PTSD, Resilience and Posttraumatic Growth Among Ex-Prisoners of War and Combat Veterans

Gadi Zerach, PhD,1 Zahava Solomon, PhD,2 Assaf Cohen, MA,2 and Tsachi Ein-Dor, PhD,3

1 Department of Behavioral Sciences, Ariel University Center of Samaria, Ariel, Israel
2 School of Social Work, Tel Aviv University, Ramat Aviv, Tel Aviv, Israel
3 School of Psychology, Interdisciplinary Center Herzliya, Herzliya, Israel

ABSTRACT

Background: Past studies have shown that adversity may yield various salutogenic outcomes. Two constructs that have been at the center of this scientific investigation are resilience and posttraumatic growth (PTG). The present study aims to clarify the relations between posttraumatic stress symptoms, resilience, and PTG among Israeli war veterans.

Method: The sample includes former prisoners of war (ex-POWs) (n=103) and comparable veterans (n=106) of the 1973 Yom Kippur War. The veterans were assessed twice: 18 and 30 years after the war with self-report questionnaires.

Results: Resilience, defined as the absence of posttraumatic symptoms, and PTG are negatively correlated. Resilient ex-POWs and veterans reported the lowest levels of PTG when compared to participants diagnosed with clinical and sub-clinical posttraumatic stress disorder (PTSD). Furthermore, PTG dimensions were found to be the most differentiating factor between study groups, followed by war exposure measures and clinical reports of depression and anxiety symptoms.

Conclusions: This study strengthens the understanding that combatants who report high-level PTSD symptoms also report higher levels of positive psychological changes in the face of severe adversity.

INTRODUCTION

Alongside the research of the pathogenic ramifications of trauma, which mainly focuses on Posttraumatic Stress Disorder (PTSD) and its co-morbidities (1), many studies have shown traumatic experiences are also implicated in salutogenic outcomes. The most prominent findings that point to a constructive benevolent outcome of trauma have shown that the majority of victims were resilient, reported no posttraumatic symptoms (PTS) and resumed normal functioning quickly after exposure to a traumatic event (2). Furthermore, survivors of trauma also report experiencing positive psychological changes in various dimensions such as personal strength, relations and appreciation of life; cumulatively defined as posttraumatic growth (PTG; 3).

While the relations between PTSD and PTG have been assessed by a large number of studies (4), the relationship between resilience and PTG requires further clarification. It is unclear whether resilient individuals are more likely to report PTG and whether the process of growth requires exposure to a severe crisis and an actual experience of PTS. This study aims to address this gap in trauma literature by assessing the relationship between PTSD, resilience and PTG among Israeli ex-POWs and veterans of the 1973 Yom Kippur War.

RESILIENCE AND PTSD

Resilience may be defined as a dynamic process encompassing positive adaptation within the context of significant adversity (5). Alternatively, it may be defined as the ability to maintain a stable mental equilibrium in the face of adversity (6). While such a definition may be acceptable, a formulation of the operational definition or assessment of resilience still poses a significant challenge (7, 8).
Currently, there are two approaches to the assessment of resilience. The first assesses resilience directly, as a construct comprised of various perceptions, cognitions, and emotions (e.g., the Connor-Davidson Resilience Scale, 9). The second approach identifies resilience indirectly, by examining traumatized populations and singling out those who did not succumb to the trauma as resilient (10, 11).

In line with this perspective and since PTSD is the most common outcome of combat and captivity (12), this study will operationally define resilience as the absence of PTS.

**PTG AND PTSD**

PTG is conceived as a positive outlook following trauma (3). This outlook is multifaceted manifested through relationships with others, perception of new possibilities, enhanced personal strength, spiritual change, and an increased appreciation for life. PTG has generated a significant body of research and an ongoing scientific debate regarding various aspects of its nominal and operational definitions (13-15).

One aspect that has been highly debated is the interrelation between PTG and PTSD (16). Based on the current empirical data, it is suggested that there are three modes of relation between these two constructs.

The first mode of relation depicts trauma as a depleting experience which does not entail any salutogenic outcomes. According to this perspective, PTG and distress represent two opposite poles of a single dimension, and are therefore negatively correlated. This perspective is supported, for example, by a negative correlation found between PTG and distress among samples of war veterans (17), sexual assault survivors (18), and young adult cancer survivors (19).

The second mode of relation suggests that the cognitive and emotional adaptation process after a traumatic experience prompts not only psychiatric symptoms, but also a thorough self-examination of substantial personal, interpersonal and social issues. This suggests that salutogenic and pathogenic outcomes are positively correlated. Empirical support for this pattern was documented among survivors of the 1995 Oklahoma City bombing (20) and among Israeli adolescents and adults (21).

While the first two modes propose associations between PTG and PTSD, a third mode suggests that there is no such correlation (22, 23). This mode argues that in the face of extreme stress, people may respond with both psychological distress and PTG, and these responses can be regarded as two separate, independent dimensions without a clear correlation. However, there is reason to believe that lack of correlation between this two construct is the result of the interactive effect of different moderating variables such as the time that had passed since stressor onset (24).

**RESILIENCE AND PTG**

The theoretical literature notes a conceptual confusion and a difficulty in distinguishing between resilience and PTG (25). Bonanno (6) argues that resilience should not be mistaken for recovery. Bonanno suggests that, within the process of recovery, the casualty is affected by the traumatic experience, endorses moderate levels of symptoms, and is able to retrieve a symptom-free state during a relatively short period of time. This process of recovery is not synonymous to resilience as the resilient individual does not endorse PTS at any point in time.

One option is to identify resilience as a reconfiguration process. Resilient people are assumed to rebound from trauma and adapt to change due to alterations in cognitive processing (26). Such changes in cognitive processing resemble those of posttraumatic growth. In this vein, resilience is expected to positively correlate with growth (27). An alternative outlook suggests that resilience is a form of resistance. A resilient individual is able to experience stress without succumbing to it and, therefore, is at a reduced risk for posttraumatic symptomatology (6). According to this notion, resilience, as a form of resistance, does not entail distress and, thus, does not yield posttraumatic growth negatively correlated with PTG.

To summarize, a positive relation between PTSD and PTG may indicate a negative relation between PTG and resilience, as resilience is defined as the absence of PTSD. On the other hand, a negative relation between PTG and PTSD may indicate a positive relation between PTG and resilience (see Figure 1).

This study has three main questions: First, do “resilient” veterans differ from “sub-clinical” and “clinical” veterans in socio-demographics measures, measures of battle stress and clinical measures of depression and anxiety? Second, do “resilient” veterans differ from “sub-clinical” and “clinical” veterans on dimensions of PTG. Third, in a comprehensive
model, we inquire which variable among socio-demographic, battle stress, clinical measures of depression and anxiety, and PTG dimensions will be found to be the most differentiating factor between the study groups.

METHOD

PARTICIPANTS AND PROCEDURE

This study is part of a longitudinal study that examines the psychological and psychosocial consequences of captivity among Israeli ex-POWs. The names of ex-POWs were divulged by IDF authorities as part of the periodic examination of soldiers after their military service (see 28 for additional details).

Participants were contacted by telephone and were asked to take part in the study. A battery of questionnaires was administered to those who expressed consent in their homes or in other locations of their choice. Before filling out the questionnaires, the participants signed informed consent forms and were assured that the data would remain confidential. The participants were told that the aims of this study were to assess their current psychological and psychosocial state after their participation in war. All the questionnaires were administered in Hebrew. Approval was obtained by both IDF and Tel Aviv University human subject committees.

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, four had died, and six 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. During captivity, the ex-POWs had been subjected to intense isolation and systematic torture, consisting of the infliction of severe physical pain and great mental pressure. POWs were also humiliated verbally and by interfering with their personal hygiene and natural bodily functions.

A comparison group of 280 combat veterans was assembled from combat soldiers who fought on the same fronts as the POWs. They were sampled from IDF computerized files that provide information about veterans’ rank, military role and location during the 1973 Yom Kippur War. They were matched to the ex-POWs on personal and military background (e.g., age and education, as well as rank and assignment during the war). Out of 185 men who participated in the previous wave of the study, 41 could not be located and one had died. Of the remaining 143 controls, 106 participated in this study, constituting a 74% response rate.

Regarding the level of PTSD, rank, age, and education in the previous study, no significant differences were found between those who participated in the second measurement and those who did not. The two groups did not differ in age (F (1,223) = 3.56, ns), education (F (1,222) = .62, ns), number of years in the relationship (marital relationship or live-in relationship) (F (1,215) = .58, ns), and number of children (F (1,220) = 2.52, ns.). Furthermore, the groups did not differ significantly in religious orientation (χ² (1) = 1.55, p=.46, ns.), and location of residence in Israel (χ² (4) = 1.19, p=.88, ns.). There was a significant difference between the groups, however, in their fathers’ country of birth (χ² (2) = 17.10, p<0.01). Among the ex-POWs, more participants reported that their fathers’ country of birth was Asia/Africa as compared with the comparison group veterans. Mean age of participants at the time of data collection was 54.6 (SD=4.63). Mean length of marriage was 29.08 years. Mean years of education was 13.94 (SD=13.46), and mean number of children was 3.24 (SD=1.17).

CLASSIFICATION OF THE STUDY GROUPS

Participants were further divided into three groups according to their scores on the PTSD scales in 1991 and 2003. Participants who reported no PTSD symptoms, both in 1991 and 2003, were classified as “resilient” (N=36). In accordance with DSM-IV, participants who reported at least one intrusive symptom (criteria B), three avoidance symptoms (criteria C) and two hyper arousal symptoms (criteria D), and who did not have a steady job (criteria F), in one or both waves of measurement were classified as “clinical PTSD” (N=32). Lastly, participants who reported on two out of three PTSD symptoms-related criteria (B, C or D) in one or both waves of measurement were classified as “subclinical” (N=136). To validate this classification, we conducted a series of χ² analyses for independence of measures, in which we examined whether the groups differed in the prevalence of veterans who reported on emotional distress (yes, no) in three eras: from the Yom Kippur War until 1974 (T-3); from 1975 until 1984 (T-2); and from 1985 until the first assessment in 1991 (T-1). The analysis revealed that only 5.4% of the resilient group reported on emotional distress in T-3, 2.1% in T-2, and 2.9% in T-1. Conversely, 50% of the clinical PTSD group and 44.6% of the subclinical group reported on emotional distress in T-3, 59.6% and 38.3%, respectively, in T-2, and
revealed four factors that explained 64.7% of the variance. Factor 1 consisted of seven items relating to encounters with injuries and death. Factor 2 consisted of two items describing active fighting. Factor 3 consisted of six items describing own army fallibilities. Factor 4 consisted of three items describing life-threatening situations. For the purpose of this study, we used mean of the questionnaire items as an index for battle severity. Internal consistency alphas ranged from .76 to .91 for the four factors.

Depression and anxiety symptoms (SCL-90; 34) were assessed with a self-report measure that inquires into 90 psychiatric symptoms during the 2 weeks preceding the assessment (34). It enables examination of the overall severity of psychiatric symptomatology, as well as of the severity of specific symptom categories. The respondent is asked to indicate how frequently he experienced each symptom during the last two weeks on a 5-point scale, ranging from “not at all” to “often.” In the present study, the anxiety and depression sub-scales were used. In a previous study based on the same sample, Cronbach’s alpha coefficients were 0.88 for anxiety and 0.92 for depression. The SCL-90 is highly correlated with similar scales in the Minnesota Multiphasic Personality Inventory (35), and the specific subscales display moderate to high theoretical–empirical agreement and stability across variation in the subject sample (36).

Socio-demographic measurements were assessed using demographic characteristics of country of origin, location of residence in Israel, family status, religious orientation, age, and level of education.

DATA ANALYSES

In order to answer our first research questions regarding differences between the study groups on socio-demographics, battle stress and clinical measures, we employed a set of χ², ANCOVAs and MANCOVAs analyses. In order to answer our second research questions regarding differences between the study groups on PTG, we employed set of MANCOVAs analyses. In order to answer the third research question we used Discriminant function Analysis (DA) with group classification as the grouping variable and all measures that were found to differentiate between classification groups in the previous analyses as the independent measures. DA is usually used to predict membership in naturally occurring groups. Usually, several variables are included in a study to see which ones contribute to the discrimination between groups and is preferred over Logistic regression in such cases.
RESULTS

DIFFERENCES IN SOCIO-DEMOGRAPHIC MEASUREMENTS
In this section, we examined whether the resilient, subclinical, and clinical PTSD groups differ in the following demographic characteristics: country of origin, family status, religious orientation, age, and level of education. A series of χ² analyses revealed that the groups were not significantly different in their country of origin, family status, or their religious orientation. Moreover, using MANOVA with group classification as the independent measure and age and level of education as the dependent measures, we found that while there were no significant age differences between the groups, there were significant differences in level of education between the groups, \( F(2,198)=10.46, p<.001 \). Planned contrasts revealed that both the resilient (\( M=15.43, SD=2.51 \)) and the subclinical (\( M=14.13, SD=3.4 \)) groups attained higher education levels (more years of education) than the clinical group (\( M=11.80, SD=3.4 \)), \( t(198) =-4.49, p<.001 \). Moreover, the resilient group was, on average, more educated than the subclinical group, \( t(198) =2.09, p<.05 \). Therefore, we included level of education as a covariate in all subsequent analyses.

DIFFERENCES IN BATTLE STRESS AND WAR CAPTIVITY MEASURES
In this section, we explored whether (a) the resilient, subclinical, and clinical groups differed in the severity of their combat experiences, and (b) being a captive of war. To this end, we conducted an analysis of covariance (ANCOVA) with group classification as the independent variable, level of education as a covariate, and battle stress severity as the dependent variable. The analysis revealed significant differences in exposure to battle severity among the groups, \( F(2,199) =7.77, p<.001 \). Planned contrasts revealed that both the resilient (\( M=1.23, SD=0.66 \)) and the subclinical (\( M=1.55, SD=0.59 \)) groups reported lower severity of combat than the clinical group (\( M=1.77, SD=0.56 \)), \( t(198) =3.24, p<.001 \). Moreover, it was found that the resilient group reported, on average, lower levels of battle stress than the subclinical group, \( t(198) =-3.02, p<.01 \). All other effects were not significant.

In order to explore whether the groups differ in the probability of being captured, we conducted a \( \chi^2 \) (resilient, subclinical, clinical) \( \times 2 \) (ex-POWs, controls) \( \chi^2 \) analysis of independence. The analysis revealed that while 80.6% of the participants in the resilient group were classified as the comparison group veterans, 81.3% of the participants in the clinical group were ex-POWs, \( \chi^2 (2)=25.93, p<.001 \). Regarding the subclinical group, 50% of the participants were ex-POWs. Therefore, we used battle severity as a covariant and captivity as an additional independent measure in all subsequent analyses.

DIFFERENCES IN CLINICAL MEASURES
In this section, we explored the robustness of the classification to resilient, subclinical and clinical groups. To this end, we examined (a) whether the groups differ in their reported levels of anxiety and depression (as measured by SCL-90R subscales) above and beyond the contribution of level of education, battle severity, and captivity. To this end, we conducted a MANCOVA with group classification and captivity as the independent variables, level of education and battle severity as covariates, and SCL-90R subscales at 1991 and 2003 as the dependent variables. Means, standard deviations, univariate statistics, and follow-up planned contrasts statistics are presented in Table 1. As can be seen in Table 1, the groups differ on all clinical measures tested. The analyses revealed that both the resilient and the subclinical groups endorsed lower levels of anxiety and depression both in 1991 and 2003 than the clinical group. In contrast, the resilient group endorsed lower levels of depression both in 1991 and 2003 and lower levels of anxiety in 2003 as compared to the subclinical group. No significant differences were found between the resilient and subclinical groups in their level of anxiety in 1991. Importantly, while the mean levels of anxiety and depression of the clinical group was above the clinical threshold of the SCL-90 (i.e., .73 [33]), the mean levels of anxiety and depression for the resilient group was below the threshold. The mean levels of anxiety and depression for the subclinical group shifted from subclinical levels (<.73) at 1991 to clinical levels in 2003 (>=.73). Furthermore, the analysis revealed significant differences between ex-POWs and controls in anxiety and depression in 2003. Ex-POWs reported higher levels of anxiety and depression than the comparison group.

Lastly, the analysis revealed significant two-way interactions between group classification and captivity on the levels of anxiety and depression in 2003. Using planned contrasts, we found that while the resilient and subclinical groups reported lower levels of anxiety and depression than the clinical group in 2003, no significant differences were found between the resilient and subclinical groups among the comparison group. In contrast, among ex-POWs, the resilient and subclinical groups reported lower levels of anxiety and depression in 2003 than the
clinical group. Moreover, the resilient group reported lower levels of anxiety and depression than the subclinical group in 2003. All effects are controlled for level of education and battle severity.

**DIFFERENCES IN POSTTRAUMATIC GROWTH**

In the current section, we explored whether the resilient, subclinical and clinical groups differed in their posttraumatic growth dimensions (PTGI sub-scales and total score), above and beyond the contribution of level of education, battle severity, and captivity. Specifically, we examined whether the groups differ in their posttraumatic growth in relations, new possibilities, personal strength, spiritual change, appreciation of life, and mean level of posttraumatic personal growth. To this end, we conducted a MANCOVA with group classification (resilient, subclinical, clinical) and captivity as the independent variables, level of education and battle severity as covariates, and posttraumatic growth scores in 2003 as the dependent variables. Means, standard deviations, and univariate statistics are presented in Table 2. As can be seen in Table 2, the analysis revealed significant differences among the resilient, subclinical, and clinical groups in the following dimensions of posttraumatic growth: relations, perceiving new possibilities, personal strength, appreciation of life, and mean level of posttraumatic personal growth. Planned contrasts revealed that both the resilient and subclinical groups reported lower levels of posttraumatic growth in relations, \( t(198) = 2.46, p < .05 \), new possibilities, \( t(198) = 1.97, p < .05 \), personal strength, \( t(198) = 2.09, p < .05 \), appreciation of life, \( t(198) = 2.97, p < .01 \), and mean level of posttraumatic personal growth, \( t(198) = 2.57, p < .05 \), compared to the clinical group. All other main effects and interactions were also not significant.

**DISCRIMINANT FUNCTION ANALYSIS**

In this section, we examined the relative contribution of previously tested measures to the difference between resilient, subclinical, and clinical groups. To this end, we used Discriminant function Analysis (DA) with group classification as the grouping variable and all measures that were found to differentiate between classification groups in the previous analyses as the independent measures. Specifically, we explored the relative contribution of level of education, war captivity, battle severity, anxiety and depression in 1991 and 2003, and PTG dimensions to the differences between the resilient, subclinical and clinical groups.

The analysis revealed one significant canonical discriminant function, Wilks’ \( \lambda = .48 \), \( \chi^2(24) = 134.26, p < .001 \), which explained 90.9% of the variance between resilient, subclinical and clinical groups. The second canonical
discriminant function was not significant, Wilks’ $\lambda = .92$, $\chi^2 (11) = 15.88$, $p = .15$. In other words, as expected, resilient, subclinical and clinical groups could be placed on one continuous dimension, with resiliency on one end and PTSD on the other. Standardized canonical discriminant function coefficients are presented in Table 3. As can be seen in Table 3, surprisingly, the analysis revealed that the least differentiating measures were captivity and battle severity. The most differentiating measures were PTG dimensions, followed by the anxiety and depression measures. Hence, it seems that, for the most part, the spectrum of posttraumatic reactions from resiliency to clinical is more related to “positive” measures, such as PTG than to the “negative” dimensions, such as captivity and battle severity, or clinical measures, such as depression and anxiety.

Table 3. Standardized Canonical Discriminant Function Coefficients for Relative Differences among Resilience, Subclinical, and Clinical Groups

<table>
<thead>
<tr>
<th>Measure</th>
<th>$B$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of Education</td>
<td>-0.16</td>
</tr>
<tr>
<td>Captivity</td>
<td>0.11</td>
</tr>
<tr>
<td>Battle Severity</td>
<td>0.10</td>
</tr>
<tr>
<td>Anxiety at 1991</td>
<td>0.16</td>
</tr>
<tr>
<td>Anxiety at 2003</td>
<td>0.50</td>
</tr>
<tr>
<td>Depression at 1991</td>
<td>0.43</td>
</tr>
<tr>
<td>Depression at 2003</td>
<td>0.37</td>
</tr>
<tr>
<td>PTG in relations</td>
<td>0.18</td>
</tr>
<tr>
<td>PTG in new possibilities</td>
<td>0.26</td>
</tr>
<tr>
<td>PTG in personal strength</td>
<td>0.23</td>
</tr>
<tr>
<td>PTG in appreciation of life</td>
<td>0.41</td>
</tr>
<tr>
<td>Total PTG</td>
<td>0.90</td>
</tr>
</tbody>
</table>

Note: PTG= Posttraumatic growth. Higher values refer to heightened differences between classification groups. Positive values refer to higher values for the clinical group than the resilience group. Negative values refer to lower values for the clinical group than the resilience group.

**DISCUSSION**

This study assessed the relationship between PTG and resilience among Israeli ex-POWs and veterans of the 1973 Yom Kippur War. Our prominent findings indicate that resilience, defined as the absence of PTSD symptoms, and PTG are negatively correlated. Resilient ex-POWs and veterans reported the lowest levels of PTG when compared to clinical and sub-clinical participants.

The negative correlation between PTG and resilience indicates that PTG is positively associated with the endorsement of PTSD symptoms. In other words, when one does not report PTS, and is deemed as resilient, it may be argued that the trauma did not generate substantial growth. This in turn suggests that in order for growth to take place, a trauma survivor needs to feel the experience of the trauma’s pathogenic ramifications. These findings are in line with past studies which demonstrated a positive relation between growth and PTSD (37-39).

If we examine our findings regarding resilience and growth on a timeline, it is possible to state that salutogenic outcomes are likely to be observed among survivors at both the earlier and later stages of the trauma timeline. At the earlier stages, as trauma ensues, the resilient individuals are spared from elevated posttraumatic symptoms, as they are able to quickly restore their balance and resume normal life. On the other hand, at later stages, the casualties who were not resilient and endorsed PTSD are capable of experiencing growth along various dimensions. In other words, our findings suggest that the capacity for employing salutogenic resources may be manifested by resisting the trauma’s ramifications, in the form of resilience, or by benefiting from it later on, in the form of growth.

The emerging literature on the psychobiology of resilience (e.g., 40) can also shed light on these study findings. For example, resilient people are characterized by dispositional optimism and high positive emotionality (41). Accordingly, mesolimbic dopamine pathways might be more responsive and/or stress resistant in individuals who remain optimistic when faced with trauma (42). It might be that in order to report posttraumatic growth a veteran needs to not resist the stress or experience it as rewarding in some way as part of the reframing process. Again, the basic psychosocial factors and their neurobiological underpinnings that help build resilience might also impact the possibility for existential change in the form of PTG.

It is also interesting to examine this pattern of result with regard to the specific characteristics of this sample. According to a meta-analysis by Helgeson, Reynolds and Tomich (24) the positive relations between PTG symptoms (intrusive-avoidant thoughts) to growth might be moderated in a primarily male sample that was assessed with well-established measure. Significant effect sizes were found also in studies where measures were administered less than two years after personal trauma. It might be that these moderating variables also play a role in the negative relation between PTSD and PTG that was found in this study.
IS GROWTH A SALUTOGENIC RESOURCE?
While our findings highlight the manner in which resilience and growth are possibly manifested, it is still unclear whether growth, unlike resilience, could be defined as a salutogenic resource. Past studies regarding the authenticity of PTG are mixed. On one hand, there is some support for the notion of PTG as a result of real change, consisting of constructive growth (3). On the other hand, PTG is also conceptualized as an illusory entity, consisting of coping strategies and self-serving biases designed to deal with the negative effects of the trauma. Alternatively, there is evidence suggesting that PTG may be conceptualized as both illusory and real where illusory PTG occurs as an adaptive mechanism to deal with immediate, short-term distress and veridical PTG signifies the result of long-term adaptation and coping (42).

While our design is unable to address the notion of PTG as a short-term adaptive mechanism, our findings may contribute to the debate concerning PTG as reflecting real change or an illusion, many years after the trauma. The discriminant function analysis indicated that the least differentiating measures between the three groups were captivity and battle severity whereas the most differentiating measures were PTG dimensions, followed by anxiety and depression. In other words, the salutogenic outcome of trauma was found to be more closely related to PTSD than exposure factors or psychiatric co-morbidities. Since battle stress, anxiety and depression have been repeatedly found to be positively associated with PTSD (44) our findings suggest that growth may be even more closely related with PTSD levels.

At this point, we may argue that it is unlikely that an illusory perception of growth would be so intertwined with PTSD symptoms levels 30 years after the war. Such an outcome would suggest that, for many years, the casualties are employing self-serving illusions which do not ameliorate their posttraumatic symptoms, as self-enhancement biases usually do (45). We suggest it is more likely the strong positive relation between growth and PTSD reflects a salutogenic inclination to benefit and grow from the harsher life lessons entailed by trauma, rather than a process which aims to continuously counteract symptoms through various illusions.

LIMITATIONS OF STUDY
This study has several methodological limitations. First, it is correlational and, therefore, does not allow inferences regarding causal relations. Second, the sole employment of self-report measures, although frequently used in trauma research, may yield results susceptible to bias. Third, in this study resilience was defined as the absence of symptoms. It is worth noting that there are other ways to measure resilience such as a self-report questionnaire (e.g. Connor-Davidson resilience scale, 9). Fourth, the time lapse between the traumatic event and the first wave of measurement may have missed out on resilience-related processes such as recovery from symptoms among some of the participants. It might be unclear which individuals may have previously suffered significant symptomology which was resolved. As such, classifying individuals as “resilient” because they do not exhibit PTS at 18 and 30 years after the event might be imprecise. Finally, it should be noted that participants were only men, although it has been suggested that women tend to experience higher levels of PTG than men (46).

SUMMARY AND FUTURE DIRECTIONS
Overall, this study contributes to a better clarification of the much debated relations between PTG and resilience, particularly since these two positive psychological processes were found to be negatively correlated. Further, our findings may indicate that PTG is unlikely to be an illusory entity and does reflect some kind of constructive change. Future research should examine both resilience and PTG’s relation to additional constructs, within different levels of trauma severity, in order to attain a wider picture of these substantially different outcomes of traumatic experience.

References


