**The role of the timing of previous stressful events in moderating the relationship between acute stress disorder and posttraumatic stress**

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**Abstract**

**Background and Objectives**: Many studies suggest a relationship between previous experience of stressful events and posttraumatic stress (PTS), but little is known about the influence of the timing of these events. The aim of the present study was to examine the moderating (buffering/intensifying) effect of stressful events on the relationship between acute stress disorder (ASD) and PTS, distinguishing between events occurring before ASD and between ASD and PTS.

**Design and Methods**: This longitudinal study was based on questionnaires administered to 301 home front civilians in Israel during the Second Lebanon War measuring ASD—and PTS 6 years later. We examined previous experience of stressful events occurring at two time points: before the war and in the 6 years following the war.

**Results**: ASD reaction predicts PTS symptoms. Additionally, we found a negative relationship between stressful events that occurred more than 6 years previously (before the war) and PTS, and a positive relationship between stressful events that occurred during the last 6 years (after the war) and PTS.

**Conclusions**: The article discusses the moderating effect of previous stressful events on the ASD–PTS relationship and suggests another way to examine the effect of previous stressful experiences—in terms of their timing.

**Keywords**: acute stress disorder; posttraumatic stress; previous stress-related events; home front

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**Introduction**

ASD was first defined in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-4;* American Psychiatric Association, 1994), to diagnose symptoms of stress in the short term (within the first month after exposure to trauma), before diagnosis of posttraumatic stress disorder (PTSD), which can be examined at least one month after a stressful event. The addition of ASD to *DSM-IV* responded to the need to identify people who are at risk of developing PTSD (Bryant et al., 2000). Indeed, some studies have shown that ASD in the first month after the trauma predicts later PTSD (Bryant, 2018; Bryant et al., 2015; McKibben et al., 2008).

Even though several studies have been conducted on ASD, there is still a lack of research (especially longitudinal studies) on the relationship between ASD, among people who experience a home front war, and PTS (Boehm-Tabib, 2016; Stein et al., 2018). In particular, little knowledge exists regarding the moderating factors that explain the variance in the development of ASD (Bryant, 2017; Bryant et al., 2015; Gil et al., 2016; Giupponi et al., 2019). In the present study, we examined individuals’ previous experiences of stressful events as a factor that moderates the development of PTS after a traumatic event during which ASD was measured. Many people experience numerous stressful events in the course of their lives (Bonanno & Mancini, 2012; Mayo et al., 2017). Therefore, it is difficult to distinguish the effect of any given event. Moreover, research has indicated that experiencing stressful events may result in vulnerability (Jakob et al., 2017) or, alternatively, build resilience (Graham et al., 2016).

Researchers have presented conflicting results regarding the effect of previous experience on PTS. For example, according to several studies, previous experience of stressful events results in vulnerability to PTS (Briere et al., 2016; Gelkopf, 2012; Jakob et al., 2017; Silver et al., 2006). Research with refugees who escaped from wars found that prior experience of stressful events contributed to the development of PTS (Mollica et al., 1999; Steel et al., 2002).

Similarly, a study conducted in four conflict areas (Cambodia, Algeria, Ethiopia, and the Gaza Strip) indicated a relationship between previous experience of stressful events and PTS (De Jong et al., 2001). A study by Silver et al. (2006) on the aftermath of 9/11 showed that past trauma contributed to PTS. A 7-year longitudinal study conducted in the Gaza Strip revealed the same (Gelkopf et al., 2012). This evidence indicates the need to explore experiences of stressful events that occurred in the distant past while examining PTS symptoms.

Other researchers, however, have reported the opposite effect: They found that having experienced stressful events in the past strengthened study participants’ resilience, thus reducing their vulnerability to PTS (Breznitz & Eshel, 1983; Graham et al., 2016; Mineka & Zinbarg, 2006). For example, Breznitz and Eshel (1983) examined resilience among Israelis in view of the country’s many stressful wars and terror attacks. They concluded that involvement in previous stressful events had helped individuals deal with these types of experiences by serving as a type of immunizing agent. In another study, Bartone (1999) found that previous experience of stressful events “trains” individuals, teaching them more effective coping skills when faced with similar situations.

Graham et al. (2016) found that military veterans who had experienced more trauma in their civilian lives exhibited fewer PTSD criteria and fewer PTSD symptoms than those with less previous exposure to trauma. Mineka and Zinbarg (2006) used learning theory to explain the positive effect of previous experience. They found that individuals who had experienced stressful events in the past coped with similar situations more effectively than those who had not had such experiences. These researchers emphasized that learning and experience are factors that strengthen the development of resilience.

Finally, in contrast to the two trends discussed above, other studies have indicated a curvilinear effect. Experiencing a moderate number of stressful events serves to create resilience, but experiencing either a very high or a very low number of such events (or none at all) contributes to increased PTS (Gerber et al., 2018; Seery et al., 2010). In a study conducted in the United States, which included a national sample, Seery et al. (2010) found that people who experienced a limited number of traumatic events reported better quality of life and mental health, not only compared to those who experienced a greater number of traumatic events, but also to those who experienced no traumatic events. The curvilinear effect indicates that experiencing limited (but not zero) stressful events predicts lower functional impairment, fewer PTS symptoms, and increased life satisfaction. Seery et al. (2010) claimed that experiencing a moderate number of previous stressful events contributes to more effective coping with future stressful events. This is based on previous studies that indicated a positive toughening effect of prior exposure to stressful events, which creates an opportunity for successful recovery (Dienstbier, 1992). Theories of anxiety have stressed the benefits of experiencing control and monitoring related to stressful events, leading to the development of coping patterns and behaviors (Mineka & Zinbarg, 2006).

Seery et al. (2010) concluded that in cases of a moderate number of experiences, “what doesn’t kill us makes us stronger.” Gerber et al. (2018) emphasized the need to identify a threshold, based on the findings that a low number of previous experiences contributes to positive coping and reduced stress symptoms, while a high number of such experiences contributes to increased stress symptoms.

For the most part, previous research did not consider the timing of previous experiences of stress. In the present longitudinal study, we were able to examine this aspect. ASD was assessed in 2006 during the Second Lebanon War (T1) and PTS was examined six years later (T2). In addition, the experience of stressful situations before the war was examined at T1, and the experience of additional stressful situations, since the war, was examined at T2.

In light of the previous research reviewed above, the aim of the present study was to address two questions. The first research question examines the relationship between ASD and PTS. The second question examines the moderating role of stressful events in this relationship. These events occurred a) prior to the first measurement (ASD) and b) between the first and second measurements (between ASD and PTS). The relationships may be linear or curvilinear. If curvilinear, PTS after ASD is more severe when the number of previous experiences is high or low and is milder when the number of experiences of stressful situations is moderate (U shape).

# Method

In the first stage of the study, we examined ASD in a geographical area where missiles had fallen during the Second Lebanon War (T1). The war lasted 17 days, ending with a ceasefire in August 2006. At the time, over 100 rockets were fired on the area every day, causing emotional stress and property damage. Six years later, in December 2012–January 2013 (T2), we examined PTS among these same civilians.

## *Participants*

All participants lived within shooting range of the rockets, at a distance of up to 30 km from Israel’s border with Lebanon. The study was based on a convenience sample. At T1 (during the war), participants were 370 civilians over the age of 18, who resided in five cities and 11 villages. At T2, 6 years later, 69 of the original 370 participants from T1 dropped out, leaving a total of 301 participants (response rate of 81.35%). Reasons for dropout were as follows: 33 participants (8.92%) had changed their address and telephone number and could not be reached; 18 (4.86%) refused to respond; 11 (2.97%) were deceased, and seven (1.89%) were abroad. We found no significant differences in background variables or ASD between participants who were available at T2 and those who dropped out.

Participants resided at an average of 13.56 km from the northern border (*SD* = 0.85).Personal exposure and exposure of an acquaintancewere defined on a scale of 0–3 with a mean of 1.03 (*SD* = 0.85) for personal exposure, and 1.07 (*SD* = 1.20) for exposure of an acquaintance.

A total of 35% of the study participants lived in cities; the rest lived in villages*.* Most of the participants were women (65%). At T1 (during the war), participants had been living in these types of residential areas for an average of 22.63 years (*SD* = 13.98), their average age was 42.67 (*SD* = 13.49), average number of years of formal education was 14 (*SD* = 2.70), and the average number of people living in each household was 4.32 (*SD* = 1.63). Most (69%) of the participants were married; the rest were single (24%), divorced, separated, or widowed (7%). Most (60%) of the participants defined their financial situation as average. A comparison of background characteristics between T1 (during the war) and T2 (6 years after the war) reflected relative stability. Most of the participants had maintained their marital status (82%); some had got married (12%) and others had separated (6%). Two-thirds (69%) of the participants reported no change in years of education, and the rest had studied for between 1 and 6 years. Most of the participants reported no change in their financial situation (63%) and others reported a deterioration (14%) or an improvement (23%).

## *Research instruments*

### Exposure to war on the home front

The participants’ exposure to war was measured at T1 using a questionnaire on exposure to terrorism, developed by Somer et al. (2008), and adapted accordingly. The participants were asked to indicate their exposure to war using the following scales: (a) falling missiles (0 – no, 1 – yes, in the town/neighborhood, 2 – near the home, in the home; (b) property damage (0 – no, 1 – yes); (c) acquaintance with a physically injured person (0 – no, 1 – yes); (d) acquaintance with a mentally injured person (0 – no, 1 – yes), and (e) acquaintance with someone who was killed (0 – no, 1 – yes). Two exposure variables were defined: personal exposure and the exposure of an acquaintance. The correlation between personal exposure and exposure of an acquaintance was *r* = .13 (*p* = .029).

### Acute Stress Disorder (ASD) Scale

The Acute Stress Disorder Scale (Bryant & Harvey, 2000) was adapted for this study to fit the experience of war on the home front. The 19-item scale was based on the *Diagnostic* *and Statistical Manual of Mental Disorders* (4th ed.; *DSM-*4; American Psychiatric Association, 1994), and included four criteria: dissociation (five items), reexperience of the traumatic event (four items), avoidance (four items), and increased arousal (four items).

The participants were asked to rank, on a 6-point scale, how often they felt anxious about rockets falling, from 0 (not at all) to 5 (very often). Based on *DSM-IV-TR* (American Psychological Association, 2000)*,* respondents were defined as suffering from ASD if they displayed at least three dissociation symptoms, one or more reexperience symptoms, one or more arousal symptoms, and at least one avoidance symptom. The internal consistency of the overall index was found to be good (α= .94; applied at T1).

### Prior Traumatic Event Experience Questionnaire

A questionnaire was developed based on the Traumatic Event Questionnaire (Vrana & Lauterbach, 1994). The participants reported whether or not they had experienced each of seven traumatic events: a) prior to the war (prior to T1) and b) between T1 and T2. Events were as follows: the death of someone close, danger of injury or death, a serious car accident, a war, a terror attack, another type of stressful event. The participants stated if they had/had not (1/0) experienced each event. Two total exposure scores, for events preceding T1 and events between T1 and T2, were calculated according to the number of positive answers, ranging from 0 to 7. The higher the score, the higher the number of stressful events had been experienced.

### Posttraumatic Stress Disorder Questionnaire (PCL – PTSD Checklist)

PTS was measured using the questionnaire developed by Weathers et al. (1993). The checklist includes 17 items that measure symptoms of reexperience, avoidance, and hyperarousal. Responses are given on a 5-point scale, ranging from “not at all” (0) to “to a great extent” (4). Total score for the 17 items ranged from 0 to 68. In the current study, the internal consistency was high (α = .93; applied at T2).

## *Research Procedure*

The study was approved by the [details withheld for blind review] ethics committee. At both time points (T1, during the Second Lebanon War, and T2, 6 years after the war), four trained interviewers distributed structured questionnaires to a convenience sample and asked the participants to fill them out. Before doing so, the voluntary nature of participation was explained and confidentiality was assured. The participants also received the telephone numbers of help centers that they could call if the need arose. At T1, most of the questionnaires were collected in bomb shelters and safe rooms. Of the 400 civilians asked to complete the questionnaires, 10 refused (97.5%). Out of the 390 questionnaires that were distributed, 20 were not returned (a 95% return rate). At T2, the questionnaires were distributed to the participants from T1. Some of the participants could not be reached, and we attempted to locate them through neighbors, neighborhood committees, local councils, and telephone centers. As stated, 69 of the 370 participants from T1 did not take part at T2.

## *Data Analysis*

We analyzed the data using SPSS 22.0. All the analyses were based on the 301 people who participated in both stages of the study. Collinearity was not found in the data (maximum condition index = 2.25). Multiple regression analysis was calculated to predict PTS from ASD scores, and to assess the moderating effect of previous experience with stressful events (preceding the war and between T1 and T2) on the relationship between ASD and PTS. All predictors were standardized.

For control purposes, Step 1 included background variables found to be related to PTS. Step 2 included the predictor (ASD), and in Step 3, the moderating variable, entered hierarchically. Step 4 included interactions between the predictor and the moderating variables, entered in a stepwise manner. The curvilinear effect was assessed using quadratic terms. Significant moderation was analyzed and graphed with simple slopes analysis (Aiken & West, 1991; Dawson, 2014).

# Findings

About 75% of the participants reported direct exposure to missile attacks and about 30% reported knowing someone who was physically injured. The participants’ overall mean ASD at T1 was *M* = 2.18 (*SD* = 0.87, range 1–5). In this category, 56 participants (18.9%) were classified in the clinical range for ASD and another 65 participants (21.8%) were classified as borderline. Overall PTS index at T2 was *M* = 8.38 (*SD* = 10.43, range 0-68). The number of past stressful experiences was defined by a 0–7 range. The average at T1 was *M* = 1.62 (*SD* = 1.24) and at T2 was *M* = 1.19 (*SD* = 1.09).

We performed a multiple regression analysis, in which the dependent variable was PTS at T2. The goal was to examine whether experiences that had occurred before a traumatic event (T1) and between the event and the PTS evaluation (T2) moderated (either intensified or buffered) the relationship between ASD and PTS.

Prior to the regression analysis, Pearson correlations were calculated to examine the associations between the background variables and PTS: distance from the border, personal exposure, the exposure of an acquaintance, age, education, number of household members, length of residence in the area, and financial situation. We found two significant results: the higher the formal education level, the lower the PTS (*r* = -0.31, *p* < .001) and the better the financial situation, the lower the PTS (*r* = -0.27, *p* < .001). In addition, we performed *t*-tests to examine differences in PTS, by gender and family status (married/not married), and detected no significant differences.

In the first step of the regression, education and financial situation were entered. In the second step, ASD was entered. In the third step, two variables related to previous experience of stressful events were entered. The first three steps were defined in a hierarchical manner. In the fourth step, the interactions between ASD and previous experience of stressful events were entered in a stepwise manner. The results of the regression are presented in Table 1.

Table 1 shows that the regression model for PTS was significant, with 29% of explained variance. The regression findings (Step 4) show that fewer years of formal education, a poorer financial situation, more severe ASD, and fewer past experiences of stressful events before T1 were related to more severe PTS. In addition, the higher the number of stressful events experienced by the individual since T1, the higher was the level of PTS. The linear interaction between ASD and stressful events experienced since T1 was significant and is presented in Figure 1. (Note that the regression illustrates the linear contribution of stressful events; examination of the curvilinear contribution of this variable yielded nonsignificant findings.)

Figure 1 illustrates the moderating effect of stressful events that occurred after T1 on the relationship between ASD and PTS. It clearly indicates that stressful events that had occurred since T1 moderated the relationship between ASD and PTS. For a low level of past experience of stressful life events, a slope of *B* = 4.99, *t* = 6.68, *p* < .001 was found; for a high level of past experience of stressful life events, a slope of *B* = 2.03, *t* = 2.46, *p* = .014 was found. Accordingly, the relationship between ASD and PTS was found to be stronger among those with a low level of experience of stressful life events compared with a high level of stressful life events.

In conclusion, we found a positive and significant relationship between ASD and PTS. Individuals who had experienced a low level of stressful life events *before* T1 had higher PTS levels. In contrast, a higher level of stressful life events *since* T1 was related to higher PTS. The relationship between ASD and PTS was stronger for individuals with less experience of stressful life events between T1 and T2.

# Discussion

The main aim of the present study was to examine whether prior experience of stressful events moderates the relationship between ASD and PTS, and whether low or high levels of prior experience of stressful events strengthens or weakens the relationship between ASD and PTS. In addition, we examined the curvilinear effect of previous experience. We also attempted to compare the effect of previous stressful events that occurred at two time points: the first during the years beforethe war (prior to T1) and the second during the 6 years between the war and the PTS diagnosis (between T1 and T2).

Before discussing the present findings, it is important to note that, in line with earlier studies, the current research results indicate a relationship between ASD and PTS (Bryant et al., 2011; Kutz & Dekel, 2006). In the current study, we focused specifically on the relationship between ASD and PTS symptoms among a civilian population living on the front line during a military conflict. Furthermore, we examined PTS after a long period, 6 years after the crisis. Thus, the findings shed light on the effect of previous experience on these relationships.

The study focused on understanding the relationship regarding two aspects of previous experience. One was the intensity of the experience, and the second, its *timing*—the period when the experience occurred. For individuals with a low number of stressful experiences that occurred after T1 (during the first 6 years after the war), the relationship between ASD and PTS was stronger than for individuals with higher numbers of stressful events. Overall, the relationship between ASD (T1) and PTS (T2) was found to be significant.

The findings of the current study partly contradict the common wisdom that the more numerous an individual’s past experiences of stressful events, the more they contribute to reinforcement of PTS symptoms (Briere et al., 2016; Gelkopf et al., 2012; Jakob et al., 2017; Silver et al., 2006). However, it is important to note that in both cases—of numerous or few experiences of previous stressful events—the high level of PTS was similar (Figure 1). Therefore, a high PTS level was not dependent on the number of stressful events, but mainly on ASD, as will be discussed later. The results of the regression analysis (Table 1) show that ASD and stressful events that occurred after the trauma event were direct predictors of PTS: The more ASD was experienced during the war and the higher the number of stressful events experienced since the war, the higher was the PTS level.

In addition, the relationship between ASD and PTS was stronger than the relationship between stressful events and PTS. ASD was the main predictor of PTS; therefore, for individuals with high levels of ASD, regardless of the number of stressful events, PTS was higher than for individuals with low ASD.

The findings show that stressful events that occurred after the war had a moderate effect on PTS that had resulted from ASD. The limited influence of previous stressful events might be explained by the simultaneous contrasting influence of stressful events: On one hand, these events lead to vulnerability (Breslau et al., 1999; Gelkopf et al., 2012; Steel et al., 2002) and on the other hand, they may help develop resilience (Gunnar et al., 2009; Seery et al., 2010).

The findings also indicate the important influence of stressful events, regardless of whether they occurred before or after the war. Previous experience of stressful events before the war (more than 6 years before diagnosis) negatively and significantly predicted PTS. In contrast, previous experience of stressful events after the war had a positive effect on PTS. In other words, previous experience of stressful events that occurred before exposure to the war (before T1) might have led to the development of resilience, but stressful events experienced during the 6 years after the war (between T1 and T2) led to vulnerability. Thus, we conclude that experience prior to the event may buffer PTS, while the same experience after the event may strengthen PTS.

These findings shed new light on the three common approaches in the literature regarding past experience of stressful events. According to the first approach, past experience of stressful events results in vulnerability, which contributes to PTS (Briere et al., 2016; Gelkopf, 2012; Jakob et al., 2017). The second (contrasting) approach states that previous experience of stressful events leads to resilience, which buffers PTS (Breznitz & Eshel, 1983; Graham et al., 2016; Mineka & Zinbarg, 2006). The third approach emphasizes a curvilinear, U-shaped effect, according to which a low number of previous stressful events, compared with a high number of previous stressful events or no previous stressful experience, contributes to resilience (Gerber et al., 2018; Seery et al., 2010).

The current study findings illustrate the need to examine the different influences of stressful events, since experiencing numerous stressful events after the war (between T1 and T2) was a positive predictor of PTS whereas experiencing stressful events before the war (prior to T1) was a negative predictor of PTS. Therefore, instead of focusing only on the frequency and/or intensity of past experience of stressful events, it is important also to examine the timing of such events—whether they occurred recently or in the distant past.

To explore this aspect further, we examined the relationship between past experience of stressful events before the war (at T1) and ASD; no significant relationship was found (linear relationship *p* = .09; curvilinear relationship *p* = .08). In contrast, past experience of (the same) stressful events after the war was a factor that explained PTS 6 years later. In other words, the same stressful events that occurred before exposure to the war (before T1), and that did not explain ASD at T1, contributed to the prevention of PTS 6 years later.

It is possible that processing stressful events over time may ease the individual’s perception of exposure to the traumatic event as a threatening factor, or even turn the event into a learning experience that protects the individual from developing additional PTS symptoms. This explanation is inconsistent with the hypothesis that stress recedes over time, according to which the effect of stressful events from the distant past would diminish over time (Bonanno, 2004; Figley, 1978). Instead, the perception of the effect of stressful events from the distant past has changed—from threatening to strengthening the individual. Thus, although the stressful events remained the same in terms of content, the passage of time was beneficial from the individual’s perspective. People were able, over time, to minimize the sense of threat they experienced from the events and had the opportunity to benefit from their learning experience. Therefore, it would be interesting to investigate this aspect in future studies.

We suggest another explanation of the findings: Research has indicated the need to examine not only pathogenic responses, such as PTS, but also salutogenic responses that reflect a tendency to report significant positive changes in self-perceptions and relationships with others following exposure to traumatic experiences (Joseph & Linley, 2008; Leiva-Bianchi & Areneda, 2015; Tedeschi et al., 2007). Calhoun and Tedeschi (2004) conceptualized the salutogenic response as a change, which they referred to as *posttraumatic growth* (PTG; Calhoun & Tedeschi, 2004; Tedeschi, 2011; Tedeschi et al., 2018). They defined posttraumatic growth as a unique experience, a positive and meaningful change that evolves from struggling and coping with the trauma and its concrete and psychological results. PTG might be a possible explanation for moderation of PTS following a past traumatic experience. Individuals who have experienced stressful events in the past are better equipped to cope with new stressful events as a result of their PTG. Therefore, we recommend investigating this idea in future studies. Nevertheless, the findings of the current study show that it is worthwhile to examine the development of PTG and its longitudinal benefits, to determine whether it increases over time.

## *Limitations and directions for future research*

As a prospective longitudinal study, the current research offers an important contribution because it examined participants in real-time—during a war—and throughout the research period at two time points. Future studies are recommended to examine additional time periods—before a war and during other intermediary periods between the war and in subsequent years.

Despite the focus on a diverse population, the study group was limited nonetheless, and future studies could include additional population groups that were not represented here, such as the Israeli Arab population. When we approached members of this population at T1, many of them required translation of the questionnaire. As this was impossible in the crisis situation, we excluded them from the study. Second, the study did not include home front residents who had evacuated or moved away to safer areas. Investigation of these populations in future studies is important. Third, the present study focused on a specific stressful event—a war on the home front. Future studies could focus on victims of other types of stressful events, such as car accidents, serious illnesses, economic crises, and epidemics. It would be particularly interesting to examine whether in these groups, as well, the same factors of vulnerability and resilience contribute to the development of post trauma following ASD. Furthermore, the current study examined the relationship between ASD and PTS. Additional stressful responses, such as depression, adaptation, and behavior disorders, could be included in future studies.

**Conclusion**

In conclusion, the present findings indicate that ASD resulting from war on the home front contributes to later development of PTS, even 6 years after the initial symptoms appear (ASD). These findings reinforce the need to diagnose ASD in its early stages, soon after the stressful events.

The main goal of the present study was to identify the factors that strengthen and buffer PTS following ASD. In addition, we focused on past experience of stressful events. The findings indicate that after several years have passed, previous experience of stressful events has a linear effect on PTS, as a moderating factor. These findings were explained by the significant contribution of ASD to understanding PTS, compared with the moderate effect of additional past experiences. These findings encourage future studies to examine other factors that may moderate (either strengthen or buffer) PTS, following ASD, such as coping strategies, as well as personal and social resources.

Finally, it is customary to examine the impact of past stressful events on PTS symptoms as a linear (positive or negative) or a curvilinear relationship. The findings of the current study suggest another way to examine the effect of previous stressful experiences, namely in terms of the timing of the events. The current findings suggest that the more time has passed since the event occurred, the less impact it has on increasing PTS and, in fact, becomes a source of resilience to PTS. Therefore, it is reasonable to assume that the longer the passage of time, the more these same stressful events that once led to vulnerability will become a source of resilience.

# References

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

American Psychiatric Association. (1994). *Diagnostic and statistical manual of Mental disorders* (4th ed.). <https://doi:10.1001/jama.1994.03520100096046>

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders: DSM-IV-TR*. Author

Bartone, P. T. (1999). Hardiness protects against war related stress, in army reserves. *Consulting Psychology Journal: Practice and Research,* *51*(2), 72–82. [https://doi.org/10.1037/1061-4087.51.2.72](https://psycnet.apa.org/doi/10.1037/1061-4087.51.2.72)

Boehm-Tabib, E. (2016). Acute stress disorder among civilians during a war and post traumatic growth six years later: The impact of personal and social resources. *Anxiety, Stress & Coping, 29*(3), 318–333. <https://doi.org/10.1080/10615806.2015.1053806>

Bonanno, G. A. (2004). Loss, trauma, and human resilience. Have we underestimated the human capacity to thrive after extremely aversive events? *American Psychologist, 59*(1), 20–28. [https://doi.org/10.1037/0003-066X.59.1.20](https://psycnet.apa.org/doi/10.1037/0003-066X.59.1.20)

Bonanno, G. A., & Mancini, A. D. (2012). Beyond resilience and PTSD: Mapping the heterogeneity of responses to potential trauma. *Psychological Trauma: Theory, Research, Practice and Policy, 4*(1), 74–83. [https://doi.org/10.1037/a0017829](https://psycnet.apa.org/doi/10.1037/a0017829)

Breslau, N., Chilcoat, H. D., Kessler, R. C., & Davis, G. C. (1999). Previous exposure to trauma and PTSD effects of subsequent trauma: Results from the Detroit Area Survey of Trauma. *American Journal of Psychiatry, 156*(6)*,* 902–907. <https://doi.org/10.1176/ajp.156.6.902>

Breznitz, S., & Eshel, Y. (1983). Life events: Stressful ordeal or valuable experience? In S. Breznitz (Ed.), *Stress in Israel* (pp. 228–261). Van Nostrand Reinhold Company.

Briere, J., Agee, E., & Dietrich, A. (2016). Cumulative trauma and current posttraumatic stress disorder status in general population and inmate samples. *Psychological Trauma: Theory, Research, Practice, and Policy,* *8*(4), 439–446. <http://dx.doi.org/10.1037/tra0000107>

Bryant, R. A. (2017). Acute stress disorder. *Current Opinion in Psychology*, *14*, 127–131. [https://doi.org/10.1016/j.copsyc.2017.01.005](https://psycnet.apa.org/doi/10.1016/j.copsyc.2017.01.005)

Bryant, R. A. (2018). The current evidence for acute stress disorder. *Current Psychiatry Report* *20*,Article 111. <https://doi.org/10.1007/s11920-018-0976-x>

Bryant, R. A., Creamer, M., O’Donnell, M., Silove, D., McFarlane, A. C., & Forbes, D. (2015). A comparison of the capacity of DSM-IV and DSM-5 acute stress disorder definitions to predict posttraumatic stress disorder and related disorders. *Journal of Clinical Psychiatry,* *76*(4), 391–397. <https://doi.org/10.4088/JCP.13m08731>

Bryant, R. A., Friedman, M. J., Spiegel, D., Ursano, R., & Strain, J. A. (2011). Review of acute stress disorder in DSM-5. *Depression and Anxiety, 28*(9), 802–817. <https://doi.org/10.1002/da.20737>

Bryant, R. A., & Harvey, A. G. (2000). *Acute stress disorder: A handbook of theory, assessment and treatment.* American Psychological Association**.**

Bryant, R. A., Moulds, M., & Guthrie, R. (2000). Acute stress disorder scale: A self-report measure of acute stress disorder. *Psychological Assessment, 12*(1), 61–68. [https://doi.org/10.1037/1040-3590.12.1.61](https://psycnet.apa.org/doi/10.1037/1040-3590.12.1.61)

Calhoun, L. G., & Tedeschi, R. G. (2004). The foundations of posttraumatic growth: New considerations. *Psychological Inquiry, 15*(1)*,* 93–102. [https://doi.org/10.1207/s15327965pli1501\_03](https://psycnet.apa.org/doi/10.1207/s15327965pli1501_03)

Dawson, J. F. (2014). Moderation in management research: What, why, when and how. *Journal of Business & Psychology, 29*(1), 1–19. <https://doi.org/10.1007/s10869-013-9308-7>

De Jong, J. T. V. M., Komproe, I. H., Van Ommeren, M., El Masri, M., Araya, M., Khaled, N., Van de Put, W., & Somasundaram, D. (2001). Lifetime events and posttraumatic stress disorder in four postconflict settings. *Journal of American Academy of Child and Adolescent Psychiatry*, *286*(5), 555–562. http://dx.doi.org/10.1001/jama.286.5.555

Dienstbier, R. A. (1992). Mutual impacts of toughening on crises and losses. In L. Montada, S. H. Filipp, & M. J. Lerner (Eds.), *Life crises and experiences of loss in adulthood* (pp. 367–384). Erlbaum.

Figley, C.R. (1978). Symptoms of delayed combat stress among a college sample of Vietnam veterans. *Military Medicine*, *143*(2), 107–110. <https://doi.org/10.1093/milmed/143.2.107>

Gelkopf, M., Berger, R., Bleich, A., & Cohen-Silver, R. (2012). Protective factors and predictors of vulnerability to chronic stress: A comparative study of 4 communities after 7 years of continuous rocket fire. S*ocial Science and Medicine, 74*(5), 757–766. <https://doi.org/10.1016/j.socscimed.2011.10.022>

Gerber, M., Frankfurt, S. B., Contractor, A. A., Oudshoorn, K., Dranger, P., & Brown, L. A. (2018). Influence of multiple traumatic event types on mental health outcomes: Does count matter? *Journal of Psychopathology and Behavioral Assessment*, *40*(4), 645–654. <https://doi.org/10.1007/s10862-018-9682-6>

Gil, S., Weinberg, M., Shamai, M., Ron, P., Harel, H., & Or-Chen, K. (2016). Risk factors for DSM–5 posttraumatic stress symptoms (PTSS) among Israeli civilians during the 2014 Israel-Hamas war. *Psychological Trauma: Theory, Research, Practice, and Policy*, *8*(1), 49–54. [https://doi.org/10.1037/tra0000063](https://psycnet.apa.org/doi/10.1037/tra0000063)

Giupponi, G., Thoma, H., Lamis, D., Forte, A., Pompili, M., & Kapfhammer, H. P. (2019). Posttraumatic stress reactions of underground drivers after suicides by jumping to arriving trains; feasibility of an early stepped care outpatient intervention. *Journal of Trauma & Dissociation, 20*(5), 495–510. <https://doi.org/10.1080/15299732.2019.1597810>

Graham, J., Legarreta, M., North, L., DiMuzio, J., McGlade, E., & Yurgelun-Todd, D. (2016). A preliminary study of DSM-5 PTSD symptom patterns in veterans by trauma type. *Military Psychology*, *28*(2), 115–122. <https://doi.org/10.1037/mil0000092>

Gunnar, M. R., Frenn, K., Wewerka, S. S., & Van Ryzin, M. J. (2009). Moderate versus severe early life stress: Associations with stress reactivity and regulation in 10–12-year-old children. *Psychoneuroendocrinology, 34*(1)*,* 62–75. <https://doi.org/10.1016/j.psyneuen.2008.08.013>

Jakob, J., Lamp, K., Rauch, S., Smith, E. R., & Buchholz, K. R. (2017). The impact of trauma type or number of traumatic events on PTSD diagnosis and symptom severity in treatment seeking veterans. *Journal of Nervous and Mental Disease*, *205*(2), 83–86. https://doi.org/[10.1097/NMD.0000000000000581](https://doi.org/10.1097/nmd.0000000000000581)

Joseph, S., & Linley, P.A. (2008). Reflections on theory and practice in trauma, recovery and growth: A paradigm shift for the field of traumatic stress. In S. Joseph, & P. A. Linley (Eds.), *Trauma, recovery, and growth* (pp. 339–353). Wiley.

Kutz, I., & Dekel, R. (2006). Follow-up of victims of one terrorist attack in Israel: ASD, PTSD, and the perceived threat of Iraqi missile attacks. *Personality and Individual Differences*, *40*(8), 1579–1589.

Leiva-Bianchi, M. C., & Araneda, A. C. (2015). Confirmatory factor analysis of the Post-traumatic Growth Inventory after the Chilean earthquake. *Journal of Loss and Trauma: International Perspectives on Stress & Coping*, *20*(4): 297–305.  [https://doi.org/10.1080/15325024.2013.873223](%20https%3A//doi.org/10.1080/15325024.2013.873223)

Mayo, D., Corey, S., Kelly, L. H., Yohannes, S., Youngquist, A. L., Stuart, B. K., & Loewy, R. L. (2017). The role of trauma and stressful life events among individuals at clinical high risk for psychosis: A review. *Frontiers in Psychiatry, 8*, Article 55*.* <https://doi.org/10.3389/fpsyt.2017.00055>

McKibben, J. B., [Bresnick, M. G](http://www.ncbi.nlm.nih.gov/pubmed?term=Bresnick%20MG%5BAuthor%5D&cauthor=true&cauthor_uid=18182894)., [Wiechman Askay, S. A](http://www.ncbi.nlm.nih.gov/pubmed?term=Wiechman%20Askay%20SA%5BAuthor%5D&cauthor=true&cauthor_uid=18182894)., & [Fauerbach J. A](http://www.ncbi.nlm.nih.gov/pubmed?term=Fauerbach%20JA%5BAuthor%5D&cauthor=true&cauthor_uid=18182894). (2008). Acute stress disorder and posttraumatic stress disorder: A prospective study of prevalence, course, and predictors in a sample with major burn injuries. *Journal of Burn* [*Care & Research*](http://journals.lww.com/burncareresearch/pages/default.aspx)*, 29*(1), 22–35. https://doi.org/[10.1097/BCR.0b013e31815f59c4](https://doi.org/10.1097/bcr.0b013e31815f59c4)

Mineka, S., & Zinbarg, R. (2006). A contemporary learning theory perspective on the etiology of anxiety disorders: It’s not what you thought it was. *American Psychologist, 61*(1)*,* 10–26 https://doi.org/[10.1037/0003-066X.61.1.10](https://www.researchgate.net/deref/http%3A//dx.doi.org/10.1037/0003-066X.61.1.10?_sg%5B0%5D=1UBtfHsmOVjp9gyfp-uf6LySnW2d5TrEzamn3cpXWEPbAIkNbSxJy8GgMk39fz-8vq6d4mJMdS-R6g0TCGL_J4mEhg.YWPpG685B35Q17vKXLt1_wDom0W_iKJygQ4UP_n9nFcj1pd6R1gujxx0Xlxl_YYtr0cwyjTe_j5ocMwSBx78ew)

Mollica, R. F., McInnes, K., Sarajlic, N., Lavelle, J., Sarajlic, I., & Massagli, M. P. (1999). Disability associated with psychiatric comorbidity and health status in Bosnian refugees living in Croatia. *JAMA: Journal of the American Medical Association, 282*(5)*,* 433–439. https://doi.org/10.1001/jama.282.5.433

Seery, M., Holman, D., Alison, E., & Silver, R. (2010). Whatever does not kill us: Cumulative lifetime adversity, vulnerability, and resilience. *Journal of Personality and Social Psychology*, *99*(6), 1025–1041. https://doi.org/[10.1037/a0021344](https://www.researchgate.net/deref/http%3A//dx.doi.org/10.1037/a0021344?_sg%5B0%5D=IT_IrhyOhVcJ-CfVGY3ckH3kS3inhmgX_4RxpZ3t8fkR4B_T2ckzA8_C0VPC5wCm1efMBs2bcp1aO9RBgQ-QTPnuMg.r7PL0sHBlctT6UCX1ByD3vOlzKkBE11uCucCzJLfX1bJT35__-lBp475EYHEdBPHnjUYP1pQe9BP8ws-6zgdBQ)

Silver, R. C., Holman, E. A., McIntosh, D. N., Poulin, M., Gil-Rivas, V., Pizarro, J. (2006). Coping with a national trauma: A nationwide longitudinal study of responses to the terrorist attacks of September 11th. In Y. Neria, R. Gross, R. Marshall, & E. Susser (Eds.), *9/11: Mental health in the wake of terrorist attacks* (pp. 45–70).  Cambridge University Press.

Somer, E., Maguen, S. Moin, V., Boehm, A., & Litz, B. T. (2008). The effects of perceived community cohesion on stress: Symptoms following a terrorist attack. *Journal of Psychological Trauma*, *7*(2), 73–90. <https://doi.org/10.1080/19322880802231759>

Steel, Z., Silove, D., Phan, T., & Bauman, A. (2002). Long-term effect of psychological trauma on the mental health of Vietnamese refugees resettled in Australia: A population-based study. *The Lancet, 360*(9339)*,* 1056–1062. https://doi.org/[10.1016/S0140-6736(02)11142-1](https://doi.org/10.1016/s0140-6736%2802%2911142-1)

Stein, J. Y., Levin, Y., Gelkopf, M., Tangir, G., & Solomon, Z. (2018). Traumatization or habituation? A four-wave investigation of exposure to continuous traumatic stress in Israel. International Journal of Stress Management, 25(S1), 137–153. https://doi.org/[10.1037/str0000084](https://psycnet.apa.org/doi/10.1037/str0000084)

Tedeschi, R. G. (2011). Posttraumatic growth in combat veterans. *Journal of Clinical Psychology in Medical Settings, 18,* 137–144.  [https://doi.org/10.1007/s10880-011-9255-2](https://psycnet.apa.org/doi/10.1007/s10880-011-9255-2)

Tedeschi, R. G., Calhoun, L. G., & Cann, A. (2007). Evaluating resource gain: Understanding and misunderstanding posttraumatic growth. *Applied Psychology, 56*(3), 396–406. <https://doi.org/10.1111/j.1464-597.2007.00299.x>

Tedeschi, R. G., Shakespeare-Finch, J., Taku, K., & Calhoun, L. G. (2018). *Posttraumatic growth: Theory, research and applications*. Routledge.

Vrana, S., & Lauterbach, D. (1994). Prevalence of traumatic events and post-traumatic psychological symptoms in a nonclinical sample of college students. *Journal of Traumatic Stress, 7*(2), 289–302. <https://doi.org/10.1007/BF02102949>

Weathers, F. W., Litz, B. T., Herman, D. S., Huska, J. A., & Keane, T. M. (1993, May). *The PTSD Checklist: Reliability, validity and diagnostic utility*. [Paper presentation]. International Society for Traumatic Stress Studies Annual Meeting, San Antonio {TX}, US.

**Table 1**

*Multiple Regression for Predicting PTS, from Background Variables, ASD, and Previous Experience of Stressful Events* (*N* = 301)

|  |  |  |
| --- | --- | --- |
| Step | PTS symptomsβ | SE |
| Step 1 |  |  |
| Education | -.25\*\*\*  | 0.61 |
| Financial situation | -.18\*\*  | 0.61 |
| *R*2 | .125\*\*\*  |  |
| Step 2 |  |  |
| Education | -.17\*\*  | 0.58 |
| Financial situation | -.12\*  | 0.57 |
| ASD | .37\*\*\*  | 0.55 |
| ΔR2 | .121\*\*\* |  |
| Step 3 |  |  |
| Education | -.15\*\*  | 0.57 |
| Financial situation | -.13\*  | 0.57 |
| ASD | .35\*\*\*  | 0.55 |
| Stressful events before T1 | -.16\*\*  | 0.53 |
| Stressful events since T1 | .11\*  | 0.53 |
| ΔR2 | .030\*\* |  |
| Step 4 |  |  |
| Education | -.15\*\*  | 0.57 |
| Financial situation | -.12\*  | 0.56 |
| ASD | .33\*\*\*  | 0.55 |
| Stressful events before T1 | -.17\*\* | 0.56 |
| Stressful events since T1 | .13\*\*  | 0.53 |
| ASD x Stressful events since T1 | -.14\*\*  | 0.56 |
| ΔR2 | .017\*\* |  |
| The entire model | *R*2 = .293*F*(6,294)= 19.14\*\*\* |

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

**Figure 1**

*The Moderating Effect of Stressful Events from T1 and the Relationship between ASD* *and PTS*