

Mental Health and Posttraumatic Growth in Civilians Exposed to Ongoing Terror

TALI BAYER-TOPILSKY, HAYA ITZHAKY, and RACHEL DEKEL

Louis and Gabi Weisfeld School of Social Work, Bar-Ilan University, Ramat Gan, Israel

YARIV N. MARMOR

Division of Health Care Policy and Research, Mayo Clinic, Rochester, Minnesota, USA

This study investigated negative and positive emotional outcomes among civilians exposed to ongoing terror. The measures included direct, indirect, and subjective exposure to terror; human resources; posttraumatic stress (PTS) symptoms; distress; and posttraumatic growth (PTG). The results indicate that whereas direct exposure is not related to the outcomes, exposure of family members to terror is positively related to PTS and to PTG. Path analysis revealed an indirect relationship between subjective exposure and PTG mediated by PTS, suggesting the role of emotional suffering in inducing growth. Clinical implications of incorporating PTG strategies into the treatment of terror victims are discussed.

KEYWORDS *ongoing terror, PTG, PTSD*

Owing to the increasing threat of global terrorism, it is timely and important to address the emotional adaptation of victims to terror events. In countries such as Israel, Iraq, and India, terrorism has developed into an ongoing reality. To date, most studies have focused on the impact of individual terror attacks (Norris et al., 2002; North et al., 1999), and research on the impact of ongoing exposure to terror is still in its early stages (Bleich, Gelkopf, Melamed, & Solomon, 2006; Laufer & Solomon, 2009).

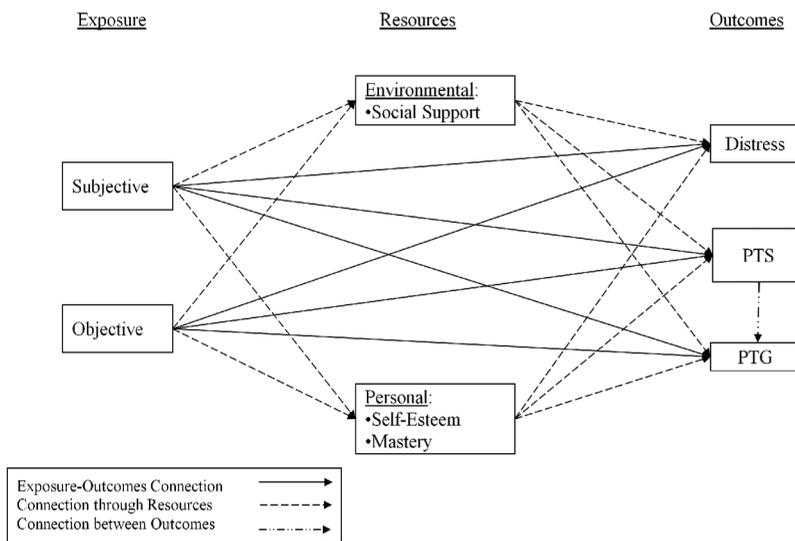
The purpose of the current study was to examine a theoretical model that attempts to identify correlates of mental health (i.e., levels of posttraumatic stress [PTS] symptoms and distress) and of posttraumatic growth (PTG) in

Received 1 October 2011; accepted 14 February 2012.

Address correspondence to Tali Bayer-Topilsky, Myers-JDC-Brookdale Institute, Jerusalem 91037, Israel. E-mail: talitopil@gmail.com

civilians living in areas highly exposed to ongoing terror. In the past, few studies examined both negative and positive trauma outcomes (Schuettler & Boals, 2011). The current model (see Figure 1) provides a *simultaneous* examination of the predictors of negative and positive trauma outcomes within the same sample by integrating central themes of three theoretical approaches: (a) posttraumatic stress disorder (PTSD) theories (e.g., Herman, 1997), (b) conservation of resources (COR) theory (Hobfoll, Dunahoo, & Monnier, 1995), and (c) PTG theories (Calhoun & Tedeschi, 2004; Joseph & Linley, 2005).

Based on an essential concept in the literature of emotional trauma (e.g., Herman, 1997) and posttraumatic growth (Calhoun & Tedeschi, 2004), objective exposure (i.e., the actual direct and indirect exposure to terror events) and subjective exposure (i.e., the subject's assessment of threat and horror caused by these events) are placed in the model as independent variables that correlate positively and directly to the outcomes (PTS, distress, and PTG) (see Figure 1). Additionally, based on COR theory (Hobfoll & de Vries, 1995), resources (self-esteem, mastery, and social support) serve as mediating variables—that is, resources are related to the exposure to terror, and they in turn correlate with negative and positive consequences of the trauma (PTS, distress, and PTG). Furthermore, another aim of the study was to explore the relationship between negative and positive consequences of the trauma. Relying on previous evidence that links PTG to PTS symptoms



Note. PTS = Posttraumatic symptoms; PTG = Posttraumatic growth.

FIGURE 1 The theoretical model.

(Helgeson, Reynolds, & Tomich, 2006; Laufer & Solomon, 2010) but not to global distress (Helgeson et al., 2006), PTS was placed as a unidirectional independent variable in relation to PTG. In this context, the model allowed for the examination of the relationship between PTS and PTG, over and above other correlations that were examined in the study. Next we review the current knowledge regarding the different variables and their interrelationships as presented in the proposed model.

EXPOSURE TO ONGOING TERROR AND ITS RELATIONS TO MENTAL HEALTH AND PTG

The current study was conducted at the end of the second Palestinian uprising (*Intifada*), a 4-year period of ongoing Palestinian-Israeli violence with dire consequences for both sides (Yaalon, 2005). We investigated both positive and negative trauma outcomes among Israelis living in areas where terror attacks occurred daily, at all hours of the day and night, which included different types of violence such as road ambushes, car bombs, and suicide bombings (Dekel & Nuttman-Shwartz, 2009).

Somer and Bleich (2005) suggested that exposure to ongoing terror within a broad population is a unique type of trauma. Wilson (1995) was the first to distinguish between this type of trauma (Type IV stress) and other traumatic situations described in the literature, such as exposure to a single traumatic event or recurrent harm as reflected in repeated torture of prisoners of war. This unique type of ongoing traumatic stress represents a basic change in the relationships between individuals and their environment (Somer & Bleich, 2005; Wilson, 1995). According to Somer and Bleich (2005), living in areas highly exposed to ongoing terror incidents may generate profound adjustment dilemmas, because the victims are unsure about the most effective way to defend themselves in their everyday life. Consequently, such individuals tend to develop hypervigilance, worry, and melancholy (Somer & Bleich, 2005).

The character of a traumatic event is perceived as the factor that has the strongest impact on the victim's mental health (Galea et al., 2002). Numerous studies have revealed a direct positive relationship between objective exposure to a traumatic event and levels of PTS and global distress (e.g., Norris et al., 2002). A positive association was also found between subjective exposure measures (assessments of threat and horror caused by a traumatic event) (American Psychiatric Association, 2000) and pathogenic effects (Gavrilovic, Lecic, Knezevic, & Priebe, 2002). Bleich et al. (2006) examined the adjustment of Israeli civilians to ongoing terror in the second Intifada. While their findings showed no correlation between objective exposure (actual exposure to terror events) and mental health, subjective exposure

was significantly and positively related to PTS. In other studies, both objective and subjective measures of exposure to ongoing terror were associated with PTS (Laufer & Solomon, 2006). Thus, the association between exposure to ongoing terror and mental health remains unclear.

Although literature on the aftermath of trauma has long focused on negative outcomes, there is a growing body of theory and evidence indicating that individuals may experience certain benefits from traumatic events (Helgeson et al., 2006; Laufer & Solomon, 2010). The term posttraumatic growth was originated by Tedeschi and Calhoun (1996) to describe positive psychological changes as a result of exposure to a traumatic event. These changes represent personal benefit and development that are consistently reported in three areas: self-perception, relationships with others, and changes in worldview. Positive changes have been reported after a wide range of traumatic life events such as bereavement, cancer diagnosis, and sexual assault (Linley & Joseph, 2004; Schuettler & Boals, 2011; Tedeschi & Calhoun, 1996).

Joseph and Linley (2005) proposed a comprehensive model that bridges the new approach of PTG with the social-cognitive theory of posttraumatic stress (Janoff-Bulman, 1992). The model is rooted in Rogers's concept of the organismic valuing process (OVP), claiming that human beings are naturally inclined toward personal goals in a pursuit of self-fulfillment (Rogers, 1959). In the aftermath of trauma, survivors' pre-traumatic assumptions about the world are shattered (Janoff-Bulman, 1992). Facing these shattered schemas, people tend to make sense and find meaning in their experience. According to Joseph and Linley, this cognitive process may result in assimilation of the traumatic experience (return to the pre-trauma baseline) or accommodation either in a negative direction (psychopathology) or in a positive direction (growth).

In a meta-analysis examining emotional growth in the aftermath of traumatic events, Helgeson et al. (2006) indicated that in most studies, both objective exposure and subjective perception of traumatic events were directly and positively related to growth. Also, in a study that assessed effects of exposure to ongoing terror on Israeli youth, objective and subjective measures of exposure were positively associated with emotional growth (Laufer & Solomon, 2006). Since growth is considered to emerge from trauma (Calhoun & Tedeschi, 2004), it is reasonable to expect that severity of the trauma is positively related to growth. However, a review by Staton et al. (2006) of studies among cancer patients implies that growth is positively related to *perceived* severity of the disease but not necessarily to the *objective* severity of the disease itself. Furthermore, some studies revealed a curvilinear correlation between exposure and growth (i.e., individuals exposed to moderate levels of exposure reported the highest levels of growth) (Powell, Rosner, Butollo, Tedeschi, & Calhoun, 2003), while other studies found no correlation between exposure to traumatic events and emotional growth

(Joseph & Linley, 2006). Hence, the relationship between exposure to trauma and PTG is far from being clarified.

RESOURCES AS MEDIATORS BETWEEN EXPOSURE, MENTAL HEALTH, AND PTG

Most theoretical approaches in the field of emotional trauma argue that exposure to traumatic events results in the loss of human resources (Herman, 1997; Hobfoll & de Vries, 1995). Empirical evidence usually supports this argument, suggesting that exposure to traumatic events decreases human resources including self-esteem (Ehigie, 2003), mastery (Flannery, Perry, & Harvey, 1993; Gurian, 2001), and social support (Keane, Owen, & Charoya, 1985). However, other findings indicate that exposure to war zone and political violence may increase personal resources such as self-esteem and mastery (Aldwin, Levenson, & Spiro, 1994; Baker, 1990). In the current study, we examined self-esteem, mastery, and social support as mediators between exposure and the outcomes assessed (PTS, distress, and PTG). These resource were selected because they are perceived in COR theory as most essential for coping with traumatic stress (Hobfoll & de Vries, 1995).

Self-esteem and sense of mastery are two dimensions of self-perception that are essential for a sense of cohesion (Sandler, 2001). There is broad consensus in the literature that these internal resources are related to low levels of PTS and distress (Boscarino et al., 2004). The importance of social support in the process of adjustment to a traumatic event has also been discussed in the theoretical and empirical literature. Two meta-analyses have revealed that lack of social support and life stress after the trauma are two of the most important predictors of PTS after trauma exposure (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003).

Compared with literature that focuses on the links between resources and mental health, research on the relationship between resources and PTG is relatively limited, and the findings are not consistent (Joseph & Linley, 2006; Schuettler & Boals, 2011). Although some of the studies have found that measures of self-perception (McMillen, Zuravin, & Rideout, 1995) and social support (Lev-Wiesel & Amir, 2003) correlate positively with PTG, other researchers have found no correlations between those variables (King, Scollon, Ramsey, & Williams, 2000; for a review, see Joseph & Linley, 2006).

THE RELATIONSHIP BETWEEN PTS AND PTG

Only a few studies have investigated the relationship between PTS and PTG (Laufer & Solomon, 2010). In an empirical review, Zoellner and Maerker (2006) reported that the correlation coefficient (r) between the measures of those concepts ranged from $= -.2$ to $= .2$ in samples such as former refugees

from Sarajevo (Powell et al., 2003) and spinal cord injury victims (Znoj, 1999). While some studies have reported a significant positive association between PTS and PTG (Cadell, Regehr, & Hemsworth, 2003), other studies have revealed negative links between those variables (Frazier, Conlon, & Glaser, 2001). Drawing on findings such as these, the OVP theory of growth through adversity (Joseph & Linley, 2005) suggests that PTS and PTG are not ends of a bipolar continuum but rather two separate, independent dimensions of well-being with a range of complex associations that should be further investigated.

Investigators argue that emotional growth takes time to emerge; therefore, measures of growth recorded soon after the traumatic event reflect perceived growth rather than actual growth (Helgeson et al., 2006; McFarland & Alvaro, 2000). Conversely, emotional growth measured at an extended time period after the event reflects actual growth (Helgeson et al., 2006). According to this concept, perceived growth is used by the individual as a cognitive coping strategy to reduce distress caused by the traumatic event. Hence, emotional growth may be related to poor mental health when assessed soon after the event and better mental health when assessed after more time has passed since the traumatic event occurred. Since we evaluated exposure to ongoing terror incidents soon after their occurrence, we hypothesized that a direct positive relationship would exist between poor mental health (higher levels of symptoms) and growth. Previous research efforts have proposed a relationship between PTS and PTG (Helgeson et al., 2006; Laufer & Solomon, 2010), but in most cases a relationship between global distress and PTG was lacking (Helgeson et al., 2006; Zoellner & Maercker, 2006). We therefore examined the correlation between PTS and PTG.

In summary, the proposed model addresses a void in the literature by simultaneously examining the effect of exposure to ongoing terror on negative and positive trauma outcomes, as well as the extent to which resources mediate this effect. In addition, the model provides a basis for examining the relationship between PTS and PTG.

METHOD

Participants

The sample of participants included 195 adult students (61.5% men) who attended institutions of higher education in Israel in areas that were at high risk for frequent terror (for example, roadside ambushes and suicide bombing). Participants ranged in age from 18 to 34 years ($M = 23.76$, $SD = 3.13$); 70 (36.1%) were married. Of the married participants, 49 (70%) had children. Nearly half of the participants (47.7%) slept in temporary accommodations near their schools, and slightly more than half (53.3%) returned home every night. Of the participants in the sample, 88.5% defined themselves as

religious, 4.2% as traditional, and 7.3% as secular. Finally, 45.1% of the participants assessed their income level as low, 47.8% as average, and 7.1% as high.

Instrument

The instrument included Hebrew versions of self-report questionnaires that were designed to assess several measures, as follows.

SOCIODEMOGRAPHIC CHARACTERISTICS

The sociodemographic questionnaire queried gender, age, family status, education level, and economic status. Income level was assessed by a question that presented the average income in Israel and asked participants to determine the level of their family income on a 5-point scale from 1 (*much below average*) to 5 (*much above average*).

EXPOSURE TO TERROR

This questionnaire was constructed for the present study on the basis of an instrument that was developed in Hebrew and was used in previous studies (Itzhaky & Dekel, 2005; Laufer & Solomon, 2009). The questionnaire aimed to examine the prevalence of exposure to different types of terror incidents among the participants. The participants were presented with a list of 11 types of terrorist attacks. Among the events included were shooting at their automobiles, car bombs, stone throwing, Molotov cocktails, and suicide bombings. For each type of event, participants were asked to indicate whether they had personally experienced the event, or whether family members or friends had been exposed to it. Three categorical variables were derived from the questionnaire: direct exposure (the participant had been exposed to a terror event; yes/no), exposure via family (a family member of the participant had been exposed to a terror event; yes/no), and exposure via friends (a friend of the participant had been exposed to a terror event; yes/no).

SUBJECTIVE PERCEPTIONS OF EXPOSURE TO TERROR

This questionnaire was designed originally in Hebrew to assess subjective exposure to trauma (Dekel, Solomon, Ginzburg, & Neria, 2003) and included seven items (e.g., due to the current political/security situation: "Were you in a situation where you thought you may never survive?" "To what extent do you feel your life is in danger?" "To what extent do you think your relatives or people that are dear to you are in danger?"). Participants were asked to indicate the extent to which they agreed with each statement on a 4-point

scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). An overall score was derived for this variable by computing the mean of the responses on the questionnaire. The Cronbach alpha reliability for the questionnaire used in this study was 0.75.

SELF-ESTEEM SCALE

Developed by Rosenberg (1965) and translated into Hebrew by Hobfoll and Walfisch (1984), this questionnaire consists of 10 statements that relate to an individual's self-esteem (e.g., "I take a positive attitude towards myself"). Responses were based on a 5-point scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). The Cronbach alpha validity of the questionnaire used in Hobfoll and Walfisch's study was 0.95, and the validity of the questionnaire used in the present study was 0.86. An overall score was derived by computing the mean of the responses on all of the items on the questionnaire.

SENSE OF MASTERY SCALE

Developed by Pearlin and Schooler (1978) and translated into Hebrew by Hobfoll and Walfisch (1984), this instrument consists of seven statements that relate to an individual's sense of mastery in life (e.g., "What happens to me in the future depends mainly on me"). Participants in the study were asked to indicate the extent to which they agreed with each statement on a scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). Hobfoll and Walfisch (1984) reported a high Cronbach alpha value for the internal consistency of the questionnaire used in their study (0.88); the internal consistency of the questionnaire used in this study was 0.86. An overall score was derived by computing the mean of the responses to the questionnaire items.

SOCIAL SUPPORT QUESTIONNAIRE

Developed by Zimet, Dahlen, Zimet, and Farley (1988) and translated into Hebrew, this questionnaire consists of 10 statements and examines people's subjective perceptions of the extent of social support they receive from three sources: family (e.g., "My family really tries to help me"), friends (e.g., "I have friends I can share my problems with"), and significant others ("I have someone close to me, who is there when I need him/her"). Participants were asked to indicate the extent to which each statement describes them on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*). Three separate scores were derived by computing the mean of the responses to the items on the questionnaire for each of the sources of support (friends, family, and significant others). The Cronbach alpha internal consistency of the instrument as reported in previous studies was as high as 0.90 (e.g., Kulik

& Kronfeld, 2005). In the present study, the internal consistency values were 0.92 for support from family, 0.90 for support from friends, and 0.84 for support from significant others.

PTSD INVENTORY

Developed by Solomon et al. (1993) in Hebrew, this instrument includes 17 statements that describe PTS (e.g., “images or thoughts of the terror attack that keep recurring”) over the past month. As the study was conducted in times of continuous terror, the introduction of the questionnaire asked participants to describe terror they had experienced recently. Responses were based on a 3-point scale ranging from 1 (*not at all*) to 3 (*to a great extent*). The statements were aggregated into three categories of symptoms in accordance with the guidelines of the DSM-IV TR: reexperiencing the trauma, avoidance of stimuli associated with the trauma, and hyperarousal. One overall score was derived by calculating the mean of the responses on the 17 items. Many studies conducted on trauma in Israel have used this questionnaire, and high Cronbach alpha reliabilities have been reported (e.g., 0.89; Dekel et al., 2003). The internal consistency of the questionnaire used in the present study was 0.84.

GENERAL HEALTH QUESTIONNAIRE (GHQ)

This screening device for identifying people who experience global distress was developed by Goldberg (1972) and translated into Hebrew. The short-form version of the questionnaire (GHQ-28) contains 28 statements (e.g., “Have you recently found everything getting on top of you?”). The statements derive from four content areas: somatic symptoms, anxiety, social dysfunction, and depression. Participants were asked to indicate the extent to which they had been experiencing each symptom on a 4-point Likert scale ranging from 1 (*not at all*) to 4 (*much more than usual*). The intercorrelations (Cronbach alphas) between the four scales in a previous study ranged from 0.69 to 0.90 (Goldberg, 1972). A general score was used in the present study. The Cronbach alpha internal consistency in the current study was high (0.89).

POSTTRAUMATIC GROWTH INVENTORY (PTGI)

Developed by Tedeschi and Calhoun (1996) and translated into Hebrew, this questionnaire aims to assess positive changes resulting from a traumatic experience. The inventory includes 21 items (e.g., “New opportunities are available which wouldn’t have been otherwise”) divided into five subscales: new possibilities, relating to others, personal strength, spiritual change, and appreciation of life. Based on the Hebrew version (Itzhaky & Dekel, 2005),

each item was scored on a 4-point Likert scale ranging from 1 (*I didn't experience this change*) to 4 (*I experienced this change to a very great extent*). One overall growth score was derived by computing the mean of all of the responses. High scores indicated that the participants experienced positive changes after terror events. A high Cronbach alpha internal consistency for the scale (0.90) and adequate test-retest reliability (0.70) have been reported in previous studies (Calhoun & Tedeschi, 2004). The internal consistency of the instrument used in the present study was 0.94.

Procedure

The study was conducted at institutions of higher education (Yeshivas, religious women's academies, and colleges) in the West Bank and in the Gaza area. Data were collected in July and August 2004, at the end of the Second Palestinian Intifada. The investigators approached the directors of all higher education institutions in the West Bank and in the Gaza area, a total of 11 institutions. We clarified the aim of the study to the directors and presented the questionnaires to them. Of the directors we approached, two declined to let us conduct the study at their institution. At the nine consenting institutions, members of the research team distributed questionnaires to all of the students after providing a brief explanation about the study and clarifying that the questionnaires were anonymous. Participants signed an informed consent form and completed the questionnaires independently. A week after distributing the questionnaires, the members of the research team returned to the participating institutions and collected the completed forms. Of the 209 questionnaires that were returned, 14 were eliminated because the data were incomplete.

RESULTS

The findings indicate that all of the participants were exposed to terror events (either directly or indirectly): 35% were directly exposed, 66% were exposed through a family member, and 43% through friends. We also evaluated the participants' subjective exposure to terror events. In order to examine the differences in the level of outcomes (PTS, distress, and PTG) between participants according to the objective exposure variables, we performed separate multifactor analyses of variance (MANOVAs) for each type of objective exposure—that is, direct exposure, exposure through friends, and exposure through family—such that participants were represented in each group accordingly. The analyses revealed significant differences in the level of outcomes only between participants whose families had been exposed to terror and those whose families had not been exposed, $F(3, 190) = 4.04$, $p < .01$. In addition, ANOVAs were conducted separately for

each of the outcome variables. ANOVAs revealed a significant difference between participants whose families had been exposed to terror and those whose families had not been exposed in terms of PTS ($M = 1.16$, $SD = 0.20$, and $M = 1.09$, $SD = 0.12$, respectively), $F(1, 191) = 5.57$, $p < .05$, $\eta^2 = 0.05$, and PTG ($M = 1.93$, $SD = 0.67$, and $M = 1.61$, $SD = 0.57$, respectively), $F(1, 191) = 10.63$, $p < .001$, $\eta^2 = 0.35$. These findings indicate that participants whose families had been exposed to acts of terror showed higher levels of PTS and higher levels of PTG than participants whose families had not been exposed.

Table 1 shows the intercorrelations of the variables. The intercorrelations indicate that participants who were exposed to terror via family and participants who perceived their level of exposure to terror (subjective exposure) as high had higher levels of PTS, as well as higher levels of PTG. Higher levels of subjective exposure were also related to higher levels of distress. Direct exposure and exposure via friends were not statistically related to any of the outcomes. All of the participants' resources (self-esteem, mastery, and family support) were negatively related to level of distress; self-esteem was also negatively related to PTS, and mastery was negatively related to PTS and to PTG. All of the resource variables were positively related to one another. PTS was positively related to distress and to PTG. Notably, no significant correlations were found between level of distress and PTG.

Based on the review of the literature and on the current univariate analysis results (see Table 1), a path analysis was employed using the AMOS program. The purpose of running the path analysis was to clarify which of the parameters that we found to be statistically significant (in the univariate

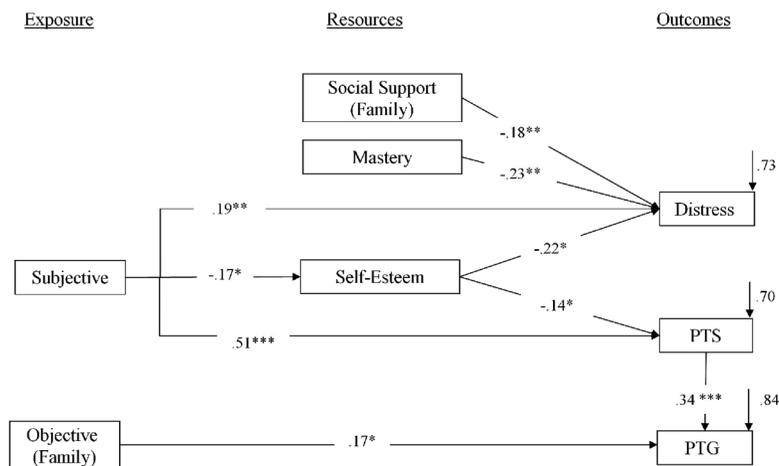
TABLE 1 Means, Standard Deviations (or Percentages), and Correlations of the 10 Measures.

Measure	<i>M (SD)</i> or %	1	2	3	4	5	6	7	8	9
1. PTSD	19.3 (3)									
2. PTG	1.8 (0.6)	.36***								
3. Distress	1.5 (0.2)	.29***	.04							
4. Exposure: subjective	1.5 (0.4)	.53***	.29***	.25**						
5. Exposure: family	66	.16*	.22**	.1	.31***					
6. Exposure: friends	43	.05	.01	.01	.23***	.28***				
7. Exposure: direct	35	.02	.08	.02	.15*	.33***	.20***			
8. Mastery	3.5 (0.5)	-.15*	-.15*	-.35***	-.15*	-.11	.06	.01		
9. Social support: family	5.9 (1.3)	.0	.12	-.28***	.04	-.02	-.07	.0	.11	
10. Self-esteem	4.1 (0.7)	-.23**	.01	-.40***	-.17*	-.04	-.01	.34***	.35***	.40***

* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed).

analysis) directly influenced the outcomes and which relied on a mediator (resource) to influence them. The path analysis included the variables for which significant correlations were found (see Table 1), and that could potentially contribute to the path model. The path model is presented in Figure 2. The path analysis was carried out as structural equation modeling (SEM) without errors (Cramer, 2003). Similar to multiple regression analyses, the model assumes no measurement error, yet it allows an index of fit that is not provided by multiple regression analyses. This index presents the extent to which the estimated parameters in the model can reproduce the original correlations in the data. In this context, it is important to note that a good fit does not necessarily indicate that the model is an accurate depiction of causation in reality, but only that it is not inconsistent with reality as indicated by the covariance matrix (Cramer, 2003). The analysis revealed that the goodness of fit was as follows: GFI = 0.99, AGFI = 0.94, RMR = 0.02, $\chi^2 = 11.36$, $df = 11$, $p = .413$. These results meet the following requirements: GFI and AGFI > 0.90, RMR < 0.05, and chi-square not significant ($p > .05$).

Figure 2 presents the standardized path coefficients for the model, which yield the following relationships. First, objective exposure via family exhibited a direct positive relationship to growth ($\beta = 0.17$, $df = 178$, $p < .05$). Second, subjective exposure exhibited a direct positive relationship to growth ($\beta = 0.19$, $df = 178$, $p < .05$). Second, subjective exposure exhibited a direct positive relationship to both distress ($\beta = 0.19$, $df = 178$, $p < .01$) and PTS ($\beta = 0.51$, $df = 178$, $p < .001$) and a direct negative relationship to self-esteem ($\beta = -0.17$, $df = 178$, $p < .05$); that is, participants who perceived their exposure to terror



* $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed)

Note. PTS = Posttraumatic symptoms; PTG = Posttraumatic growth.

FIGURE 2 Path analysis results: the interrelationship between exposure, resources, and outcomes.

as higher also showed lower levels of self-esteem, higher levels of distress, and higher PTS. Third, social support, mastery, and self-esteem displayed a direct positive relationship to distress ($\beta = -0.18$, $df = 178$, $p < .01$; $\beta = -0.23$, $df = 178$, $p < .01$; and $\beta = -0.22$, $df = 178$, $p < .05$, respectively). Fourth, self-esteem exhibited a direct negative relationship to PTS ($\beta = -0.14$, $df = 178$, $p < .05$). Finally, PTS displayed a direct positive relationship to PTG ($\beta = 0.34$, $df = 178$, $p < .001$). The higher the participants' levels of PTS, the higher their levels of PTG.

As described above, path analysis revealed no direct relationship between subjective exposure and PTG. However, a positive indirect relationship was found between those two variables, mediated by PTS ($\beta = 0.18$, $df = 178$, $p < .05$). Thus, the higher the level of subjective exposure to terror, the more the participants reported PTS that was directly related to PTG. Accordingly, the higher the level of subjective exposure to terror, the higher the level of PTG. Essentially, this indirect relationship was the only one that was found to be significant.

DISCUSSION

The current study investigated negative and positive trauma outcomes simultaneously among civilians who were exposed to ongoing terror. Specifically, the study examined (a) links of objective and subjective exposure to PTS, distress, and PTG; (b) human resources (self-esteem, mastery, and social support) as mediators between exposure variables and the outcomes (PTS, distress, and PTG); and (c) the relationship between PTS and PTG.

The findings revealed that objective exposure to terror via family links positively and directly to PTS and to PTG, yet direct exposure and exposure via friends were not related to the outcome variables. Conversely, subjective exposure was positively and directly related to all of the outcome variables (PTS, distress, and PTG). These findings are consistent with the results of preliminary studies indicating that in cases of exposure to ongoing terror, it is probably individuals' subjective evaluations of the threat that relate to poor mental health (Bleich et al., 2006; Gavrilovic et al., 2002). The current results, together with previous data (Laufer & Solomon, 2006), suggest that subjective exposure is significant not only to mental health (increased symptoms of PTS and distress) but also to PTG.

A question arises, why did exposure via family and subjective exposure correlate with the outcomes, whereas direct exposure and exposure via friends did not? A possible explanation for these findings relates to the type of exposure to terror that was examined in the present study. As mentioned in the introduction, investigators argue that ongoing exposure to terror within a broad population is a unique type of trauma (Somer & Bleich, 2005; Wilson, 1995). This particular type of trauma (Type IV stress, according

to Wilson, 1995) differs from other types of traumatic stress because it represents a basic change in the relationships between individuals and their environment that generates continuous uncertainty in daily life.

According to this concept, individuals who are exposed to ongoing terror tend to develop hypervigilance, worry, and melancholy (Somer & Bleich, 2005). Hence, it is possible that in situations of exposure to ongoing terror, poor mental health is caused by the potential threat and by the concern for one's relatives who were exposed to terror incidents, and not necessarily by a direct exposure to the actual violence that occurs. Our findings suggest that in situations of ongoing exposure to terror, the family's exposure (and concern for family members), as well as subjective assessments of exposure, are reflected not only in poor mental health but also in higher levels of PTG.

The findings regarding the relationship between subjective exposure and PTG are illuminating. In the path analysis, the model reflects the indirect relationship between subjective exposure to terror and PTG, mediated by PTS. Thus, the higher the level of subjective exposure, the higher the level of PTS, which in turn is associated with PTG. These findings are consistent with previous studies (Cadell et al., 2003; Helgeson et al., 2006; Zoellner & Maercker, 2006), which revealed a positive relationship between PTS and PTG. The significance of our findings is that they indicate that subjective exposure is related to higher levels of PTG only when such exposure is accompanied by PTS.

On the one hand, one can argue that the positive relationship between PTS and PTG supports Tedeschi and Calhoun's (1996) conception that the process of PTG includes suffering and pain caused by the traumatic exposure itself (Calhoun, Cann, & Tedeschi, 2010; Tedeschi & Calhoun, 1996). On the other hand, one can also argue that measures of growth recorded soon after traumatic events (as in the current study) reflect perceived growth of the individual rather than actual growth. Perceived growth may be used as a cognitive coping strategy to reduce distress caused by the traumatic event (Helgeson et al., 2006; McFarland & Alvaro, 2000).

In this context, Helgeson and colleagues (2006) revealed in their meta-analysis a positive correlation between intrusive/avoidance thoughts and emotional growth. Although intrusive and avoidance thoughts are considered to be characteristic symptoms following exposure to extreme traumatic stressors (American Psychiatric Association, 2000), the investigators suggested that they may also reflect attempts of cognitive processing of the traumatic event. Thus, experiencing these thoughts may signify that the individual is coping with the implications of the traumatic event, which could also be reflected in higher levels of PTG.

Regarding the relationships between resources and the outcomes, path analysis revealed that sense of mastery, self-esteem, and social support related significantly to distress. However, besides a minimal direct relationship of self-esteem to PTS, none of the other resources were significantly

related to those symptoms. These findings are surprising and contradict results of previous studies, which have found that personal resources (Boscarino, Adams, & Figley, 2004) and environmental resources (Brewin et al., 2000; Ozer et al., 2003) are correlated with less PTS. Thus, the question arises: Why did those resources correlate more strongly with distress than with PTS?

A possible answer may relate to the type of trauma examined in this study, that is, ongoing terror. It can be reasonably assumed that when people live under the constant threat of terror attacks, they face a situation of uncertainty that undermines their sense of mastery. Thus, in a situation of ongoing exposure to terror, the individual's resources may be related to coping with general feelings of stress such as depression or anxiety (i.e., the distress variable), but not to coping with symptoms that are directly associated with exposure to terror (i.e., the PTS variable).

Moreover, since individuals who are exposed to ongoing terror tend to develop hypervigilance and excessive concern (Somer & Bleich, 2005), environmental resources such as social support can intensify their psychological stress. Hobfoll and London (1986) argued that when an entire population is exposed to the same stressor (e.g., in a state of war and general conscription), intimate ties among people in a social network can create a "pressure cooker" effect where concern spreads and intensifies. The present study focused on residents of areas exposed to the highest levels of terror at the time. Hence, it is possible that such a "pressure cooker" effect was evident among that population.

With respect to the relationship between resources and PTG, path analysis revealed that none of the resources examined in this study were significantly related to PTG. A review of the literature showed that the evidence regarding this relationship is diverse (Joseph & Linley, 2006; Schuettler & Boals, 2011). The current results support previous findings suggesting that human resources are not related to PTG (King et al., 2000). It is possible that in situations of ongoing terror other mediators, such as cultural variables that were recently added to the PTG model (Calhoun et al., 2010), play a more significant role than resources in the PTG process. The need for further investigation of PTG predictors is thus echoed in the findings of the present study, as they demonstrate that although resources were significantly related to negative outcomes, they were not related to PTG.

Finally, the results of the multivariate analysis (path analysis) can shed light on the relatively weak relationship between the resources and the outcome variables (PTS, distress, and PTG). As mentioned, the analysis showed that subjective exposure has a direct effect on distress and a strong effect on PTS. In addition, path analysis revealed a strong indirect impact of subjective exposure on PTG, mediated by PTS. It is possible that during the period of the study, the participants' subjective sense of danger and concern for loved ones had a greater impact on their mental health and on the extent of PTG than did any of the internal or external resources.

CLINICAL IMPLICATIONS

Following terror attacks, mental health professionals are often positioned on the front line, providing help to victims of terror. In this respect, the current results have important implications. First, our findings imply that in a situation of ongoing terrorism, indirect victims are as vulnerable as victims who were directly exposed to terror, particularly family members of individuals who were directly exposed to terror events. Therefore, intervention plans should consider outreach and treatment of individuals indirectly exposed to ongoing regional terrorism.

Second, understanding of the paradoxical relationship between PTS and PTG (that may reflect either the victim's perceived or actual growth) revealed in this study is vital to the treatment of trauma victims. The pain caused by trauma can be enormous, and it is extremely important to reduce the suffering of survivors and promote their well-being. At the same time, we recommend that clinicians also attempt to encourage PTG. As Joseph and Linley (2005) posited, although people are motivated toward growth, this "inner voice" is not easy to hear. A clinician who listens actively and attentively to the survivor's inner voice toward growth may help facilitate the natural process of positive change in the aftermath of trauma.

LIMITATIONS OF THE STUDY

The study was conducted at the end of the second Palestinian uprising (Intifada) and reflects the emotional consequences of 4 years of exposure to terror among the population of participants. Because the data were collected so close to the events, which were still taking place, it is possible that the findings reflect a temporary state of the participants' mental health and PTG. In addition, the objective exposure variable in the study was dichotomous and did not reflect the number of events experienced by the subject. It may be preferable for future research investigating ongoing exposure to terror to take into account the number of events experienced by oneself, one's friends, and one's family. Since processes of adjustment and PTG develop over time, it would also be worthwhile to conduct a follow-up study among the same population after a given period of time has elapsed.

This study was cross-sectional, and as mentioned in the method section, path analysis cannot determine causality. For example, symptoms can certainly affect social support or self-esteem, with causal arrows going in directions opposite to those presented in our model. Also, the possibility of additional data collection is currently not feasible due to the altered situation (reduction in terror incidents) in our region.

Finally, the study aimed to examine a population that had an extremely high level of exposure to terror. The participants were students in institutions

of higher education in Israel in areas that were at high risk for frequent terror events. This was a unique population that comprised mainly young men with a strong right-wing ideological orientation and high levels of religiosity and education. A homogeneous population may have certain advantages: A sample population characterized by high education and defined ideology could serve as a control of these specific variables, yet caution should be exercised in generalizing the findings of the current study to other populations.

CONCLUSION

The findings of this study imply that posttraumatic growth occurs in civilians exposed to ongoing terror. The exposure of relatives to terror (i.e., objective exposure via family) and the manner in which individuals assess the danger (i.e., subjective exposure) are positively related to PTS and to PTG. These findings stress the need for outreach and treatment of indirect victims of continuous terrorism, particularly family members of individuals directly exposed to terror events. Moreover, the findings revealed a relationship between PTS and PTG, supporting the view that positive and negative aspects of trauma are interrelated, whereby emotional suffering can be a catalyst for emotional growth. Further research in areas experiencing ongoing terror is needed to enable the development of interventions that facilitate posttraumatic growth without overlooking the negative effects of trauma.

REFERENCES

- Aldwin, C. M., Levenson, M. R., & Spiro, A. (1994). Vulnerability and resilience to combat exposure: Can stress have lifelong effects? *Psychology and Aging, 9*, 34–44.
- American Psychiatric Association. (2000). *DSM-IV-TR 2000: Diagnostic and statistical manual of mental disorders*. Washington, DC: Author.
- Baker, A. M. (1990). The psychological impact of the Intifada on Palestinian children in the occupied West Bank and Gaza: An exploratory study. *American Journal of Orthopsychiatry, 60*, 496–505.
- Bleich, A., Gelkopf, M., Melamed, Y., & Solomon, Z. (2006). Mental health and resiliency following 44 months of terrorism: A survey of an Israeli national representative sample. *BMC Medicine, 27*, 4–21.
- Boscarino, J. A., Adams, R. E., & Figley, C. R. (2004). Mental health service use 1 year after the World Trade Center disaster: Implications for mental health care. *General Hospital Psychiatry, 26*, 346–358.
- Brewin, C. R., Andrews, B., & Valentine, D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 68*, 748–766.

- Cadell, S., Regehr, C. R., & Hemsworth, D. (2003). Factors contributing to post-traumatic growth: A proposed structural equation model. *American Journal of Orthopsychiatry*, *73*, 279–287.
- Calhoun, L. G., Cann, A., & Tedeschi, R. G. (2010). The posttraumatic growth model: Sociocultural considerations. In T. Weiss & R. Berger (Eds.), *Posttraumatic growth and culturally competent practice* (pp. 1–14). Hoboken, NJ: Wiley.
- Calhoun, L. G., & Tedeschi, R. G. (2004). The foundations of posttraumatic growth: New considerations. *Psychological Inquiry*, *15*, 93–102.
- Cramer, D. (2003). *Advanced quantitative data analysis*. Philadelphia, PA: Open University Press.
- Dekel, R., & Nuttman-Shwartz, O. (2009). Posttraumatic stress and growth: The contribution of cognitive appraisal and sense of belonging to the country. *Health & Social Work*, *34*, 87–96.
- Dekel, R., Solomon, Z., Ginzburg, K., & Neria, Y. (2003). War combat exposure, wartime performance and long-term adjustment among combatants. *Military Psychology*, *15*, 117–131.
- Ehigie, B. O. (2003). Comparative analysis of the psychological consequences of the traumatic experiences of cancer, HIV/AIDS, and sickle-cell anemia patients. *IFE Psychologia: An International Journal of Psychology in Africa*, *11*(3), 34–54.
- Flannery, R. B., Perry, J. D., & Harvey, M. R. (1993). A structured stress-reduction group approach modified for victims of psychological trauma. *Psychotherapy: Theory, Research, Practice, Training*, *30*, 646–650.
- Frazier, P., Conlon, A., & Glaser, T. (2001). Positive and negative life changes following sexual assault. *Journal of Consulting and Clinical Psychology*, *69*, 1048–1055.
- Galea, S., Resnick, H. S., Ahern, J., Gold, J., Bucavlas, M., Kilpatrick, D. G. . . . , Vlahov, D. (2002). Posttraumatic stress disorder in Manhattan, New York City, after the September 11th terrorist attacks. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, *79*, 340–353.
- Gavrilovic, J., Lecic, T. D., Knezevic, G., & Priebe, S. (2002). Predictors of posttraumatic stress in civilians 1 year after air attacks: A study of Yugoslavian students. *Journal of Nervous and Mental Disease*, *190*, 257–262.
- Goldberg, D. (1972). *The detection of psychiatric illness by questionnaire: A technique for the identification of nonpsychiatric illness*. London, England: Oxford University Press.
- Gurian, B. (2001). Anxiety in older adults: The reach for optimal care in private practice. *Journal of Geriatric Psychiatry*, *34*, 211–219.
- Helgeson, V. S., Reynolds, K. A., & Tomich, P. L. (2006). A meta-analytic review of benefit finding and growth. *Journal of Consulting and Clinical Psychology*, *74*, 797–816.
- Herman, J. (1997). *Trauma and recovery*. New York, NY: Basic Books.
- Hobfoll, S. E., & de Vries, W. (1995). *Extreme stress and communities: Impact and intervention*. Dordrecht, the Netherlands: Kluwer Academic.
- Hobfoll, S. E., Dunahoo, C. A., & Monnier, J. (1995). Conservation of resources and traumatic stress. In J. R. Freedy & S. E. Hobfoll (Eds.), *Traumatic stress* (pp. 29–47). New York, NY: Plenum.

- 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.
- Hobfoll, S. E., & Walfisch, S. (1984). Coping with a threat to life: A longitudinal study of self concept, social support, and psychological distress. *American Journal of Community Psychology, 12*, 87–99.
- Itzhaky, H., & Dekel, R. (2005). Helping victims of terrorism: What makes social work effective? *Social Work, 50*, 335–343.
- Janoff-Bulman, R. (1992). *Shattered assumptions: Towards a new psychology of trauma*. New York, NY: Free Press.
- Joseph, S., & Linley, P. A. (2005). Positive adjustment to threatening events: An organic valuing theory of growth through adversity. *Review of General Psychology, 9*, 262–280.
- Joseph, S., & Linley, P. A. (2006). Growth following adversity: Theoretical perspectives and implications for clinical practice. *Clinical Psychology Review, 26*, 1041–1053.
- Keane, T. M., Owen, S. W., & Charoya, G. A. (1985). Social support in Vietnam veterans with PTSD: A comparative analysis. *Journal of Consulting and Clinical Psychology, 53*, 95–102.
- King, L. A., Scollon, C. K., Ramsey, C. M., & Williams, T. (2000). Stories of life transition: Subjective well-being and ego development in parents of children with Down syndrome. *Journal of Research in Personality, 34*, 509–536.
- Kulik, L., & Kronfeld, M. (2005). Adjustment to breast cancer: The contribution of resources and causal attributions regarding the illness. *Social Work in Health Care, 41*(2), 37–57.
- Kulik, J. A., & Mahler, H. I. (1993). Emotional support as a moderator of adjustment and compliance after coronary artery bypass surgery: A longitudinal study. *Journal of Behavioral Medicine, 16*, 45–63.
- Laufer, A., & Solomon, Z. (2006). Posttraumatic symptoms and posttraumatic growth among Israeli youth exposed to terror incidents. *Journal of Social and Clinical Psychology, 25*, 429–447.
- Laufer, A., & Solomon, Z. (2009). Gender differences in PTSD in Israeli youth exposed to terror attacks. *Journal of Interpersonal Violence, 24*, 959–976.
- Laufer, A., & Solomon, Z. (2010). Posttraumatic growth in Israeli Jews. In T. Weiss & R. Berger (Eds.), *Posttraumatic growth and culturally competent practice* (pp. 1–14). Hoboken, NJ: Wiley.
- Lev-Wiesel, R., & Amir, M. (2003). Posttraumatic growth among Holocaust child survivors. *Journal of Loss & Trauma, 8*, 229–237.
- Linley, P. A., & Joseph, S. (2004). Positive change following trauma and adversity: A review. *Journal of Traumatic Stress, 17*, 11–21.
- McFarland, C., & Alvaro, C. (2000). The impact of motivation on temporal comparison: Coping with traumatic events by perceiving personal growth. *Journal of Personality and Social Psychology, 79*, 327–343.
- McMillen, C., Zuravin, S., & Rideout, G. (1995). Perceived benefit from child sexual abuse. *Journal of Consulting and Clinical Psychology, 63*, 1037–1043.
- Norris, F. H., Friedman, M. J., Watson, P. J., Byrne, C. M., Diaz, E., & Kaniasty, K. (2002). 60,000 disaster victims speak: Part 1. An empirical review of the empirical literature, 1981–2001. *Psychiatry, 65*, 207–223.

- North, C. S., Nixon, S. J., Shariat, S., Mallonee, S., McMillan, J. C., Spitznagel, E., & Smith, E. M. (1999). Psychiatric disorders among survivors of the Oklahoma City bombing. *Journal of the American Medical Association*, *282*, 755–762.
- 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.
- Pearlin, L. I., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior*, *19*, 2–21.
- Powell, S., Rosner, R., Butollo, W., Tedeschi, R. G., & Calhoun, L. G. (2003). Posttraumatic growth after war: A study with former refugees and displaced people in Sarajevo. *Journal of Clinical Psychology*, *59*, 71–83.
- Rogers, C. R. (1959). A theory of therapy, personality, and interpersonal relationships, as developed in the client-centered framework. In S. Koch (Ed.), *A study of science: Study 1. Conceptual and systematic: Vol. 3 Formulations of the person and the social context* (pp. 184–256). New York: McGraw Hill.
- Rosenberg, M. (1965). *Society and adolescent self-image*. Princeton, NJ: Princeton University Press.
- Sandler, I. (2001). Quality and ecology of adversity as common mechanisms of risk and resilience. *American Journal of Community Psychology*, *29*, 19–61.
- Schuetzler, D., & Boals, A. (2011). The path to posttraumatic growth versus posttraumatic stress disorder. *Journal of Loss & Trauma*, *16*, 180–194.
- Solomon, Z., Benbenishty, R., Neria, 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.
- Somer, A., & Bleich, A. (2005). The stress of a population under continuous terror attacks: Challenges in identification and treatments. In A. Somer & A. Bleich (Eds.), *Mental health in the shadow of terror: The Israeli experience* (pp. 9–26). Tel Aviv, Israel: Tel Aviv University.
- Stanton, A. L., Bower, J. E., & Low, C. A. (2006). Posttraumatic growth after cancer. In L. G. Calhoun & R. G. Tedeschi (Eds.), *Handbook of posttraumatic growth* (pp. 138–175). New York: Lawrence Erlbaum Associates.
- Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress*, *9*, 455–471.
- Wilson, J. P. (1995). The need for an integrative theory of post-traumatic stress disorder. In M. B. Williams & J. F. Sommer (Eds.), *Handbook of post-traumatic therapy* (pp. 3–18). Westport, CT: Greenwood Press.
- Yaalon, M. (2005). *Lessons from the Palestinian 'war' against Israel*. Washington, DC: Washington Institute for Near East Policy.
- Zimet, G. D., Dahlen, N. W., Zimet, S. G., & Farley, G. K. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment*, *52*, 30–41.
- Zoellner, T. M., & Maercker, A. (2006). Posttraumatic growth in clinical psychology: A critical review and introduction of a two component model. *Clinical Psychology Review*, *26*, 626–653.
- Znoj, H. J. (1999). Model of growth: Transformation following loss and physical handicap (APA 107th Annual Convention, August 20–24). *ERIC Reports-Research*, *143*, 1–15.

Tali Bayer-Topilsky received her PhD in social science from the Louis and Gabi Weisfeld School of Social Work at Bar-Ilan University in Israel. She is currently a researcher at the Myers-JDC-Brookdale Institute in Israel, which is a premier center for applied social policy research. Dr. Topilsky is interested in the relationship between negative and positive (PTG) outcomes of exposure to traumatic life events.

Haya Itzhaky is a full professor at the Louis and Gabi Weisfeld School of Social Work at Bar-Ilan University in Israel. She is particularly interested in the study of communities that have experienced terror attacks and how they deal with these experiences. Her research has also examined the correlation between supervision and secondary traumatization of therapists who have treated victims of different types of trauma: battered women, survivors of terror attacks, and children at risk.

Rachel Dekel is an associate professor at the Louis and Gabi Weisfeld School of Social Work at Bar-Ilan University in Israel. She is particularly interested in the study of individuals who have experienced secondary exposure to traumatic events. In addition, she is interested in exploring the consequences of direct exposure to traumatic events.

Yariv N. Marmor is a research associate in the Division of Health Care Policy and Research at the Mayo Clinic. His current research interests are in the areas of process analysis and improvement of medical systems.