

Posttraumatic Stress Disorder and Posttraumatic Growth Among Israeli Ex-POWs

Zahava Solomon

Adler Research Center, Tel Aviv University, Ramat Aviv, Israel

Rachel Dekel

Department of Social Work, Bar Ilan University, Ramat Gan, Israel

In this article, the authors present a prospective study that dealt with pathological (posttraumatic stress disorder; PTSD) and salutary (posttraumatic growth; PTG) outcomes of captivity and the correlates of those outcomes among a sample of ex-prisoners of war (POWs) and a control group of combat veterans. Posttraumatic stress disorder and its correlates were assessed in 1991 and 2003, and PTG was assessed in 2003. The results indicate that ex-POWs exhibited higher levels of PTSD and PTG than did the controls. In addition, both linear and quadratic associations between PTSD and PTG were found. The authors discuss some unresolved issues related to assessment of PTG and salutary outcomes, and outline directions for future research.

Participation in war and war captivity are considered extremely stressful life events. Dangers such as loss of life, injury, and the death of comrades, as well as harsh physical conditions, loneliness, loss of family support, sexual deprivation, and loss of privacy are prevalent. War captivity, which usually comes at the heels of brutal combat, entails yet further harsh stressors. These include torture and terror, solitary confinement, and systematic deprivation of basic needs, which are repeatedly and deliberately employed to break prisoners' of war (POWs') spirits (e.g., Hunter, 1993).

The most common outcome of war captivity is posttraumatic stress disorder (PTSD), found in variously ranging percentages of ex-POWs (Sutker & Allain, 1996; Tennant, Fairley, Dent, Sulway & Broe, 1997). In addition, the literature on the aftermath of war captivity identifies ex-POWs as a high-risk group for anxiety and depression (e.g., Engdahl, Page, & Miller, 1991), schizophrenia (Beebe,

1975), hypochondria (Klonoff, Clark, Horgan, Kramer & McDougall, 1976), and alcoholism (Beebe, 1975).

Not ignoring the extreme and long-lasting negative consequences of war, recent studies have also found evidence for the existence of salutary outcomes of both combat (Aldwin, Levenson, & Spiro, 1994; Schnurr, Rosenberg & Friedman, 1993) and war captivity (Sledge, Boydston, & Rabe, 1980). Sledge et al. (1980), for example, found that over 90% of American former air-force officers held prisoner in Vietnam viewed their changes following captivity as favorable, including greater understanding of self and others and a clearer concept of priorities in life. Similarly, Solomon, Waysman, and Neria (1999) found that positive changes were more frequently endorsed than negative ones by Israeli ex-POWs and war veterans.

An alternative view suggests that growth and distress are two separate, independent dimensions of the traumatic experience, such that high scores on one dimension do

The study was supported by Israel Science Foundation (ISF), Israel.

Correspondence concerning this article should be addressed to: Zahava Solomon, Adler Research Center, Tel Aviv University, Ramat Aviv, Tel Aviv, Israel 69978. E-mail: solomon@post.tau.ac.il

© 2007 International Society for Traumatic Stress Studies. Published online in Wiley InterScience (www.interscience.wiley.com) DOI: 10.1002/jts.20216

not necessarily entail low scores on the other. According to this perspective, positive and negative changes emerge as two separate unrelated outcomes that can both occur in one person, though not necessarily within the same areas. This two-dimensional stress response perspective posits that most people will respond to even extreme stress with some mixture of both resilience and vulnerability. Lending support to this view are studies that found no correlations between growth and distress (Ursano, Wheatley, Sledge, Rabe, & Carlson, 1986). In line with this perspective, Solomon et al. (1999) found no correlation between PTSD measures and positive changes among Israeli POWs, yet showed that they can both occur in the same individual simultaneously. Elder and Clipp (1989), in a study of American World War II combat veterans, found that “the more resilient veterans at mid-life are not necessarily symptom free in terms of emotional distress” (pp. 337).

The third perspective claims that salutary and pathological outcomes are positively correlated—hence the most highly distressed persons are also likely to show the highest psychological growth. Lending support to this claim are Tedeschi and Calhoun’s (1996) findings that people who experienced traumatic events report more positive changes than persons who have not experienced such events. Positive correlations between growth and distress were also found in Pargament, Smith, Koenig, and Perez’s (1998) study of residents of Oklahoma City following the 1995 bombing. In some cases, however, a curvilinear relationship has been noted, where higher growth is reported by those with intermediate levels of exposure (Fontana & Rosenheck, 1998) or symptoms (Butler et al., 2005).

Another unanswered question is whether the pathological and salutary outcomes of trauma share similar predictors. In ex-POWs, these predictors include the emotions and behaviors used in coping with captivity, and the ex-POWs’ subjective assessment of the severity of captivity.

Experimental and empirical studies on ex-POWs’ coping mechanisms have shown that sense of control, faith, reality testing, denial, rationalization, humor, and active problem-focused coping promote better mental health after release. Yet, apathy, withdrawal, emotional constriction, and emotion-focused coping have been found to decrease

anxiety and stress during captivity (Nardini, 1952; Strentz & Auerbach, 1988). Appraisal findings suggest that the more the subjective suffering, the greater the postcaptivity psychological distress (e.g., Sledge et al., 1980; Solomon, Ginzburg, Neria & Ohry, 1995).

Regarding predictors of growth, the literature suggests that growth is an interactive function of preevent resources, event appraisals, and coping strategies (Holahan, Moos, & Schaefer, 1996). Studies dealing with the determinants of growth, and specifically with the relationships between appraisals and coping, have found that high levels of perceived threat and harm (Armeli, Gunther, & Cohen, 2001; Fontana & Rosenheck, 1998) as well as problem-focused coping are related to high levels of growth (Armeli, Gunther, & Cohen, 2001). These findings support the notion that growth stems, to a certain degree, from coping with the event (Tedeschi, Park, & Calhoun, 1998). Although the contribution of appraisal has been examined among combatants (Fontana & Rosenheck, 1998), it has not been examined among POWs.

In this article, we present a longitudinal study which aims (a) to assess PTSD and posttraumatic growth among former POWs and combat veterans; (b) to assess the relationship between PTSD and posttraumatic growth; and (c) to assess the relationships between coping and appraisal, on the one hand, and PTSD and posttraumatic growth, on the other. The following hypotheses are put forth in this study:

- Prisoners of war will report higher levels of PTSD and posttraumatic growth than will control combatants.
- A positive correlation will be found between PTSD and posttraumatic growth.

METHOD

Procedure and Participants

Participants in the study were Israeli veterans of the 1973 Yom Kippur War: All had taken part in an earlier study conducted in 1991 (see Solomon, Neria, Ohry, Waysman, & Ginzburg, 1994, for additional details). After

explaining the purpose of this study in a phone conversation, they were asked to participate in this follow-up study. Before filling out the questionnaire, participants signed an informed consent form.

According to Israel's Ministry of Defense records, 240 soldiers from the Israeli Army land forces were captured during the Yom Kippur War (October 1973). Of the 164 POWs who participated in the previous study, 10 could not be located, 4 had died, and 6 could not participate due to a deteriorated mental status. Of the remaining 144 POWs, 103 participated in this study, constituting a 71.5% response rate.

A control group of 280 combat veterans of the same war, matched with the ex-POWs in personal and military background, was sampled from Israel Defense Forces (IDF) computerized data banks (Solomon et al., 1994). Out of 185 men who participated in the previous study, 41 could not be located and 1 had died. Of the remaining 143 controls, 106 participated in this study, constituting a 74% response rate. With regard to the level of PTSD in 1991, rank, age, and education, no significant differences were found between those who participated in the second measurement and those who did not.

Prisoners of war and controls in the present study did not differ in current age, education, religiosity, or income. The mean age of the participants was 53.4 ($SD = 4.4$), and mean years of schooling was 14.02 ($SD = 3.41$). Sixty percent of the participants in both groups defined themselves as secular; 17% assessed their income as lower than average, 23% as average, 39% as a bit higher than average, and 21% as much higher than average.

Measures

Captivity experiences (coping with captivity and subjective suffering) were measured in 1991, along with the first PTSD measurement. Posttraumatic growth was measured in 2003, along with a second PTSD measurement.

Posttraumatic stress disorder was measured using the PTSD Inventory (Solomon et al., 1994). This is a self-report scale based on *the Diagnostic and Statistical Manual of Mental Disorders, Third Edition Revised (DSM-III-R;*

American Psychiatric Association [APA], 1987) criteria, which was the standard used at the time of the first measurement in 1991. To enable comparison, the same inventory was employed in the second measurement in 2003. The inventory consists of 17 statements corresponding to the 17 PTSD symptoms listed in the *DSM-III-R*. For each statement, subjects were asked to indicate whether or not they had the symptom in the previous month, on a 4-point scale ranging from 1 (*not at all*) to 4 (*I usually did*).

The *DSM-IV* (APA, 1994) moved the "physiological reactivity to resembling events" symptom of the *DSM III-R* from the hyperarousal cluster (Criterion D) to the intrusion cluster (Criterion B). To conform to the updated definition, we analyzed the current data in accord with the *DSM-IV* symptoms' clusters.

Participants were identified as having PTSD if they endorsed at least one intrusive symptom, three avoidant symptoms, and two hyperarousal symptoms on the PTSD Inventory. In addition, we assessed the mean number of PTSD symptoms as well as the mean number of symptoms in each cluster (intrusion, avoidance, and hyperarousal).

Internal consistency among the 17 items for both measurements was high (Cronbach $\alpha = .87$ for 1991 and $.95$ for 2003 total score and ranged from $.70$ to $.82$ for the subscales). The scale was also found to have high convergent validity when compared with diagnoses based on structured clinical interviews (Solomon et al., 1994).

The Post Traumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) was used to assess the salutary impact of trauma. The prompt and items can be linked with the specified traumatic event; in the present case, it read: "For each of the statements below, please indicate the extent to which this change occurred in your life as a result of your captivity or your participation in the war" (according to participant's group).

This 21-item self-report scale includes five subscales: relating to others, new possibilities, personal strength, spiritual change, and appreciation of life. Each item was scored on a 4-point scale (1 = *I didn't experience this change at all*; 4 = *I experienced this change to a very great degree*). Subscales scores as well as general scores were calculated.

The PTGI has good internal consistency, and construct, convergent, and discriminant validity (Tedeschi & Calhoun, 1996). In the current study, Cronbach's α reliability values for the subscales ranged from .70 to .83, and the value for the total scale was .94.

A variety of demographic and personal characteristics were assessed (age, education, marital status, religiosity, economic situation). To assess one's subjective appraisal of suffering in captivity, respondents were asked to rate on a 5-point scale the severity of the physical abuse, mental abuse, and humiliation to which they were subjected. Score was calculated as the average endorsement for the three forms of abuse.

Owing to the lack of a valid and reliable standardized measure that assesses coping in captivity, we constructed a 24-item self-report questionnaire based on literature review and clinical interviews with ex-POWs (Neria, Solomon, & Dekel, 1998). A factor analysis, using a principal component analysis with Varimax rotation, yielded three main factors that explained 31.6% of the variance ($n = 93$). Factor 1 explained 12.9% of the variance and consisted of eight items describing active coping (e.g., I played mental games to pass the time; Cronbach's $\alpha = .72$, item loadings ranged from .43 to .70, except for one item with a loading of .37, eigenvalue = 3.86). Factor 2 explained 11.2% of the variance and consisted of eight items describing detachment (e.g., I closed myself off from the world; Cronbach $\alpha = .65$, item loadings ranged from .41 to .66, eigenvalue = 3.35). Factor 3 explained 7.6% of the variance and consisted of eight items describing loss of emotional control (e.g., I felt I was going crazy, Cronbach $\alpha = .66$, item loadings ranged from .50 to .71, eigenvalue = 2.27).

Data Analysis

The first part of the Results section compares PTSD rates using (χ^2), PTSD clusters, and PTG among POWs and controls using MANOVA for the subscales and ANOVA for the total score. The valid cases in this part of the analysis totaled 97 POWs and 103 controls. The second part of the Results section examines the relationships between PTSD and growth among POWs. The valid cases in this part of

the analysis totaled 93 POWs. Curve estimation regression analyses (examining both linear and quadratic terms) were carried out to determine the applicability of a curvilinear relationship between trauma symptoms and growth. Next, Pearson correlations between study variables were calculated. Finally, multiple linear regression models were used to predict PTSD and PTG by background variables and captivity experiences.

RESULTS

Significantly more ex-POWs than non-POW controls met *DSM-IV* symptom criteria for PTSD 30 years after the Yom Kippur War ($n = 23$, 23.0% and $n = 4$, 3.9%, respectively), $\chi^2(1, N = 200) = 16.82, p < .001$.

A MANOVA was conducted to examine group differences in the mean numbers of intrusion, avoidance, and hyperarousal symptoms, as well as in posttraumatic growth. The three PTSD subscales served as the dependent variables, and group affiliation served as the independent variable. This analysis revealed an overall significant effect, $F(3, 196) = 48.86, p < .001$. As expected, ex-POWs differed significantly from the controls. Specifically, the ex-POWs exhibited a significantly greater number of symptoms in each of the three PTSD clusters. Table 1 presents the means, standard deviations, and the results of the univariate tests.

A MANOVA conducted for the five posttraumatic growth subscales revealed a significant overall effect, $F(5, 194) = 5.68, p < .001$. An ANOVA for the total score also revealed a significant effect, $F(1, 199) = 23.01, p < .001$. As can be seen in Table 1, ex-POWs showed higher levels of growth than did the combat controls in the five subscales as well as in the general score.

Curve estimation regression analysis of trauma symptom levels revealed significant linear and quadratic relationships for the total PTG score (Linear $R^2 = .18, b_1 = .35, F(1, 91) = 20.35, p < .001$; (Quadratic $R^2 = .24, b_1 = 1.60, b_2 = -.256, F(1, 90) = 14.41, p < .001$). In other words, besides the linear relations there is a curvilinear (inverted U) relationship between PTSD symptoms and growth, i.e., participants who reported

Table 1. Posttraumatic Stress Disorder (PTSD) and Posttraumatic Growth (PTG) Means, Standard Deviations, and Univariate ANOVA Results

Variable	POWs		Controls		F(1, 199)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
PTSD					
Intrusion	2.60	0.88	1.49	0.57	111.46***
Avoidance	2.49	0.73	1.42	0.63	123.100***
Hyperarousal	2.94	0.87	1.81	0.75	96.65***
PTG					
Relating to others	2.35	0.69	1.90	0.80	17.92***
New possibilities	2.27	0.78	1.91	0.82	10.10**
Personal strength	2.75	0.80	2.16	1.03	19.75***
Spiritual change	2.08	0.94	1.78	0.98	4.85*
Appreciation of life	3.13	0.89	2.45	1.04	24.28***

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

intermediate levels of symptoms experienced the highest levels of growth.

The results of correlation analyses are presented in Table 2. Age correlated positively with education and negatively with the number of PTSD symptoms in 2003. Education correlated positively with active coping, and negatively with subjective suffering in captivity and number of PTSD symptoms in 2003. Subjective suffering correlated positively with the three coping factors and with the number of PTSD symptoms in 2003 and PTG. Active coping was not related to the two other factors in the coping questionnaire. Detachment correlated positively with loss of

emotional control as well as with the number of PTSD symptoms in 2003 and PTG. Loss of emotional control correlated with the number of PTSD symptoms in 1993 and PTG.

Finally, two regressions were carried out to examine the contribution of the independent variables to the variance in PTSD and PTG among the ex-POWs. Both regressions included sociodemographic background (age and education), coping during captivity (active coping, detachment, loss of emotional control), subjective appraisal of suffering in captivity, and the mean of PTSD symptoms in 1991. For the prediction of PTG, the linear mean of PTSD

Table 2. Pearson Correlations among Study Variables ($n = 93$)

	2	3	4	5	6	7	8	9
1. Age	.23*	-.13	.06	-.06	.00	-.06	-.33***	-.18
2. Education	1.00	-.44***	.30**	.09	-.03	-.12	-.30**	-.13
3. Subjective suffer		1.00	-.05	.28**	.37***	.25*	.37***	.25*
4. Active coping			1.00	.00	.06	-.10	-.05	.10
5. Detachment				1.00	.27*	.06	.20*	.37***
6. Loss of emotional control					1.00	.44***	.25*	.12
7. PTSD in 1993						1.00	.43***	.19
8. PTSD in 2003							1.00	0.43***
9. PTG								1.00

Note. Subjective suffer = Subjective suffering in captivity; PTSD = posttraumatic stress disorder; PTG = posttraumatic growth.

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

Table 3. Results of Hierarchical Regression Predicting Posttraumatic Stress Disorder (PTSD)

Variable	<i>B</i>	<i>SE B</i>	β
Age	−.04	0.01	−.25*
Education	−.12	0.09	−.14
Subjective appraisal of suffering in captivity	.12	0.08	.16
Detachment	.15	0.13	.11
Active coping	.06	0.12	.04
Loss of emotional control	.00	0.15	.00
PTSD in 1993	0.07	0.02	.36**

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

symptoms in 2003 was also entered. In addition, the quadratic PTSD symptoms in 2003 was entered in the second step (both variables were centered).

The entire set of variables explained 35.8% of PTSD, $F(7, 92) = 6.76$, $p < .001$. The only significant variables were age and PTSD in 1991. Higher numbers of PTSD symptoms in 1991 were related to higher numbers of PTSD symptoms in the current measurement, and older veterans reported lower levels of distress (Table 3).

The total set of variables explained 32.6% of the variance in PTG, $F(9, 92) = 4.47$, $p < .001$. The significant variables in the first step were detachment as a coping strategy, and PTSD in 2004 (linear). Higher levels of detachment as a coping strategy and more PTSD symptoms in 2004 were related to higher posttraumatic growth. Posttraumatic stress disorder distress in 1991 did not contribute significantly to the explained variance in current growth. In the second step, the quadratic PTSD symptoms contributed 3.3% to the explained variance. In other words, intermediate levels of PTSD symptoms were also related to higher levels of PTG (Table 4).

DISCUSSION

The findings show that traumatic events are associated with pathological and salutary outcomes. Twenty-three percent of the former Israeli POWs and almost 4% of the combat controls met criteria for PTSD. At the same time, both groups reported considerable posttraumatic growth on all five posttraumatic growth subscales.

These findings are consistent with the co-occurrence of negative and positive effects following a wide range of catastrophic events that were reported at the beginning of this article. They are also consistent with Maercker and Zoellner's (2004) finding that 72% of East German former political prisoners spontaneously provided at least one example of posttraumatic growth when asked whether they got anything positive from their incarceration. Furthermore, they are consistent with Solomon et al.'s (1999) findings, who had studied the same Israeli former prisoners of the Yom Kippur War as the current study, but used Sledge et al.'s (1980) measure of positive and negative consequences of war captivity.

How can we reconcile the apparently contradictory findings of positive changes following war captivity on the one hand, and negative changes in the form of PTSD, on the other? Several attempts at synthesizing the literature were made. Masten, Best, and Garmezy (1990) stated that the hallmark of resilience is adaptive functioning, despite feelings of distress and negative affect. In other words, a person may experience considerable distress, yet at the same time continue to function and grow. The current findings confirm this view: Positive and negative changes clearly emerge as two separate yet related outcomes. Posttraumatic stress disorder distress is not necessarily indicative of an absence of psychological growth and maturation. These two different types of outcome cannot, therefore, be conceptualized as two ends of the same continuum; they are not necessarily characteristic of two different types of individuals (e.g., resilient vs. vulnerable) and are not mutually exclusive.

Table 4. Results of Hierarchical Regression Predicting Posttraumatic Growth

Variable	<i>B</i>	<i>SE B</i>	β
<i>Step 1^a</i>			
Age	-.01	.01	-.05
Education	.00	.08	.00
PTSD in 1993	.01	.02	.08
Subjective appraisal of suffering in captivity	.04	.07	.07
Detachment	.37	.12	.31**
Active coping	.14	.10	.13
Loss of emotional control	-.13	.13	-.11
PTSD in 2004 (linear)	.27	.10	.33**
<i>Step 2^b</i>			
Age	.00	.01	.00
Education	-.03	.08	-.40
PTSD in 1993	.01	.02	.09
Subjective appraisal of suffering in captivity	.02	.07	.03
Detachment	.32	.12	.27**
Active coping	.15	.10	.14
Loss of emotional control	-.10	.13	-.08
PTSD in 2004 (linear)	.19	.10	.23
PTSD in 2004 (quadratic)	-.20	.10	-.22*

Note. PTSD = Posttraumatic stress disorder.

^aStep 1 R^2 change = 29.4, $F(8,92) = 4.36$, $p < .001$. ^bStep 2 R^2 change = 3.3, $F(1,92) = 4.03$, $p < .001$.

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

The results of the present study thus highlight the complexity of the human response to traumatic stress as well as the multidimensionality of psychological well-being. Negative posttraumatic effects occur, but in many cases they are contained and do not interfere with subsequent psychological development and growth. Conversely, the findings also indicate that even when a person is able to grow and experience positive changes following trauma, this does not undo the ongoing suffering that the event has created.

The findings also suggest that the posttraumatic growth is associated with the severity of the traumatic experience. The ex-POWs in this study, endorsed more growth than the combat veterans on all the posttraumatic growth subscales. This finding is consistent with several empirical studies that have similarly shown that the positive consequences of trauma are directly proportional to the severity of the traumatic exposure (Aldwin et al., 1994; Tedeschi & Calhoun, 1996). In particular, they are consistent with Elder and Clipp's (1989) findings on American soldiers in

World War II and the Korean War, which show that those who had been exposed to severe combat were more likely to report distress in midlife and showed more resilience and resourcefulness in coping during later life than did those who had less exposure.

Two very different interpretations have been offered for the coexistence of positive effects and severe trauma. The first approach views the perceived benefits of trauma as signifying healthy adjustment, that is, either a real strengthening of personality stemming from the experience (e.g., enhanced self-efficacy or acquisition of unique coping skills) or the adoption of a unique set of cognitions or "positive illusions," which help a person cope with victimization (Taylor, 1989). Fontana and Rosenheck (1998) suggest that this paradoxical relationship stems from the fact that coping with or even surviving trauma strengthens beliefs in one's abilities and bolsters self-esteem. Traumatic events also bring people face to face with their own mortality, which may help them to live their lives to the fullest.

The alternative explanation suggests that positive changes may not be positive at all. According to this perspective, the insistence that one has benefited from a traumatic experience reflects pathological adjustment to trauma. Thus, perceived benefits are seen as compensating defenses, which protect victims from gaining awareness of the psychological damage caused by their experiences. In this vein, it has been argued that because these perceived benefits are based on denial rather than on accurate reality testing, the adoption of such a “Pollyanna” type response will inhibit recovery and contribute to chronicity of problems (Andersen, 1975). Similarly, Sledge et al. (1980) maintained that the sense of having been changed favorably by captivity is a defensive maneuver, aimed at denying a deeper sense of having been impaired by captivity.

The findings also revealed a significant relationship between the extent of posttraumatic growth and severity of PTSD. This result suggests that posttraumatic growth is a function not only of the severity of the traumatic experience, but also of the suffering that a person experiences because of it. This finding supports our third perspective, i.e., salutary and pathological outcomes correlated positively with each other. Additionally, the curvilinear (inverted U) relationship between PTSD symptoms and growth, i.e., the finding that participants reporting intermediate levels of symptoms experienced the highest levels of growth, suggests that although distress and PTG can be experienced simultaneously, there may be an optimal level of distress that promotes growth. These findings are consistent with previous findings (Schnurr et al., 1993). At the same time, however, there may also be a point at which a person is overwhelmed by distress and growth is impeded (Butler et al., 2005).

The variables that contributed to the prediction of PTSD were age and initial PTSD distress level. The finding on age is consistent with other studies, which indicates that the younger a person is at the time of exposure to a traumatic event, the greater the likelihood of developing PTSD later in life (Engdahl, Dikel, Eberly, & Blank, 1997). This finding may be attributed either to young people’s relative lack of life experience and coping resources, or to the impressionability of youth.

Detachment was found to be a coping strategy that contributes to growth. It is possible that detachment facilitates compartmentalization, and allows feelings of growth to exist alongside feelings of suffering and distress. Because they could not change their immediate prison environment, POWs had no other recourse but to withdraw and use detachment as an adaptive coping mechanism (Sledge et al., 1980; Solomon et al., 1999).

Even though our findings do not support the hypothesis that distress and growth are two opposite poles of the same dimension (the first perspective), some studies have found negative correlations between pathological and salutary outcomes (Zoellner & Maercker, 2006), which are consistent with the hypothesis. Because the study of positive effects is still in its early stages, it is worth considering some of the reasons for these distinctions. In this connection, it should be noted that salutary outcomes have been defined differently in different studies (e.g., benefit finding, posttraumatic growth), and although the definitions may overlap they are not identical. For example, Sears, Stanton, and Danoff-Burg (2003) found that benefit finding, positive reappraisal coping, and posttraumatic growth among women with breast cancer were not necessarily concurrent and had different predictors. In a similar vein, different definitions of distress have been used in research. For example, some studies have measured depression, some have measured PTSD levels, and others have measured physical health. Thus, the type of distress measured in the study might affect the nature of the correlations (Zoellner & Maercker, 2006).

Another possible explanation for the inconsistent findings is the way the question of change after trauma was assessed. In some studies, participants were asked about both positive and negative changes (e.g., Changes in Outlook Questionnaire or Perceived Benefit Scales). Other studies, particularly those that employed the PTGI queried mostly positive changes. Indeed, Frazier, Conlon, and Glaser (2001) claim that many studies on posttraumatic growth focus exclusively on growth without also assessing negative changes that may occur in these same domains. Clearly, these methodological differences may account for the incompatible findings.

The fact that the studies examined various kinds of traumatic events also makes it difficult to compare their results. It is possible that different stressors such as rape, war captivity, and cancer do not evoke identical reactions. Less severe experiences may produce lower rates of negative change, and will consequently make it more difficult to detect any correlations between the positive and negative outcomes.

Before concluding, several methodological limitations should be discussed: an attrition rate of close to 30%, the use of self-report measures, and the time lapse between the examined stressor and the first assessment. The attrition rate is actually not high, considering the 12-year gap between assessments. The coping questionnaire was developed especially for the current study, and its psychometric properties were limited. A more validated questionnaire might have yielded significant relationships between the coping factors and PTSD and PTG. In addition, participants were only men, although it has been suggested that women tend to experience higher levels of growth than do men (Linley & Joseph, 2004).

Overall, the present study contributes to our knowledge regarding the consequences of war captivity, and has practical implications for the treatment of ex-POWs. The findings reveal high levels of resilience and posttraumatic growth, along with serious emotional impairment. They also indicate that ex-POWs are more likely than are non-POW combat soldiers to exhibit both PTSD and posttraumatic growth. In practical terms, the study suggests some potentially useful ways to encourage posttraumatic growth among trauma survivors. Reframing the traumatic experience in terms of positive outcomes while not ignoring the negative ones may help ex-POWs experience themselves as survivors rather than victims.

The concept of posttraumatic growth presents a major challenge to future research. Future studies should attempt to clarify and refine the concept of posttraumatic growth and to devise various valid and reliable assessment tools. Furthermore, we recommend that future research examine different traumatized populations using the same measurement tools, which will make it possible to examine the unique contribution of various traumatic events and their severity across cultures.

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. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., revised). Washington, DC: Author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Andersen, R. S. (1975). Operation homecoming: Psychological observations of repatriated Vietnam prisoners of war. *Psychiatry: Journal for the Study of Interpersonal Processes, 38*, 65–74.
- Armeli, S., Gunthert, K. C., & Cohen, L. H. (2001). Stressor appraisals, coping and post-event outcomes: The dimensionality and antecedents of stress related growth. *Journal of Consulting and Clinical Psychology, 55*, 29–35.
- Beebe, G. W. (1975). Follow up studies of World War II and Korean War prisoners: Morbidity, disability, and maladjustment. *American Journal of Epidemiology, 10*, 400–422.
- Butler, L. D., Blasey, C. M., Garlan, R. W., McCaslin, S. E., Azarow, J., Chen, X. H., et al. (2005). Posttraumatic growth following the terrorist attacks of September 11, 2001: Cognitive, coping, and trauma symptom predictors in an Internet convenience sample. *Traumatology, 11*, 247–267.
- Elder, G. H., Jr., & Clipp, E. C. (1989). Combat experiences and emotional health: Impairment and resilience in later life. *Journal of Personality, 57*, 311–341.
- Engdahl, B. E., Dikel, T. N., Eberly, R., & Blank, A. (1997). Posttraumatic stress disorder in community group of former prisoners of war: A normative response to severe trauma. *American Journal of Psychiatry, 154*, 1576–1581.
- Engdahl, B. E., Page, W. F., & Miller, T. W. (1991). Age, education, maltreatment, and social support as predictors of chronic depression in former prisoners of war. *Social Psychiatry and Psychiatric Epidemiology, 26*, 63–67.
- Fontana, A., & Rosenheck, R. (1998). Psychological benefits and liabilities of traumatic exposure in the war zone. *Journal of Traumatic Stress, 11*, 485–505.
- Frazier, P., Conlon, A., & Glaser, T. (2001). Positive and negative life changes following sexual assault. *Journal of Consulting and Clinical Psychology, 69*, 1048–1055.
- Holahan, C., Moos, R., & Schaefer, J. (1996). Coping, stress resistance, and growth: Conceptualizing adaptive functioning. In M. Zeidner & N. Endler (Eds.), *Handbook of coping: Theory, research, applications* (pp. 24–43). New York: Wiley.

- Hunter, E. J. (1993). The Vietnam prisoner of war experience. In J. P. Wilson & B. Raphael (Eds.), *International handbook of traumatic stress syndromes* (pp. 297–303). New York: Plenum Press.
- Klonoff, H., Clark, C., Horgan, J., Kramer, P., & McDougall, G. (1976). The MMPI profile of prisoners of war. *Journal of Clinical Psychology, 32*, 623–627.
- Linley, P. A., & Joseph, S. (2004). Positive change following trauma and adversity: A review. *Journal of Traumatic Stress, 17*, 11–21.
- Maercker, A., & Zoellner, T. (2004). The Janus face of self-perceived growth: Toward a two-component model of posttraumatic growth. *Psychological Inquiry, 15*, 41–48.
- Masten, A. S., Best, K. M., & Garmezy, N. (1990). Resilience and development: Contributions from the study of children who overcome adversity. *Development and Psychopathology, 2*, 425–444.
- Nardini, J. E. (1952). Survival factors in American prisoners of war of the Japanese. *American Journal of Psychiatry, 92*, 241–248.
- Neria, Y., Solomon, Z., & Dekel, R. (1998). Eighteen years follow up study of Israeli prisoners of war and combat veterans. *The Journal of Nervous and Mental Disease, 186*, 174–182.
- Pargament, K. I., Smith, B. W., Koenig, H. G., & Perez, L. (1998). Patterns of positive and negative coping with major life stressors. *Journal for the Scientific Study of Religion, 37*, 710–723.
- Schnurr, P. P., Rosenberg, S. D., & Friedman, M. J. (1993). Change in MMPI scores from college to adulthood as a function of military service. *Journal of Abnormal Psychology, 102*, 288–296.
- Sears, S. R., Stanton, A. L., & Danoff-Burg, S. (2003). The yellow brick road and the emerald city: Benefits finding, positive reappraisal coping, and posttraumatic growth in women with early-stage breast cancer. *Health Psychology, 22*, 487–497.
- Sledge, W. H., Boydston, J. A., & Rabe, A. J. (1980). Self-concept changes related to war captivity. *Archives of General Psychiatry, 37*, 430–443.
- Solomon, Z., Ginzburg, K., Neria, Y., & Ohry, A. (1995). Coping with war captivity: The role of sensation seeking. *European Journal of Personality, 9*, 57–70.
- Solomon, Z., Neria, Y., Ohry, A., Waysman, M., & Ginzburg, K. (1994). PTSD among Israeli former prisoners of war and soldiers with combat stress reaction: A longitudinal study. *American Journal of Psychiatry, 151*, 554–559.
- Solomon, Z., Waysman, M., & Neria, Y. (1999). Positive and negative changes in the lives of Israeli former prisoners of war. *Journal of Social and Clinical Psychology, 18*, 419–435.
- Strentz, T., & Auerbach, S. M. (1988). Adjustment to the stress of simulated captivity: Effects of emotion-focused versus problem-focused preparation on hostages differing in locus of control. *Journal of Personality and Social Psychology, 55*, 652–660.
- Sutker, P. B., & Allain, A. N. (1996). Assessment of PTSD and other mental disorders in World War II and Korean Conflict POW survivors and combat veterans. *Psychological Assessment, 8*, 18–25.
- Taylor, S. E. (1989). *Creative self-deception and the healthy mind*. New York: Basic Books.
- Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress, 9*, 455–471.
- Tedeschi, R. G., Park, C. L., & Calhoun, L. G. (Eds.). (1998). *Posttraumatic growth: Positive changes in the aftermath of crisis*. Mahwah, NJ: Erlbaum.
- Tennant, C. C., Fairley, M., Dent, O. F., Sulway, M. R., & Broe, G. A. (1997). Declining prevalence of psychiatric disorder in older former prisoners of war. *Journal of Nervous and Mental Disease, 185*, 686–689.
- Updegraff, J. A., Taylor, S. E., Kemeny, M. E., & Wyatt, G. E. (2002). Positive and negative effects of HIV infection in women with low socioeconomic resources. *Personality and Social Psychology Bulletin, 28*, 382–394.
- Ursano, R. J., Wheatley, R. D., Sledge, W., Rabe, A., & Carlson, E. (1986). Coping and recovery styles in the Vietnam era prisoner of war. *Journal of Nervous and Mental Disease, 174*, 707–714.
- Zoellner, T., & Maercker, A. (2006). Posttraumatic growth in clinical psychology—A critical review and introduction of a two component model. *Clinical Psychology Review, 26*, 626–653.