

The Association of Exposure, Risk, and Resiliency Factors With PTSD Among Jews and Arabs Exposed to Repeated Acts of Terrorism in Israel

Stevan E. Hobfoll

Department of Psychology, Kent State University, Kent, OH and Department of Psychiatry, Summa Health System, Akron, Ohio

Daphna Canetti-Nisim

Department of Political Science, University of Haifa and Department of Political Science, Yale University, Mt. Carmel, Israel

Robert J. Johnson

Department of Sociology, University of Miami, Miami, FL

Patrick A. Palmieri and Joseph D. Varley

Department of Psychiatry, Summa Health System, Akron, OH

Sandro Galea

Department of Epidemiology, University of Michigan, School of Public Health, Ann Arbor, MI

Israel has faced ongoing terrorism since the beginning of the Al Aqsa Intifada in September 2000. The authors examined risk and resiliency factors associated with posttraumatic stress disorder (PTSD) among 1,117 Jews and 394 Arab adult citizens of Israel during August and September 2004 through telephone interviews. Probable PTSD was found among 6.6% of Jews and 18.0% of Arabs. Predictors of probable PTSD in a multivariate model for Jews were refusal to report income, being traditionally religious, economic and psychosocial resource loss, greater traumatic growth, and lower social support. For Arabs, predictors were low education and economic resource loss among those exposed to terrorism. Findings for only those directly exposed to terrorism were similar to those for the overall national sample.

From September 2000 to the time of this study, the Al Aqsa Intifada resulted in Israeli Jews' and Arabs' exposure to extreme ongoing acts of terrorism. Studies following September 11th suggested marked psychological impact for those in Manhattan (Galea et al., 2002) and more moderate to modest impact for those geographically distant from the attacks (Schuster et al., 2001; Silver, Holman, McIntosh, Poulin, & Gil-Rivas, 2002). This is generally consistent with findings regarding terrorism in Israel that have found a marked impact of terrorism on posttraumatic stress disorder (PTSD; Bleich, Gelkopf, & Solomon, 2003; Shalev & Freedman, 2005).

Conservation of resources (COR) theory has been adopted to understand how people are affected by a terrorist attack, war, and disaster (Benight, Freyaldenhoven, Hughes, Ruiz, & Zoschke, 2000; Hobfoll, Canetti-Nisim, & Johnson, 2006; Ironson et al., 1997), suggesting that stress is primarily a consequence of threat

of loss or actual loss of resources (Hobfoll, 1989, 1998). Resources include material (e.g., transportation, housing) and psychosocial (e.g., self-efficacy, social support) resources. Although terrorism threatens interpersonal resources such as social support, those who sustain supportive social relationships have been found to be more resilient (Benight et al., 2000; Galea et al., 2002; Norris & Kaniasty, 1996; Shalev, Tuval-Mashiach, & Hadar, 2004).

The COR theory also provides a unified explanation as to why a number of demographic variables may be related to vulnerability. Low education, ethnic minority status, female gender, and low income have been previously found to be associated with risk of PTSD following terrorism (Bleich et al., 2003; Galea et al., 2002; Hobfoll, Tracy, & Galea, 2006; Silver et al., 2002). These are, of course, complex indicators, but each has been associated with either poor access to resources or obstacles to using resources even if they are possessed (Dohrenwend, 1981; Kessler, McLeod,

& Wethington, 1985). Ethnic minority status may particularly be associated with differential resources, and subsequent PTSD, owing to lifetime discrimination patterns (Galea et al., 2002; Norris & Kaniasty, 1996).

Even when facing traumas, people often look for meaning and intimacy with others (Frankl, 1963), leading to the study of traumatic growth (McMillen, Smith, & Fisher, 1997; Tedeschi & Calhoun, 1995). In this regard, COR theory originally posited and, in fact, found that people experienced decreased psychological distress when they experienced resource gains following stressful circumstances (Hobfoll, 1989, 1998). However, studies of benefit finding following more traumatic events have actually found it to have both positive and negative consequences (Helgeson, Reynolds, & Tomich, 2006; Zoellner & Maercker, 2006). In our own earlier investigation of terrorism, we found traumatic growth, which we operationalized as resource gains in intimacy and sense of meaning resulting from trauma, to be related to greater PTSD symptoms (Hobfoll, Canetti-Nisim, et al., 2006). The negative impact of finding gains in trauma in some studies is poorly understood. It may be related to the negative consequences of increased rumination, denial, or a style of emotion-focused coping that interferes with more active coping, and with raising false-positive expectations that are then not actualized (Hobfoll, Canetti-Nisim, & Johnson, 2006; Zoellner & Maercker, 2006).

The current study is one of the first investigations of terrorism's impact to examine the specific effects of resource loss on probable PTSD diagnosis, in addition to the impact of degree of terrorism exposure (Galea et al., 2002). Moreover, it is the first study, to our knowledge, to examine how traumatic growth that people report they derived from the experience of terrorism impacts probable PTSD diagnosis.

We predicted that both resource losses and gains would be associated with higher risk of probable PTSD diagnosis. We further predicted that possessing social support would be associated with lower risk of probable PTSD diagnosis and that women, those with low education and low income, and Arabs (Arabs represent 18.6% of the Israeli population [Central Bureau of Statistics, 2004] and have experienced discrimination historically) would report greater risk for PTSD than men, those with higher education and income, and Jews, respectively.

METHOD

Participants

Data were collected through telephone interviews with a random national sample of adult (18 years of age or older) Israeli residents between August 17, 2004 and September 8, 2004, one year after an earlier study we reported (Hobfoll, Canetti-Nisim, et al., 2006). In that study we did not use a measure that allowed assessment of probable PTSD diagnosis, which was a major goal for the current effort. The institutional review boards of the University of Haifa

and Kent State University approved the study, and oral informed consent was obtained.

The response rate among eligible responders was 57%. Correcting for business lines, which in Israel cannot be removed as in the United States, would give us a corrected rate of 63%. Analyses were based on 1,511 Jews and Arabs who answered the phone and agreed to be interviewed. The sample represented the distribution in the Israeli population on sex, age, place of residence (inside/outside 1967 borders), and voting behavior. The samples are slightly more educated than indicated by census data, which may be a result from not knowing Hebrew, Russian, or Arabic (analysis available upon request).

Measures

A structured survey instrument, originally written in Hebrew, and translated and back-translated into Arabic and Russian, was administered to all study participants in the participants' native tongue. Each survey was approximately 30 minutes in length. Demographic variables included participants' age (five categories), sex (*female* = 1, *male* = 0), educational attainment (four categories), income (three categories plus a code for missing), ethnicity (Jew, Arab), and religiosity were obtained by self-report. Religiosity was categorized as *secular* (nonobservant), *traditional* (observing some religious laws), *religious* (observing most laws, but living a modern lifestyle), and *very religious* (living fully according to religious law) by self-report, these being meaningful categories for Jews and Arabs in Israel.

Terrorism exposure was since the beginning of the Al Aqsa Intifada in 2000. We assessed whether participants were in an attack, whether they underwent a period of time in which they feared a family member was in an attack, whether a family member or friend was killed, or whether they, a family member, or a close friend were injured in an attack. The exposure scale was trichotomized as *none*, *once*, or *multiple exposures* based on being above or below the modal category (one exposure) for the descriptive, bivariate, and multivariate analyses.

We assessed loss of resources related to the Intifada using a 10-item scale that has been used in previous postterrorism contexts, e.g., "Have you suffered economically as a result of terrorism and war since the Intifada began?" "There is at least one person whom you know that you like less than you used to because of things that occurred between you since the Intifada began." (Hobfoll, Canetti-Nisim, et al., 2006; Hobfoll & Lilly, 1993; Norris, 2001) Two summative scores were calculated—one for loss of economic/work resources and one for loss of psychosocial resources. The three items for economic loss were answered no (0) or yes (1) and then summed. The scale was coded into three categories (*none*, *one*, or *2 or more*). Items for loss of psychosocial resources were answered from 0 (*not at all*) to 3 (*extremely*). The summed scale was trichotomized into low (<3), medium (3–6.9), and high (7 or more).

Six items were summed to assess traumatic growth. "Indicate the degree you have gained any of the following things in the past three months as a result of terrorism (0 = *not at all*, 3 = *extremely*): (1) feeling closer to someone else, (2) feeling closer to a friend, (3) feeling that my life has meaning/purpose, (4) sense of confidence, (5) hope, (6) sense of intimacy with family (Hobfoll & Lilly, 1993; alpha .74 Jews; .70 Arabs). Individuals were divided into three categories of low (>2), medium (2–7), and high (>7–18). As the category of low was the modal group, an effort was made to keep medium and high nearly even.

Social support was assessed by summing three items addressing satisfaction with perceived social support, e.g., "How satisfied are you with the social support you receive from your spouse, partner, family, or friends?" ($\alpha = .66$, Jews; .50, Arabs; Sarason, Sarason, Shearin, & Pierce, 1987).¹ Alpha, although low, is not untypical for such brief scales. Individuals were divided into three categories of low (0–5), medium (6–8), and high (9).

Probable PTSD diagnosis was measured using the PTSD symptoms Scale (PSS; Foa, Riggs, Dancu, & Rothbaum, 1993), assessing feelings for at least a month related to specific exposure to a terrorist attack or war-related event. All participants answered items vis a vis their exposure to terrorism, which might have been direct or indirect. The items assess symptom criteria indicated by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (American Psychiatric Association, 1994) criteria for determining PTSD. Items assessed symptoms that were present during the past month related to specific exposure to a terrorist attack that occurred since the beginning of the Al Aqsa Intifada in September of 2000. If more than one exposure was noted, respondents related to their exposure in general. Current probable PTSD was specified when individuals reported the following symptoms at moderately severe to severe levels: presence of at least one reexperiencing symptom (e.g., intrusive memories or distressing dreams), three avoidance symptoms (e.g., efforts to avoid thoughts or activities associated with the trauma), and two symptoms of hyperarousal (e.g., difficulty falling asleep or concentrating) in the past month. Finally, to meet probable diagnosis they had to endorse that they found their work, personal, or social lives moderately or severely impaired by their symptoms (an additional item). This method is more stringent than one originally designated for the PSS.

¹ If the scale had six items instead of three; the alpha reliability coefficient would be an acceptable value of 0.76. The factor analyses and latent variable analyses show that the items all have acceptable construct validity in that factor loadings are significant and greater than the threshold of 0.35. Even with the few (three items) that we have, the reliabilities are acceptable according to Nunnally (1967). "In the early stages of research . . . reliabilities of .60 or .50 will suffice." (Nunnally, 1967, p. 226). Finally, we would add that social support between spouse, family, and friend would be suspect if it had high internal consistency (for example, unlike self-esteem or depression which are more unidimensional constructs), as these three realms should only be moderately correlated theoretically, a point which is often forgotten in discussion scale of homogeneity of variance.

Data Analysis

We first conducted bivariate analyses of religion/ethnicity (Jews by Arabs) with each of the variables to determine where there were significant differences between them. We next conducted bivariate analyses of the relationship between probable diagnosis of PTSD and the theoretically indicated independent predictor variables, separately for Arabs and Jews, to determine which variables should be included in the later multivariate analyses. We included any variable in the multivariate analyses using hierarchical logistic regression (HLR) that was significant in the bivariate case for either Jews or Arabs to have a comparable test of the theoretical model in both groups. Hierarchical logistic regression is a theoretically driven method for entering variables in the model rather than a statistically driven method such as stepwise. We first entered the demographic variables; then terrorism exposure; followed by economic resource loss, psychosocial resource loss, and social support; and finally, traumatic growth.

RESULTS

Limiting the sample to the stratified participants only, the bivariate tables have up to 1,511 participants, 1,117 Jewish, and 394 Arabs. The final sample used in the multivariate analyses with listwise missing data included 1,463 Israelis; 1,076 of respondents were Jewish and 387 were Arabs.

Demographic characteristics of participants in the total sample are shown in Table 1. Jews tended to be older, have more social support, have higher income, and be more educated than Arabs. Jews were also significantly more likely to be exposed to terrorism than Arabs. Arabs reported significantly higher levels of psychosocial loss and traumatic growth than Jews. The prevalence of current probable PTSD was 6.6% among Jews, 95% confidence interval (CI) = 5.1%–8.1% and 18.0% among Arabs, 95% CI = 14.2%–21.8%.

We next examined if there were any key associations between demographic predictors and other predictors (i.e., exposure, economic and psychosocial loss, and traumatic growth). We report the statistically significant findings briefly as they could themselves fill an entire article (results available upon request).

Among Arabs, men reported greater economic loss than women, but lower exposure to terrorism. Those with the highest level of education reported the greatest terrorism exposure among the Arabs.

Among Jews, younger age, greater religiosity and being female were associated with greater terrorism exposure. Traumatic growth among Jews was also associated with age, religiosity, and education. Being younger was related to greater traumatic growth. The traditional and religious were also more likely to report high traumatic growth than the secular. Education showed a curvilinear relationship with traumatic growth, with those with middle educational level reporting highest traumatic growth. Among Jews,

Table 1. Percentages and Group Differences of Jewish ($n = 1,117$) and Arab ($n = 394$) Respondents

Variable	Jews		Arabs		χ^2 or t
	%	n	%	n	
Age					$\chi^2(4) = 154.81^{***}$
18–25	14.3	159	29.0	114	
26–35	17.7	197	33.6	132	
36–50	28.2	313	28.0	110	
51–65	25.5	283	8.1	32	
66+	14.3	159	1.3	5	
Sex					$\chi^2 < 1$
Male	47.1	526	47.7	188	
Female	52.9	591	52.3	206	
Income					$\chi^2(3) = 126.16^{***}$
Below average	34.2	382	64.2	253	
Average	22.1	247	19.3	76	
Above average	33.3	372	15.0	59	
Missing	10.4	116	1.5	6	
Education					$\chi^2(3) = 50.41^{***}$
<High school	4.1	46	11.4	45	
High school	32.7	365	43.1	170	
Post-high school	23.6	263	16.5	65	
Academic	39.6	442	28.9	114	
Religiosity					$\chi^2(3) = 198.42^{***}$
Secular	64.4	716	26.9	105	
Traditional	23.5	261	46.9	183	
Religious	8.4	93	25.1	98	
Ultra religious	3.7	41	1.0	4	
Direct terrorism exposure					$\chi^2(2) = 122.70^{***}$
No	20.2	226	45.9	181	
Yes, 1	48.0	536	43.4	171	
Yes, 2 or more	31.8	355	10.7	42	
Economic loss					$\chi^2(2) = 11.39^{**}$
Low	76.2	851	75.6	298	
Medium	21.2	237	18.3	72	
High	2.6	59	6.1	24	
Psychosocial loss					$\chi^2(2) = 29.34^{***}$
Low	39.5	441	24.9	98	
Medium	29.2	326	32.5	128	
High	31.3	350	42.6	168	
Social support					$\chi^2(2) = 26.56^{***}$
Low	8.3	90	15.3	60	
Medium	37.2	403	43.4	170	
High	54.5	591	41.3	162	
Traumatic growth					$\chi^2(2) = 47.34^{***}$
Low	40.9	456	22.6	89	
Medium	32.0	357	35.9	141	
High	27.2	303	41.5	163	

Continued

Table 1. Continued

Variable	Jews		Arabs		χ^2 or t
	%	n	%	n	
Probable PTSD					
Total (with impaired functioning)	6.6	1117	18.0	394	$t(1509) = -5.49^{***}$
Criterion B (Reexperiencing)	50.5	1117	68.0	394	$t(1509) = -6.27^{***}$
Criterion C (Avoidance)	19.4	1117	51.3	393	$t(1508) = -11.43^{***}$
Criterion D (Hyperarousal)	30.3	1116	68.2	393	$t(1507) = -14.01^{***}$

Note. Numbers within categories may not add up to total for some variables due to missing values. PTSD = Posttraumatic stress disorder.

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

psychosocial resource loss and sex were also associated, with men reporting lower loss than women. Finally, social support and age were also significantly negatively related to each other.

Bivariate Analyses

Table 2 shows the results of bivariate analyses. For both Jews and Arabs, the likelihood of probable PTSD was significantly greater among those with greater economic resource loss, greater psychosocial resource loss, and inversely related to social support. Traditional practicing Jews had higher probable PTSD prevalence than secular or religious and ultra-religious Jews. The higher rate of PTSD for women compared to men was significant only for Jews and the relationship of probable PTSD with lower income, higher terrorism exposure, and greater reported traumatic growth were only significant among Jews as well. Among Arabs, higher education was related to lower odds of probable PTSD.

Multivariate Analyses

The multivariate results for the full sample of Jews and Arabs are reported in Tables 3a and 3b.² We deemed it important to examine all participants as virtually everyone in Israel has at least vicarious exposure to terrorism; this was also the method used in prior key studies (Bleich et al., 2003; Galea et al., 2002). We also thought it critical to more closely examine those who reported exposure to terrorism to investigate the impact of the predicted associations among those with exposure experiences, so this was done in subsequent analyses (see Tables 4a and 4b).

Multivariate Findings by Ethnicity: Full Sample

The HLR analysis indicated that among the full sample of Jews, those who identified their religiosity as traditional versus secular

were about three times as likely to meet the criteria for probable PTSD. Psychosocial resource loss and traumatic growth were markedly related to greater likelihood of probable PTSD diagnosis. Social support militated against the likelihood of probable PTSD. The more exact nature of these odds ratios are described below for those exposed to terrorism directly, so as not to be repetitive.

For Arabs, greater education, exposure to terrorism and psychosocial resource loss were significant predictors of greater odds of probable PTSD as they were entered in logistic regression models (see Table 3b), but only education was significant in the final model.³ This suggests that these predictors have considerable overlap, rather than their not being significant overall predictors. Again, we delineate these odds ratios in more detail below for those exposed to terrorism.

Participants Exposed to Terrorism

We next restricted the multivariate analyses to only those participants who reported exposure to one or more indicators of terrorism exposure (see Tables 4a and 4b for Jews and Arabs, respectively). The results are similar to those found in the total samples, largely because of the high proportion of exposure levels. Results from logistic regression indicated that among Jews who were exposed to terrorism ($n = 860$), those with unreported income were only 22% as likely to have probable PTSD (or about 78% less likely) as those with low income. It may be that those with the highest income are more likely to conceal this information from researchers over the phone, and if true, this would represent a protective effect of income. Those reporting traditional religiosity were 3.06 times more likely to be diagnosed with probable PTSD as secular Jews. Psychosocial resource loss and traumatic growth both significantly increased probable PTSD. Those with mid and high levels of psychosocial resource loss were about 3.54 and 8.66 times more

² Any variable that was not significant in bivariate analyses for Jews or Arabs were removed, as they would not be significant in multivariate analyses.

³ Being Russian was not found to be a risk factor and so was not considered in analyses.

Table 2. Bivariate Odds Ratios (OR) and 95% Confidence Intervals (CI) of Probable PTSD with Predictor Variables by Race/Ethnicity

	Jews		Arabs	
	OR	95% CI	OR	95% CI
Sex				
Male	1.00		1.00	
Female	1.81*	1.10–2.98	1.40	0.83–2.36
Age				
18–25	1.00		1.00	
26–35	1.41	0.54–3.67	1.01	0.51–2.00
36–50	1.72	0.72–4.10	1.57	0.80–3.07
51–65	1.15	0.41–3.25	...	...
Income				
Below	1.00		1.00	
Average	0.71	0.40–1.28	1.00	0.52–1.90
Above	0.41**	0.22–0.74	0.46	0.19–1.13
Missing	0.16*	0.04–0.67	...	...
Education				
<High school	1.00		1.00	
High school	0.94	0.32–2.80	0.48*	0.23–1.00
Post-high school	0.68	0.22–2.13	0.32*	0.13–0.82
Academic	0.60	0.20–1.82	0.28**	0.12–0.64
Religion				
Secular	1.00		1.00	
Traditional	3.20***	1.93–5.31	0.59	0.32–1.10
Religious	1.21	0.46–3.20	0.91	0.47–1.80
Ultra religious	1.10	0.25–4.74	1.19	0.12–11.97
Exposure				
None	1.00		1.00	
Once	3.12**	1.31–7.44	0.68	0.39–1.20
Multiple	2.90*	1.17–7.16	1.67	0.78–3.58
Economic loss				
Low	1.00		1.00	
Medium	2.43***	1.46–4.07	2.28**	1.24–4.13
High	6.29***	2.54–15.56	2.96*	1.20–7.35
Resource loss				
Low	1.00		1.00	
Medium	3.25*	1.24–8.56	3.16*	1.30–7.64
High	13.23***	5.62–31.14	3.93**	1.68–9.18
Social support				
Low	1.00		1.00	
Medium	0.68	0.34–1.35	0.56	0.28–1.12
High	0.25***	0.12–0.53	0.42*	0.20–0.86
Traumatic growth				
Low	1.00		1.00	
Medium	3.07**	1.44–6.54	1.84	0.87–3.89
High	6.98***	3.44–14.17	1.66	0.79–3.50

Note. The ellipses (...) in cells mean that *n* is too small.

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

Table 3a. Multivariate Logistic Regression of Probable PTSD Among All Jews ($n = 1,076$)

	OR				95% CI
	Model 1	Model 2	Model 3	Model 4	
Sex					
Male	1.00	1.00	1.00	1.00	
Female	1.42	1.42	1.20	1.20	0.68–2.12
Income					
Below	1.00	1.00	1.00	1.00	
Average	0.72	0.70	0.75	0.76	0.39–1.48
Above	0.52*	0.50*	0.65	0.63	0.32–1.23
Missing	0.19*	0.18*	0.21*	0.21*	0.05–0.96
Education					
<High school	1.00	1.00	1.00	1.00	
High school	1.09	1.03	1.66	1.46	0.44–4.88
Post-high school	0.87	0.81	1.13	1.05	0.29–3.80
Academic	0.90	0.85	0.28	1.27	0.37–4.43
Religion					
Secular	1.00	1.00	1.00	1.00	
Traditional	2.80***	2.73***	3.11***	2.63**	1.44–4.82
Religious	1.26	1.14	1.28	1.08	0.38–3.12
Ultra religious	0.42	0.40	0.65	0.57	0.07–4.60
Exposure					
None		1.00	1.00	1.00	
Once	–	2.84*	2.11	2.22	0.86–5.72
Multiple	–	2.70*	1.72	1.69	0.63–4.57
Economic loss					
Low	–	–	1.00	1.00	
Medium	–	–	1.76	1.87*	1.04–3.34
High	–	–	3.61*	4.14*	1.38–12.41
Psychosocial resource loss					
Low	–	–	1.00	1.00	
Medium	–	–	3.35*	2.81	0.97–8.16
High	–	–	11.34***	7.75***	2.91–20.65
Social support					
Low	–	–	1.00	1.00	
Medium	–	–	0.74	0.60	0.27–1.35
High	–	–	0.32**	0.25**	0.11–0.60
Traumatic growth					
Low	–	–	–	1.00	
Medium	–	–	–	1.80	0.77–4.22
High	–	–	–	3.30**	1.42–7.64
-2LLR	487	479	407	397	
Nagelkerke R^2	.09	.10	.26	.28	
Cox & Snell R^2	.03	.04	.10	.11	

Note. All odds ratios (OR) are listed whether or not they are significant and for the sake of clarity the confidence intervals are presented only for the final Model 4 with all independent variables entered. Earlier blocks of the model have the significance of the OR indicated by an asterisk.

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

Table 3b. Multivariate Logistic Regression of Probable PTSD Among All Arabs ($n = 387$)

	OR				95% CI
	Model 1	Model 2	Model 3	Model 4	
Sex					
Male	1.00	1.00	1.00	1.00	
Female	1.44	1.491	1.65	1.70	0.92–3.11
Income					
Below	1.00	1.00	1.00	1.00	
Average	1.05	1.00	1.20	1.19	0.59–2.41
Above	0.46	0.42	0.57	0.54	0.19–1.54
Missing	...	...	...	...	...
Education					
<High school	1.00	1.00	1.00	1.00	
High school	0.51	0.49	0.52	0.53	0.24–1.17
Post-high school	0.28*	0.24**	0.24**	0.26*	0.09–0.74
Academic	0.29**	0.29**	0.29**	0.28**	0.11–0.73
Religion					
Secular	1.00	1.00	1.00	1.00	
Traditional	0.55	0.56	0.56	0.59	0.30–1.16
Religious	0.66	0.65	0.75	0.77	0.35–1.69
Ultra religious	0.75	0.86	0.56	0.56	0.04–7.74
Exposure					
None		1.00	1.00	1.00	
Once	–	0.78	0.70	0.70	0.37–1.32
Multiple	–	2.43*	1.68	1.74	0.72–4.22
Economic Loss					
Low	–	–	1.00	1.00	
Medium	–	–	1.94	1.91	0.96–3.80
High	–	–	2.17	2.37	0.82–6.85
Psychosocial resource loss					
Low	–	–	1.00	1.00	
Medium	–	–	2.20	2.11	0.83–5.34
High	–	–	2.70*	2.51	0.99–6.32
Social support					
Low	–	–	1.00	1.00	
Medium	–	–	0.80	0.76	0.36–1.65
High	–	–	0.60	0.54	0.24–1.23
Traumatic growth					
Low	–	–	–	1.00	
Medium	–	–	–	1.78	0.76–4.16
High	–	–	–	1.44	0.62–3.34
–2LLR	345	337	32	321	
Nagelkerke R^2	.08	.11	.17	.11	
Cox & Snell R^2	.05	.07	.10	.18	

Note. All odds ratios (OR) are listed whether or not they are significant and for the sake of clarity the confidence intervals are presented only for the final model 4 with all independent variables entered. Earlier blocks of the model have the significance of the OR indicated by an asterisk. The ellipses (...) in a cell mean that the n is too small. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4a. Multivariate Logistic Regression of Probable PTSD Among those Jews Directly Exposed to Trauma ($n = 860$)

	OR				95% CI
	Model 1	Model 2	Model 3	Model 4	
Sex					
Male	1.00	1.00	1.00	1.00	
Female	1.38	1.36	1.11	1.12	0.62–2.04
Income					
Below	1.00	1.00	1.00	1.00	
Average	0.56	0.56	0.60	0.62	0.30–1.29
Above	0.53	0.53	0.68	0.66	0.33–1.31
Missing	0.19*	0.19*	0.21*	0.22*	0.05–0.98
Education					
<High school	1.00	1.00	1.00	1.00	
High school	0.85	0.86	1.43	1.28	0.37–4.43
Post-high school	0.78	0.78	1.12	1.10	0.30–4.06
Academic	0.74	0.74	1.16	1.16	0.32–4.16
Religion					
Secular	1.00	1.00	1.00	1.00	
Traditional	3.00***	3.00***	3.54***	3.06***	1.62–5.76
Religious	1.19	1.20	1.34	1.15	0.40–3.33
Ultra religious	0.43	0.43	0.73	0.62	0.08–5.15
Exposure					
Once	–	1.00	1.00	1.00	
Multiple	–	0.95	0.82	0.77	0.43–1.40
Economic loss					
Low	–	–	1.00	1.00	
Medium	–	–	1.65	1.76	0.95–3.24
High	–	–	2.66	3.09	0.94–10.14
Psychosocial resource loss					
Low	–	–	1.00	1.00	
Medium	–	–	4.09*	3.54*	1.11–11.28
High	–	–	12.10***	8.66***	2.93–25.53
Social support					
Low	–	–	1.00	1.00	
Medium	–	–	0.73	0.59	0.25–1.38
High	–	–	0.31*	0.24**	0.10–0.60
Traumatic growth					
Low	–	–	–	1.00	
Medium	–	–	–	1.82	0.74–4.44
High	–	–	–	3.20**	1.32–7.75
-2LLR	427	427	365	357	
Nagelkerke R^2	.09	.09	.25	.27	
Cox & Snell R^2	.04	.04	.11	.11	

Note. All odds ratios (OR) are listed whether or not they are significant and for the sake of clarity the confidence intervals are presented only for the final model 4 with all independent variables entered. Earlier blocks of the model have the significance of the OR indicated by an asterisk.

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

Table 4b. Multivariate Logistic Regression of Probable PTSD Among Those Arabs Directly Exposed to Trauma ($n = 209$)

	OR				95% CI
	Model 1	Model 2	Model 3	Model 4	
Sex					
Male	1.00	1.00	1.00	1.00	0.84–5.87
Female	1.73	1.91	2.08	2.22	
Income					
Below	1.00	1.00	1.00	1.00	
Average	0.85	0.75	1.17	1.14	0.39–3.39
Above	0.48	0.40	0.62	0.58	0.14–2.34
Missing	...	...	...	...	...
Education					
<High school	1.00	1.00	1.00	1.00	
High school	0.24*	0.21*	0.33	0.33	0.08–1.47
Post-high school	0.20*	0.12*	0.17	0.19	0.03–1.23
Academic	0.12**	0.10**	0.14*	0.13*	0.03–0.70
Religion					
Secular	1.00	1.00	1.00	1.00	
Traditional	0.68	0.76	0.83	0.93	0.32–2.74
Religious	0.56	0.55	0.73	0.79	0.23–2.74
Ultra religious	...	...	...	...	...
Exposure					
Once	–	1.00	1.00	1.00	
Multiple	–	3.34**	2.27	2.44	0.91–6.51
Economic loss					
Low	–	–	1.00	1.00	
Medium	–	–	2.11	2.06	0.75–5.66
High	–	–	4.45*	5.50*	1.24–24.26
Psychosocial resource loss					
Low	–	–	1.00	1.00	
Medium	–	–	5.35	4.89	0.57–41.87
High	–	–	6.24	5.48	0.64–47.20
Social support					
Low	–	–	1.00	1.00	
Medium	–	–	0.45	0.42	0.15–1.17
High	–	–	0.36	0.33	0.10–1.05
Traumatic growth					
Low	–	–	–	1.00	
Medium	–	–	–	2.31	0.65–8.17
High	–	–	–	1.64	0.48–5.60
-2LLR	177	170	153	151	
Nagelkerke R^2	.12	.17	.28	.30	
Cox & Snell R^2	.07	.10	.17	.18	

Note. All odds ratios (OR) are listed whether or not they are significant and for the sake of clarity the confidence intervals are presented only for the final model 4 with all independent variables entered. Earlier blocks of the model have the significance of the OR indicated by an asterisk. The ellipses (...) in a cell mean that the n is too small.

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

likely to report probable PTSD than those with low psychosocial resource loss. Those with high traumatic growth were about 3.20 times more likely than those with low traumatic growth to meet criteria for probable PTSD. Those with high social support were about 24% as likely to develop probable PTSD compared to those with low social support (or about 76% less likely).

For Arabs exposed to terrorism ($n = 209$), logistic regression analysis indicated that education and economic resource loss were significant predictors of meeting criteria for probable PTSD in the final model. Those who had a college education were 13% as likely to report probable PTSD as those who had less than high school educations. Arabs who were exposed to terrorism who experienced high levels of economic resource loss (compared to low levels of loss) were significantly more likely to report probable PTSD. Exposure to terrorism also significantly predicted probable PTSD when entered, but became nonsignificant with the entry of economic resource loss, indicating the impact of terrorism exposure was mediated by economic resource loss. Also, those with high levels of psychosocial resource loss were more likely to report probable PTSD in bivariate analysis, but this was not sustained in multivariate analyses, suggesting that psychosocial resource loss overlaps with other key predictors.

DISCUSSION

The prevalence of probable PTSD is considerably higher for Jews and markedly higher for Arabs than would be expected for a population that was not threatened by war and terrorism (Norris et al., 2002; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). Our overall findings for prevalence of probable PTSD among Jews are somewhat lower than those found by the one prior national study of PTSD prevalence among Israelis that found rates of 9.4%. However, this prior study was conducted during an even more pronounced period of terrorism, and combined rates for Jews and Arabs (Bleich et al., 2003), which would increase the overall rates of PTSD. The high rates we found for Arabs were consistent with the extremely high rates of probable PTSD previously documented for Palestinians in the Gaza strip (de Jong et al., 2001) and with PTSD symptom scores previously noted for Israeli Arabs (Hobfoll, Canetti-Nisim, et al., 2006).

Consistent with other research on terrorism (Galea et al., 2002; Hobfoll, Canetti-Nissim, et al., 2006; Hobfoll, Tracy, et al., 2006) and disaster (Benight et al., 1999; Freedy, Shaw, Jarrell, & Masters, 1992; Ironson et al., 1997; Norris & Kaniasty, 1996), loss of personal, social, and economic resources was associated with higher probable PTSD (Galea et al., 2002; Hobfoll, 1998). Further, social-structural indicators (education for Arabs and unreported income for Jews) remained significant when controlling for other factors, suggesting that access to resources in terms of possession versus lack is critical, along with resource loss (Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Hobfoll, 1998). This supports COR

theory (Hobfoll, 1998, 2001) that posits that resource loss and resource lack (vs. possession) are key predictors of PTSD.

For Jews, the group more exposed to terrorism, traumatic growth was associated with an increased risk of probable PTSD and as can be seen in Tables 3a and 4a, there was no sign of a curvilinear relationship. Those with more distress may have sought more growth; however, our findings for growth are independent of exposure and psychosocial loss. This negative association with traumatic growth is unlikely to be attributed to our using a different scale than that developed by Tedeschi and Calhoun (1996), as even with a somewhat different item pool, opposite results are unlikely to be attributable to the scale. Supporting this point, consistent with Helgeson et al.'s (2006) meta-analysis, more "tried and true" scales were more, not less, likely to be related to more trauma symptoms, as we found. Studies of traumatic growth have found it to be particularly beneficial when time has elapsed since the crisis (Helgeson et al., 2006) and the ongoing nature of terrorism in Israel may not allow this to ever occur. Finally, as our traumatic growth scale includes increase in hope, this may be another way our findings differ from those using the Tedeschi and Calhoun scale.

The proposed model generally held for those who reported some exposure to terrorism and those who did not. During this period nearly the entire population was exposed in the sense of watching news reports (Ahern et al., 2002) and to threat of exposure even if living in remote areas. Moreover, exposure was not significant when other key predictors were entered in the model, suggesting that the impact of exposure on PTSD may be mediated by how exposure translates to resource loss and traumatic growth, as was previously found (Hobfoll, Canetti-Nisim, et al., 2006).

The high rate of probable PTSD for Arabs, despite their lower exposure to terrorism can be explained in a number of ways. First, as a discriminated-against ethnic minority, Arabs are likely to have fewer resources to combat the influence of terrorism (Smootha, 2002). They are also often blamed by Jews for terrorism and have torn identity, being both Israelis and Palestinians. This suggests a social-contextual element to PTSD risk that has not previously been emphasized in models that highlight the role of traumatic exposure and personal trait vulnerability (Brewin & Holmes, 2003). Because younger adults with poor educational opportunities are overrepresented among the Arab population (i.e., not a sampling bias), they may be particularly vulnerable to see their future as bleak because of the economic and social consequences of the Intifada. The higher rates of posttraumatic growth for Arabs are also consistent with a group under greater distress and have been noted previously for ethnic minority populations (Helgeson et al., 2006).

The findings for religiosity were complex, suggesting that it had a curvilinear effect. Traditional Jews had the highest rates of probable PTSD. Traditional practice in Israel is reflected by following some religious laws, but not a complete commitment to religious practice. These individuals may see Israel's facing ongoing

terrorism as challenging their faith in a way that those who see world events as unrelated to faith (secular Jews) or faith as unchallengeable (the very religious) do not. Clearly, research directed at religiosity in different cultures will be important as religion and politics are very much tied up with interpretations of terrorism around the world, including in the United States

Sex differences in PTSD, noted in other studies (Tolin & Foa, 2006) were attenuated by other factors. Resource loss and traumatic growth may have, in particular, influenced these findings. In this regard, Kessler and colleagues (1985) noted that women experience more stress exposure due to their greater social network, and Helgeson et al. (2006) found that women were more likely than men to experience traumatic growth.

This study has a number of strengths in terms of sample size, inclusion of ethnic minority individuals, and theoretical examination, but also has limitations. The cross-sectional design limits any assignment of causality. We also did not assess lifetime trauma or other stressors in people's lives. Further, we chose to analyze Jews and Arabs separately due to their many differences, and studies that analyze combined samples will reveal different kinds of findings that are more generalizable across cultures. Our cooperation rates are similar to other studies (Bonanno, Galea, Bucciarelli & Vlahov, 2006; Boscarino, Adams, Stuber, & Galea, 2005), but we must consider that nonresponders may be different in important ways that cannot be discerned. Nonresponders may include both those who are more socially adapted and therefore at work more hours, or those more maladapted, who decline being interviewed, or otherwise cannot be reached. By asking for voting patterns, we are better able than many studies to have confidence in the representativeness of our findings, but questions remain. The low internal reliability of some of our brief measures also suggests caution, we also have only rudimentary knowledge about the cross-cultural basis for PTSD, and so comparisons across ethnic groups must be considered cautiously. The lower power for Arabs may have resulted in findings to be more equivalent for Jews than they appear, but given a smaller sample it would not be judicious to infer statistical significance where it was not found. Finally, our study did not assess the complex possibility of intergenerational transmission of PTSD owing to the Holocaust for Jews and population dislocation for Arabs. In the Middle East, the past very much lives on in the present in ways that require study.

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