63$ ), divorce rate (5.5% of ex-POWs, 5% of controls had divorced), or number of children ( $M = 3.25$ ,  $SD = 1.23$ ). Mean years of schooling was 14.02 ( $SD = 3.41$ ); the majority were secular (67%) with an average income (62%). No significant differences were found between those who participated in the follow-up assessments with regard to the level of PTSD in 1991, rank, age, and education.

### Measures

**Combat injury.** Participants were asked if they were injured during combat and if they were injured when they were captured via two Yes/No questions.

War captivity adjustments were assessed with two measurements that tapped ex-POWs' subjective experiences and psychological responses:

**Subjective suffering during captivity.** Participants were asked to rate on a scale of 1–5, (a) the severity of physical abuse, (b) the severity of psychological abuse, and (c) the severity of humiliation to which they had been subjected. This measure was also used in previous studies (e.g., Solomon & Dekel, 2005).

**Psychological responses during captivity.** In the absence of any valid and reliable standardized measure, we constructed a 23-item self-report questionnaire. Based on both a literature review and clinical interviews with ex-POWs, we identified a number of themes that reflect the ways in which ex-POWs coped with the captivity stressors and tortures (e.g., shame, fear of losing control, clinging to rituals etc.). Based on these themes and literature we constructed the items on a 4-point scale, for self-reported frequency of coping response during captivity, ranging from 0 (*not at all*) to 4 (*almost always*). Factor analysis with Varimax rotation revealed three main factors that explained 38.1% of the variance. Factor 1 explained 14.6% of the variance and consisted of nine items describing active coping (e.g., "I was busy learning new things"). Factor 2 explained 12.14% of the variance and consisted of six items describing a loss of emotional control (e.g., "I felt like I was going crazy"). Factor 3 explained 11.4% of the variance and consisted of eight items describing detachment (e.g., "I closed myself off from the world"). Participant mean score on each of the three factors were considered an assessment of their psychological responses during combat. This measure was also used in previous studies (e.g., Ohry et al., 1994).

PTSD Inventory (Solomon et al., 1993) taps the 17 PTSD symptoms listed in the *DSM-IV-TR* (APA, 2000). Participants were asked to rate how often they suffered from each symptom in the previous month on a scale ranging from 0 (*not at all*) to 4 (*almost always*). The number of positively endorsed symptoms



was calculated by counting the items in which the respondents answered “3” or “4.” This symptom count was used to operationalize PTSD both as a continuous variable of number of posttraumatic symptoms and as a dichotomized DSM diagnosis. Using *DSM-IV* symptom criteria, participants were identified as having PTSD if they endorsed at least one intrusive symptom, three avoidant symptoms, and two hyper-arousal symptoms. *DSM-IV-TR* also specified the *F* criterion as clinically significant distress or impairment in the social area, occupational area, or other important areas of functioning. Disability was defined as dysfunction at work in the previous year. When compared with diagnoses based on structured clinical interviews, the PTSD inventory showed high convergent validity (Solomon, 1988). The PTSD inventory was administered in all three waves: 1991, 2003, and 2008. Reliability values for total and subscale scores were high at all assessments (Cronbach  $\alpha$ : .78 to .96).

**Dissociation Experiences Scale-II (DES-II) (Bernstein & Putnam, 1986).** This revised version of the DES is a 28-item self-report questionnaire that measures the frequency of dissociative experiences, with questions including experiences that may occur in one’s daily life such as not recognizing friends or family, having no recollection of past events, or being unable to discriminate between an actual occurrence and a dream. Because of an administrative error, in the current study, respondents were asked to rate the frequency with which they experience each of the 28 dissociative reactions on a 10-point scale (1 = *never*; 10 = *all the time*) and not an 11-point scale like the original DES-II (0 = *never*; 10 = *all the time*). Hence, only the respondent’s mean score was used in this study, representing his tendency to dissociate, with higher scores reflecting stronger tendencies. The DES-II has been used to assess dissociative tendencies in various populations (e.g., Halligan & Yehuda, 2000). It has been shown to have high validity and reliability (Frueh, Johnson, Smith, & Williams, 1996). The Cronbach  $\alpha$  for the current sample was high (0.95), indicating high internal consistency.

**Negative life events after the war.** Participants were asked about stressful life events they experienced between the end of the war and the time of the study. The measure is an adaptation of a scale used in previous studies of Israeli combat veterans (e.g., Solomon, Mikulincer, & Waysman, 1991). It includes nine stressful experiences: bereavement, financial loss, threat of injury or death, severe motor vehicle accident, criminal victimization, severe illness experienced by the veteran and/or a close person, criminal encounters with the law, and substance abuse). The score indicates the total number of events endorsed.

## Procedure

All participants had taken part in a study by Solomon, Dekel, and Mukulincer (2008). Approval for this study was given by both Israel Defense Forces (IDF) and Tel Aviv University human subjects committees. The names of ex-POWs were passed on by IDF authorities as part of the periodic examination of veterans after their military service. We contacted participants by telephone and, after explaining the purpose of our study, asked them to take part. Questionnaires were administered in participants’ homes or in other locations of their choice. Before filling out the questionnaires, participants signed an informed consent agreement.

## Results

### Relationship Between Captivity and PTSD

As a preliminary analysis we assessed PTSD rates according to the *DSM-IV-TR* criteria among the ex-POWs and control groups. A chi-square analysis showed a significant relationship between group and PTSD,  $\chi^2(1) = 42.58, p < .00$ . Among the ex-POWs, 34.7% ( $n = 58$ ) endorsed PTSD as compared with the control group, in which 2.5% ( $n = 3$ ) endorsed PTSD.

### Relationship Between Captivity, PTSD, and Persistent Dissociation

The first aim of the current study was to examine whether ex-POWs and controls with and without PTSD differ in their levels of PD at T3. We hypothesized that ex-POWs with PTSD will report higher levels of PD at Time 3 (T3, 2008) than ex-POWs and controls without PTSD. To do so we performed a  $2 \times 2$  ANOVA with research groups (ex-POWs and controls) and the dichotomous measure of PTSD as independent variables. The analysis revealed a significant difference between ex-POWs and controls,  $F(1, 270) = 13.76, p < .00, \eta^2 = .05$ . Ex-POWs reported higher levels of PD compared to controls ( $M = 2.75, SD = 1.53$ ;  $M = 1.80, SD = 0.90$ , respectively). Furthermore, the ANOVA yielded a significant difference between the veterans with and without PTSD,  $F(1, 272) = 47.96, p < .00, \eta^2 = .15$ . Veterans with PTSD reported higher levels of PD than veterans without PTSD ( $M = 3.65, SD = 1.73$ ;  $M = 2.00, SD = 1.02$ , respectively).

Because of the low number of participants among the control group with PTSD ( $n = 3$ ) that limited our possibility to examine the interaction between research groups (ex-POWs and controls) and PTSD, we decided to remove them from this analysis. In addition, we separated the two groups into three groups: ex-POWs with PTSD ( $n = 54$ ), ex-POWs without PTSD ( $n = 107$ ), and control group without PTSD ( $n = 109$ ). The analyses revealed a significant differences between the three groups,  $F(1, 270) = 49.77, p < .00, \eta^2 = .27$ . As can be seen in Figure 1 and results of post hoc Scheffé test, ex-POWs with PTSD represent the group of veterans with the highest levels of PD ( $M = 3.65, SD = 1.73$ ) followed by ex-POWs without PTSD ( $M = 2.29, SD = 1.22$ ) and veterans from the control group without PTSD ( $M = 1.70, SD = .67$ , respectively).

### Predicting Persistent Dissociation by Captivity Stressors and Reactions and Posttraumatic Symptoms Clusters

The second aim of the current study was to examine the unique contribution of captivity stressors and reactions and posttraumatic symptom clusters to PD among ex-POWs. To examine this, a four-step hierarchical regression analyses was conducted. All variables in this analysis were assessed in 2008. In the first step of the regression, we entered three sociodemographic variables: age, years of education, and income level. These variables were entered as control variables for their possible relations with PD. In the second step, we entered five captivity variables: two variables tapping the objective injury during capture and during captivity and three tapping subjective experiences of captivity stressors:

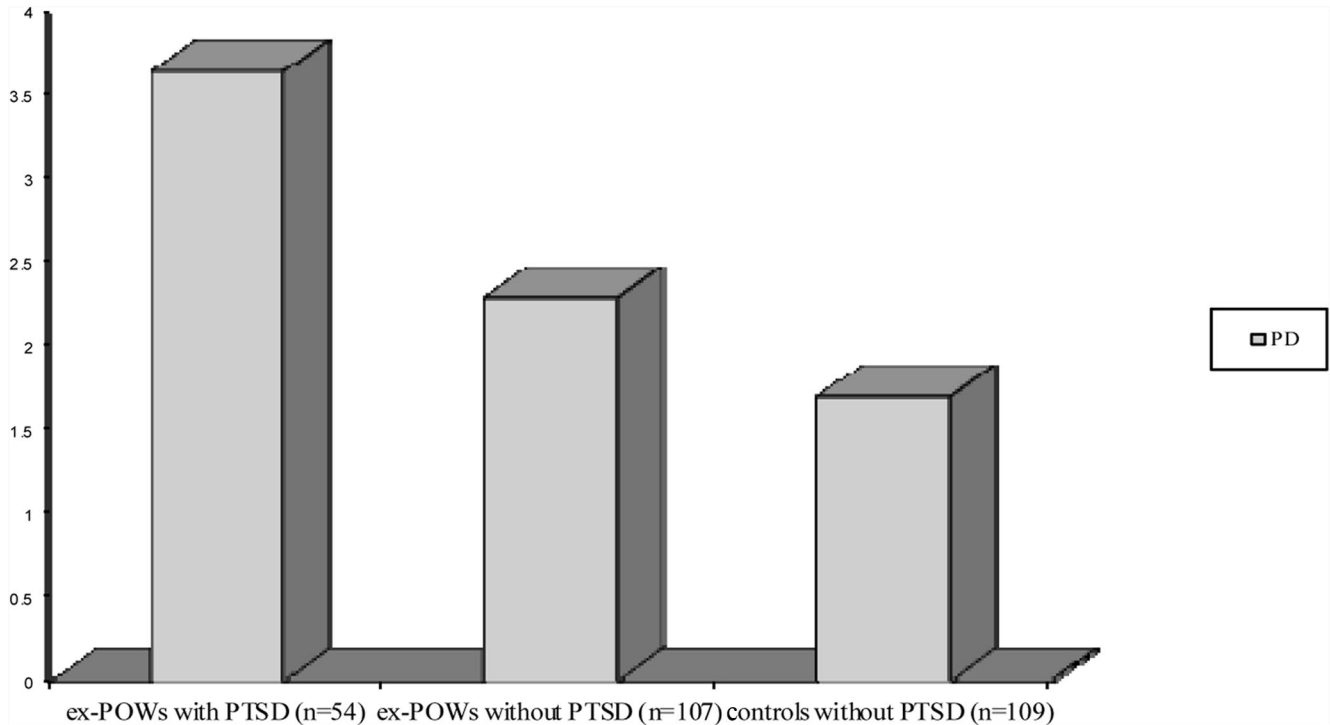


Figure 1. Levels of PD according to group (ex-POWS vs. controls) and PTSD status. Because of the low number of participants among the control group with PTSD (n = 3) we deleted them from the graph presentation.

physical and mental suffering, and humiliation during captivity. In the third step, we entered the three factors of coping in captivity: active coping, loss of emotional control and detachment coping. In the last step, we entered the number of posttraumatic symptoms in each of the three main PTSD symptom clusters: intrusion, avoid-

ance and hyper arousal and the number of negative life events after the war. Table 1 presents regression coefficients for the prediction of PD.

The total set of variables explained 46.4% of the variance of the PD,  $F(14, 110) = 5.93, p < .00$ . As hypothesized, in the last model

Table 1

Summary of Hierarchical Regression Coefficients of Persistent Dissociation Among Ex-POWs by Stressors and Coping in Captivity and Posttraumatic Symptom Clusters

	Persistent dissociation (n = 110)											
	Model 1			Model 2			Model 3			Model 4		
	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β
Education	-0.07	0.13	-0.06	-0.06	0.13	-0.05	-0.04	0.13	-0.03	0.08	0.12	-0.03
Income level	-71.84	31.46	-0.24*	-62.22	31.34	-0.21*	-59.17	31.76	-0.20	-40.69	28.18	-0.14
Age	-0.14	0.10	-0.13	-0.16	0.10	-0.15	-0.14	0.10	-0.14	-0.03	0.09	-0.02
Wounding during capture (yes/no)				0.16	0.09	0.16	0.15	0.09	0.15	0.11	0.08	0.10
Wounding during captivity (yes/no)				0.10	0.09	0.10	0.09	0.09	0.09	0.08	0.08	0.09
Physical suffering in captivity				-0.11	0.15	-0.11	-0.10	0.14	-0.10	-0.05	0.14	-0.05
Mental suffering in captivity				0.17	0.16	0.18	-0.07	0.14	-0.06	-0.13	0.14	-0.14
Humiliation in captivity				0.05	0.10	0.05	-0.11	0.10	-0.12	-0.13	0.10	-0.14
Active coping							0.03	0.07	0.03	0.03	0.07	0.03
Loss of emotional control							0.55	0.10	0.53***	0.38	0.10	0.37***
Detachment response							0.31	0.08	0.33***	0.30	0.08	0.32***
Intrusion symptoms										0.33	0.14	0.32*
Avoidance symptoms										0.06	0.10	0.06
Hyper-arousal symptoms										0.10	0.14	0.08
Negative life-events after the war										0.06	0.08	0.47
R <sup>2</sup>	10.9%			16.8%			38.9%			46.7%		
F change	F(3, 107) = 4.36**			F(5, 102) = 1.44			F(3, 99) = 11.89***			F(4, 95) = 3.49**		

\* =  $p < .05$ . \*\* =  $p < .01$ . \*\*\* =  $p < .001$ .

we found that loss of emotional control and detachment coping were positively associated with PD (see Table 1). The more an ex-POW reported being detached or lost his emotional control during captivity, the higher his levels of reported PD. Furthermore, among PTSD symptom clusters we found that intrusion symptoms predicted PD, above and beyond other PTSD symptom clusters. Hence, the more an ex-POW experienced intrusion symptoms, the more he reported PD in 2008.

### PTSD Symptoms in T1, T2, and T3 Mediate the Association Between War Captivity and Persistent Dissociation

The third aim of this study dealt with the possible mediation role of PTSD in T1, T2, and T3 of the association between war captivity and PD. To examine the mediation, we used Hayes's (2012) serial multiple mediation model, multistep methodology. Specifically, we examined (1) whether war captivity (ex-POWs, controls) directly related to PD outcome in 2008, controlling for PTSD in 1991, 2003 and 2008; (2) whether war captivity indirectly related to PD via PTSD symptoms at any of the time points (i.e., 1991, 2003, and 2008, separately); (3) whether war captivity indirectly related to PD via a two-step mediation process (i.e., via PTSD symptoms in 1991 and 2003, 1991 and 2008, and 2003 and 2008); and (4) whether war captivity indirectly related to PD via a three-step mediation process (i.e., via PTSD symptoms in 1991, 2003 and 2008). The analysis was conducted controlling for the number of negative life events after the war. To examine whether these indirect paths were significant we used accelerated bias-corrected bootstrap analyses. Unstandardized coefficients and bootstrap solutions are presented in Table 2 (see Figure 2).

The analysis revealed that the association between war captivity and PD was completely mediated by PTSD symptoms. Specifically, war captivity related to the level of PD through three indirect (and independent) pathways: War captivity increased the level of PTSD symptoms in 2008, which in turn was related to higher levels of PD in that year; war captivity increased the level of PTSD symptoms in 2001 as well as in 2008, which in turn was related with higher levels of PD in 2008; and finally, war captivity increased the level of PTSD symptoms in 1991, which in

turn increased the level of PTSD symptoms in 2003, which in turn increased the level of PTSD symptoms in 2008, which by its own merit was related with higher levels of PD in the same year.

### Discussion

The main finding of this study shows that veterans who were held in captivity during the 1973 Yom Kippur War reported higher levels of PD compared with war veterans who were not held in captivity. Results also show that ex-POWs with PTSD reported higher levels of PD compared with ex-POWs and comparison veterans without PTSD at T3. Furthermore, war captivity had an indirect association with PD through the serial mediation of PTSD symptoms over the years. In addition, we found that loss of emotional control and detachment as responses to captivity were associated with PD. Among PTSD symptom clusters we found that intrusion symptoms predicted PD, above and beyond other PTSD symptom clusters.

Our results regarding the relationship between war captivity on PD are consistent with the theoretical models and empirical studies that pointed to the implication of war-related traumatic stress in dissociative tendencies across the life span (e.g., Briere & Godbout, 2011). However, to the best of our knowledge, no other study has been conducted on the negative impact of war captivity on PD. The results emphasize that even 35 years after the end of war and captivity, ex-POWs still report higher levels of PD as compared with their cohort combatants.

Unlike many other traumatic events, the extreme experiences of war captivity are recurrent and often persist for a long time. Captivity trauma occurs in circumstances under which a victim cannot escape and is deliberately traumatized and controlled by a captor. Moreover, it was suggested that the cumulative effect of captivity stressors is not simply additive multiplicative. Because of the lack of control the POW has over his or her life, the captivity stressors of torture, humiliation, and deprivation are greatly magnified and might lead to a chronic state of PD (Başoğlu, 2009). Hence, people in captivity often use dissociation to alter their perception of their overwhelming reality, using denial, thought suppression, and minimization (Herman, 1992). Furthermore, during extended periods of stimulus deprivation captives may turn to

Table 2  
Standardized Regression Coefficients for Direct and Indirect Effects and Bootstrap 95% Confidence Intervals for Predicting Persistent Dissociation by War Captivity Through PTSD Symptoms in 1991, 2003, and 2008

Persistent dissociation	Bootstrap 95% confidence intervals	Standardized regression coefficients
Direct effect of captivity		-.13
Indirect via PTSD 1991	(-.03, .16)	.01
Indirect via PTSD 2003	(-.04, .67)	.10
Indirect via PTSD 2008	(.13, .52)*	.09
Indirect via PTSD 1991 and 2003	(-.01, .08)	.01
Indirect via PTSD 1991 and 2008	(-.02, .03)	.01
Indirect via PTSD 2003 and 2008	(.34, .92)*	.19
Indirect via PTSD 1991, 2003 and 2008	(.01, .10)*	.01

Note. 95% confidence intervals are presented in parentheses. Confidence intervals that do not include 0 (null association) are significant.

\* Significant at .05.

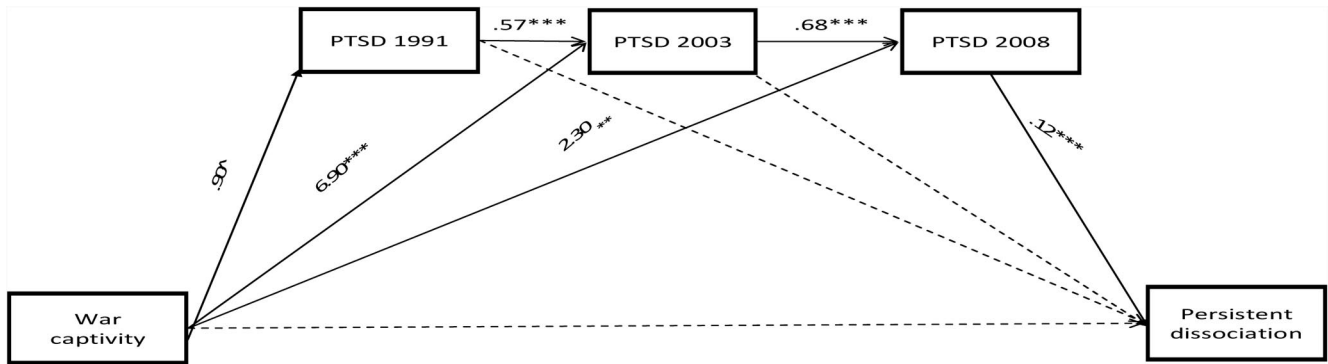


Figure 2. Results of the serial multiple mediation model assessing whether posttraumatic stress disorder symptoms in 1991, 2003, and 2008 mediate the effects of war captivity on persistent dissociation. Dashed lines represent nonsignificant paths; solid lines represent significant paths with unstandardized path coefficients. PTSD, posttraumatic stress disorder.  $\hat{p} < .07$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

dissociation to create alternative reality, hallucinate, and even generate an altered persona or a pseudoidentity (West & Martin, 1996).

It was proposed that dissociation may initially serve as a defense mechanism for trauma survivors, altering their perception and experience of traumatic incidents. However, dissociative experiences may become embedded in the mental processes and become a habitual response in the form of PD (Classen et al., 1993). The undermining of the captive's sense of self and autonomy might lead to dissociation that can result in a division between the torture experience (I am a victim) and the personality self-concept (I am independent), rather than an integration between the two (I am a victim and I am also independent). Ferenczi suggested that integrating the experience of repeated trauma may actually lead to more suffering as the individual fully comprehends (Ferenczi, Dupont, Balint, & Jackson, 1995). The mind, in this conceptualization, prefers to dissociate itself so that every part of it will suffer less. Thus, the peritraumatic dissociation that was relatively adaptive in captivity can have a severe impact on the sufferer's well-being and limits their functioning in their postcaptivity daily life. For example, peritraumatic dissociation that was adaptive during sexual torture in prison may manifest itself as PD and limited intimacy and sexual satisfaction in marital relations (Zerach, Anat, Solomon, & Heruti, 2010).

Our results show that ex-POWs with PTSD reported higher levels of PD compared with ex-POWs and comparison veterans without PTSD at T3. Various studies found significant relationships between war-related PTSD and dissociation. The tendency for posttraumatic dissociation among combat veterans is stronger for those with PTSD compared with those without (Bremner & Brett, 1997), and the intensity of the dissociation is associated with the severity of the PTSD (Lee, Albrecht, Patrick, Woods, & Brandsma, 1993). Furthermore, some individuals with PTSD react with intense dissociative symptoms to reminders of previous traumatic experiences, new traumatic stressors, and even minor life stresses (Koopman et al., 2001). However, to our knowledge, this is the first study to point to the multiple impact of both captivity and PTSD on the probability of PD.

The higher levels of PD among ex-POWs might also be a result of comorbidity, as ex-POWs reported high rates of PTSD as

compared with control veterans. Dalenberg and Carlson (2012) present the "comorbidity model" as a potential explanation of this finding. This model, they suggest, is such that the trauma (i.e., captivity) initiated both PTSD and dissociative responses. However, according to this model, these two responses should not have any relationship with each other and co-occur by chance. That is, having PTSD does not increase the likelihood of dissociation and vice versa. They conclude, however, that there is little empirical evidence to suggest that this model is correct. Rather, our results are consistent with the literature that strongly suggests that PTSD and dissociation are related (e.g., Schapiro et al., 2002).

One of the interesting results of the study is that war captivity had an indirect influence on PD through the serial mediation of PTSD symptoms over the years. To date, the literature informs about captivity as a risk factor for PTSD (Solomon et al., 2012) and the relationship between PTSD and dissociation (Koopman et al., 2001). However, there is little evidence regarding the mediation role of PTSD in the relations between trauma exposure and PD. It can be suggested that the crystallization of the stress reaction in chronic PTSD creates an additional and continuous stressor which ex-POWs need to cope with by means of persistent dissociation and may have an ongoing detrimental impact on ex-POWs' self-esteem. It could increase their tendency to use dissociation to avoid encounter with their day to day functioning challenges and the gap between subjective perceptions of their former and current functioning.

In terms of the particular risk factors in captivity, our study found an association between loss of emotional control and detachment reactions to captivity, and PD in later life. The loss of emotional control—as manifested by a wish to die or by the feeling that one is going insane—reflects the loss of emotional autonomy and the acceptance of defeat. Only a few studies have documented the association between loss of emotional control and PTSD (Başoğlu, 2009) and between catastrophic appraisals and PTSD (Bryant & Guthrie, 2005). It may also be that the peritraumatic detachment may represent a form of peritraumatic dissociation that may be a risk factor to continue fragmented self-perception and disaggregation of experience in the years that follows captivity (Ginzburg et al., 2008). This may then become assimilated into the ex-POW's personality, such that some become pathologically dis-



connected from their emotions and experiences are unable to fully process them, as seen in PD.

Regarding the relationship between PTSD symptom clusters and PD, in the current study, intrusion symptoms were found to be the strongest contributor to PD. Interestingly, a positive correlation between intrusion and dissociation was shown among adult survivors of childhood sexual abuse (Koopman et al., 2002), but not among male and female Vietnam veterans (Tampke & Irwin, 1999; Tichenor et al., 1996). The similarities between the experience of war captivity and childhood abuse were documented by Herman (1992), which emphasized the significance of the persistent coercive control, which can be inflicted by physical or psychological force. It may be that intrusion is the symptom group that causes the greatest sense of a lack of control, which thus evokes the strongest dissociative reactions. For example, flashbacks catch sufferers off-guard and can strike at any time. This may lead to a sense in the individual that they are not in control of all elements of their psychological experience, but rather that there is a part of them that seems to function independently and unpredictably.

Some of the intrusive symptoms, such as psychogenic amnesia, can be considered dissociative responses. Memory disturbances or amnesia of the traumatic experience may serve as a defense against the trauma (e.g., Ludwig, 1983). However, the lack of memory of the traumatic experience prevents the survivor from fully processing the traumatic experience, which gives rise to dissociation (Van der Kolk, Brown, & Van der Hart, 1989). Furthermore, there is evidence that survivors of severe and chronic trauma are at greater risk of developing amnesia than those who experienced a single traumatic event (Briere & Conte, 1993). This may help to explain the relationship found between the PTSD intrusion symptoms cluster and PD in the current study.

This study has several limitations. First, the use of self-report measures, although very common in trauma studies, entails the risk of a reporting bias. Future studies should consider gathering data from multiple informants such as the participants' psychiatrists, and make use of objective measures, such as observation of ex-POWs' actual functioning. Second, the lack of precombat assessment of dissociation strongly limits our ability to infer causality. It is possible that current report of PD is related to pretrauma dissociation that originally began when the ex-POW was young, which may contribute to the results, above and beyond captivity experiences and PTSD. Furthermore, future studies should include a self-report assessment of childhood maltreatment that might explain some of the PD variance and might interact with PTSD effects. Third, our measurements did not cover the entire span of 35 years since the war. Therefore, we were unable to monitor changes in the course of posttraumatic symptoms and changes in PD during the gap between the war and later measurement periods. Fourth, the PD index should be treated with some caution because of the reported minor changes done in the numbering of the scale. Fifth, a few of our measurements (e.g., subjective suffering during captivity) were created specifically for the purpose of this study and as such were not validated. Hence, results obtained from these measures should be interpreted cautiously. Last, we note the possibility of alternative longitudinal associations between the study variables (e.g., PD could lead to PTSD over time) because the study design does not offer a strong longitudinal test (e.g., not a cross-lagged panel design).

The attrition of participants between measurements deserves special consideration. On the mediation analysis in which we used longitudinal data, we used only the 165 veterans that participated in all three waves of measurement (107 ex-POWs, representing 45% of the original list and 65% of the participants in the first assessment). Because of that attrition the sample may be somewhat selective. It is possible that the participants that did not participate in all three waves would provide different pattern of relations between PTSD and PD. For example, it is possible that if the missing participants suffered from higher levels of PTSD (their chronic condition and functioning limitations might explain their drop-out), the direct paths from PTSD at 1991 and 2003 might also have been significant, a part of the serial mediation that was exemplified.

## Conclusions

Despite these limitations, this study yielded several important findings. This is the first study to report long-term and enduring dissociation among former prisoners of war. Furthermore, this study points to the links between the reported loss of control and detachment reactions to captivity as well as posttraumatic intrusion symptoms and PD. In addition, this longitudinal study sheds light on the long-term relations between posttraumatic stress symptoms and dissociation across the life span. Importantly, the findings of this study have important clinical implications. They reveal that veterans with a history of captivity, particularly those who also suffered from posttraumatic symptoms, may be at increased risk not only for mental distress but also persistent experiences of dissociation that might affect their functioning and well-being.

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