

# The Contribution of Loneliness and Posttraumatic Stress Disorder to Marital Adjustment Following War Captivity: A Longitudinal Study

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*This prospective study examined the relative contribution of loneliness and post-traumatic stress disorder (PTSD) to marital adjustment among Israeli veterans of the 1973 Yom Kippur war. Specifically, we examined the mediating role of loneliness as measured in 1991 in the association between PTSD as measured in 1991 and marital adjustment as measured in 2003. Our sample consisted of 225 participants divided into 2 groups: ex-prisoners of war (ex-POWs) (N = 122) and a comparison group comprised of veterans who fought in the same war but who had not experienced captivity (N = 103). The findings demonstrate that ex-POWs display lower levels of marital adjustment and higher levels of PTSD than controls. Loneliness was found to mediate the relationship between PTSD as measured in 1991 and marital adjustment as measured in 2003 for both ex-POWs and controls. Further, for ex-POWs, loneliness contributes to marital adjustment above and beyond the contribution of PTSD as measured in 2003. The theoretical implications of loneliness for the marital relationships of traumatized ex-POWs are discussed.*

*Keywords: Loneliness; PTSD; POWs; Marital Adjustment*

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War captivity is considered one of the most traumatic experiences perpetrated on human beings. It is often experienced subsequent to brutal combat and involves prolonged and repeated traumatization (e.g., Herman, 1992; Hunter, 1993). Empirical research of ex-prisoners of war (ex-POWs) has clearly demonstrated that the stress of captivity profoundly impairs quality of life for many years after release, and can lead to the development of severe mental health problems such as posttraumatic stress disorder (PTSD; e.g., Engdahl, Speed, Eberly, & Schwartz, 1991).

War captivity in itself has an important impact on veterans' ability to function in the interpersonal realm (e.g., Herman, 1992), and several studies have revealed the

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direct deleterious effect of war captivity on marital life. Bernstein (1998), in a study of World War II ex-POWs, found that participants were relatively emotionally detached from their families, preferring solitude, and prone to outbursts of anger toward their wives and children. Similarly, ex-POWs have been reported to have higher divorce rates compared with non-POW veterans (Nice, McDonald, & Mcmillian, 1981).

A parallel line of research has examined the effects of war-related PTSD on marital relationships. Studies have shown that war-related PTSD casualties report greater impairments in spousal intimacy (Carroll, Rueger, Foy, & Donahue, 1985) and satisfaction (Cook, Riggs, Thompson, & Coyne, 2004), they are more prone to outbursts of rage and aggression (Beckham & Moore, 2000; Spasojevic, Heffer, & Snyder, 2000), and they report reduced sexual desire and more sexual dysfunction (Johnson & Williams-Keeler, 1998; Solomon, 1993). As a result, this population tends to report lower levels of family functioning (Ford, Shaw, & Sennhauser, 1993)

Combining these two concepts, a recent study examined American World War II ex-POWs with and without PTSD, and found that ex-POWs with PTSD reported more marital distress, less satisfaction within their marital relationship, and less intimacy and constructive communication within their relationships than their non-PTSD counterparts (Cook et al., 2004).

Another important and potentially confounding factor that has not been addressed by these studies of the relationship between trauma, PTSD, and poor marital adjustment is the role of loneliness. Loneliness is defined as an unpleasant and distressing emotion that is evoked when one's social relationships are extremely deficient (Peplau & Perlman, 1982). It has been described as a discrepancy between actual and desired interpersonal relationships (e.g., Dykstra & De-Jong Gierveld, 1994). A distinction can be made between loneliness deriving from social isolation and loneliness deriving from emotional isolation (Weiss, 1973). Social-isolation loneliness results from the absence of an engaging social network, whereas emotional-isolation loneliness stems from the absence or loss of close attachment relationships.

Given the depiction of loneliness as a rather aversive and distressing state, the often-described link between loneliness and mental health problems is not surprising. Loneliness has been closely associated with depression (Hojat, 1983), anxiety (Russell, Cutrona, Rose, & Yurko, 1984), psychosomatic symptoms (Lynch, 1985), suicide (Diamant & Windholdz, 1981), and PTSD (e.g., Solomon, Mikulincer, & Waysman, 1991).

Loneliness also plays an important role in the experience of war captivity. Prisoners are often kept in solitary confinement, sometimes for very long periods. Furthermore, loneliness is experienced by many combat veterans, ex-POWs and non-POWs alike, following their return home from the war. During the homecoming period, many veterans feel that those surrounding them do not understand or are not interested in knowing about their harsh war experiences. Subsequently, they feel lonely and estranged from their environment (e.g., Figley & Leventman, 1980).

Several studies have shown that loneliness may be one of the factors that contributes to unstable marital relationships (e.g., Olson & Wong, 2001). Positive correlations have been found between loneliness and low marital satisfaction (Demir & Fisiloglu, 1999; Perlman, Gerson, & Spinner, 1978), and negative correlations have been found between loneliness and levels of intimacy in marital relationships (Ross, 1992).

The theoretical link between loneliness, complex traumatic experience, and marital relationship can be explained by both Stress theory (e.g., Cohen & Wills, 1985) and Attachment theory (Bowlby, 1969). These theories provide the theoretical underpinning for the Buffering Model, which suggests that high levels of social and emotional support may protect the individual against the deleterious impact of stress. Among traumatized individuals, several factors such as guilt, shame, and a sense of inferiority hinder their capability to receive social and emotional support, thereby inducing loneliness (Herman, 1992). Estrangement from others, in turn, complicates communication within the family and contributes further to feelings of loneliness, both for the veteran and for his spouse (Solomon et al., 1992). To the best of our knowledge, only one study has examined the mediating role of loneliness in the association between stressors and current well-being. The results indicated that the effect of the loss of a partner on the current well-being was mediated by emotional loneliness (Stroebe, Stroebe, Abakoumkin, & Schut, 1996).

Loneliness can be thought of as a major contributor to a vicious cycle in the relationship between the traumatized veteran and his spouse. In situations where veterans refrain from accepting social support from their spouses, they may not receive the needed support, thus exposing themselves to an increased risk of developing chronic or delayed PTSD. In turn, they may experience even greater feelings of loneliness (Solomon et al., 1991).

The present study aims to extend our knowledge of the relationship between PTSD and loneliness, as well as their impact on marital adjustment over a 12-year period, among ex-POWs. The two main goals are: (1) to examine differences between ex-POWs of the 1973 Yom Kippur War and controls in levels of PTSD, loneliness, and marital adjustment, 30 years after the war, and (2) to examine the mediating role of loneliness in the relationship between PTSD in 1991 and marital adjustment in 2003.

## METHOD

### Participants

The current study is a prospective longitudinal study with two waves of measurement: the first assessment took place in 1991 (T1) and the second assessment took place in 2003 (T2). Participants consisted of 225 Israeli veterans of the 1973 Yom Kippur War: 122 ex-POWs and 103 controls.

#### *Prisoners of War*

According to records of the Israeli Ministry of Defense, 240 soldiers serving in the Israeli Army land forces were taken prisoner in the 1973 Yom Kippur War. Of the 164 ex-POWs who participated in the first assessment (1991), 10 could not be located, 4 had died, and 6 could not participate due to deterioration in their mental status. Of the remaining 144 ex-POWs, 122 agreed to participate in the second wave of this study, constituting an 84.7% response rate.

#### *Controls*

A control group of 280 combat veterans of the Yom Kippur war, matched with the ex-POWs on personal and military backgrounds, was sampled from the Israeli Defense Forces' (IDF) computerized data banks. Of the 185 men who participated in the first assessment, 41 could not be located and one had died. Of the remaining 143 controls,

103 agreed to participate in the second wave of this study, constituting a 72% response rate.

The two groups did not differ in baseline characteristics of age, length of marriage, education, religiosity, or income level. The mean age of participants at the time of data collection was 54.66 ( $SD = 4.58$ ). The mean length of marital relationship was 27.5 years ( $SD = 6.74$ ). The mean years of education was 13.9 ( $SD = 3.4$ ). With regard to religiosity, 60.2% of the sample considered themselves secular, 26.7% traditional, and 11.7% religious. Income level was reported as below the average by 15.6%, average by 23.8%, and above the average by 57.3%.

## Procedure

All participants had taken part in an earlier study of ex-POWs conducted in 1991 (for details, see Solomon, Neria, Ohry, Waysman, & Ginzburg, 1994). Participants were located for the second wave of measurement (2003) using IDF files. Participants were contacted by telephone and were asked to take part in the study. A battery of questionnaires was administered to the participants in their homes or in another location of their choice by trained graduate students. Before filling out the questionnaires, participants were asked to sign an informed consent form. The PTSD inventory was administered on both waves of measurement. The loneliness questionnaire was administered only on the first wave of measurement, and the Dyadic Adjustment Scale (DAS) was administered only on the second wave of measurement.

## Measures

1. *PTSD*. Posttraumatic stress symptomatology was measured using the PTSD Inventory (Solomon et al., 1993). This is a self-report scale based on DSM-III-R criteria, which was the standard used at the time of the first measurement in 1991. The inventory consists of 17 statements corresponding to the 17 PTSD symptoms listed in the DSM-III-R (APA, 1987). In order to conform to the changes made in the updated edition of the DSM, we analyzed the data from both the 1991 and the 2003 measurement in accordance with the DSM-IV symptoms' clusters. For each statement, subjects were asked to indicate whether or not they had experienced the symptom in the previous month. The inventory enables measurement of both the number and the intensity of PTSD symptoms, as well as their position in the posttraumatic symptom clusters (i.e., intrusion, avoidance, and hyperarousal).

Internal consistency among the 17 items for both measurements was high (Cronbach's  $\alpha = .87$  for 1991 and  $.95$  for 2003), and the scale was found to have high convergent validity when compared with diagnoses based on structured clinical interviews (Solomon et al., 1993).

2. *Loneliness*. Loneliness was measured using the UCLA loneliness scale (Russell, Peplau, & Cutrona, 1980). This scale consists of 20 items, 10 reflecting satisfaction with social relationships and 10 reflecting dissatisfaction. Subjects were asked to indicate how often they had experienced these feelings on a 4-point Likert scale (1 = *not at all*, 4 = *very often*). The total score of the scale is the mean of all 20 items after having reversed the positively worded items. High scores reflect more feelings of loneliness. The Cronbach's  $\alpha$  for the UCLA scale in the current sample was  $.87$ , indicating high internal consistency.

3. *Marital adjustment.* Marital adjustment was measured using the DAS (Spanier, 1976). This scale assesses marital adjustment among married couples. It consists of 32 items in four subscales: consensus, cohesion, satisfaction, and affectional expression. Participants were asked to indicate the extent to which each item described their current marital relationship. The dyadic adjustment score was calculated by summing the ratings on the 32 items. High scores reflect better adjustment. Heyman, Sayers, and Bellack (1994) have previously reported that the scale has very good convergent validity (high correlations with other measures of marital functioning) and discriminant validity (low or no significant correlations with psychopathology subscales). The scale has been widely used with Israeli populations (e.g., Horesh & Fennig, 2000; Mikulincer, Horesh, Levy-Shiff, Manovich, & Shalev, 1998). The Cronbach's  $\alpha$  of the current sample was .94.

### Statistical Analysis

Group differences between ex-POWs and controls were examined using MANOVA analyses on several variables: PTSD symptoms (as measured in 1991 and 2003), loneliness as measured in 1991, and marital adjustment as measured in 2003. Correlation coefficient matrices among the study variables for each sample and then estimated path analyses models were then calculated using the EQS-6.1 software (Bentler & Wu, 1995).

## RESULTS

### PTSD, Loneliness, and Marital Adjustment

In order to examine the differences between ex-POWs and controls, MANOVA analyses were performed on loneliness scores as measured in 1991, posttraumatic symptom scores as measured in 1991 and 2003, and marital adjustment scores as measured in 2003 (see Table 1 for means, *SDs* and *F* tests).

MANOVA analyses revealed a significant overall effect,  $F(4, 169) = 39.46, p < .001$ . As can be seen in Table 1, ex-POWs and controls did not differ significantly in level of loneliness as measured in 1991. However, ex-POWs and controls did differ significantly in the number of reported posttraumatic symptoms. In 1991 and 2003,

TABLE 1  
*Means and Standard Deviations of PTSD Symptoms (1991, 2003), Loneliness (1991), and Marital Adjustment (2003) According to Study Group*

| Variable           | POWs     |           | Controls |           | <i>F</i> (1,173) |
|--------------------|----------|-----------|----------|-----------|------------------|
|                    | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |                  |
| <i>Time 1—1991</i> |          |           |          |           |                  |
| Loneliness         | 1.87     | (0.50)    | 1.76     | (0.45)    | 1.87             |
| PTSD symptoms      | 2.61     | (0.72)    | 1.65     | (2.45)    | 4.66**           |
| <i>Time 2—2003</i> |          |           |          |           |                  |
| PTSD symptoms      | 2.64     | (1.10)    | 1.50     | (0.48)    | 149.45***        |
| Marital adjustment | 110.11   | (20.94)   | 121.42   | (18.76)   | 15.06***         |

PTSD = posttraumatic stress disorder.

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

TABLE 2

*Pearson's Correlations Between PTSD (1991 and 2003), Loneliness (1991), and Marital Adjustment (2003) for Ex-POWs*

|                            | PTSD<br>Symptoms<br>(1991) | Loneliness<br>(1991) | PTSD<br>Symptoms<br>(2003) | Marital<br>Adjustment<br>(2003) |
|----------------------------|----------------------------|----------------------|----------------------------|---------------------------------|
| PTSD symptoms<br>1991      | —                          |                      |                            |                                 |
| Loneliness 1991            | .23**                      | —                    |                            |                                 |
| PTSD symptoms<br>2003      | .40***                     | .10                  | —                          |                                 |
| Marital<br>adjustment 2003 | -.10                       | -.24*                | -.45***                    | —                               |

PTSD = posttraumatic stress disorder.

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

ex-POWs reported a higher number of posttraumatic symptoms (2.61 and 2.64, respectively) than controls (1.65 and 1.50, respectively). A significant group effect was found in marital adjustment scores as measured in 2003, with ex-POWs reporting lower levels of marital adjustment ( $M = 109.8$ ) than controls ( $M = 121.51$ ).

### **Contribution of Loneliness (1991) and PTSD (1991 and 2003) to Marital Adjustment (2003)**

Tables 2 and 3 present the correlation coefficients matrices among the study variables for each group. Significant positive associations were found for both groups between posttraumatic symptoms in 1991 and 2003. Positive associations were also seen between posttraumatic symptoms in 1991 and loneliness. That is, increased levels of posttraumatic symptoms were associated with higher levels of loneliness. Negative associations were found between loneliness and marital adjustment. Higher levels of loneliness were related to lower levels of marital adjustment. In the ex-POWs sample, a positive association was found between posttraumatic symptoms in 2003 and marital adjustment. In controls, a positive association was found between loneliness and marital adjustment.

The relationship between the predicting variables and marital adjustment was assessed next. Specifically, a model in which loneliness (1991) mediates the relation between PTSD (1991) and marital adjustment (2003), and also contributes to the prediction of marital adjustment above and beyond the contribution of PTSD (2003) was tested. Having found group differences for PTSD and marital adjustment, we examined whether the mediation model fit the data in the same way for both ex-POWs and controls. To this end, a series of Structural Equation Models (SEM) based on the raw data were performed.

Ex-POWs and controls were compared using multiple group analysis. We compared a default model that allowed for different effects within the groups, with a constrained model that presupposed equality of the regression coefficients between the groups.

The results revealed a significant difference between the default model and the constrained model ( $\Delta\chi^2 = 188.7$ ,  $df = 16$ ,  $p < .00$ ). In other words, the findings showed

TABLE 3

*Pearson's Correlations Between PTSD (1991 and 2003), Loneliness (1991), and Marital Adjustment (2003) for Controls*

|                                 | <b>PTSD<br/>Symptoms<br/>(1991)</b> | <b>Loneliness<br/>(1991)</b> | <b>PTSD<br/>Symptoms<br/>(2003)</b> | <b>Marital<br/>Adjustment<br/>(2003)</b> |
|---------------------------------|-------------------------------------|------------------------------|-------------------------------------|--|
| PTSD symptoms<br>(1991)         | —                                   |                              |                                     |  |
| Loneliness (1991)               | .36**                               | —                            |                                     |  |
| PTSD symptoms<br>(2003)         | .56***                              | .29**                        | —                                   |  |
| Marital<br>adjustment<br>(2003) | -.24                                | -.45***                      | -.19                                | —  |

PTSD = posttraumatic stress disorder.

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

that the structure of the relationships between the independent variables and marital adjustment was not similar for the two groups.

Subsequently, we examined whether the specified mediation model fit the data separately for ex-POWs and controls, using Holmbeck's (1997) procedure (the logic of which is modeled on Baron & Kenny, 1986). This procedure requires three steps, and each step must produce a significant result in order to proceed to the next. In this analysis, we adopted Shrout and Bolger's (2002) recommendation (see also Collins, Graham, & Flaherty, 1998; MacKinnon, 2000; MacKinnon, Krull, & Lockwood, 2000) to set aside the first step of Baron and Kenny's (1986; see also Hoyle & Smith, 1994, for an equivalent SEM strategy) classical approach in which one needs to establish a direct association between the independent variable (i.e., PTSD at 1991) and the dependent variable (i.e., marital adjustment at 2003).

First, the fit of the overall A-B-C model was tested, meaning that we tested the fit of the overall model in which PTSD in 1991 predicts feelings of loneliness and loneliness predicts marital adjustment in 2003, above and beyond the contribution of PTSD at 2003. Second, assuming that the overall model provides an adequate fit, the A-B and B-C path coefficients were examined. In other words, we tested whether PTSD at 1991 predicts feelings of loneliness and whether loneliness predicts marital adjustment at 2003, above and beyond the contribution of PTSD at 2003. At this point, the A-B and B-C paths (as well as the A-B-C model) should all be significant in the directions predicted. The final step in assessing whether there is a mediational effect is to assess the fit of the A-B-C model under two conditions: (a) when the A-C path is constrained to zero and (b) when the A-C path is not constrained, and then whether the second model provides a significant improvement in fit over the first model. Improvement in fit is assessed with a significance test on the basis of the difference between the two model chi-squares. If there is a mediational effect, the addition of the A-C path to the constrained model should not improve the fit.

#### *Fit of the overall A-B-C model*

The structural model describing the pattern of relationships between the variables for ex-POWs produced an excellent fit to the data:  $\chi^2(1, N = 124) = .62, p = .42$ ,

NFI = 0.99, CFI = 1, 1-RMSEA = 1. Likewise, the structural model describing the pattern of relationships between the variables for the control group produced an excellent fit to the data:  $\chi^2(1, N = 106) = .02, p = .89, NFI = 1, CFI = 1, 1-RMSEA = 1$ .

*PTSD in 1991 as a predictor of feelings of loneliness and loneliness as a predictor of marital adjustment in 2003*

As can be seen in Figure 1, the effect of PTSD in ex-POWs in 1991 on feelings of loneliness was significant:  $r = .26, p < .05, 95\% CI = (.24, .29)$ : A higher level of PTSD in an ex-POW predicted a higher level of feelings of loneliness. Moreover, the effect of feelings of loneliness in ex-POWs on their marital adjustment in 2003 was also significant:  $r = -.18, p < .01, 95\% CI = (-.16, -.19)$ : Higher levels of feelings of loneliness predicted lower levels of marital adjustment in 2003. Both scores are significant above and beyond the contribution of PTSD in 2003 to the overall model.

As can be seen in Figure 2, the effect of PTSD in control veterans in 1991 on feelings of loneliness was also significant:  $r = .36, p < .001, 95\% CI = (.32, .39)$ , as was the effect of feelings of loneliness on marital adjustment in 2003:  $r = -.43, p < .001, 95\% CI = (-.39, -.465)$ . Both scores are significant above and beyond the contribution of PTSD in 2003 to the overall model.

*Mediational effect*

In order to assess whether there is a mediational effect, the overall fit of the A-B-C model was calculated with the A-C path constrained to zero. With regard to ex-POWs, the model produced an excellent fit to the data:  $\chi^2(3, N = 124) = .633, p = .89, NFI = 0.98, CFI = 1, 1-RMSEA = 1$ . Next, the overall fit of the A-B-C model was calculated with the A-C path not constrained. Again, the model produced an excellent fit to the data:  $\chi^2(2, N = 124) = .011, p = .99, NFI = 1, CFI = 1, 1-RMSEA = 1$ . These results indicate that there was no significant improvement in fit on the basis of the difference between the two model chi-squares ( $\Delta\chi^2 = 0.622, df = 1, p = ns$ ). In other words, feelings of loneliness mediate the relationship between PTSD in 1991 and

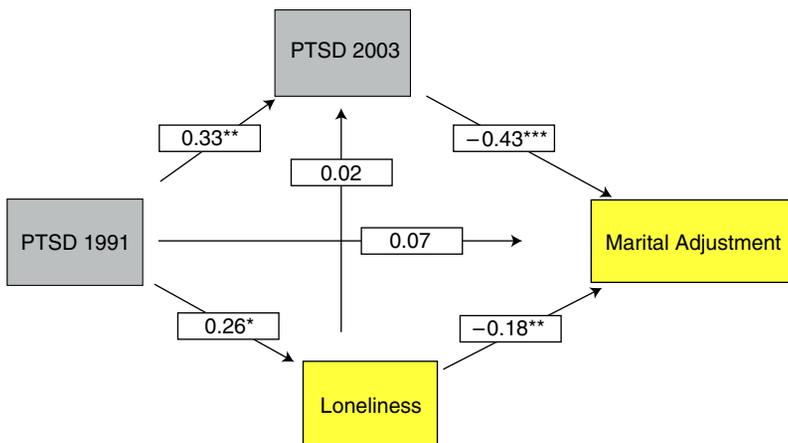


FIGURE 1 Structural Equation Model for Posttraumatic Stress Disorder (1991 and 2003), Loneliness (1991), and Marital Adjustment (2003) for Ex-POWs:  $\chi^2(1, N = 124) = .62, p = .42, NFI = 0.99, CFI = 1, 1-RMSEA = 1. ***p < .001, **p < .01, *p < .05$

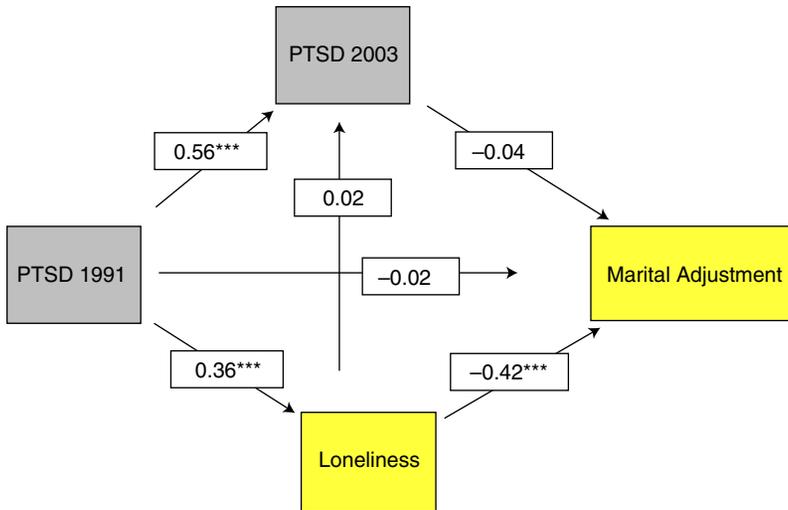


FIGURE 2 Structural Equation Model for Posttraumatic Stress Disorder (1991 and 2003), Loneliness (1991), and Marital Adjustment (2003) for Controls:  $\chi^2(1, N = 106) = .02, p = .89, NFI = 1, CFI = 1, 1-RMSEA = 1. ***p < .001, **p < .01, *p < .05$

marital adjustment in 2003, above and beyond the contribution of PTSD in 2003 to the overall model.

With regard to the control group, the overall fit of the A-B-C model with the A-C path constrained to zero was excellent:  $\chi^2(3, N = 106) = .069, p = .99, NFI = 1, CFI = 1, 1-RMSEA = 1$ . The overall fit of the A-B-C model without the A-C path constrained was also excellent:  $\chi^2(2, N = 106) = .05, p = .99, NFI = 1, CFI = 1, 1-RMSEA = 1$ . These results indicate that there was no significant improvement in fit on the basis of the difference between the two model chi-squares ( $\Delta\chi^2 = 0.019, df = 1, p = ns$ ). In other words, similar to the ex-POWs group, feelings of loneliness mediate the relationship between PTSD in 1991 and marital adjustment in 2003, above and beyond the contribution of PTSD in 2003 to the overall model.

Finally, Cohen and Cohen's (1983) procedure was used to examine the difference in the magnitude of the association between PTSD in 2003 and marital adjustment in 2003 of the ex-POWs and control groups. The analyses revealed that the association between PTSD in 2003 and marital adjustment in 2003 was significantly greater for the ex-POWs group,  $r = -.43, p < .001, 95\% CI = (-.39, -.465), N = 124$  compared with the control group,  $r = -.039, p = ns, 95\% CI = (-.036, -.043), N = 106, Fisher's Z = 4.42, p < .001$ . In other words, the negative contribution of PTSD in 2003 to marital adjustment in 2003 was significantly greater for ex-POWs compared with controls.

**DISCUSSION**

The current study examined the contribution of posttraumatic symptoms and loneliness to marital adjustment among ex-POWs and control veterans from the 1973 Yom Kippur War. More specifically, it tested a model in which loneliness mediates the relationship between PTSD and marital adjustment, over a 12-year period.

The results of the study demonstrate that ex-POWs endorse a higher number of posttraumatic symptoms and a lower level of marital adjustment compared with control veterans. These findings support previous studies documenting the long-term impact of war captivity on both PTSD (e.g., Engdahl, Speed, Eberly, & Schwartz, 1991) and marital adjustment (e.g., Dent et al., 1998).

The effect of captivity on marital relationships is both direct—as a result of the stress inflicted on the families and the ex-POWs during captivity and upon returning home, and indirect—as a possible consequence of posttraumatic symptoms experienced by the ex-POW. As noted, both alternatives could cause ex-POWs to feel more emotionally distant from their families, more inclined to spend time alone, and more prone to outbursts of anger at their spouses (Bernstein, 1998). Meanwhile, the ex-POWs' spouses are forced to cope with both the stressful atmosphere in the family and the emotional and personal changes in their husbands as a result of their experiences.

Another important finding of this study is that for both POWs and non-POWs, loneliness may serve as a mediator in the association between PTSD and marital adjustment, even many years after the war. To the best of our knowledge, only one other study has focused on the mediating role of loneliness in the association between stressors and current well-being. The study found that the effect of losing a partner on current well-being was mediated by emotional loneliness (Stroebe, Stroebe, Abakoumkin, & Schut, 1996).

Several factors may explain the mediating role of loneliness in PTSD and marital adjustment. First, posttraumatic stress symptoms of avoidance may cause the ex-POW to distance himself emotionally, leading to social withdrawal and feelings of loneliness. Second, feelings of guilt, shame, and a sense of inferiority may prevent the traumatized veteran from sharing the harsh events he had experienced or asking for help, further lowering his chances of receiving much-needed social support and adding to feelings of loneliness. Taken together, these factors lead to intense loneliness and isolation (Herman, 1992). This estrangement from others and the feelings of loneliness may lead to poor communication within the family and be a link between intrapsychic experiences and interpersonal problems, both for the veteran and for his spouse.

It is important to note that in the final models for both ex-POWs and controls, loneliness predicted dyadic adjustment in 2002 but did not predict posttraumatic symptoms in 2002. This finding suggests that loneliness has a more profound impact on the marital life of veterans than on their psychological state. A possible explanation for the effect of loneliness on dyadic adjustment can be drawn from the loneliness descriptions put forth by Weiss (1973). From his point of view, both social-isolation loneliness and emotional-isolation loneliness have significant interpersonal roots that can hinder marital relations. Many veterans suffer from loneliness related to their traumatic war experiences (Solomon, Waysman, & Mikulincer, 1992), and the behavioral consequences of these feelings may reveal themselves in the veterans' intimate relationships. However, the finding that loneliness did not predict PTSD in 2002 is surprising. As noted, loneliness has previously been found to be associated with a variety of mental health problems and thus the lack of association with our final model here is interesting and warrants further investigation.

For ex-POWs, however, we did find a direct negative effect of posttraumatic symptoms in 2002 on marital adjustment. This finding may explain the more complicated and sometimes problematic marital atmosphere in the families of ex-POWs

(Cook et al., 2004). The direct path from posttraumatic symptoms to marital adjustment found in our study lends support to the body of research pointing to the direct deleterious impact of war captivity (e.g., Bernstein, 1998), and the secondary impact of posttraumatic symptoms on marital relations. Empirical studies of war veterans have consistently revealed anger, hostility, aggressiveness, violence, and abuse toward family members (Evans, Mchugh, Hopwood, & Watt, 2003; Herman, 1992; Jordan, Marmar, Fairbank, & Schlenger, 1992). Many traumatized veterans also report avoidance of social relations and emotional numbness (Galovski & Lyons, 2004), which inhibits their capacity for intimacy. It is not difficult to imagine how these feelings and behaviors could have a negative impact on marital adjustment.

### **Implications for Clinical Practice**

The results of our study have important implications for the field of marital therapy. Studies have repeatedly shown that spousal support is an important resource in coping with mental illness (e.g., Silver & Iacono, 1984), and preventative intervention programs for veterans and their spouses such as marital enrichment programs have been highly recommended (Demir & Fisiloglu, 1999). Our findings suggest that an important mediator of marital adjustment in ex-POWs is loneliness. Thus, this factor could serve as a target for intervention in therapy. On a clinical level, clinicians who work with the ex-POW couples might use psycho-education to help the veteran and his spouse to understand the symptoms of PTSD. When veterans' spouses better understand the relationship between avoidance and emotional numbing and feelings of loneliness, they may be able to empathize and understand their husbands' tendency to withdraw. Moreover, talking about the war experience—and especially captivity experiences—could reduce the feelings of loneliness for the ex-POWs (Sherman, Zanotti, & Jones, 2005).

The current study makes an important contribution to our knowledge regarding the long-term consequences of war captivity, and the important role of loneliness in the lives of war veterans. The study reveals that 30 years after the war ex-POWs continue to have lower levels of marital adjustment than control veterans. This study is one of the first to emphasize the relationship among complex psychological trauma, loneliness, and marital relationships, over many years. Our conclusions may be relevant not only to the lives of ex-POWs but also to the lives of other victims of captivity and isolation such as the individuals kidnapped in Latin America or other high-security and political prisoners.

### **Limitations**

This study suffers from several methodological limitations. First, the assessment was based solely on self-report questionnaires, which—although common in trauma research—are susceptible to bias (e.g., social desirability). Second, the study was based only on veterans' self-reports and did not include any partner reports. In order to build a more comprehensive picture of the couple's marital adjustment, future studies should collect reports from both spouses. Third, information on whether the veterans were married to the same women they had been married to in 1991 or whether the couples had participated in couples' therapy was not collected. Fourth, the inference of causal associations between the study's variables should be made with caution, as this study is only correlative in nature. Finally, this study did not examine

the possibility that marital relationships could have an effect on PTSD. Future studies should test this alternative model in which interpersonal experiences contribute to the intrapsychic condition.

### Suggestions for Future Research

Further research is needed to examine the mediating and moderating effects of loneliness following different types of traumatic events and among various traumatized populations. It is important to examine whether different kinds of trauma are associated with different types of loneliness. For example, in the context of the present study, it would have been interesting to assess the specific characteristics of loneliness experienced by ex-POWs.

In order to better understand the concept of loneliness, future studies should also assess feelings of loneliness at various stages—both during and after the traumatic experience—as well as to examine the development of these feelings over time.

Another important issue that merits further examination are the feelings of loneliness experienced by the ex-POW's spouse. The spouse's time apart from her husband may also induce feelings of loneliness, which in turn may affect future marital adjustment (Lieblich, 1994).

Finally, future studies of trauma-related loneliness are encouraged to include a host of other concepts (e.g., attachment style—Larose, Guay, & Boivin, 2002) that are traditionally found to be related to loneliness.

### REFERENCES

- Baron, R.M., & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182.
- Beckham, C., & Moore, S.D. (2000). Interpersonal hostility and violence in Vietnam combat veterans with chronic posttraumatic stress disorder: A review of theoretical models and empirical evidence. *Aggression and Violent Behavior*, *5*, 451–466.
- Bentler, P.M., & Wu, E.J.C. (1995). *EQS for windows user's guide*. Encino, CA: Multivariate Software.
- Bernstein, M. (1998). Conflicts in adjustment: WW2 prisoners of war and their families. In Y. Danieli (Ed.), *International handbook of multigenerational legacies of trauma* (pp. 119–124). New York: Plenum Press.
- Bowlby, J. (1969). *Attachment and loss: Attachment*. New York: Basic Books.
- Carroll, E.M., Roeger, D.B., Foy, D.W., & Donahue, C.P. (1985). Vietnam combat veterans with posttraumatic stress disorder: Analysis of marital and cohabiting adjustment. *Journal of Abnormal Psychology*, *94*, 329–337.
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.
- Cohen, S., & Wills, T.A. (1985). Stress, social support and buffering. *Psychological Bulletin*, *98*, 310–357.
- Collins, L.M., Graham, J.W., & Flaherty, B.P. (1998). An alternative framework for defining mediation. *Multivariate Behavioral Research*, *33*, 295–312.
- Cook, J.M., Riggs, D.S., Thompson, R., & Coyne, J.C. (2004). Posttraumatic stress disorder and current relationship functioning among World War II ex-prisoners of war. *Journal of Family Psychology*, *18*, 36–45.

- Demir, A., & Fisiloglu, H. (1999). Loneliness and marital adjustment of Turkish couples. *The Journal of Psychology, 13*, 230–240.
- Dent, O.F., Tennant, C., Fairley, M.J., Sulway, M.R., Broe, G., & Jorm, A.F., et al. (1998). Prisoner of war experience: Effects on wives. *Journal of Nervous and Mental Disease, 186*, 231–237.
- Diamant, L., & Windholdz, G. (1981). Loneliness in college students: Some therapeutic considerations. *Journal of College Student Personnel, 22*, 515–522.
- Dykstra, P.A., & De-Jong Grieveld, J. (1994). The theory of mental incongruity, with a specific application to loneliness among widowed men and women. In R. Gilmour & R. Erber (Eds.), *Theoretical frameworks for personal relationship* (pp. 235–259). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Engdahl, B.E., Speed, N., Eberly, R.E., & Schwartz, J. (1991). Comorbidity of psychiatric disorders and personality profiles of American World War II prisoners of war. *Journal of Nervous and Mental Disease, 179*, 181–187.
- Evans, L., Mchugh, T., Hopwood, M., & Watt, C. (2003). Chronic posttraumatic stress disorder and family functioning of Vietnam veterans and their partners. *Australian and New Zealand Journal of Psychiatry, 37*, 765–772.
- Figley, C.R., & Leventman, S. (1980). Introduction: Estrangement and victimization. In C.R. Figley & S. Leventman (Eds.), *Strangers at home: Vietnam veterans since the war* (pp. xxi–xxxi). New York: Praeger.
- Ford, J.D., Shaw, D., Sennhauser, S., & Greaves, D. (1993). Psychosocial debriefing after operation desert storm: Marital and family assessment and intervention. *Journal of Social Issues, 49*, 73–102.
- Galovski, T., & Lyons, J. (2004). Psychological sequelae of combat violence: A review of the impact of PTSD on the veterans family and possible intervention. *Aggression and Violent Behavior, 9*, 477–501.
- Herman, J.H. (1992). *Trauma and recovery*. New York: Basic Books.
- Heyman, R.E., Sayers, S.L., & Bellack, A.S. (1994). Global marital satisfaction versus marital adjustment: An empirical comparison of three measures. *Journal of Family Psychology, 18*, 432–446.
- Hojat, M. (1983). Comparison of transitory and chronic loners on selected personality variables. *British Journal of Psychology, 74*, 199–202.
- Holmbeck, G.N. (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology, 65*, 599–610.
- Horesh, N., & Fennig, S. (2000). Perception of spouses and relationships: A matched control study of patients with severe affective disorder in remission and their spouses. *Journal of Nervous and Mental Disease, 188*, 463–466.
- Hoyle, R.H., & Smith, G.T. (1994). Formulating clinical research hypotheses as structural equation models: A conceptual overview. *Journal of Consulting and Clinical Psychology, 62*, 429–440.
- Hunter, E.J. (1993). The Vietnam prisoner of war experience. In J.P. Wilson & B. Raphael (Eds.), *International handbook of traumatic stress syndromes* (pp. 297–304). New York: Plenum Press.
- Johnson, S.M., & Williams-Keeler, L. (1998). Creating healing relationships for couples dealing with trauma: The use of emotionally focused couple therapy. *Journal of Marital and Family Therapy, 24*, 25–40.
- Jordan, B.K., Marmar, C.R., Fairbank, J.A., & Schlenger, W.E. (1992). Problems in families of male Vietnam veterans with posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology, 60*, 916–926.
- Larose, S., Guay, L., & Boivin, M. (2002). Attachment, social support, and loneliness in young adulthood: A test of two models. *Personality and Social Psychology Bulletin, 28*, 684–693.

- Lieblich, A. (1994). *Seasons of captivity: The inner world of POWs*. New York: New York University Press.
- Lynch, J.J. (1985). *The language of the heart*. New York: Basic Books.
- MacKinnon, D.P. (2000). Contrasts in multiple mediator models. In J. Rose, L. Chassin, C.C. Presson, & S.J. Sherman (Eds.), *Multivariate applications in substance use research: New methods for new questions* (pp. 141–160). Mahwah, NJ: Erlbaum.
- MacKinnon, D.P., Krull, J.L., & Lockwood, C.M. (2000). Equivalence of the mediation, confounding, and suppression effect. *Prevention Science, 1*, 173–181.
- Mikulincer, M., Horesh, N., Levy-Shiff, R., Manovich, R., & Shalev, J. (1998). The contribution of adult attachment style to the adjustment to infertility. *British Journal of Medical Psychology, 71*, 265–280.
- Nice, D.S., McDonald, B., & Mcmillian, T. (1981). The families of U.S. Navy prisoners of war from Vietnam five years after reunion. *Journal of Marriage and Family, 43*, 431–437.
- Olson, K.L., & Wong, E.H. (2001). Loneliness in marriage. *Family Therapy, 28*, 105–112.
- Peplau, L.A., & Perlman, D. (1982). Perspectives on loneliness. In L.A. Peplau & D. Perlman (Eds.), *Loneliness: A source book of current theory, research & therapy*. New York: Wiley Interscience.
- Perlman, D., Gerson, A.C., & Spinner, B. (1978). Loneliness among senior citizens: An empirical report. *Essence, 2*, 239–249.
- Ross, R.F. (1992). A preliminary investigation of parental loneliness. *Dissertation Abstracts International, 58*, 8.
- Russell, D., Cutrona, C.E., Rose, J., & Yurko, K. (1984). Social and emotional loneliness: An exploration of Weiss's typology of loneliness. *Journal of Personality and Social Psychology, 46*, 1313–1321.
- Russell, D., Peplau, L.A., & Cutrona, C.A. (1980). The revised UCLA loneliness scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology, 39*, 472–480.
- Sherman, M.D., Zanotti, D.K., & Jones, D.E. (2005). Key elements in couple's therapy with veterans with combat-related posttraumatic stress disorder. *Professional Psychology: Research and Practice, 36*, 626–633.
- Shrout, P.E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7*, 422–445.
- Silver, S.M., & Iacono, C. (1984). Factor analytic support for DSM-III's post-traumatic stress disorder for Vietnam veterans. *Journal of Clinical Psychology, 40*, 5–14.
- Solomon, Z., Benbenishty, R., Nevia, Y., Abramowitz, M., Ginzburg, K., & Ohry, A. (1993). Assessment of PTSD: Validation of the revised PTSD Inventory. *Israel Journal of Psychiatry and Related Sciences, 30*, 110–115.
- Solomon, Z., Mikulincer, M., & Waysman, M. (1991). Delayed and immediate onset posttraumatic stress disorder: II. The role of live events and social resources. *Social Psychiatry and Psychiatric Epidemiology, 19*, 231–236.
- Solomon, Z., Neria, Y., Ohry, A., Waysman, M., & Ginzburg, K. (1994). PTSD among Israeli former prisoners of war and soldiers with combat stress reaction: A longitudinal study. *American Journal of Psychiatry, 151*, 554–559.
- Solomon, Z., Waysman, M., Levy, G., Fried, B., Mikulincer, M., & Benbenishty, R., et al. (1992). From frontline to home front: A study of secondary traumatization. *Family Process, 31*, 289–302.
- Solomon, Z., Waysman, M., & Mikulincer, M. (1992). Family functioning, perceived societal support and combat-related psychopathology: The moderating role of loneliness. *Journal of Social and Clinical Psychology, 9*, 456–472.
- Spanier, G.B. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family, 38*, 15–28.

- Spasojevic, H., Heffer, R.W., & Snyder, D.K. (2000). Effects of posttraumatic stress and acculturation on marital functioning in Bosnian refugee couple. *Journal of Traumatic Stress, 13*, 205–215.
- Stroebe, W., Stroebe, M., Abakoumkin, G., & Schut, H. (1996). The role of loneliness and social support in adjustment to loss: A test of attachment versus stress theory. *Journal of Personality and Social Psychology, 70*, 1241–1249.
- Weiss, R.S. (1973). *Loneliness: The experience of emotional and social isolation*. Cambridge, MA: MIT Press.



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