When Home Isn't a Safe Haven: Insecure Attachment Orientations, Perceived Social Support, and PTSD Symptoms Among Israeli Evacuees Under Missile Threat

Avi Besser
Sapir Academic College

Yuval Neria
The New York State Psychiatric Institute
and Columbia University

This study examined a theoretically based mediation model including intensity of trauma exposure, adult attachment, perceived social support, and posttraumatic stress disorder (PTSD) symptoms. The sample consisted of 135 Israeli students who were evacuated from a college campus located near the Israel–Gaza border in response to increased missile fire in the area. An Internet-based data collection procedure was used to survey the evacuees, who remained within the affected region. Individuals at different locations within the affected area were exposed to different levels of trauma intensity. Results indicated that intensity of trauma exposure did not affect levels of PTSD symptoms or perceived social support. Structural equation modeling showed that the link between attachment anxiety and PTSD symptoms is mediated by low levels of perceived social support. These findings underscore the role of interpersonal resources in the psychological sequelae of exposure to a continuous, life-threatening situation by highlighting the negative role played by low perceived social support among insecurely attached individuals exposed to missile attacks. Theoretical and clinical implications of the findings are discussed.

Keywords: attachment, PTSD, social support, war zone, evacuees

For the past 8 years, a large population in southwestern Israel has been exposed to ongoing rocket and mortar fire from Hamas and Islamic Jihad forces located in the Gaza Strip. Recently, the ongoing low-level conflict escalated into a massive military operation in the Gaza Strip and the launching of long-distance missiles from Gaza to locations deep inside Israel. The operation lasted 22 days, from December 27, 2008, through January 17, 2009. The present study focused on a sample of Israeli students who were forced to evacuate a college campus located close to the Israel–Gaza border in response to increased missile fire in the area. However, the long-distance missiles launched by Hamas from the Gaza Strip were capable of reaching the students in their new locations, even in areas up to 40 km from the border. Individuals located farther from the border had more time to seek shelter between the moment the air-raid sirens sounded and the moment that the incoming missile(s) hit.

A series of studies conducted following the 9/11 attacks have reported a higher incidence of posttraumatic stress disorder (PTSD) among individuals located closer to the disaster site than among those in more distant areas (e.g., Neria et al., 2006; Schlenger et al., 2002). In line with these findings, in the present study, we used an estimation of proximity to the border as a representation of intensity of exposure to trauma.

This study was designed to investigate (a) whether PTSD symptoms are associated with intensity of exposure to trauma when intensity of exposure is expressed in terms of the amount of time individuals had to seek shelter from incoming missile fire (a function of proximity to the border), (b) whether levels of PTSD symptoms are associated with intrapersonal resources (i.e., attachment orientations), and (c) whether interpersonal resources (i.e., perceived social support) mediate the associations between attachment orientations and levels of PTSD symptoms.

Exposure to war trauma may place civilians at risk for short- and long-term mental health problems and is likely to mobilize internal and external resources for coping with stress. Conservation of resources theory (Hobfoll, 1991) proposes that a sudden loss of or threat to critical resources results in a stress response aimed at guarding or regaining these resources. In addition to this main role in the prediction of trauma, the loss of resources has been found to play a mediating role in the relation between trauma exposure and differential reactions, such as general distress and physical symptoms (see B. W. Smith & Freedy, 2000). Interpersonal resources are essential in stress responses. Among these resources, social support has received significant attention in trauma and stress-coping research. In the present study, we tested the importance of interpersonal resources (i.e., perceived social support) in mediating

the relationship between attachment orientation and PTSD symptoms.

PTSD, defined as the re-experiencing of a traumatic event, avoidance of stimuli associated with the trauma, and numbing of general responsiveness, as well as symptoms of increased arousal (for detailed criteria, see the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.); *DSM–IV–TR*; American Psychiatric Association, 2000) is common among populations exposed to war trauma. A number of studies have documented PTSD in Israeli populations exposed to terrorism (e.g., Besser & Neria, 2009; Besser, Neria, & Haynes, 2009; Besser & Priel, 2010; Bleich, Gelkopf, & Solomon, 2003; Shalev, Tuval, Frenkiel-Fishman, Hadar, & Eth, 2006). The current study extends this previous research by investigating how attachment style relates to psychological outcomes and how social resources influence this relationship.

Attachment Theory

Initially, attachment theory focused on the relationships between children and their caregivers, with the assumption that early relationships are internalized in the form of mental representations of both the self and others. These representations lead to the creation of internal working models, which, in turn, may guide the formation of cognition, affect, and expectations in subsequent relationships (Bowlby, 1980). Attachment orientations were found to be relatively stable across a person's life and, thus, are thought to guide his or her relationships with others in adulthood (Grossmann, Grossmann, & Waters, 2005; Main, Kaplan, & Cassidy, 1985).

A growing body of empirical research has extended the study of attachment beyond childhood (e.g., Hazan & Shaver, 1987), suggesting that the quality of early attachments may have long-term repercussions in various aspects of adult life. In recent years, attachment research has furthered the conceptualization of internal working models of attachment. This research has proposed two main dimensions along which individual differences in attachment can be assessed: attachment anxiety and attachment avoidance (Brennan, Clark, & Shaver, 1998; Cassidy & Kobak, 1988; Mikulincer & Shaver, 2003, 2007).

A person's position in each of these orthogonal dimensions indicates his or her sensitivity to potential threats of rejection or lack of responsiveness and the extent to which proximity is looked for or avoided in coping with such threats. Figure 1 presents the two-dimension model. As shown in Figure 1, low scores on both dimensions characterize the secure attachment style, whereas insecure attachment styles are defined by high scores on one or both dimensions (fearful: high anxiety and high avoidance; dismissive: low anxiety, high avoidance; and preoccupied: high anxiety, low avoidance). The present study focused on the role of these two dimensions or orientations. High attachment anxiety scores and high scores for the attachment avoidance orientation express different strategies for coping with insecurity; the hyperactivation of the attachment system by increasing proximity (attachment anxiety), on one hand, or the deactivation of the attachment system through the avoidance of contact (attachment avoidance), on the other hand.

Attachment Dimensions and Affect Regulation

Adult attachment research has focused on the roles of the attachment-related anxiety and avoidance orientations (Brennan et al., 1998; Mikulincer & Shaver, 2003, 2007) in emotional self-regulation (e.g., Mikulincer & Shaver, 2003) and in individuals' responses to stress (e.g., Besser & Priel, 2003, 2005, 2006, 2009; Besser, Priel, & Wiznitzer, 2002; Mikulincer, Birnbaum, Woddis, & Nachmias, 2000; for a review, see Mikulincer & Shaver, 2007). Individuals with high attachment anxiety scores tend to intensify negative emotional states (hyperactivation strategies), whereas those with high attachment avoidance scores tend to distance themselves from emotional situations (deactivation strategies; e.g., Mikulincer, Shaver, & Pereg, 2003). Individuals scoring high for the attachment anxiety orientation tend to be hypervigilant to sources of distress and hypersensitive to negative and stressful
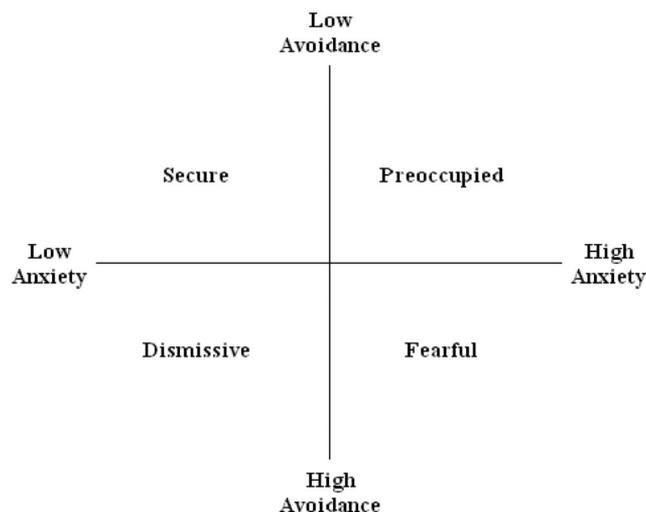

Figure 1. The two-dimension model. Four adult attachment styles distinguished by the axes of anxiety and avoidance (based on Bartholomew & Horowitz, 1991).

experiences (see Mikulincer & Shaver, 2007, for a review). In contrast, individuals scoring high on the attachment avoidance orientation are likely to downplay threats, dismiss their importance, and erect barriers against their own stressful thoughts and affect. These individuals appear to be less sensitive to stress than individuals with high attachment anxiety scores; insecurely attached individuals are believed to be especially vulnerable to symptom development following negative experiences and stressful life events (e.g., Hammen et al., 1995).

The associations between adult attachment and PTSD have been investigated in a number of samples exposed to trauma, including a civilian population in a war-torn area (Mikulincer, Florian, & Weller, 1993), civilians living under life-endangering conditions (Mikulincer, Horesh, Eilati, & Kotler, 1999), recruits in military training (Mikulincer & Florian, 1995; Neria et al., 2001), prisoners of war (Dieperink, Leskela, Thuras, & Engdahl, 2001; Solomon, Ginzburg, Mikulincer, Neria, & Ohry, 1998; Zakin, Solomon, & Neria, 2003), war veterans (Dekel, Solomon, Ginzburg, & Neria, 2004), Holocaust child survivors (Cohen, Dekel, & Solomon, 2002), high-exposure survivors of the 9/11 terror attacks (Fraley, Fazzari, Bonanno, & Dekel, 2006) and, recently, a civilian population directly exposed to a prolonged period of ongoing terror attacks in southern Israel (Besser et al., 2009). The results of these studies have consistently indicated that attachment anxiety, rather than attachment avoidance, is associated with increased vulnerability to stress reactions (for a review, see Mikulincer & Shaver, 2007). We expected to replicate this direction of findings in the current study. Yet, because our study was the first attempt to examine attachment orientations and PTSD in evacuees from a war zone, we explored the possible associations of both attachment anxiety and attachment avoidance with PTSD.

Recently, increased attention has been focused on attempts to identify the intervening process variables that mediate the links between insecure attachment styles and emotional distress (see Mikulincer & Shaver, 2007, for a review). The purpose of the present study was to examine the mediating role of perceived social support in the association between adult attachment orientation and traumatic stress symptoms.

Social Support Theory

Perceived social support is a primary interpersonal resource that is critical for coping with stress (Haber, Cohen, Lucas, & Baltes, 2007) and has been associated with psychological well-being in times of stress (Norris & Kaniasty, 1996). The extant literature on perceived social support suggests that perceived social support mediates the links between stressful life events and psychological consequences, such as anxiety, depression, and behavioral distress (Russell & Cutrona, 1991). Results in the literature also have suggested that a person's perception of the availability of others as a resource, rather than actual support received, plays important roles in the prediction of coping effectiveness, well-being, and psychological and physical health (Dolbier & Steinhardt, 2000). Perceived social support is generally considered to be a protective factor for individuals who have experienced a disaster (Norris et al., 2002) or terror attack (e.g., Hobfoll, Canetti-Nisim, & Johnson, 2006). Individuals who maintain supportive social relationships are more resilient in the face of life-threatening conditions (Galea et al., 2002; Norris & Kaniasty, 1996; Shalev, Tuval-Mashiach, &

Hadar, 2004). Higher levels of perceived social support have also been linked to resilience and recovery with respect to PTSD (e.g., King, King, Foy, Keane, & Fairbank, 1999).

Indeed, as suggested by both Brewin, Andrews, and Valentine (2000) and Ozer, Best, Lipsey, and Weiss (2003) in their meta-analyses, impaired social support is one of the most powerful risk factors for PTSD (cf. Palmieri, Galea, Canetti-Nissim, Johnson, & Hobfoll, 2008). The primary explanation that has emerged for this is that social support serves a protective role, primarily during times of stress, by enhancing adaptive coping behaviors (Cutrona & Russell, 1987). What remains unknown, however, is how internal working models of attachment and perceived social support interrelate in responses to traumatic experiences.

Attachment Orientation and Social Support

In the context of adult attachment theory, empirical studies have found that securely attached individuals deal with distress by acting constructively and turning to others for emotional and instrumental support (e.g., Mikulincer & Shaver, 2003). These studies have found that secure attachment is associated with the perceived availability of support, whereas insecurely attached adults report less available support (see Mikulincer & Shaver, 2007, for a review). Accordingly, individuals scoring high on the attachment anxiety orientation tend to overreact to their negative feelings in order to elicit support from others (Mikulincer & Florian, 1995). In contrast, individuals scoring high on the attachment avoidance dimension tend to distance themselves from others when faced with stressful events (e.g., Mikulincer & Florian, 1995; Mikulincer et al., 1993).

Despite their different theoretical backgrounds and diverse research focuses, empirical findings stemming from both social support and attachment theory perspectives have produced consistent evidence that a person's perception of the availability of support is associated with the individual's self-regulation of distress. Existing research suggests that the attachment and social support constructs share the assumption that basic personal characteristics influence expectations, interpretations, and actual patterns of interpersonal behavior (e.g., B. R. Sarason et al., 1991). However, whereas studies of social support center more on contextual dimensions than on the history of relationships, the opposite is the case with attachment theory (B. R. Sarason, Shearin, Pierce, & Sarason, 1987; I. G. Sarason, Sarason, & Shearin, 1986).

Theoretically, it is possible that perceived social support may play two distinct, simultaneous roles in the relationship between attachment dimensions and PTSD, acting as both a mediator and a moderator. A growing body of research (e.g., Holahan, Moos, Holahan, & Cronkite, 1999; Lepore, Evans, & Schneider, 1991; Norris & Kaniasty, 1996; Quittner, Gluekauf, & Jackson, 1990; Thompson et al., 2000) has reported that perceived support is a potent mediator of the stress–distress relation. These studies have found that perceived support is eroded by pervasive, chronic stressors, and that individuals with lower levels of perceived available support present higher levels of distress. Furthermore, these findings have been consistent across a variety of populations, such as community-resident adults (Holahan et al., 1999), college students living under crowded conditions (Lepore et al., 1991), natural disaster victims (Norris & Kaniasty, 1996), and civilians directly exposed to prolonged and ongoing terror attacks (Besser &

Priel, 2010). Social support studies have focused on the role that the resources provided by interpersonal relationships play in individuals' coping and adjustment. (For a review of the role of social bonds in PTSD, see Charuvastra & Cloitre, 2008.) The present study aimed to extend this line of thought by suggesting that perceived social support mediates the association between individual differences in the tendency to experience stress (attachment orientations; anxiety and avoidance dimensions) and PTSD symptoms.

Nevertheless, a plausible competing hypothesis might be that high levels of perceived social support moderate the relations between insecure attachment orientations and PTSD symptoms. Cohen and Wills (1985), for instance, suggested that support from specific interpersonal relationships buffers (moderates) the deleterious effects of stressful events. With regard to perceived social support, secure attachment has been positively associated with the general perception of social support, support seeking, and the evaluation of received support (I. G. Sarason, Pierce, & Sarason, 1990; Vogel & Wei, 2005). Attachment insecurity, in turn, has been shown to interfere with an individual's ability to use support when it is offered (Coble, Gantt, & Mallinckrodt, 1996). Maunder and Hunter (2001) have proposed that the reduced success of social support in buffering stress is one way in which attachment insecurity might influence stress responses. Accordingly, we also tested the hypothesis that perceived social support moderates the relationship between insecure attachment orientations and PTSD symptoms. Thus, we sought to investigate the interaction between attachment orientations and perceived social support and their associations with PTSD symptoms.

Hypothesized Models

We conceptualized perceived social support as a mediating variable on the basis of our interpretation of the extant literature on both perceived social support and adult attachment. Baron and Kenny (1986) characterized mediation as a case in which a variable, such as perceived social support, functions as a "generative mechanism through which a focal independent variable [such as personality predisposition] is able to influence the dependent variable of interest" (p. 1173; see also Frazier, Tix, & Barron, 2004). Mediation occurs when an external variable such as perceived social support better explains a relationship between a predictor, such as insecure attachment orientation, and an outcome, such as PTSD symptoms (e.g., Frazier et al., 2004). As such, and consistent with the extant literature on perceived social support, our primary hypothesis was that perceived social support serves as a vehicle through which attachment anxiety associates with PTSD symptoms. We hypothesized that insecurely attached evacuees, especially those with high attachment anxiety scores, would report low levels of perceived social support, which, in turn, would associate with higher levels of PTSD symptoms. Low levels of perceived social support were expected to mediate the relationship between evacuees' insecure attachment, especially among those scoring high on the attachment anxiety orientation, and evacuees' reported levels of PTSD symptoms.

As noted earlier, we also tested a competing hypothesis—that perceived social support moderates the relationship between insecure attachment orientations, especially those with high attachment anxiety scores, and PTSD symptoms. Baron and Kenny (1986)

described a moderating effect "as an interaction between a focal independent variable and a factor that specifies the appropriate conditions for its operation" (p. 1174). Moderation occurs when a variable changes either the direction or the strength of any relationship between a predictor variable and an outcome variable. Moderated relationships are those in which a variable (e.g., perceived social support) associates with an outcome (e.g., PTSD symptoms) via an interaction with an independent variable (e.g., one of the insecure attachment orientations) when the main effects of both variables (perceived social support and insecure attachment orientation) are controlled. In the case of this study, therefore, the inclusion of perceived social support would alter the strength of any relationship between insecure attachment orientations and PTSD symptoms, such that the level of PTSD symptoms would vary depending on the nature of a person's reported level of perceived social support (see Frazier et al., 2004, for a review). Specifically, we hypothesized that high levels of perceived social support would moderate the relationship between insecure attachment orientations, especially for those with high attachment anxiety scores, and evacuees' levels of PTSD symptoms. High levels of PTSD were expected for evacuees who score high on the attachment anxiety orientation and also report low levels of perceived social support, but not for those who report high levels of perceived social support.

Method

Participants and Procedure

The data for this article were derived from a longitudinal research project designed to study the mental health effects of the Israel–Gaza war (which lasted from December 27, 2008, to January 17, 2009) among the 135 first-year, Jewish undergraduate students from Sapir College who took part in this study. The current analysis is based on the first survey of this project, which was conducted during the war on January 7, 2009. The participants were young adults with a mean age of 23.85 years ($SD = 2.15$), who were forced to evacuate a college campus located close to the border between Israel and the Gaza Strip. The students were evacuated from the campus to their families' homes in other parts of southern Israel. It was assumed that, after having moved farther from the border, the students would be safe from incoming missiles. However, the long-distance missiles launched by Hamas from the Gaza Strip were capable of reaching the students in their new locations, even in areas up to 40 km from the border. Thus, it was assumed that participants were under potential threat of attack as they completed the survey. The time available for residents to take shelter from an incoming missile (in response to an air-raid siren) varied depending on their distance from the Gaza Strip, from 15 s in the border areas to 60 s in areas 40 km from the border (see Figure 2 for the alarm zones as defined by the Israeli Home Front Command). In our sample, 34.8% ($n = 47$) of the students relocated to areas between 11 and 20 km from the border, 29.6% ($n = 40$) relocated to areas between 21 and 30 km from the border, and 35.6% ($n = 48$) relocated to areas between 31 and 40 km from the border.
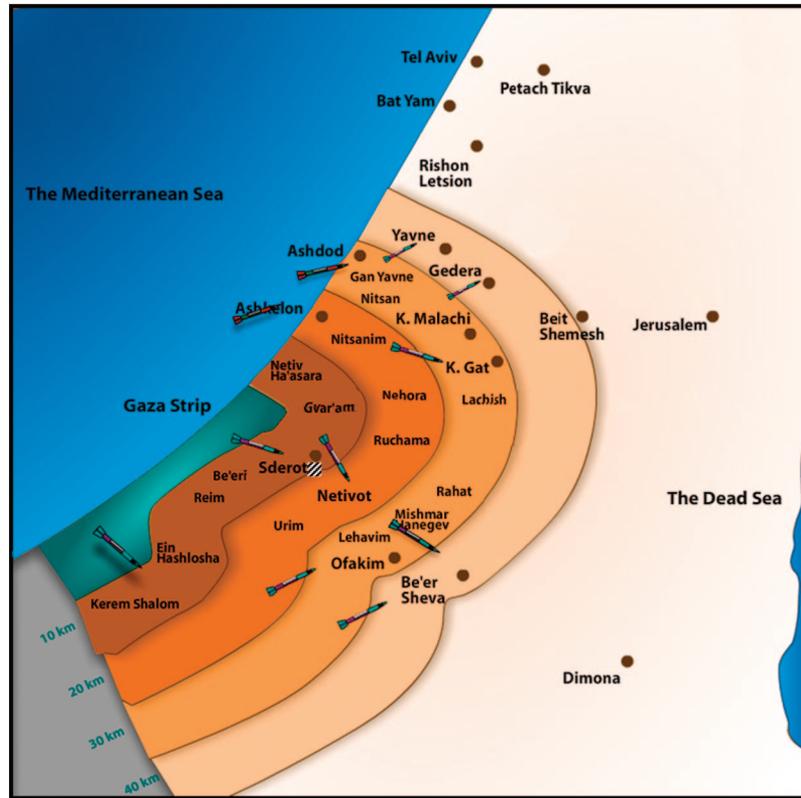
Figure 2. Map showing the range of Hamas' missile fire into Israel. Alarm zones (i.e., the amount of time one had to take cover between the moment the air-raid siren sounded and the moment the incoming rocket or missile hit) as defined by the Israeli Home Front Command. ▨Location of the college campus from which the students were evacuated (7 km from the Gaza Strip). At locations within 10 km of the border, there was a period of only 15 s between the sounding of air-raid sirens and missile impact. Areas to which the evacuated students relocated: 20 km from the Gaza Strip—30 s between the air-raid siren and missile impact; 30 km from the Gaza Strip—45 s between the air-raid siren and missile impact; 40 km from the Gaza Strip—60 s between the air-raid siren and missile impact.

Measures

Adult attachment insecurities. Participants' self-reported attachment scores on the anxiety and avoidance dimensions were evaluated using the Experiences in Close Relationships—Revised scale (ECR–R; Fraley, Waller, & Brennan, 2000). This scale contains 36 items derived from an item response theory analysis of a majority of the existing self-report measures of adult attachment (Brennan et al., 1998). ECR–R scores are computed for two dimensions: avoidance (or discomfort with closeness and discomfort depending on others) and anxiety (or fear of rejection and abandonment). (See Fraley et al., 2000, for more information on the reliability, validity, and scoring of this measure.) In the current sample, the Cronbach's alpha internal consistency coefficients were .88 and .81 for attachment anxiety and attachment avoidance, respectively.

Perceived social support. The Multidimensional Scale of Perceived Social Support (MSPSS; Canty-Mitchell & Zimet, 2000) was used to assess social support. The MSPSS is a 12-item questionnaire containing three subscales, each consisting of four items measuring the perceived availability of social support from friends, family, and a significant other. Items are scored on a 7-point Likert-type scale, ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*) for each item. For this study, we calculated overall MSPSS scores. The Cronbach's alpha internal consistency coefficient for MSPSS scores in the present study was .91.

PTSD symptoms. PTSD was measured using the PTSD Inventory (Solomon et al., 1993; Solomon, Neria, Ohry, Waysman, & Ginzburg, 1994), a 17-item, self-reported symptom scale that corresponds to the *DSM–IV* (American Psychiatric Association, 1994) symptom clusters. Respondents rate the extent to which they have been bothered by each symptom using a 4-point scale (1 = *not at all* to 4 = *extremely*). The inventory assesses the intensity of PTSD symptoms and provides scores for aggregated symptom clusters (i.e., intrusion, avoidance, and hyperarousal). In the current study, participants were specifically asked to consider their symptoms over the past month in relation to their experience of and response to the fighting between Israel and Hamas. This scale demonstrated high internal consistency, as well as high convergent validity when compared with diagnoses based on structured clinical interviews (Solomon et al., 1993). In the current sample, the Cronbach's alpha internal consistency coefficients were .86, .79, and .83 for intrusion, avoidance, and hyperarousal, respectively.

Procedure

Web administration of the study questionnaire enabled the simultaneous collection of data from evacuees in numerous locations in Israel. We used the university's e-learn distance learning Web system to present the study and invite students to volunteer to take part in it. In addition, we also sent personal e-mail messages to all of the students enrolled in an introductory psychology course ($n = 200$). Participants who agreed to take part in the study were asked to send a consent form over e-mail within 48 hr of being invited to participate. If they responded in the affirmative, they were asked to send back an electronic consent form within 48 hr on receipt of the invitation and to submit the completed survey within 24 hr. Of those who agreed to participate ($n = 150$), 135 (90%) completed and returned the electronic questionnaire. Participants received course credit for their participation. Anonymity was preserved by matching participants' ID numbers with numbers in a database created by the college administration.

Results

Prevalence of Current Probable PTSD and Associations With Intensity of Exposure

To permit comparisons across studies, we assessed probable PTSD using *DSM–IV* diagnostic criteria (the presence of at least one re-experiencing symptom, three avoidance symptoms, and two hyperarousal symptoms; M. Y. Smith, Redd, DuHamel, Vickberg, & Ricketts, 1999). In the present study, 20% of the participants met criteria for current probable PTSD. Although the reported levels of PTSD symptoms among the exposed individuals seem to exceed previous estimates for Israeli populations (e.g., Bleich et al., 2003; Shalev et al., 2006), they are in line with estimates previously reported among populations recently exposed to terrorism and large-scale disasters (e.g., Neria, Nandi, & Galea, 2008).

We examined the associations between the intensity of trauma exposure, as represented by the different alarm zones in which the evacuees were located, and symptoms of PTSD. The alarm zones described how much time residents had to run for cover between the siren warning of incoming fire and the missiles' landing (20 km/30 s; 30 km/45 s; and 40 km/60 s; see Figure 2). Individuals in the different alarm zones had different amounts of time in which to seek shelter from incoming missile fire, representing different levels of intensity of

threat exposure. Our results indicate that intensity of exposure (as represented by the different alarm zones) was not significantly associated with avoidance, $F(2, 132) = 1.13$, *ns*, intrusion, $F(2, 132) = 0.87$, *ns*, or hyperarousal symptom levels, $F(2, 132) = 0.84$, *ns*. Furthermore, analyses of the associations between the different alarm zones and the remaining study variables indicated that intensity of exposure was not significantly associated with attachment anxiety, $F(2, 132) = 0.65$, *ns*, attachment avoidance, $F(2, 132) = 0.76$, *ns*, or perceived social support, $F(2, 132) = 0.10$, *ns*. Means and standard deviations for attachment variables, PTSD scales, and perceived social support are presented in Table 1. It is important to note that, in our sample, the distributions of the scores for the different PTSD scales, attachment dimensions, and perceived social support were not skewed but followed a normal curve.

Insecure Attachment Orientations, Perceived Social Support, and PTSD Symptoms

We began by testing our primary hypothesis: that social support mediates the relationship between insecure attachment orientations and PTSD symptoms. In testing this hypothesis, we followed Baron and Kenny's (1986) criteria for mediation, according to which (a) there must be a significant association between the predictor and criterion variables, and (b) in an equation including both the mediator and the criterion variable, there must be a significant association between the predictor and the mediator, and the mediator must be a significant predictor of the criterion variable. If the significant direct relationship between the predictor and the criterion variables decreases when both the mediator and the predictor variable are included in the equation, then the obtained pattern is consistent with the mediation hypothesis. If the direct association approaches zero, the mediator fully (although not necessarily exclusively) accounts for the relation between the predictor and the criterion (Baron & Kenny, 1986). Although Baron and Kenny's recommendations are influential and extensively cited, recently, some criticism has been raised (see MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002), especially concerning the use of Sobel's (1982) large-sample test to evaluate the significance of indirect associations. Therefore, we evaluated the proposed mediational model by studying the sampling variability of estimates of the indirect association using the bootstrap framework that Shrout

Table 1

Correlations, Means, and Standard Deviations for Measures of Attachment and Posttraumatic Stress Disorder (PTSD) Symptoms for Relocated Israeli College Students (N = 135)

Variable	1	2	3	4	5	6	M	SD
Attachment orientations								
1. Attachment anxiety	—						3.38	1.05
2. Attachment avoidance	.22	—					2.82	.74
3. Perceived social support	−.34**	−.10	—				67.83	16.48
PTSD symptoms								
4. Intrusion	.26*	−.18	−.47**	—			2.29	.818
5. Avoidance	.35**	.09	−.56**	.56**	—		1.70	.595
6. Hyperarousal	.34**	−.04	−.59**	.73**	.69**	—	2.36	.795

Note. To ensure that the overall chance of a Type I error remained less than .05, we applied a full Bonferroni correction.
* $p < .01$. ** $p < .001$.

and Bolger (2002) and Mallinckrodt, Abraham, Wei, and Russell (2006) recently implemented for mediation in structural equation modeling (SEM). Using the options in AMOS, we implemented this procedure in the mediational models, which involved drawing 1,000 bootstrapping samples. We found that 100% of the bootstrap samples converged for all of the models analyzed. The 95% confidence intervals and the confidence intervals based on the bias-corrected bootstrap for the direct and indirect associations in our models were consistent with the conclusion that the direct and indirect associations were significantly different from zero (reported in parentheses near each estimated β value in Figure 3). These results suggest that our procedure led to a stable estimation of the distributions.

The first-order correlations among all of the observed variables that were used as indicators of the latent construct used in the mediational model are listed in Table 1. There were highly significant correlations among the PTSD subscale scores. Levels of perceived support were negatively and significantly associated with all three PTSD symptom scales. Finally, attachment anxiety, but not attachment avoidance, was found to be significantly associated with low levels of perceived social support and with high scores for all three PTSD symptom scales. Thus, attachment avoidance did not meet the initial requirement for mediation, and the mediational model was tested for attachment anxiety only.

Then, we analyzed the direct associations between attachment anxiety and PTSD (see Figure 3A). We defined the latent PTSD

A) Direct association model
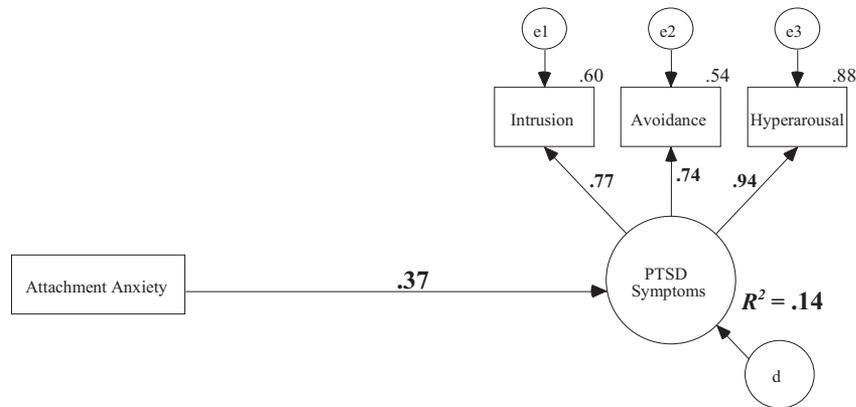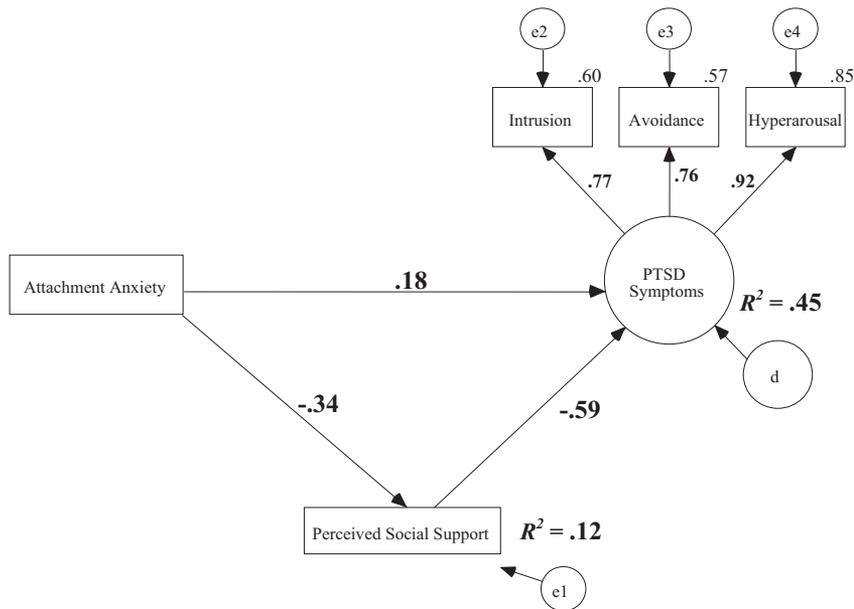
B) Mediational association model

Figure 3. (A) Direct association model. (B) Mediational association model. Rectangles indicate measured variables and large circles represent latent constructs. Small circles reflect residuals (e) or disturbances (d); bold numbers above or near endogenous variables represent the amount of variance explained (R^2). Unidirectional arrows depict hypothesized directional or "causal" links. Standardized maximum likelihood parameters are used. Bold estimates are statistically significant.

construct (factor) using participants' intrusion, avoidance, and hyperarousal scores as its indicators. As shown in Figure 3, all of the factor indicators and path loadings were substantial and statistically significant. We then specified the models of the direct and indirect associations of attachment anxiety with PTSD (see Figure 3B). Analyses were conducted using an SEM strategy that assessed measurement errors for the dependent and independent variables (Hoyle & Smith, 1994) and were performed using AMOS software (Version 4.01; Arbuckle, 1999) and the maximum likelihood method. Although a nonsignificant p value has traditionally been used as a criterion for not rejecting a hypothesis in SEM, this criterion is overly strict and overly sensitive for models. Therefore, we also used alternative criteria that reflect the real-world conditions of clinical research. The following fit indices were used: (a) the chi-square/df ratio, (b) the root-mean-square error of approximation (RMSEA), (c) the comparative fit index (CFI), and (d) the nonnormed fit index (NNFI). A model in which chi-square/df ratio was less than or equal to 2, CFI and NNFI were greater than 0.90, and the RMSEA index was between 0.00 and 0.06 with confidence intervals between 0.00 and 0.08 (Hu & Bentler, 1999) was deemed acceptable. These moderately stringent acceptance criteria clearly reject inadequate or poorly specified models, while accepting for consideration models that meet real-world criteria for reasonable fit and representation of the data (Kelloway, 1998).

Direct association model. We first confirmed the existence of a significant direct relation between attachment anxiety and PTSD (see Figure 3A). This model fit the observed data well, $\chi^2(2) = 2.35$, $p = .31$, $\chi^2/df = 1.17$, NNFI = 0.99, CFI = 1.00, RMSEA = 0.03, CI [0.000, 0.06]. As predicted, attachment anxiety was significantly associated with high levels of PTSD, $\beta = .37$, $t = 4.099$, $p < .0001$; $SE = 0.198$, CI [0.487, 1.290], $p < .002$.

Mediational association model. Finally, we tested whether the indirect relation between attachment anxiety and PTSD that is mediated by perceived social support (the mediator) significantly reduced (accounted for) the direct relation between attachment anxiety and PTSD (the outcome). To do this, we specified a model in which attachment anxiety had a direct path to PTSD, as well as an indirect path through perceived social support. To ensure that the perceived social support and PTSD symptom scores did not convey essentially the same information, despite the fact that these variables were highly correlated, we performed multicollinearity diagnostic analyses. Eigenvalues of the scaled and uncentered cross-products matrix, condition indices, and variance-decomposition proportions, along with variance inflation factors and tolerances from multicollinearity diagnostic analyses, indicated the absence of multicollinearity. Thus, the measures of perceived social support and PTSD symptoms were not redundant.

The meditational model fit the observed data well, $\chi^2(4) = 5.703$, $p = .22$, $\chi^2/df = 1.43$, NNFI = 0.98, CFI = 0.99, RMSEA = 0.06, CI [0.000, 0.08]. As noted earlier, the direct path from attachment anxiety to PTSD was significant. However, this path became significantly weaker, $\beta = .18$, $t = 2.30$, $SE = 0.18$, CI [0.06, 0.76], $p < .05$; $z' = 3.59$, $p < .001$, when perceived social support was included in the model. As shown in Figure 3B, attachment anxiety was significantly associated with social support, $\beta = -.34$, $t = -4.18$, $SE = 1.27$, CI [−7.81, −2.74], $p < .002$, which, in turn, was associated with PTSD, $\beta =$

$-.59$; $t = -6.82$, $SE = 0.013$, CI [−0.12, −0.07], $p < .001$. Overall, our analyses indicated that the associations between attachment anxiety and PTSD were significantly mediated by perceived social support (indirect association: $SE = 0.120$, CI [0.26, 0.74], $p < .001$).

Moderational association model. We next tested whether perceived social support moderates the relationship between insecure attachment dimensions and PTSD symptoms. According to Baron and Kenny (1986), moderation exists when the interaction of the moderator and the predictor variables (perceived social support and insecure attachment orientation, respectively) accounts for a statistically significant amount of criterion variable (PTSD symptoms) variance when the main effects of both the predictor variables (insecure attachment dimensions) and the moderator variable (perceived social support) are controlled. We tested this competing hypothesis using hierarchical multiple regressions with interactions represented by product terms (Aiken & West, 1991) and ensured all of the conditions for omnibus regression analysis, reducing substantially the chances of Type I errors. In these hierarchical multiple regression analyses, PTSD symptom scores served as criterion variables and insecure attachment orientation scores (attachment anxiety and avoidance), perceived social support, and all two-way interactions served as predictors. The Attachment Avoidance × Attachment Anxiety dimensions interaction was also included in this analysis to determine whether a particular region of the two-dimensional space (i.e., specific attachment style; see Figure 1) is strongly responsible for the effect of high attachment anxiety on PTSD symptoms. For example, if the effect were due to preoccupied people rather than to people who were simply anxious, we would see a significant interaction between anxiety and avoidance in the regression analysis.

To control for collinearity of variables with their interaction terms, we calculated centered versions of each variable, and interaction terms based on the centered variables were entered into a regression model. The results indicated that, in our data set, Baron and Kenny's (1986) conditions for moderation were not satisfied.

Discussion

This study was conducted in a sample of Israeli students who were forced to evacuate a college campus in southern Israel because of missile attacks, which occurred as part of a recent armed conflict between Israel and the Hamas regime in the Gaza Strip (December 2008–January 2009).

Studies conducted following the 9/11 terror attacks have suggested that the prevalence of PTSD is higher among persons closer to the site of an attack than among those in distant areas (Jordan et al., 2004; Neria et al., 2006; Schlenger et al., 2002). Our data suggest that intensity of exposure to a traumatic event, as represented by the amount of time one has to run for cover after hearing air-raid sirens, is not associated with reported levels of PTSD symptoms. This finding is consistent with a number of Israeli studies that failed to demonstrate positive associations between psychological distress and proximity to disaster (e.g., Bleich et al., 2003; Shalev et al., 2006; Somer, Ruvio, Soref, & Sever, 2005). The lack of secure geographic distance may partially explain this pattern among civilians living in countries in which they are continuously exposed to traumatic events. Thus, regardless of the intensity of the exposure to the traumatic threat (e.g., the amount

of time one has in which to take cover before the rocket or missile lands), our findings suggest that the evacuation did not yield an improved sense of safety among evacuees who continued to be exposed to missile attacks as indicated by the lack of differences in their PTSD levels. Although it is not intuitive, intensity of exposure is not necessarily a strong predictor of PTSD, at least within the range of intensities of exposure examined in this study.

Our findings indicate that 20% of the sample met the criteria for current probable PTSD, a high estimate that is generally in line with previous studies documenting PTSD among individuals exposed to large-scale violent events (e.g., see reviews in Galea et al., 2002; Neria et al., 2008; Norris et al., 2002). We refer to this outcome as *current probable PTSD* to acknowledge that symptoms determined through the use of a screening instrument do not necessarily indicate whether an individual meets diagnostic criteria (as suggested by North & Pfefferbaum, 2002).

The magnitude of our finding is in line with a previous study of university students exposed to a bus bombing. That study found that 18% of the students exposed to the attack met the diagnostic criteria for PTSD 6 months after the event (Gil, 2005). However, the magnitude of our findings is significantly higher than that reported by Palmieri et al. (2008) in a study examining the impact of the Israel–Hezbollah war. Palmieri et al. reported that only 7.2% of their surveyed population met the diagnostic criteria for PTSD. Several methodological and sample characteristics might explain the differences in the prevalence of PTSD prevalence in the two studies. Whereas Palmieri and colleagues used a nationally representative sample, our study was conducted using a selected sample of young adults who were all exposed to some level of direct threat. In addition, the two studies used different PTSD measures, which prohibit direct comparison of the findings.

Our results show that anxious attachment among individuals exposed to ongoing traumatic events is significantly associated with levels of PTSD symptoms, and that low levels of perceived social support are associated with increased levels of PTSD symptoms. These findings can be explained by a twofold process. First, anxiously attached individuals are less resilient to life threat and are, therefore, more likely to exhibit high levels of PTSD symptoms. Second, individuals who perceive their social networks as being unsupportive under situations of continuous stress may exhibit elevated anxiety levels in the form of PTSD symptoms. A possible speculation as to how anxious individuals interact with their social systems might be that anxiously attached individuals tend to overreact to their negative feelings in order to elicit support from others (Mikulincer & Florian, 1995).

The use of social resources in extremely stressful situations undoubtedly puts immense pressure on these relationships, possibly exacerbating the influence of negative attachment orientations. This would be an extension of and consistent with the deterioration model of social support proposed by Kaniasty and Norris (1995) and the "pressure-cooker effect" described by Hobfoll and London (l986).

Future research should investigate whether highly anxiously attached individuals facing extreme traumatic stress may become overly needy and overtax significant others. Given that the participants were still within the range of missile attacks, it seems reasonable to assume that their significant others were experiencing the same life-threatening events. This situation may have aggravated individuals' negative moods, as loved ones in a similar situation of shared fears and worries may be less capable of offering support. Cutrona and Russell (1990) have suggested that the need for occasional external reassurance may become especially great in stressful situations that prompt an individual to maintain proximity to others and seek social support. It remains unclear how negative attachment orientations might interrelate with this natural affiliative process.

Our findings support the validity of a mediational model in which low levels of perceived social support mediate the association between attachment anxiety and PTSD. The positive link between attachment anxiety and the need for reassurance from others (e.g., Davila, 2001; Lopez, 2001) and the positive link between the need for reassurance from others and psychopathology (e.g., Joiner & Metalsky, 2001) may shed light on this finding. It is plausible that, in highly stressful situations, when proximity-seeking behavior of individuals with high levels of attachment anxiety fails to accomplish its protective function, it may increase their vulnerability. Further studies should investigate the possible mediational role of reassurance seeking in the attachment anxiety, low social support, and PTSD association.

Taken as a whole, the present study's main findings demonstrate the vulnerability of individuals scoring high for the attachment anxiety orientation, as compared with those scoring high for the avoidance orientation. Individuals with high attachment anxiety scores reported low levels of social support, which, in turn, were associated with higher levels of PTSD symptoms. This finding is consistent with those of previous studies that have documented the link between attachment anxiety orientation and psychological distress (Mallinckrodt & Wei, 2005; Wei, Heppner, & Mallinckrodt, 2003; Wei, Russell, Mallinckrodt, & Zakalik, 2004) and PTSD (Declercq & Willemsen, 2006), as well as with those of a study that documented the association between the attachment avoidance regulation strategy and decreased sensitivity to stress (Lopez & Brennan, 2000). Individuals with different attachment orientations seem to differ in the strategies they use to deal with distress, as well as in their associated symptomatology. Those scoring high for the attachment anxiety orientation may be hypervigilant to sources of distress and hypersensitive to the problems they experience, whereas individuals scoring high for the avoidance attachment orientation seem to divert negative emotions from awareness (Kobak & Sceery, 1988; Mikulincer, Florian, & Tolmatz, 1990).

In the context of the present study, such inhibition and suppression of emotional experiences seem to be an effective defense, at least on the level of manifest symptoms. However, and consistent with the deactivation strategy, it is also possible that the apparent lack of any effect of attachment avoidance could be due to highly avoidant participants denying PTSD symptoms as opposed to not experiencing them. The persistent harmful effects of extreme and continuous traumatic events may have a significant negative impact on the sense of safety of individuals scoring high on the attachment anxiety orientation, posing great challenges to their ability to maintain attachment capacities, such as supportive interpersonal relationships.

Furthermore, the results of our study are in line with the notion that traumatic stress often challenges social relationships, highlighting the role of early and ongoing attachment orientations in predicting differential outcomes (e.g., Solomon, Dekel, & Mikulincer, 2008). Moreover, the findings of the present study pro-

vide support for theoretical frameworks that have addressed adaptation to trauma, such as social cognition theories (see Benight in this issue). It is interesting that the role that attachment theorists have assigned to working models of the self and others is somewhat similar to the role played by cognitive–affective schemas in social cognition theories (e.g., Baldwin, 1992; Fiske & Taylor, 1991). Both theories emphasize the extent to which people subjectively construct social experiences, store representations of these experiences (working models in attachment theory and schemas, prototypes or scripts in social cognition), and use these representations in understanding new social experiences and formulating action plans. In both theoretical approaches, mental representations guide and coordinate the regulation of emotions, personal perceptions, and goal striving in interpersonal settings.

The findings of this study have a number of clinical implications. Our findings suggest the importance of personality evaluations in the provision of mental health treatment and prevention programs among exposed populations in war-like situations. Moreover, our findings point to perceived availability of social support as a most valuable resource among anxiously attached individuals, suggesting that mental health personnel should consider developing programs that will enhance social support in general and among anxiously attached individuals in particular. In this respect, the development of interventions for highly anxiously attached individuals may include strategies to modify their frequent tendency for emotional hyperactivation. Promoting a sense of attachment security may contribute to the reconstruction of comforting, health-sustaining beliefs that might have been shattered by trauma and, consequently, might enhance the opportunities for recruiting support.

There are several limitations to this study. Our sample was small and relatively homogeneous in terms of demographics and trauma exposure. Because of the unique circumstances under which it was conducted, this study did not include a control group of evacuated students located outside the range of the missile fire. (None of the students who responded to our invitation to participate in the study had relocated beyond the range of the missile fire.) This limited the range of levels of intensity of exposure that could be evaluated.

In addition, its cross-sectional nature limits any assignment of causality; our model cannot provide a definitive answer to the question of the direction of the observed effects. One might argue a possible alternative interpretation of the study findings, implying that attachment orientations may have been affected by the stressful life-threatening situation. Because attachment style was measured during the war, it is possible that those who experienced high levels of PTSD symptoms during the war or ongoing anxiety also reported less availability of social support. However, this possibility can be discounted because there were no differences in the levels of attachment orientations, the levels of PTSD symptoms, or the levels of perceived support reported by individuals located in the different alarm zones. In a recent study, Mikulincer, Shaver, and Horesh (2006) examined the causal role of attachment in the development of PTSD. Their study reported on Israelis' psychological reactions during the 2003 U.S.–Iraq war (during which Israel came under missile attack) and examined the effect of attachment orientations measured before the war on PTSD symptoms assessed daily for 21 days. Their findings indicate that attachment shapes daily responses to the trauma of war. They also reported that anxiously attached individuals exhibited more war-related PTSD symptoms, as was found in the present study. Future studies on attachment that use a longitudinal design from childhood into adulthood will be able to supply the strongest test of early childhood attachment and subsequent responses during and following a major trauma.

Despite its limitations, our naturalistic study investigated a unique phenomenon that may well have significant ecological validity. The study focused on participants reporting on their experiences as they occurred, under "in vivo" life-threatening conditions. Moreover, to the best of our knowledge, the present study represents the first attempt to study attachment dimensions and their associations with social support and PTSD among war-zone evacuees experiencing life-threatening attacks. In addition, our findings indicate the need to take both interpersonal and intrapersonal processes into account in the investigation of responses to life-threatening events. These findings highlight the importance of intrapersonal resources (internal working models of attachment) and individuals' perceptions of interpersonal resources (perceived social support) as important sources of vulnerability. The evidence that levels of perceived social support mediate the association between insecure attachment and PTSD symptoms points to the possibility that internal models of insecure attachment may include an important, active intrapsychic component that regulates person–environment interactions.

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

Arbuckle, J. L. (1999). *AMOS: A structural equation modeling program.* Chicago: Small Waters.

Baldwin, M. W. (1992). Relational schemas and the processing of social information. *Psychological Bulletin, 112,* 461–484.

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.

Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four-category model. *Journal of Personality and Social Psychology, 61,* 226–244.

Besser, A., & Neria, Y. (2009). PTSD symptoms, satisfaction with life, and prejudicial attitudes toward the adversary among Israeli civilians exposed to ongoing missile attacks. *Journal of Traumatic Stress, 22,* 268–275.

Besser, A., Neria, Y., & Haynes, M. (2009). Adult attachment, perceived stress, and PTSD among civilians continuously exposed to terrorism in southern Israel. *Personality and Individual Differences, 47,* 851–857.

Besser, A., & Priel, B. (2003). A multisource approach to self-critical vulnerability to depression: The moderating role of attachment. *Journal of Personality, 71,* 515–555.

Besser, A., & Priel, B. (2005). The apple does not fall far from the tree: Attachment styles and personality vulnerabilities to depression in three generations of women. *Personality and Social Psychology Bulletin, 31,* 1052–1073.

Besser, A., & Priel, B. (2006). Models of attachment, confirmation of positive affective expectations and satisfaction with vacation activities: A pre–post panel design study of leisure. *Personality and Individual Differences, 41,* 1055–1065.

Besser, A., & Priel, B. (2009). Emotional responses to a romantic partner's imaginary rejection: The roles of attachment anxiety, covert narcissism, and self-evaluation. *Journal of Personality, 77,* 287–325.

Besser, A., & Priel, B. (2010). Personality vulnerability, low social support, and maladaptive cognitive emotion regulation under ongoing exposure to terrorist attacks. *Journal of Social and Clinical Psychology.*

Besser, A., Priel, B., & Wiznitzer, A. (2002). Childbearing depressive symptomatology in high-risk pregnancies: The roles of working models and perceived spouse support. *Personal Relationships, 9,* 395–413.

Bleich, A., Gelkopf, M., & Solomon, Z. (2003). Exposure to terrorism, stress-related mental health symptoms, and coping behaviors among a nationally representative sample in Israel. *Journal of the American Medical Association, 290,* 612–620.

Bowlby, J. (1980). *Attachment and loss: Vol. 3. Loss, sadness, and depression.* New York: Basic Books.

Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In I. Simpson & W. S. Roles (Eds.), *Attachment theory and close relationships* (pp. 46–76). New York: Guilford Press.

Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 68,* 748–766.

Canty-Mitchell, J., & Zimet, G. D. (2000). Psychometric properties of the Multidimensional Scale of Perceived Social Support in urban adolescents. *American Journal of Community Psychology, 28,* 391–400.

Cassidy, J., & Kobak, R. R. (1988). Avoidance and its relation to other defensive processes. In J. Belsky & T. Tezworski (Eds.), *Clinical implications of attachment* (pp. 300–323). Hillsdale, NJ: Erlbaum.

Charuvastra, A., & Cloitre, M. (2008). Social bonds and PTSD. *Annual Review of Psychology, 59,* 301–328.

Coble, H. M., Gantt, D. L., & Mallinckrodt, B. (1996). Attachment, social competency, and the capacity to use social support. In G. R. Pierce & B. R. Sarason (Eds.), *Handbook of social support and the family* (pp. 141–172). New York: Plenum Press.

Cohen, E., Dekel, R., & Solomon, Z. (2002). Long-term adjustment and the role of attachment among Holocaust child survivors. *Personality and Individual Differences, 33,* 299–310.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98,* 310–357.

Cutrona, C. E., & Russell, D. W. (1987). The provisions of social relationships and adaptation to stress. In W. H. Jones & D. Perlman (Eds.), *Advances in personal relationships* (Vol. 1, pp. 37–67). Greenwich, CT: JAI Press.

Cutrona, C. E., & Russell, D. W. (1990). Type of social support and specific stress: Toward a theory of optimal matching. In B. R. Sarason, I. G. Sarason, & G. R. Pierce (Eds.), *Social support: An interactive view* (pp. 319–366). New York: Wiley.

Davila, J. (2001). Refining the association between excessive reassurance seeking and depressive symptoms: The role of related interpersonal constructs. *Journal of Social and Clinical Psychology, 20,* 538–559.

Declercq, F., & Willemsen, J. (2006). Distress and post-traumatic stress disorders in high risk professionals: Adult attachment style and the dimensions of anxiety and avoidance. *Clinical Psychology and Psychotherapy, 13,* 256–263.

Dekel, R., Solomon, Z., Ginzburg, K., & Neria, Y. (2004). Long-term adjustment among Israeli war veterans: The role of attachment style. *Anxiety, Stress, & Coping, 17,* 141–152.

Dieperink, M., Leskela, J., Thuras, P., & Engdahl, B. (2001). Attachment style classification and posttraumatic stress disorder in former prisoners of war. *American Journal of Orthopsychiatry, 71,* 374–378.

Dolbier, C. L., & Steinhardt, M. A. (2000). The development and validation of the Sense of Support Scale. *Behavioral Medicine, 25,* 167–179.

Fiske, S. T., & Taylor, S. E. (1991). *Social cognition.* New York: McGraw-Hill.

Fraley, R. C., Fazzari, D. A., Bonanno, G. A., & Dekel, S. (2006). Attachment and psychological adaptation in high exposure survivors of the September 11th attack on the World Trade Center. *Personality and Social Psychology Bulletin, 32,* 538–551.

Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item-response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology, 78,* 350–365.

Frazier, P. A., Tix, A. P., & Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of Counseling Psychology, 51,* 115–134.

Galea, S., Ahern, J., Resnick, H., Kilpatrick, D., Bucuvalas, M., Gold, J., & Vlahov, D. (2002). Psychological sequelae of the September 11 terrorist attacks in New York City. *New England Journal of Medicine, 346,* 982–987.

Gil, S. (2005). Coping style in predicting posttraumatic stress disorder among Israeli students. *Anxiety, Stress, & Coping, 18,* 351–359.

Grossmann, K. E., Grossmann, K., & Waters, E. (Eds.). (2005). *Attachment from infancy to adulthood.* New York: Guilford Press.

Haber, M. G., Cohen, J. L., Lucas, T., & Baltes, B. B. (2007). The relationship between self-reported received and perceived social support: A meta-analytic review. *American Journal of Community Psychology, 39,* 133–144.

Hammen, C. L., Burge, D., Daley, S. E., Davila, J., Paley, B., & Rudolph, K. D. (1995). Interpersonal attachment cognitions and predictions of symptomatic responses to interpersonal stress. *Journal of Abnormal Psychology, 104,* 436–443.

Hazan, C., & Shaver, P. R. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology, 52,* 511–524.

Hobfoll, S. E. (1991). Traumatic stress: A theory based on rapid loss of resources. *Anxiety Research, 4,* 187–197.

Hobfoll, S. E., Canetti-Nisim, D., & Johnson, R. (2006). Exposure to terrorism, stress-related mental health symptoms, and defensive coping among Jews and Arabs in Israel. *Journal of Consulting and Clinical Psychology, 74,* 207–218.

Hobfoll, S. E., & London, P. (1986). The relationship of self-concept and social support to emotional distress among women during war. *Journal of Social and Clinical Psychology, 4,* 189–203.

Holahan, C. J., Moos, R. H., Holahan, C. K., & Cronkite, R. C. (1999). Resource loss, resource gain, and depressive symptoms: A 10-year model. *Journal of Personality and Social Psychology, 77,* 620–629.

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.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6,* 1–55.

Joiner, T. E., & Metalsky, G. I. (2001). Excessive reassurance-seeking: Delineating a risk factor involved in the development of depressive symptoms. *Psychological Science, 12,* 371–378.

Jordan, N. N., Hoge, C. W., Tobler, S. K., Wells, J., Dydek, G. J., & Egerton, W. E. (2004). Mental health impact of 9/11 Pentagon attack: Validation of a rapid assessment tool. *American Journal of Preventative Medicine, 26,* 284–293.

Kaniasty, K., & Norris, F. H. (1995). In search of altruistic community: Patterns of social support mobilization following Hurricane Hugo. *American Journal of Community Psychology, 23,* 447–477.

Kelloway, E. K. (1998). *Using LISREL for structural equation modeling: A researcher's guide.* Newbury Park, CA: Sage.

King, D. W., King, L. A., Foy, D. W., Keane, T. M., & Fairbank, J. A. (1999). Posttraumatic stress disorder in a national sample of female and male Vietnam veterans: Risk factors, war-zone stressors, and resilience-recovery variables. *Journal of Abnormal Psychology, 108,* 164–170.

Kobak, R. R., & Sceery, A. (1988). Attachment in late adolescence:

Working models, affect regulation, and representations of self and others. *Child Development, 59,* 135–146.

Lepore, S. J., Evans, G. W., & Schneider, M. L. (1991). Dynamic role of social support in the link between chronic stress and psychological distress. *Journal of Personality and Social Psychology, 61,* 899–909.

Lopez, F. G. (2001). Adult attachment orientations, self–other boundary regulation, and splitting tendencies in a college sample. *Journal of Counseling Psychology, 48,* 440–446.

Lopez, F. G., & Brennan, K. A. (2000). Dynamic processes underlying adult attachment organization: Toward an attachment theoretical perspective on the healthy and effective self. *Journal of Counseling Psychology, 47,* 283–301.

MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7,* 83–104.

Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A move to the level of representation. *Monographs of the Society for the Research in Child Development, 50,* 66–104.

Mallinckrodt, B., Abraham, T. W., Wei, M., & Russell, D. W. (2006). Advance in testing statistical significance of mediation effects. *Journal of Counseling Psychology, 53,* 372–378.

Mallinckrodt, B., & Wei, M. (2005). Attachment, social competence, social support, and psychological distress. *Journal of Counseling Psychology, 52,* 358–367.

Maunder, R. G., & Hunter, J. J. (2001). Attachment and psychosomatic medicine: Developmental contributions to stress and disease. *Psychosomatic Medicine, 63,* 556–567.

Mikulincer, M., Birnbaum, G., Woddis, D., & Nachmias, O. (2000). Stress and accessibility of proximity-related thoughts: Exploring the species-typical and intra-individual components of attachment theory. *Journal of Personality and Social Psychology, 78,* 509–523.

Mikulincer, M., & Florian, V. (1995). Appraisal of and coping with a real-life stressful situation—The contribution of attachment styles. *Personality and Social Psychology Bulletin, 21,* 406–414.

Mikulincer, M., Florian, V., & Tolmatz, R. (1990). Attachment styles and fear of personal death: A case study of affect regulation. *Journal of Personality and Social Psychology, 58,* 273–280.

Mikulincer, M., Florian, V., & Weller, A. (1993). Attachment style, coping strategies, and posttraumatic psychological distress: The impact of the Gulf War in Israel. *Journal of Personality and Social Psychology, 64,* 817–826.

Mikulincer, M., Horesh, N., Eilati, I., & Kotler, M. (1999). The association between adult attachment style and mental health in extreme life-endangering conditions. *Personality and Individual Differences, 27,* 831–842.

Mikulincer, M., & Shaver, P. R. (2003). The attachment behavioral system in adulthood: Activation, psychodynamic, and interpersonal processes. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 35, pp. 53–152). San Diego, CA: Academic Press.

Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics, and change.* New York: Guilford Press.

Mikulincer, M., Shaver, P. R., & Horesh, N. (2006). Attachment bases of emotion regulation and posttraumatic adjustment. In D. K. Snyder, J. A. Simpson, & J. N. Hughes (Eds.), *Emotion regulation in couples and families: Pathways to dysfunction and health* (pp. 77–99). Washington, DC: American Psychological Association.

Mikulincer, M., Shaver, P. R., & Pereg, D. (2003). Attachment theory and affect regulation: The dynamics, development, and cognitive consequences of attachment-related strategies. *Motivation and Emotion, 27,* 77–102.

Neria, Y., Gross, R., Olfson, M., Gameroff, M., Wickramaratne, P., Das, A., . . . Weissman, M. M. (2006). Posttraumatic stress disorder in primary care one year after the 9/11 attacks. *General Hospital Psychiatry, 28,* 213–222.

Neria, Y., Guttmann-Steinmetz, S., Koenen, K., Levinovsky, L., Zakin, G., & Dekel, R. (2001). Do attachment and hardiness relate to each other and to mental health in real-life stress? *Journal of Social and Personal Relationships, 18,* 844–858.

Neria, Y., Nandi, A., & Galea, S. (2008). Posttraumatic stress disorder following disasters: A systematic review. *Psychological Medicine, 38,* 467–480.

Norris, F., Friedman, M., Watson, P., Byrne, C., Diaz, E., & Daniasty, K. (2002). 60,000 disaster victims speak: I. An empirical review of the empirical literature, 1981–2001. *Psychiatry, 65,* 207–239.

Norris, F. H., & Kaniasty, K. (1996). Received and perceived social support in times of stress: A test of the social support deterioration deterrence model. *Journal of Personality and Social Psychology, 71,* 498–511.

North, C. S., & Pfefferbaum, B. (2002). Research on the mental health effects of terrorism. *Journal of the American Medical Association, 288,* 633–636.

Ozer, E. J., Best, S. R., Lipsey, T. L., & Weiss, D. S. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. *Psychological Bulletin, 129,* 52–73.

Palmieri, P. A., Galea, S., Canetti-Nisim, D., Johnson, R. J., & Hobfoll, S. E. (2008). The psychological impact of the Israel–Hezbollah war on Jews and Arabs in Israel: The impact of risk and resilience factors. *Social Science & Medicine, 67,* 1208–1216.

Quittner, A. L., Gluekauf, R. L., & Jackson, D. N. (1990). Chronic parenting stress: Moderating versus mediating effects of social support. *Journal of Personality and Social Psychology, 59,* 1266–1278.

Russell, D., & Cutrona, C. E. (1991). Social support, stress, and depressive symptoms among the elderly: Test of a process model. *Psychology and Aging, 6,* 190–201.

Sarason, B. R., Pierce, G. R., Shearin, E. N., Sarason, I. G., Waltz, J. A., & Poppe, L. (1991). Perceived social support and working models of self and actual others. *Journal of Personality and Social Psychology, 60,* 273–287.

Sarason, B. R., Shearin, E. N., Pierce, G. R., & Sarason, I. G. (1987). Interrelations of social support measures: Theoretical and practical implications. *Journal of Personality and Social Psychology, 52,* 813–832.

Sarason, I. G., Pierce, G. R., & Sarason, B. R. (1990). Social support and interactional processes: A triadic hypothesis. *Journal of Social and Personal Relationships, 7,* 495–506.

Sarason, I. G., Sarason, B. R., & Shearin, E. (1986). Social support as an individual difference variable: Its stability, origins and relational aspects. *Journal of Personality and Social Psychology, 50,* 845–855.

Schlenger, W. E., Caddell, J. M., Ebert, L., Jordan, B. K., Rourke, K. M., Wilson, D., . . . Kulka, R. A. (2002). Psychological reactions to terrorist attacks: Findings from the national study of Americans' reactions to September 11. *Journal of the American Medical Association, 288,* 581–588.

Shalev, A. Y., Tuval, R., Frenkiel-Fishman, S., Hadar, H., & Eth, S. (2006). Psychological responses to continuous terror: A study of two communities in Israel. *American Journal of Psychiatry, 163,* 667–673.

Shalev, A. Y., Tuval-Mashiach, R., & Hadar, H. (2004). Posttraumatic stress disorder as a result of mass trauma. *Journal of Clinical Psychiatry, 65,* 4–10.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and non-experimental studies: New procedures and recommendations. *Psychological Methods, 7,* 422–445.

Smith, B. W., & Freedy, J. R. (2000). Psychosocial resource loss as a mediator of the effects of flood exposure on psychological distress and physical symptoms. *Journal of Traumatic Stress, 13,* 349–357.

Smith, M. Y., Redd, W., DuHamel, K., Vickberg, S. J., & Ricketts, P. (1999). Validation of the PTSD Checklist—Civilian Version in survivors of bone marrow transplantation. *Journal of Traumatic Stress, 12,* 485–499.

Sobel, M. E. (1982). Asymptotic intervals for indirect effects in structural equation models. In S. Leinhart (Ed.), *Sociological methodology* (pp. 290–312). San Francisco: Jossey-Bass.

Solomon, Z., Benbenishty, R., Neria, Y., Abramovitz, 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., Dekel, R., & Mikulincer, M. (2008). Complex trauma of war captivity: A prospective study of attachment and PTSD. *Psychological Medicine, 38,* 1427–1434.

Solomon, Z., Ginzburg, K., Mikulincer, M., Neria, Y., & Ohry, A. (1998). Coping with war captivity: The role of attachment style. *European Journal of Personality, 12,* 271–285.

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.

Somer, E., Ruvio, A., Soref, E., & Sever, I. (2005). Terrorism, distress, and coping: High- versus low-impact regions and direct versus indirect civilian exposure. *Anxiety, Stress, & Coping, 18,* 165–182.

Thompson, M. P., Kaslow, N. J., Kingree, J. B., Rashid, A., Puett, R.,

Jacobs, D., & Matthews, A. (2000). Partner violence, social support, and distress among inner-city African American women. *American Journal of Community Psychology, 28,* 127–143.

Vogel, D. L., & Wei, M. (2005). Adult attachment and help-seeking intent: The mediating roles of psychological distress and perceived social support. *Journal of Counseling Psychology, 52,* 347–357.

Wei, M., Heppner, P. P., & Mallinckrodt, B. (2003). Perceived coping as a mediator between attachment and psychological distress: A structural equation modeling approach. *Journal of Counseling Psychology, 50,* 438–447.

Wei, M., Russell, D. W., Mallinckrodt, B., & Zakalik, R. A. (2004). Cultural equivalence of adult attachment across four ethnic groups: Factor structure, structured means, and associations with negative mood. *Journal of Counseling Psychology, 51,* 408–417.

Zakin, G., Solomon, Z., & Neria, Y. (2003). Hardiness, attachment style, and long-term psychological distress among Israeli POWs and combat veterans. *Personality and Individual Differences, 34,* 819–829.