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The Limits of Resilience: Distress Following Chronic Political Violence among Palestinians

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Abstract

We examined posttraumatic stress disorder (PTSD) and depression symptom trajectories during ongoing exposure to political violence, seeking to identify psychologically resilient individuals and the factors that predict resilience. Face-to-face interviews were conducted with a random sample of 1196 Palestinian adult residents of the West Bank, Gaza, and East Jerusalem across three occasions, six months apart (September, 2007–November, 2008). Latent growth mixture modeling identified PTSD, and depression symptom trajectories. Results identified three PTSD trajectories: moderate-improving (73% moderate symptoms at baseline, improving over time), severe-chronic (23.2% severe and elevated symptoms over the entire year); and severe-improving (3.5% severe symptoms at baseline and marked improvement over time). Depression trajectories were moderate-improving (61.5%); severe-chronic (24.4%); severe-improving (14.4%). Predictors of relatively less severe initial symptom severity, and improvement over time for PTSD were less political violence exposure and less resource loss; and for depression were younger age, less political violence exposure, lower resource loss, and greater social support. Loss of psychosocial and material resources was associated with the level of distress experienced by participants at each time period, suggesting that resource-based interventions that target personal, social and financial resources could benefit people exposed to chronic trauma.

Keywords

Palestinian; war; mass casualty; political violence; PTSD; depression; resilience; resistance; West Bank; Gaza

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Research on mass casualty events, including political violence, has overwhelmingly focused on pathological responding in the face of traumatic stress (Galea et al., 2002; de Jong, Komproe, Van Ommeren, El Masri, Araya, Khaled et al., 2001; Punamaki, Komproe, Qouta, Elmasri, & de Jong, 2005). However, a contrasting viewpoint suggests that a majority of those exposed to trauma evidence a relatively stable trajectory of healthy functioning, or quick recovery, indicative of psychological resilience (Bonanno, 2004; Bonanno, Galea, Bucciarelli, & Vlahov, 2007). The complete absence of a stress response, called stress *resistance* has also been observed, although less commonly than resilient outcomes ((Layne, Warren, Shalev, & Watson, 2007).

The bulk of research on resilience and resistance has examined responses to isolated, time-limited stressor events, or personal crises (Bonanno, Westphal, & Mancini, 2011). In contrast, the single prior study of resilience and resistance in the face of chronic mass casualty, focusing on actually doing well, or at least being relatively symptom-free, found that a majority of the population in Israel did not display resilience or resistance patterns (Hobfoll, Palmieri, Johnson, Canetti-Nisim, Hall, & Galea, 2009). This study suggesting the possibility that individual level traumas are not directly comparable to chronic mass casualty circumstances, even in the relatively high resource nation of Israel. Further, this study found that the predictors of resilience and resistance mirror the predictors of psychopathology under chronic mass casualty conditions, which is a critical finding, as it would suggest that efforts to strengthen the population would positively impact both the vulnerable and generally resilient segments of the population.

Studies have increasingly examined the impact of war and political turmoil in low-income countries as well as the predictors of PTSD and depression in such contexts (Bayer, Klasen, & Adam, 2007; Cardozo et al., 2000; de Jong et al., 2001; Eggerman & Panter-Brick, 2010; Panter-Bricker, 2010; Vinck, Pham, Stover, & Weinstein, 2007). The region of the Palestinian Authority is one such region where chronic, severe stress circumstances have predominated during recent years due to the social, economic, and violent repercussions of Israeli military occupation, Palestinian militant resistance to that occupation, and Palestinian factional infighting. Studies of adult Palestinians have found marked levels of PTSD, depression, and physical health problems (Ai, Peterson, & Uebelhor, 2002; Cardozo, Vergara, Agani, & Gotway, 2000; de Jong et al., 2001). This includes our own prior work on the same sample under study here (Canetti, Galea, Hall, Johnson, Palmieri, & Hobfoll, 2010; Hobfoll, Hall, & Canetti, in press).

Our aim in the current investigation was to further explore variations in adjustment following mass casualty by empirically modeling the prevalence of different symptom trajectories in a population-based study of Palestinians living in Gaza, the West Bank, and East Jerusalem. We were particularly interested in the prevalence of the resilience and recovery trajectories in this population as well as the predictors of those trajectories. Such trajectory analysis allows for revealing of positive, or healthy trajectories that prior methods do not uncover. As such, this methodological advance also constitutes as major difference in how resilience and resistance can be explored. Further, although we based our study on a Palestinian population because of their exposure to chronic adversity, our interest was in the broader context of chronic events as they occur in many regions of the world.

Among the variables associated with more favorable outcomes following trauma exposure are demographic factors, such as higher education, being male, and higher income (Bonanno et al., 2007; Hobfoll et al., 2009; Norris et al., 2002). These indicators are thought to be related to more favorable outcomes, in part, because they reflect having greater access to other psychosocial resources, status, and financial resources (Bonanno et al., 2007; Hatch & Dohrenwend, 2007; Hobfoll, 1989). Religiosity has also been indicated in some research to

be a resiliency resource, but other studies have found religiosity to be related to poorer coping in the face of trauma (Chen & Koenig, 2006; Hobfoll, et al., 2008). This treatment of demographic variables as resources is consistent with the foundational work of Hollingshead and Redlich (1958), and a long-term sociological tradition, which indicated that these demographic factors were social structures associated with privilege, lifestyle, and possessing desired (and undesirable) status roles (Hatch & Dohrenwend, 1997).

Examining mass casualty events, studies have found that possessing psychosocial resources (e.g., self-efficacy, social support) and sustaining them (i.e., not losing resources) is also related to more favorable outcomes (Bleich, Gelkopf, Melamed, & Solomon, 2006; Bonanno et al., 2010; Eggerman & Panter-Brick, 2010; Galea et al; 2002; Hobfoll et al., 2009). Such findings are consistent with Hobfoll's (1989; 1998) conservation of resources (COR) theory that posits that people's psychosocial resources create a protective web that enables them to receive emotional and task support, sustain everyday life tasks and the special demands that accompany trauma, and provides an objective basis that supports the belief that they will be able to do reasonably well in the face of trauma. This is particularly important during times of sustained trauma, such as Palestinians have experienced, as resources are challenged and may be overwhelmed with chronic demand and because loss cycles during such circumstances oftentimes are of both great impact and move quickly (de Jong, 2002; Palmieri, Canetti-Nisim, Galea, Johnson, & Hobfoll, 2008), and in ways that are not explained by the trauma exposure alone (Miller & Rasmussen, 2010).

In a prospective 3-wave study of a national sample of Palestinians, we framed our hypotheses in the context of repeated or chronic traumatic circumstances. This study goes beyond our prior studies on this sample by searching for resilience and resistance trajectories, whereas our and other's prior work has focused entirely on levels of PTSD and depression symptoms or diagnosis. Trajectory analyses allow for an uncovering of the full range of outcomes, which is not possible in analyses of distress levels where those experiencing low, or virtually no distress are lumped together with those under mid-distress and compared to those under high distress. We examined the following hypotheses, which had not been tested in our earlier studies on this sample:

1. We expected to find several trajectories that have been noted in prior research in regions experiencing political violence. Specifically, we anticipated:

A chronically distressed trajectory, as indicated by moderate to high symptomatology sustained across the duration of our study. Given the plight of Palestinians, we predicted that this would be a common trajectory.

A recovery trajectory, as indicated by initially high symptom levels that gradually decrease across time. We believed that this might be the most common trajectory, as during our study the intensity of the Intifada was declining, violence was easing, the economy was improving, and freedom of mobility was improving, even if all these stressors were still considerable.

A delayed distress trajectory, as indicated by initially moderate levels of psychological distress that increase across time. This trajectory has generally been found to be of limited size, but notable nonetheless, and is an indication of people who are initially experiencing sub-threshold pathology but gradually succumb to the pressures in their environment.

A relatively resilient trajectory, indicated by relatively consistently low levels of symptoms across the duration of our study. Although prior studies have found this to be the most common trajectory, we expected it to be rarer given the omnipresent violence and other

chronic stressors Palestinians encountered during this period, but still not an uncommon trajectory.

Given the degree of trauma exposure, we predicted that there would be no resistance trajectory in the current sample, as Conservation of Resources theory would predict that such chronic distress would have exhausted individual and community resources to too great a degree.

2. We hypothesized that predictors of these trajectories would be evidenced as follows:

Persons exhibiting the resilience and recovery trajectories would have greater economic and material resources (e.g., males, and people having higher income and education levels) compared to the persons exhibiting the chronic distress and delayed distress trajectories.

Persons exhibiting the resilience and recovery trajectories would have greater social support, less political violence exposure, and less psychosocial and material resource loss compared to persons exhibiting the chronic distress and delayed distress trajectories.

Based on prior research, we did not expect differences between the chronic and delayed distress trajectories.

Methods

Face-to-face interviews were conducted across three measurement occasions (Baseline interview from September 17th to October 16th, 2007; 6-month follow-up from October 15, 2008 to November 1, 2008; 12-month follow-up from May 29, 2009 to June 10, 2009) with an initial sample of 1196 people over the age of 18 in the West Bank, Gaza Strip, and East Jerusalem. Interviewers were Palestinians from the local population who were trained in interviewing techniques and supervised by experienced interview supervisors. Most were professionals in the areas of social work and teaching. For the purpose of achieving a margin of error of 3%, the sample size was set to be around 1200 participants. The sampling was conducted using a stratified 3-stage cluster random sampling strategy. First, 60 clusters were selected with populations of 1,000 or more individuals (after stratification by district and type of community – urban, rural, and refugee camp) with probabilities proportional to size, using the most currently available census information. Next, 20 households in each of the chosen clusters were selected. The third stage involved selecting one individual in each household using Kish Tables. We visited each sampled household at least 3 times to complete the interview. Once the identified individual was identified, the study was presented as confidential and part of an international study of the stress on Palestinians. Participants provided verbal informed consent and were paid the equivalent of about \$5 (U.S.D.).

The study was approved by the institutional review boards of Rush University Medical Center, The University of Haifa, and Kent State University.

Participants

Participants were 764 Palestinian adults living in the West Bank, Gaza Strip, and East Jerusalem who completed interviews at all three measurement occasions. This sample comprised 64.0% of the 1,196 people who completed the baseline interview and 86% of the 889 who participated at the 12-month study follow-up. The overall rate of attrition was 36%, which is deemed acceptable (Vinck et al., 2007) and the retained sample paralleled the known Palestinian population demographics in age, economic status, and sex, (ICBS, 2007; Vinck et al., 2007) (see Table 1). When comparing rates of attrition across the three regions,

it was noted that East Jerusalem represented the largest proportion of attrition (35% compared to 30.5% West Bank and 32% for Gaza, $\chi^2 = 2, 100.51, p < .001$).

To assess possible differences between the analyzed and the attrition sample, chi-square tests and independent samples t-tests were conducted on all independent variables at baseline assessment. Only income differed, with drop-outs reporting higher household incomes ($M = 1.82, SD = .85$) than those retained ($M = 1.64, SD = .79$), $t(1160) = -3.66, p < .001$.

Study Instruments and Variables

All interview measures were translated and back-translated into Arabic. In previous studies, these measures were found to have sound psychometric properties in this population (Hobfoll, Hall & Canetti, in press; Canetti et al., in press). Each interview lasted approximately 45 to 60 minutes. Participants reported their sex, marital status (single/divorced/separated/widowed, married), age, education (less than high school, high school graduate, some college, college graduate) and income within three categories ranging from less than average to more than average.

Region of residence was coded as East Jerusalem, Gaza, and the West Bank, as these are three distinct geo-political regions with quite different circumstances. East Jerusalem is most contiguous and interactive with Israel, and essentially borderless with Israel. It is also the area most in contention in any future settlement. Gaza is most economically deprived, isolated, and governed by Hamas. The West Bank is economically challenged, under clear military occupation, and under the governance of the more moderate Fatah political party.

Exposure to political violence was assessed by three items that were summed. Participants self-reported the total number of times they had experienced any of the following *as a direct result of the Intifada or political violence*: 1) a death of a family member or a friend, 2) an injury to a family member, friend, or to themselves, or whether they 3) witnessed political violence. At the first measurement wave, participants provided information about whether these events occurred during the past year, or within the past three months. At each subsequent measurement wave, participants answered these questions about events occurring since the previous interview.

Loss of psychosocial and material resources related to exposure to political violence was assessed using a 10-item scale from the Conservation of Resources Evaluation (COR-E; Hobfoll & Lilly, 1993). Participants were asked "To what extent have you lost any of the following things in the past year as a result of violence among factions?" Items include: "feeling that you are successful," "feeling that you are of great value to other people," "stability of your family," "intimacy with at least one friend," "hope," "sense of control in your life," "the feeling that life has meaning and purpose," "Faith in the ability of government to protect you and your family," "economic loss," and "loss of employment or business." Participants indicated the degree they lost these resources on a 4-point scale with item responses ranging from 0 (did not lose at all) to 3 (lost very much). All items were summed to represent a total loss score, with higher numbers indicating greater resource loss.

Social support satisfaction was measured rated from 0 (not at all satisfied) to 3 (very satisfied). "How satisfied are you with the social support you receive from your... 1) "family," 2) "friends."

PTSD symptoms occurring within the past month owing to exposure to political violence were assessed with the well-validated 17-item PTSD Symptom Scale Interview (PSS-I; Foa, Riggs, Dancu, & Rothbaum, 1993), which has been shown to be reliable and valid among in

non-Western, low-income regions (Hobfoll et al., 2008; Palmieri et al., 2008). Items (0 (not at all) to 3 (very much)) were summed to create a total score. Alpha was .86-.89 across waves).

Symptoms of depression were assessed using the 9-item Patient Health Questionnaire-9, a well-validated, highly sensitive instrument for identifying depression symptom severity (Kroenke, Spitzer, & Williams, 2001), used in Israeli Palestinian populations (Hobfoll et al., 2009). Responses were based on a 4-point rating scale with 0 (not at all), 1 (several days), 2 (more than half the days), and 3 (nearly every day) ($\alpha = .85-.90$ across waves).

Statistical Analysis

We used a latent growth mixture model (LGMM) framework to group participants into different patterns of change in depression and PTSD across time (Muthé, 2004).¹ In effect, LGMM tests whether the population under study is composed of a mixture of subpopulations that display these distinct trajectories of change across time. The trajectories are determined through growth parameters (latent continuous variables) that can be defined in different ways. Typically, an intercept, linear, and quadratic model is tested, though growth can also be defined in terms of cubic change or can be freely estimated based on the data themselves. The degree of heterogeneity in these patterns determines whether multiple trajectories of response are characteristic of the data, and the groupings are defined by categorical latent variables, similar to a factor structure in factor analysis.

We used Mplus 5.1 to identify latent trajectories. Mplus employs a robust full-information maximum-likelihood (FIML) estimation procedure for handling missing data. FIML assumes missing data are unrelated to the outcome variable (missing at random). Our analyses consisted of three steps. First, we identified a univariate single-class growth model without covariates to facilitate model specification for the LGMM. Second, we compared one- to five-class unconditional LGMMs (no covariates), assessing relative fit with conventional indices, including the Bayesian, sample-size adjusted Bayesian, and Akaike information criterion indices, entropy values, the Lo-Mendell-Rubin likelihood test (LRT: Lo, Mendell, & Rubin, 2001), and the bootstrap likelihood ratio test (BLRT: Nylund, Asparouhov, & Muthén, 2007). We sought a model with lower values for the criterion indices, higher entropy values, and significant p values for both the LRT and the BLRT. We also used theory regarding prototypical trajectories to inform our model selection.

Results

Simple Growth Models

For both PTSD and depression symptoms, we began by estimating a simple growth model. Using the likelihood ratio chi-square test to determine fit, we examined models with an intercept parameter (no growth), and intercept and slope parameters (linear growth). The linear model provided a significant improvement in fit over the intercept only model for

¹LGMM is one of a group of latent variable techniques that identifies meaningful subpopulations within a larger population of individuals based on heterogeneous patterns of growth in an outcome across time. Related techniques, such as latent class growth analysis (Jung & Wickrama, 2008) and group-based modeling (Nagin, 1999), also seek to group individuals into meaningful subpopulations based on longitudinal growth patterns. In the present study, we employed LGMM based on the considerable heterogeneity evidenced in previous work on acute stressors (Bonanno, 2004), which suggested that a similar degree of inter-individual variability would be present in responses to a chronic stressor. LGMM is widely acknowledged as the most powerful method of diagnosing this population heterogeneity (Muthén, 2004). LGMM is distinguished from other approaches by its capacity not only to use latent continuous (intercept, slope) and categorical variables (trajectory class) but also to model the variances for these variables within each class. This allows for greater flexibility in characterizing growth, a particularly important consideration when a greater degree of heterogeneity is present.

both depression and PTSD symptoms, indicating an overall pattern of change in depression and PTSD symptoms across time.

Before testing different class solutions, we varied model parameters to ensure model convergence and inspected modification indices to obtain the best fit. Log likelihood-ratio chi-square testing of multi-class models indicated that allowing intercept parameter to vary freely across classes (random effect) while fixing the variance of the slopes across classes (fixed effect) provided the best fitting model for both PTSD and depression symptoms.

Data were collapsed for the three regions (West Bank, Gaza, and East Jerusalem), as prior study of the full sample found no differences by region for PTSD or depression ($\chi^2(2, N = 1106) = 1.00, p = .606$; $\chi^2(2, N = 1106) = .367, p = .832$, respectively) (Canetti, et al., 2010), and preliminary trajectory analysis also rejected region as a covariate, indicating that it did not predict beyond what was predicted by the exposure or loss variables.

Trajectory Class Solutions for Symptoms of PTSD and Depression

PTSD Trajectories—As shown in Table 2, the information criterion indices showed decreasing Akaike Information Criterion (AIC) values for each additional class going from 2 to 5 classes; Bayesian Information Criterion (BIC) decreased from 1 to 3 classes and then began to increase. Entropy was similar across class solutions. However, the guidance offered by Lo-Mendell-Rubin test (Lo, Mendell, and Rubin, 2001) suggested that either a 3- or 4-class solution represented the best fit to the data. Both the 3- and 4-class solutions described similar patterns. The 3-class solution revealed groups with conceptually interpretable symptoms (Bonanno, 2004): one group had initially moderate PTSD symptoms that grew worse over time, another group had initially moderate PTSD symptoms that improved over time, and a third group had elevated PTSD symptoms but showed marked improvement over time. The 4-class solution was similar to the 3-class solution but split the improved group into two. Based on the fit statistics and conceptual interpretability, then, we selected the 3-class solution as optimal (Curran & Hussong, 2003; Nylund, Asparouhov, and Muthén, 2007).

The next step was to include relevant baseline covariates in a conditional model. Inclusion of six covariates improved model fit: age, income, social support, exposure to violence, recent trauma exposure, and resource loss. In the final model, class assignment and the intercept parameter were regressed on the covariates. Table 3 shows growth parameter estimates for the three-class conditional model and Figure 1 depicts the trajectories of estimated mean PTSD symptom scores for each class across time. By far the most common trajectory was characterized by a moderate level of PTSD symptoms at T1 and a slight but significant decline in PTSD symptoms across time. This trajectory, which we labeled *moderate-improving*, was assigned to 73.3% of the sample. The next most common trajectory was characterized by a severe level of PTSD symptoms at T1 that remained elevated across time. We labeled this trajectory, *severe-chronic*, and it was assigned to 23.2% of the sample. The remaining class was characterized by a severe level of PTSD symptoms at T1 and marked decrease in PTSD symptoms across time. This trajectory, which we labeled *severe-improving* accounted for 3.5% of the sample. No delayed distress trajectory was noted.

Covariate prediction of PTSD intercept and class membership—To assess the role of baseline covariates in the LGMM, we examined predictors of the class intercepts. Within each class, resource loss was a significant predictor of a higher intercept. To examine prediction of class membership, we conducted a series of logistic regression analyses. These analyses revealed the following group differences. Baseline resource loss was greater in the severe-improving group compared to all other groups: severe-improving ($B = -6.34, SE =$

1.51, $p < .001$), moderate-improving ($B = -3.48$, $SE = .96$, $p < .001$), and severe-chronic ($B = -5.09$, $SE = 1.16$, $p < .001$). The moderate-improving group also had significantly greater baseline resource loss than the severe-chronic group ($B = -1.61$, $SE = .45$, $p < .001$) and the severe-improving group ($B = -2.85$, $SE = 1.12$, $p < .01$). Baseline *exposure to violence* was significantly greater in the severe chronic group than the moderate-improving group ($B = -.91$, $SE = .029$, $p < .001$) and the severe-improving group ($B = -0.37$, $SE = .019$, $p = .05$). The severe-improving group also had greater baseline exposure to political violence than the moderate-improving group ($B = -.85$, $SE = .034$, $p < .05$). *Recent trauma exposure* in the 3 months prior to T1 was greater in the moderate-improving group than the severe-improving group ($B = 2.34$, $SE = 1.20$, $p = .05$). Baseline *income* did not differentiate the groups.

Depression trajectories—We next applied the approach described above to depression symptoms. As shown in Table 4, the information criterion indices showed decreasing AIC and BIC values for each additional class going from 2 to 4 classes. However, both the Lo-Mendell-Rubin tests and entropy values clearly suggested that a 3-class solution represented the best fit to the data. Therefore, we selected the 3-class solution as optimal for depression symptoms.

As in the previous analyses, the next step was to include relevant baseline covariates in a conditional model for symptoms of depression. Inclusion of five covariates improved model fit: recent exposure to political violence, age, income, resource loss, and social support. In the final model, class assignment and the intercept parameters were regressed on the covariates. Table 5 shows growth parameter estimates for the three-class conditional model and Figure 2 shows the mean depression scores for each class across time. Similar to the analysis for PTSD symptoms, the most common trajectory was characterized by a moderate level of depression symptoms at T1 and a slight but significant decline in depression symptoms across time. This trajectory, which we labeled *moderate-improving*, was assigned to 61.5% of the sample. The next most common trajectory was characterized by a more severe level of depression at T1 and then steadily worsening depression symptoms across time. We labeled this trajectory, *severe-chronic*, and it was assigned to 24.4% of the sample. The remaining trajectory captured was characterized by severe depression at T1 and then a marked decline in symptoms over time. We labeled this trajectory *severe-improving*. It captured 14.1% of the sample. Again, no delayed distress group was found.

Covariate prediction of depression class membership—The role of baseline covariates in the LGMM were again examined in a series of logistic regression analyses. These analyses revealed the following group differences. Baseline *resource loss* was greater in the severe-improving group compared to the two other groups: severe-chronic ($B = -3.10$, $SE = 1.29$, $p < .001$), moderate-improving ($B = -3.81$, $SE = .90$, $p < .001$). The severe-chronic distress group had significantly greater *recent trauma exposure* than the moderate-improving group ($B = -.35$, $SE = .13$, $p < .01$). The severe-chronic distress group also had significantly lower baseline *social support* than the moderate-improving group ($B = .91$, $SE = .37$, $p < .05$). The severe-chronic distress group was older in *age* at baseline than both the moderate-improving group ($B = -.038$, $SE = .015$, $p < .05$) and the severe-improving group ($B = -.049$, $SE = .024$, $p = .05$). Baseline *income* again failed to differentiate the groups.

Predictors of Class Membership

In order to more fully examine predictors of the latent class trajectories, we conducted multinomial logistic regression analyses. Included variables were participant sex, age, income, education, marital status, exposure to political violence at T1, T2, and T3, resource loss at T1, T2 and T3, and social support at T1, T2 and T3.

Predictors of PTSD classes—For the first model, we compared the likelihood of being in Class 3 (severe-chronic distress) to Class 1 (moderate-improving) and Class 2 (severe-improving) by specifying Class 3 as the reference group in the models. See Table 6 for complete results. For model 2, we specified Class 1 (moderate-improving) as the reference category in order to compare Class 1 and Class 2.

Results of Model 1 indicated that being a member of the moderate-improving group as opposed to the severe-chronic distress group was predicted by being male (OR = .61, $p = .04$), being younger (OR = .96, $p < .001$), having less exposure to political violence at T1 (OR = .91, $p < .001$), greater resource loss at T1 (OR = 1.38, $p < .001$), and greater social support at T1 (OR = 1.38, $p < .001$). Being a member of the moderate-improving group as opposed to the severe-chronic distress group was predicted by less resource loss at T2 (OR = .88, $p < .001$), and by less resource at T3 (OR = .89, $p < .001$).

Being a member of the severe-improving group as opposed to the severe-chronic distress group was predicted by having less exposure to political violence at T1 (OR = .93, $p = .004$), greater resource loss at T1 (OR = 2.59, $p < .001$), less resource loss at T2 (OR = .85, $p = .005$), greater exposure to political violence at T3 (OR = 2.30, $P = .004$), and less resource loss at T3 (OR = .65, $p < .001$).

Results of Model 2 indicated that being a member of the severe-improving group compared to the moderate-improving group was predicted by greater resource loss at T1 (OR = 1.88, $p < .001$), and less social support at T1 (OR = .58, $p = .005$) and by greater exposure to political violence (OR = 2.78, $p < .001$) and less resource loss at T3 (OR = .74, $p < .001$).

Predictors of Depression Classes—For the first model, we compared the likelihood of being in Class 3 (severe-chronic) to Class 2 (moderate-improving) and Class 1 (severe-improving) by specifying Class 3 as the reference group in the models. For model 2, we specified Class 2 as the reference category in order to compare Class 1 and Class 2. See Table 7 for complete results.

Results of Model 1 indicated that being a member of the moderate-improving group as opposed to the severe-chronic group was predicted by being younger (OR = .94, $p < .001$), having less resource loss at T2 (OR = .90, $p < .001$) and at T3 (OR = .86, $p < .001$), and having greater social support at T1 (OR = 1.56, $p < .001$).

Being a member of the severe-improving as opposed to the severe-chronic group was by being male (OR = .38, $p < .05$), being younger (OR = .92, $p < .001$), having greater resource loss at T1 (OR = 2.22, $p < .001$), less resource loss at T3 (OR = .70, $p < .001$), and less social support at T1 (OR = .65, $p = .006$).

Results of Model 2 indicated that being a member of the severe-improving group compared to the moderate-improving group was predicted by greater resource loss at T1 (OR = 2.19, $p < .001$), less social support at T1 (OR = .42, $p < .001$), greater resource loss at T2 (OR = 1.08, $p = .04$) and less resource loss at T3 (OR = .81, $p < .001$).

Discussion

Our most striking finding is the generally higher prevalence of PTSD and depression, combined with the relative absence of truly resilient, resistant, or full recovery trajectories compared to prior studies of these patterns. Indeed, as predicted, a healthy resilient/resistant trajectory was not identified in any analyses. Although this may appear obvious given the level of environmental threat and loss in the region, prior studies of even severe community trauma in many regions of the world (Bonanno, Brewin, Kaniasty, & LaGreca, 2010;

Hobfoll et al., 2009) and personal health trauma (Bonanno et al., 2011) revealed a substantive relatively unscathed subgroup and a more fully recovered group. This suggests a necessary addendum to Bonanno's view of resilience and recovery when it is applied to repetitive or chronic severe trauma circumstances. Consistent with Conservation of Resources (COR) theory (1998), and our own prior study of resistance and resilience in a higher income population exposed to chronic political violence (Hobfoll et al., 2009), over time resiliency resources can be overburdened and a much more sizable percent of the population may become symptomatic. This does not mean that recovery does not occur, but rather that it may take more time for the recovery process to be enacted, and that few individuals will be resistant to stress.

Differences between our current and prior study of resilience and resistance among Israeli Jews and Palestinians are notable (Hobfoll et al., 2009). In that study, exposure to terrorism and war was not statistically significant, whereas psychosocial and resource loss was. Further, that study, while focusing on a high distress population, still revealed a small percent of resilient and resistant individuals. This suggests that the much greater levels of chronic, repeated trauma and the much poorer resources among Palestinians in this region may contribute to these differences. As such, although Israelis have experienced major trauma and traumatic threat, Israelis reside in one of the wealthier nations in the world, and have a manifold lower level of exposure to political violence, even during the worst period of the Second Intifada.

The failure to find differences by region (i.e., Gaza, the West Bank, and East Jerusalem) is notable. The lack of differences on PTSD and depression, even initially when the Intifada and Israeli military reaction was at its height may indicate that exposure and resilience variables are balancing these sociopolitical and economic differences. Further, region did not influence the trajectory modeling. These findings support Conservation of Resources theory's primary principle, that it is the degree of resource loss that is most significant, and that exposure to trauma itself mainly manifests its influence through psychosocial and material resource lack and loss (see also Miller & Rasmussen, 2010).

In general, men and younger individuals had more favorable trajectories than women and older individuals. Likewise, being exposed to less political violence and having greater social support were associated with being in the relatively more favorable or improving trajectories. Initial high levels of distress were predicted by greater psychosocial and material resource loss during this highly tumultuous period. However, a recovery pattern was predicted by experiencing lower levels of psychosocial and material resource loss in subsequent assessments as the political climate surrounding political violence decreased and the situation relatively stabilized. That social support remains salient given intense challenges to family functioning is a critical finding here and in other reports of Palestinians (Qouta, Punamki, & El Sarraj, 2008).

It is also of interest that for PTSD the severe-improving group, compared to the chronic distress group was predicted by greater exposure to political violence. This may suggest that being in the chronic distress group is more likely to be characterological, whereas members of the other trajectories may have intense reactions that they are better able to recover from. Also, depression trajectories were not well-identified by trauma exposure, suggesting that PTSD is more traumatogenic. These and other inconsistencies with the trauma literature underscore the importance of considering chronic traumatic circumstances in their socio-ecological perspective, whereby the overall chronicity of adversity becomes a major signature of the circumstances and therefore people's reactions (Miller & Rasmussen, 2010; Miller & Rosco, 2004).

Limitations and Strengths of the Study

We do not know who declined study, and if some individuals were sheltered from our interviewers for personal, social, or political reasons. Overall, our cooperation rates were similar or better than similar studies (Scholte et al., 2004; Vinck et al., 2007) and many studies of war's impact in low income regions did not use random sampling (Basoglu et al., 2005; Bayer et al., 2007), but not knowing who declined or even avoided our interviewers remains a concern. The application of trauma-related diagnostic constructs in non-Western cultures has also been questioned (Nicholl & Thompson, 2004). We and others have documented cross-cultural applicability and quite similar findings as those found in the West in our own and others' research (Cardozo et al., 2000; Hobfoll et al., 2008; Scholte et al., 2004), however similarity should not be assumed to mean equivalence. It is also important to underscore that naturalistic studies can be used to imply causality, but such implications must be viewed cautiously.

Also, although we can assume that the high levels of distress and low levels of resiliency are attributable to chronic conditions of mass casualty and extreme adverse conditions, we only measured recent resource loss and recent trauma exposure. Future study might examine personal exposure to these conditions versus just living in a region where exposure is widespread in order to examine how these two related, but different, aspects of this experience contributes to resilience and distress. Finally, although only income predicted attrition, income itself is a complex variable which may be related to degree of involvement in political process, political attitudes, and availability of personal, social, and material resources in ways that we did not measure but are potentially meaningful.

Conclusions

A major finding of this study is that in the context of repeated or chronic traumatic circumstances, resilience and resistance are relative terms, and cannot be construed to mean that a majority, or even a substantive percentage of the population are symptom free, or have only a few symptoms of distress as previous work has argued (Bonanno et al., 2011). The shape of these patterns in our study was similar to that observed in previous trauma studies, only the floor levels of low symptoms were markedly higher. Indeed, the adjustment in the floor level of responding was dramatic, and has major theoretical, as well as practical meaning. These findings suggest, for example, that the normal adaptive mechanisms that drive high levels of resilience and resistance to psychological distress in the face of aversive events can be overwhelmed when mass casualties are ongoing and occur in an economically depressed region. Psychosocial and material resource loss during each period was the key predictor of the shape of the trajectories across periods consistent with recent theoretical work that, like Conservation of Resources theory, emphasizes that trauma exposure and the context of daily events must both be considered in mass casualty situations (Miller & Rasmussen, 2010). Loss of psychosocial and material resources was associated with the level of distress experienced by participants at each time period, suggesting that resource-based interventions could benefit people exposed to chronic trauma. Such intervention could focus on all levels of resources, including personal resources (e.g., self-efficacy, job skills), social resources (e.g., social support, family relationships), material resources (e.g., housing, transportation), and condition resources (e.g., job availability, fair access to work, open borders). Although any meaningful intervention is complex, such a resource model leads to targeted goals that are potentially achievable.

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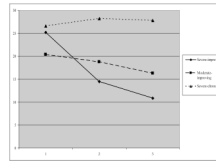


Figure 1.

PTSD symptom trajectory classes for the conditional model (with covariates).

Note. On the X-axis, 1 = baseline, 2 = six-month follow-up, and 3 = 12-month follow-up. Y-axis refers to PTSD symptom severity.

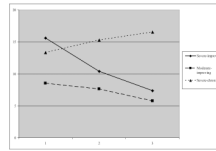


Figure 2.

MD symptom trajectory classes for the conditional model (with covariates).

Note. On the X-axis, 1 = baseline, 2 = six-month follow-up, and 3 = 12-month follow-up. Y-axis refers to MD symptom severity.

Table 1

Sample characteristics (n=764)

Variable	%	<i>M (SD)</i>	Range
Age		35.01 (12.68)	18 – 80
Sex			
Female	52.0		
Yearly Household Income			
Below Average	52.4		
Average	25.0		
Above Average	22.5		
Education			
Elementary	34.3		
High School/Post High School	32.9		
College Graduate	22.8		
Marital Status			
Single/widowed/divorced	31.4		
Married/cohabitating	68.6		
Exposure to political violence			
Baseline		3.10 (6.29)	0 – 104
6-month Follow-up		2.09 (4.31)	0 – 60
12-month Follow-up		0.28 (0.91)	0 – 12
Psychosocial resource loss			
Baseline		9.26 (6.65)	0 – 30
6-month Follow-up		7.42 (6.24)	0 – 30
12-month Follow-up		7.24 (6.41)	0 – 30
Social support			
Baseline		4.33 (1.58)	0 – 6
6-month Follow-up		4.34 (1.52)	0 – 6
12-month Follow-up		4.26 (1.51)	0 – 6

Table 2
Fit Indices for One- to Five-Class Growth Mixture Models (Unconditional) using PTSD symptoms

Fit Indices	Growth Mixture Model				
	1	2	3	4	5
	Class	Classes	Classes	Classes	Classes
AIC	20951.96	20587.31	20531.81	20529.02	20524.01
BIC	20977.39	20627.99	20587.38	20600.22	20615.55
SSBIC	20961.51	20602.58	20552.44	20555.75	20558.38
Entropy	--	.55	.49	.54	.54
LRT <i>p</i> value	--	<.001	<.001	<.05	.46
BLRT <i>p</i> value	--	<.001	<.001	<.05	.45

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion; SSBIC = sample size adjusted Bayesian information criterion; LRT = Lo-Mendell-Rubin test; BLRT = bootstrap likelihood ratio test.

Table 3

Growth Factor Parameter Estimates for 3-Class Conditional Model using PTSD Symptoms

	Intercept Mean (SD)	Slope Mean (SD)
Severe-improving	31.69 (3.71)***	-14.94 (0.00)***
Severe-chronic	28.68 (5.25)**	1.33 (0.00)
Moderate-improving	20.43 (5.42)***	-4.27 (0.00)***

Note. SD = Standard deviation.

* $p < .05$;

** $p < .01$;

*** $p < .001$ (two-tailed)

Table 4

Fit Indices for One- to Five-Class Growth Mixture Models (Unconditional) using MD symptoms

Fit Indices	Growth Mixture Model			
	1 Class	2 Classes	3 Classes	4 Classes
AIC	18659.12	18238.06	18164.37	18139.46
BIC	18684.56	18278.76	18220.33	18210.69
SSBIC	18668.68	18253.35	18185.39	18166.22
Entropy	--	.61	.62	.56
LRT <i>p</i> value	--	<.001	<.001	.57
BLRT <i>p</i> value	--	<.001	<.001	.58

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion; SSBIC = sample size adjusted Bayesian information criterion; LRT = Lo-Mendell-Rubin test; BLRT = bootstrap likelihood ratio test.

Table 5

Growth Factor Parameter Estimates for 3-Class Conditional Model using MD symptoms

	Intercept Mean (SE)	Slope Mean (SE)
Severe-improving	15.13 (2.47)***	-7.48 (0.00)***
Severe-chronic	12.95 (2.46)***	-2.71 (0.00)*
Moderate-improving	8.67 (2.21)***	3.16 (0.00)***

Note. SD = Standard deviation.

* $p < .05$;

** $p < .01$;

*** $p < .001$ (two-tailed)

Table 6

Results of Multinomial Logistic Regressions Predicting PTSD Latent Class Membership

Variable	-2 log likelihood	$\chi^2(2)$	Class 1: Moderate-improving			Class 2: Severe-improving			Class 3: Severe Chronic			
			M	Exp(B)	95% confidence interval for Exp(B)	M	Exp(B)	95% confidence interval for Exp(B)	M	Exp(B)	Reference Category	
Intercept	587.99	24.12**										
			B: -13.61									
Sex: women	568.40	4.52	52.6	0.61*	0.38, 0.99	33.0	0.98	0.22, 4.37	52.4			
Age	579.72	15.84**	33.9	0.96**	0.95, 0.98	41.3	0.99	0.93, 1.07	38.9			
Income	566.99	3.11	1.8	1.32	0.96, 1.82	1.6	1.07	0.43, 2.65	1.5			
Education	568.66	4.78	2.3	1.25	0.99, 1.58	2.2	1.81	0.85, 3.87	1.9			
Married	565.15	1.27	67.0	1.02	0.61, 1.73	81.0	3.50	0.35, 35.4	74.0			
Exposure to political violence (T1)	584.15	20.28**	2.3	0.91**	0.86, 0.96	7.6	0.93**	0.89, 0.98	6.3			
Exposure to political violence (T2)	565.58	1.71	1.6	0.96	0.89, 1.02	2.3	0.97	0.80, 1.17	4.5			
Exposure to political violence (T3)	579.50	15.62**	0.2	0.83*	0.68, 1.00	0.7	2.30**	1.31, 4.02	0.7			
Psychosocial resource loss (T1)	828.19	264.31**	9.4	1.38**	1.29, 1.47	22.9	2.59**	1.97, 3.40	6.4			
Psychosocial resource loss (T2)	599.19	35.31**	6.6	0.88**	0.84, 0.92	7.0	0.85**	0.76, 0.95	10.1			
Psychosocial resource loss (T3)	614.46	50.59**	6.4	0.89**	0.85, 0.93	6.9	0.65**	0.55, 0.78	9.8			
Social support (T1)	590.88	26.99**	4.5	1.38**	1.19, 1.60	3.2	0.80	0.53, 1.20	3.7			
Social support (T2)	565.14	1.27	4.4	1.01	0.87, 1.18	4.4	0.78	0.49, 1.26	4.0			
Social support (T3)	566.47	2.59	4.4	1.13	0.97, 1.32	4.3	1.06	0.66, 1.69	3.9			

Note. The χ^2 indicates the difference between the -2 log likelihoods of the full model and the model in this independent variable was omitted. Exp(B) indicates that the odds ratio of being in the class as opposed to the reference category as a function of a one-unit increase of the independent variable. Means are reported for all variables save for sex, and married, which are expressed in percentages.

* $p < .05$.

** $p < .001$.

Table 7
Results of Multinomial Logistic Regressions Predicting Depression Latent Class Membership

Variable	-2 log likelihood	$\chi^2(2)$	Class 1: Severe-improving			Class 2: Moderate-improving			Class 3: Severe Chronic	
			M	Exp(B)	95% confidence interval for Exp(B)	M	Exp(B)	95% confidence interval for Exp(B)	M	Reference Category
Intercept	694.20	25.84**								
Sex: women	673.38	5.02	45.4	0.38*	0.14, 0.99	52.8	0.70	0.44, 1.09	54.0	
Age	715.53	47.17**	36.6	0.92**	0.87, 0.96	32.9	0.94**	0.93, 0.96	40.5	
Income	671.11	2.74	1.8	0.59	0.31, 1.11	1.7	0.90	0.68, 1.21	1.7	
Education	669.81	1.45	2.1	1.21	0.78, 1.85	2.3	0.95	0.77, 1.17	2.0	
Married	671.46	3.10	73.0	1.67	0.53, 5.25	67.3	1.55	0.94, 2.55	70.0	
Exposure to political violence (T1)	672.46	4.09	2.9	0.96	0.92, 1.00	2.5	0.96	0.92, 1.01	4.5	
Exposure to political violence (T2)	668.83	0.47	1.3	0.96	0.83, 1.11	1.7	1.01	0.96, 1.06	3.6	
Exposure to political violence (T3)	670.26	1.89	0.1	1.08	0.74, 1.58	0.2	0.90**	0.75, 1.07	0.6	
Psychosocial resource loss (T1)	1034.10	365.73**	11.3	2.22**	1.84, 2.69	7.0	1.02**	0.97, 1.07	9.5	
Psychosocial resource loss (T2)	694.15	25.79**	9.4	0.97	0.90, 1.04	5.7	0.90**	0.87, 0.94	10.9	
Psychosocial resource loss (T3)	762.17	93.80**	9.6	0.70**	0.63, 0.78	5.3	0.86**	0.83, 0.90	11.7	
Social support (T1)	733.78	65.42**	4.2	0.65**	0.47, 0.89	4.7	1.56**	1.34, 1.80	3.5	
Social support (T2)	669.44	1.07	3.8	0.97	0.71, 1.32	4.6	1.07	0.92, 1.25	3.9	
Social support (T3)	669.14	0.78	3.9	0.88	0.65, 1.19	4.5	1.01	0.87, 1.17	3.9	

Note. The χ^2 indicates the difference between the -2 log likelihoods of the full model and the model in which this independent variable was omitted. Exp(B) indicates that the odds ratio of being in the class as opposed to the reference category as a function of a one-unit increase of the independent variable. Means are reported for all variables save for sex, and married, which are expressed in percentages.

* $p < .05$.

** $p < .001$.