

War-Zone Exposure and Long-Term General Life Adjustment Among Vietnam Veterans: Findings From Two Perspectives¹

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This two-part investigation examined associations between service in Vietnam and indices of long-term general life adjustment using a national sample of male and female members of the Vietnam generation. In Study 1, we documented reasonably high levels of satisfaction and attainment among Vietnam veterans, levels that differed minimally, on average, from those who served elsewhere and those who never served in the military. In Study 2, dimensions of war-zone stressor exposure were only marginally related to satisfaction and attainment, in contrast with research documenting strong relationships with psychopathology. These findings support the importance of expanding our thinking about dimensions of mental illness and mental health.

Current statistics indicate that exposure to highly stressful or traumatic events is not an uncommon experience for many people (Breslau, Davis, Andreski, & Peterson, 1991; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Kilpatrick, Saunders, Veronen, Best, & Von, 1987; Norris, 1992; Vrana & Lauterbach, 1994). In turn, exposure to extreme stressors has been linked to a variety of negative mental health outcomes, including depression (e.g., Shalev et al., 1998), substance abuse (e.g., Kilpatrick, Acierno, Resnick, Saunders, & Best, 1997), and especially posttraumatic stress disorder (PTSD; e.g., Foy,

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Sippelle, Rueger, & Carroll, 1984; Green, 1994; King, King, Gudanowski, & Vreven, 1995). In addition, there is evidence that exposure to traumatic stress may have long-term implications for health and well-being (Baum, O'Keefe, & Davidson, 1990).

The vast majority of research on the impact of traumatic events quite understandably emphasizes psychopathology and psychological impairment. Yet, as O'Leary and Ickovics (1995) as well as Tedeschi, Park, and Calhoun (1998) pointed out, many individuals accommodate or recover, and some may even thrive in response to extremely stressful events and circumstances. Thus, one could argue that a more complete picture of the sequelae of trauma exposure should include representations of adjustment that are not restricted to psychopathological conditions. Accordingly, the main goal of the present two-part research endeavor was to examine how exposure to potentially traumatic events relates to long-term general life adjustment in one population with a documented highly stressful experience: veterans of the Vietnam War. As will be detailed later, we defined and operationalized *general life adjustment* in terms of satisfaction with various aspects of life and attainment in the educational and occupational domains.

Several theoretical frameworks provide support for the possibility that people may recover or even thrive following traumatic exposure. For example, Hobfoll and colleagues' (Hobfoll, 1988, 1989; Hobfoll, Dunahoo, & Monnier, 1995) conservation-of-resources theory indicates that trauma may result in both the loss and gain of important resources. This theory also asserts that attempts at gain actually increase amid loss. Thus, one might expect that exposure to war could result in a deeper appreciation for the value of life, which, in turn, might lead to greater attainment and satisfaction with life. Moreover, the coping literature suggests that resilience may develop from confronting stressful experiences and coping with them effectively (Holahan, Moos, & Schaefer, 1996; Schaefer & Moos, 1992).

While an initial stage of emotional distress and disorganization may follow a traumatic event, positive outcomes may emerge after a long recovery process (Schaefer & Moos, 1992). By virtue of having survived the life-threatening experience of war, many veterans could consider themselves to be quite resilient, and this, in turn, may lead to an enhanced sense of self-efficacy that translates into positive outcomes, such as occupational and educational attainment.

The idea that people may recover, or even thrive, in response to trauma is also consistent with Kobasa's (1979) work, which suggests that certain individuals—those who are hardy and thus high on the dimensions of commitment, control, and challenge—may be able to remain healthy under periods of extreme stress.

Conclusions from past research on the impact of service in the Vietnam War on general life adjustment have been mixed. For example, based on a meta-analysis of veteran studies appearing in the literature between the years 1972 and

1985, Kaylor, King, and King (1987) reported that Vietnam veterans scored lower on indicators of adjustment (characterized quite broadly) than did era veterans (i.e., veterans who were not deployed to Vietnam but who served elsewhere in the military during this period) and nonveterans. Some of the studies in the meta-analysis included measures of general psychosocial adaptation and well-being (e.g., educational attainment), but the preponderance addressed psychopathological outcomes, such as depression and PTSD. Thus, it is difficult to draw conclusions from that study about life adjustment as defined here.

A more recent study by Bookwala, Frieze, and Grote (1994) revealed significantly lower satisfaction with career, finances, and overall quality of life on the part of male Vietnam veterans, compared to their nonveteran counterparts. In contrast, Card (1983) reported no differences between male Vietnam veterans and comparison groups on measures of job, marriage, and parenting satisfaction, although Vietnam veterans expressed slightly less satisfaction with life as a whole and had lower occupational achievement. Additionally, Phelps and Waigandt (1989) concluded that Vietnam veterans exhibited ample levels of life satisfaction, despite the fact that they scored slightly lower on average than did their nonveteran counterparts.

Another study that touched on the long-term general life adjustment of Vietnam veterans is the National Vietnam Veterans Readjustment Study (NVVRS; Kulka et al., 1990a, 1990b), a highly regarded survey of a nationally representative sample of male and female members of the Vietnam generation. Although the emphasis of that study was on psychopathological conditions (most notably PTSD), the NVVRS researchers identified several statistically significant differences on satisfaction and achievement outcomes between male and female veterans who served in the Vietnam theater of war operations and their Vietnam-era counterparts who served elsewhere in the military and those who never saw military service. As examples, female theater veterans exhibited higher educational achievement and male theater veterans exhibited lower educational achievement, compared with era veterans. Male theater veterans also reported less marital and parenting satisfaction compared with nonveterans, while female theater veterans reported less marital satisfaction compared with era veterans.

In the first part of the present study, we revisited the NVVRS (Kulka et al., 1990a, 1990b) database with two emphases in mind. First, we documented the life adjustment of Vietnam theater veterans in an absolute sense, examining where group averages actually fall along various continua of satisfaction and attainment. The intent was to augment the earlier analyses conducted by Kulka et al., who identified significant differences but largely collapsed continuous data into a relatively few, broad, ordinal categories without reporting group means. Then, we compared the mean scores of Vietnam theater veterans with those of Vietnam-era veterans (to characterize a war-zone effect), followed by comparison of all veterans with nonveterans (to characterize a more general military-service

effect), reporting both confidence intervals and effect sizes to ascertain the practical importance of differences. This approach is consistent with current emphasis on the value of both the statistical significance and practical implications of findings (e.g., Cohen, 1990, 1994; Harlow, Mulaik, & Steiger, 1997; Hubbard & Ryan, 2000; Rosnow & Rosenthal, 1989; Wilkinson & The APA Task Force on Statistical Inference, 1999).

Turning to the second part of this study, we again used the NVVRS database (Kulka et al., 1990a, 1990b), but here we were interested in relationships between separate features of the war-zone experience and long-term general life adjustment. Prior research has been aimed at understanding the effects of various war-zone stressor dimensions for the population of Vietnam theater veterans, albeit with outcomes reflecting psychopathology. For example, King et al. (1995) developed and tested a model that demonstrated differential relationships between four war-zone stressor representations and PTSD for a subset of veterans participating in the NVVRS. Briefly, experiences characterized as atrocities or incidents of abusive violence (e.g., terrorizing, wounding, or killing civilians), aspects of the harsh and malevolent day-to-day living environment (e.g., insects, disease, filth), and subjective or perceived threat (e.g., feeling as if you would never survive) all had direct associations with PTSD. Malevolent environment was indirectly related to PTSD through the perceived-threat variable, and the association between exposure to traditional combat events (e.g., firing a weapon or being fired upon by the enemy) and PTSD was likewise mediated by perceived threat. Using a more detailed categorization of stressor components and also relying on the NVVRS data, Fontana and Rosenheck (1998) found direct and indirect relationships that supported King et al.'s findings. Further work of this type was accomplished by Litz, King, King, Orsillo, and Friedman (1997), who operationalized different features of the military peacekeeping mission in Somalia and found differential direct and indirect associations with PTSD.

Thus, there is evidence in the literature supporting the notion that exposure to war-zone stressors is multidimensional and that the various aspects or components of this exposure may demonstrate differential associations with PTSD. However, there have been no studies to our knowledge of the associations of different war-zone stressors to indicators of long-term general life adjustment, such as facets of satisfaction and educational and occupational attainment. In our second study, then, we examined the relationships between multiple aspects of war-zone exposure and indicators of general life adjustment. Moreover, to provide a context for findings, we compared the strengths of these associations—that is, the effect sizes—to parallel associations calculated between the same war-zone stressor dimensions and PTSD.

Although evidence indicates that war-zone exposure—defined both broadly in terms of Vietnam service, and more specifically as particular war-zone experiences in the Vietnam theater—is related to psychopathology, relationships

between exposure and indicators of more general life adjustment and have yet to be explored. Yet, a positive relationship between exposure and psychopathology does not necessarily imply a negative relationship between exposure and general life adjustment. As indicated by the conservation-of-resources theory (Hobfoll et al., 1995), both loss and gain of resources may occur following highly stressful or traumatic events, and both loss and gain might result as part of the same event. This suggests the possibility of the coexistence of markers of both mental illness and mental health within a single individual. This idea is not new and has underpinnings in the early work of Jahoda (1958), who argued for a conceptualization of mental health based on more than merely the absence of mental illness.

Building on this work, as well as that of Ryff and Keyes (1995), an operationalization of mental health that is independent of mental illness was recently put forth in the literature, and evidence for the independence of mental illness and mental health was presented (Keyes, 2002). These findings are consistent with other research results demonstrating the independence of positive and negative emotional states (Tellegen, Watson, & Clark, 1999). Based on this work, as well as evidence from investigations of the impact of service in the Vietnam War on general life adjustment, we hypothesize that there will be negligible to small associations between exposure in Vietnam and our indicators of general life adjustment.

In summary, in the present two-part investigation, we sought to move beyond research focusing on psychopathological disorders suffered by some Vietnam veterans, and instead build on and extend the limited body of research on the long-term adjustment of the population of Vietnam veterans. The key question underlying both parts of the study was "To what extent is war-zone exposure (broadly defined in Study 1, and more specifically represented in Study 2) associated with dimensions of general life adjustment?" We used an array of measures to index the satisfaction and attainment outcomes. Additionally, we benefitted from having a large, nationally representative sample and its sample design weights to facilitate generalization to the population of Vietnam veterans, both men and women. And, as noted earlier, we incorporated effect size throughout the study in an effort to highlight realistic interpretations of observed associations.

Study 1: Long-Term General Life Adjustment in Vietnam Theater Veterans, Vietnam Era Veterans, and Nonveterans

Method

Data Source

The data for this study were taken from the NVVRS (Kulka et al., 1990a, 1990b), a Congressionally mandated, national survey whose purpose was to

document the current and lifetime prevalence rates of PTSD in the population of Vietnam veterans. While not the primary focus of this project, other indicators of health and adjustment were also assessed.

Three major groups of respondents were included in the NVVRS (Kulka et al., 1990a, 1990b) survey: (a) male and female veterans, both enlisted personnel and officers from all branches of the armed forces who served in or around Vietnam sometime during the period August 5, 1964, to May 7, 1975 (Vietnam theater veterans); (b) a comparable group of male and female veterans who served elsewhere in the military during the period (Vietnam era veterans); and (c) civilians or nonveterans matched to the Vietnam theater veterans on demographic characteristics. For men, the matching variables were age, geographic origin, and race/ethnicity; while for women, the matching variables were age, geographic origin, and occupation. Since female Vietnam veterans were overwhelmingly White, race/ethnicity was not a matching variable for them. However, all three samples of women had approximately 84% registered nurses, since that occupation was dominant for U.S. military women in Vietnam. African American and Hispanic men, veterans with service-connected disabilities, and women were oversampled.

The overall response rate was 78% (83% for theater veterans, 76% for era veterans, and 68% for nonveterans). In total, there were 3,016 participants: 1,632 theater veterans (1,200 male, 432 female); 716 era veterans (412 male, 304 female); and 668 nonveterans (450 male, 218 female). Data were generated via extensive face-to-face interviews lasting from an average of 3 hr (for nonveterans) to 5 hr (for theater veterans). An array of prewar, military (for theater and era veterans), and postwar characteristics was assessed. Further details about the sampling procedure and sample are available in a number of published sources (e.g., Jordan et al., 1991, 1992; Kulka et al., 1990a, 1990b; Schlenger et al., 1992; Weiss et al., 1992).

Measures

Using a rational approach to test construction (Jackson, 1971; Nunnally, 1978), the procedure for creating measures of the general life, marital, and parenting satisfaction domains of life adjustment involved developing formal definitions, screening the NVVRS (Kulka et al., 1990a, 1990b) interview protocol for items reflecting the constructs, and then having judges sort the items into relevant categories. After discarding items for which there was disagreement about categorization, item-total correlations were computed for each item set. Final selection of items was based on a consideration of both content breadth and balance and maximization of internal consistency, where appropriate.

General life satisfaction. Our general life satisfaction scale consisted of five items assessing veterans' subjective evaluations of happiness or contentment

with current life. Sample items are "Taking things altogether, how would you say things are these days? Would you say you're *very happy, pretty happy, or not too happy* these days?" and "In general, how satisfied have you been with yourself in the past year?" Each item was scored using a 5-point Likert response format. An average item score was computed, representing a range from 1 (*very dissatisfied*) to 5 (*very satisfied*). The internal consistency estimate (coefficient alpha) for this measure was .79.

Marital satisfaction. Our measure of marital satisfaction consisted of 15 NVVRS items (Kulka et al., 1990a, 1990b). These items were initially taken from several sources (Campbell, Converse, & Rodgers, 1976; Spanier, 1976; Veroff, Kulka, & Douvan, 1981), assessing happiness, companionship, and closeness in the marriage or intimate relationship. Sample items are "How much companionship do you and your husband/wife/partner have—how often do you do things together?" and "During the past year, how often have you felt affectionate towards your husband/wife/partner?" The questions were asked of each participant who was married or living with a partner at the time of the study ($n = 2,372$). Each item was scored using a 5-point Likert response format. An average item score then was computed, representing a range from 1 (*a very unsatisfying, cold, or distant relationship*) to 5 (*a very satisfying, warm, or close relationship*). Coefficient alpha for this measure was .92.

Parenting satisfaction. Five NVVRS (Kulka et al., 1990a, 1990b) items were selected to characterize respondents' evaluations of several aspects of their role as a parent and associated parent-child relationships. The items—originally adapted from Campbell et al. (1976), Veroff et al. (1981), and Dohrenwend & Dohrenwend (1982)—were administered to all participants who had children ($n = 2,491$) and assessed problems presented by their children, their perceived efficacy as parents, how enjoyable they found being a parent, how well they got along with their children, and how satisfied they were with how their children were turning out. Each item was scored using a 5-point Likert response format. An average item score was computed, representing a range from 1 (*very dissatisfied*) to 5 (*very satisfied*). Coefficient alpha was .69.

Job satisfaction. Our measure of job satisfaction consisted of a single item taken from the NVVRS (Kulka et al., 1990a, 1990b) interview: "In general, how satisfied are/were you with your current/most recent job?" Responses were rated on a 4-point scale ranging from 1 (*not at all satisfied*) to 4 (*very satisfied*).

Educational attainment. Participants were asked their highest level of education achieved at the time of the study. Using the same system devised by the original NVVRS researchers (Kulka et al., 1990a, 1990b), responses corresponded to an ordinal scale and included the following values: 1 = *7th grade or lower*; 2 = *completed junior high school*; 3 = *completed some high school*; 4 = *graduated from high school/trade school*; 5 = *some college/specialty training*; 6 = *graduated from 4-year college*; and 7 = *some graduate training/professional work or higher*.

Occupational attainment. The present study incorporated an occupational attainment measure developed by the original NVVRS investigators (Kulka et al., 1990a, 1990b) that was based on a socioeconomic index created by Duncan (1961) and adapted to the occupational classification scheme used for the 1980 Census (Stevens & Cho, 1985). This measure, an empirically based indicator of occupational prestige, assesses current occupational status or highest occupational status achieved prior to retirement. For men, it had a possible range from 10.00 to 89.99, with higher values assigned to the more prestigious occupations. Stevens and Cho reported the U.S. population average for this index to be 34.48, with white-collar occupations generally represented by scores above the mean and blue-collar occupations indexed by scores below the mean. For women, the NVVRS public domain database only included a collapsed version of this index (range = 1 to 8). Thus, the female veterans' scores on occupational attainment, while deriving from the same Stevens and Cho base and having the same general interpretation, are somewhat less precise than those for the male veterans. To achieve a metric approximately comparable for both genders, the women's scores were multiplied by 10 prior to analyses.

Analyses

The NVVRS (Kulka et al., 1990a, 1990b) incorporated a complex sampling design that consisted of two phases for both veterans and nonveterans: (a) screening eligible participants from a variety of sources, largely military and other government documents; and (b) stratifying samples by race/ethnicity and age for men and by occupation and age for women. As noted earlier, several demographic groups (African American and Hispanic men, veterans with service-connected disabilities, and women) were oversampled for the purpose of allowing meaningful comparisons among subgroups. Sample design weights were included to adjust for this oversampling, to permit the projection of results to the larger population of Vietnam theater veterans, and to facilitate comparisons of theater veterans to era veterans and nonveterans matched to the theater veteran reference population. These weights were used to adjust responses of era veterans and nonveterans, so that the sum of the weights for cases in these groups equaled the number of cases in the reference population of theater veterans. The weights permitted unbiased estimates and correct standard errors for making our comparisons. The STATA (StataCorp, 1999) software package was employed for analyses.

Across all adjustment outcomes, weighted means were calculated for each of the study populations, along with their standard errors and 95% confidence intervals. To compare levels of adjustment among the study populations, planned orthogonal contrasts using Bonferroni corrected *t* tests were performed. We tested for significant differences between theater and era veterans and then between all veterans (theater and era together) and nonveterans. Finally, effect

sizes in the form of correlation coefficients (Rosenthal, 1984) were calculated for all group contrasts. Analyses were conducted for men and women separately.

Results and Discussion

Table 1 presents means, standard errors, and 95% confidence intervals for each of the indicators of general life adjustment for theater veterans, era veterans, and nonveterans. To document Vietnam theater veterans' levels of adjustment in an absolute sense, we examined where their means fell along the continua of satisfaction and attainment. For all four indicators of satisfaction, means were toward the upper or more positively valenced end of the response scale for both male and female Vietnam veterans. For general life satisfaction, the means for both genders were approximately halfway between 3.00 and 4.00 on a 5-point scale; for marital satisfaction and parenting satisfaction, the means for both genders were very close to 4.00 on a 5-point scale; and for job satisfaction, the mean for both genders was 3.33 on a 4-point scale.

Moreover, the mean responses to the inquiry about highest level of education were almost 5.00 for male veterans (representing an average educational attainment of some college or specialty training) and almost 6.00 for female veterans (representing an average educational attainment of college completion), suggesting that both groups were fairly well educated: 91% of the male theater veterans had achieved at least a high school degree, and 19% of them reported the completion of a 4-year college degree or higher. It should be noted that the female theater veterans were largely registered nurses with at least 3-year diplomas or 4-year baccalaureate degrees when they served in Vietnam. Accordingly, 59% of these women reported having attained at least a college degree or higher at the time of the survey.

Finally, we also gain information about the occupational attainment of the Vietnam theater veterans from Table 1. The index average for men was 38.54, and the index average for women was 44.28. The average for men was above the U.S. population index average of 34.48 reported by Stevens and Cho (1985), with 42% of the men scoring above the mean, in the range of scores generally representative of white-collar occupations. The average for women was well above the population index average of 34.48, with approximately 91% of the women reporting white-collar occupations. The relatively higher proportion of women in white-collar occupations is likely a result of the fact that most women who served in Vietnam were in white-collar occupations (i.e., registered nurses) prior to and at the time of their service.

Table 2 presents the results of the planned contrasts for theater veterans compared with era veterans and for all veterans compared with nonveterans (*t* statistics and associated *dfs* are provided for tests on all indicators of adjustment, separately for men and women). Five of the six contrasts between male theater

Table 1

Descriptive Statistics for Male and Female Theater Veterans, Era Veterans, and Nonveterans on Adjustment Indicators

Variable/group	Men			Women		
	<i>M</i>	<i>SE</i>	95% C.I.	<i>M</i>	<i>SE</i>	95% C.I.
General life satisfaction^a						
Theater veterans	3.40	0.02	3.36-3.44	3.53	0.03	3.48-3.59
Era veterans	3.43	0.03	3.36-3.49	3.56	0.04	3.48-3.64
Nonveterans	3.51	0.03	3.45-3.57	3.52	0.04	3.44-3.59
Marital satisfaction^a						
Theater veterans	3.99	0.03	3.94-4.04	3.95	0.04	3.87-4.02
Era veterans	4.04	0.04	3.96-4.11	4.08	0.05	3.97-4.19
Nonveterans	4.15	0.04	4.08-4.22	4.08	0.04	3.99-4.16
Parenting satisfaction^a						
Theater veterans	3.96	0.03	3.90-4.02	3.92	0.05	3.83-4.01
Era veterans	4.01	0.05	3.92-4.11	3.90	0.07	3.77-4.03
Nonveterans	4.15	0.06	4.03-4.27	4.02	0.07	3.89-4.16
Job satisfaction^b						
Theater veterans	3.33	0.03	3.27-3.40	3.33	0.04	3.24-3.41
Era veterans	3.31	0.05	3.20-3.41	3.39	0.07	3.26-3.52
Nonveterans	3.42	0.06	3.31-3.54	3.46	0.06	3.35-3.57
Educational attainment^c						
Theater veterans	4.91	0.04	4.82-4.99	5.90	0.05	5.81-5.99
Era veterans	5.11	0.07	4.99-5.24	5.77	0.06	5.64-5.89
Nonveterans	5.09	0.12	4.86-5.32	5.52	0.09	5.33-5.70
Occupational attainment^d						
Theater veterans	38.54	0.74	37.10-40.00	44.28	0.64	43.03-45.52
Era veterans	38.80	1.15	36.55-41.05	43.11	0.86	41.43-44.78
Nonveterans	44.38	1.72	41.01-47.75	44.25	1.55	41.21-47.30

Note. C.I. = confidence interval.

^aResponse scale = 1 to 5. ^bResponse scale = 1 to 4. ^cResponse scale = 1 to 7. ^dResponse scale = 10.00 to 89.99.

Table 2

Planned Orthogonal Contrasts and Effect Sizes for Adjustment Outcomes

Contrast	Men			Women		
	<i>t</i>	<i>df</i>	Effect size (<i>r</i>)	<i>t</i>	<i>df</i>	Effect size (<i>r</i>)
General life satisfaction						
Theater veterans vs. era veterans	-0.63	1,608	.02	-0.52	733	.02
Veterans vs. nonveterans	-2.61**	2,057	.06	0.67	951	.02
Marital satisfaction						
Theater veterans vs. era veterans	-0.99	1,369	.03	-1.88	451	.09
Veterans vs. nonveterans	-3.19**	1,740	.08	-0.97	628	.04
Parenting satisfaction						
Theater veterans vs. era veterans	-0.87	1,455	.02	0.25	444	.01
Veterans vs. nonveterans	-2.43**	1,846	.06	-1.39	641	.05
Job satisfaction						
Theater veterans vs. era veterans	0.43	1,604	.01	-0.79	720	.03
Veterans vs. nonveterans	-1.58	2,052	.03	-1.47	936	.05
Educational attainment						
Theater veterans vs. era veterans	-2.66**	1,608	.07	1.60	732	.06
Veterans vs. nonveterans	-0.65	2,058	.01	3.13**	950	.10
Occupational attainment						
Theater veterans vs. era veterans	-0.19	1,605	.00	1.10	724	.04
Veterans vs. nonveterans	-3.09**	2,054	.07	-0.34	940	.01

** $p < .025$ (Bonferroni correction).

and era veterans were nonsignificant: for all measures of satisfaction, and for the index of occupational attainment. The one statistically significant contrast involved educational attainment, in which male era veterans reported greater educational attainment, compared with their theater veteran counterparts.

When all male veterans, theater and era combined, were compared with their matched nonveterans, four statistically significant findings obtained. Male non-veterans exhibited significantly greater general life satisfaction, marital satisfaction, parenting satisfaction, and occupational attainment than did male

veterans. Given that military veterans might be expected to fare better than their nonveteran counterparts—they are selected on the basis of physical and mental health; and they have access to postmilitary educational, housing, and health benefits—one might anticipate findings counter to these (see the extensive work of Elder and Clipp and their associates on the life course of combat veterans: Clipp & Elder, 1996; Elder, 1985; Elder & Clipp, 1989; Elder, Shanahan, & Clipp, 1994). Yet, there is a good deal of evidence that selection for military service during the Vietnam era introduced a bias toward the induction of those of lower socioeconomic status and possibly poorer family environments (Baskir & Strauss, 1978; King & King, 1991). For women, only 1 of the 12 contrasts achieved statistical significance. The group of female theater and era veterans as a whole had significantly higher scores on the measure of educational attainment than did their nonveteran peers.

Effect sizes for all contrasts are provided in Table 2. They range from .00 (with rounding) to .10, obviously quite small and generally smaller than that required to meet Cohen's (1977) criterion for a small effect size. These low values suggest that, although some comparisons are statistically significant, the differences have little practical meaning. Additional support for this observation may be found in the confidence intervals for the means of the three groups on each of the six indicators (Table 1). Many of these intervals are highly overlapping, especially for the theater and era veteran groups.

Altogether, these findings reveal that, on average, Vietnam theater veterans, both men and women, enjoyed reasonably satisfying and fulfilling lives and demonstrated ample levels of accomplishment and success at the time the survey was conducted. Moreover, their long-term general life adjustment was not that discrepant from that of their era veteran and nonveteran counterparts. All contrast effects were negligible, borne out by the values of the sample means and confidence intervals for the corresponding population parameters.

Study 2: Multiple Dimensions of War-Zone Stressor Exposure and Long-Term General Life Adjustment

Method

Data Source

For Study 2, data from the sample of 1,632 Vietnam theater veterans were used.

Measures

The NVVRS (Kulka et al., 1990a, 1990b) interview protocol included numerous items querying Vietnam theater veterans about their war-zone experiences.

For the present study, we adopted the four measures of war-zone stressor exposure developed by King et al. (1995) from the NVVRS database and subsequently used in their series of studies addressing risk and resilience factors associated with PTSD symptom severity (King, King, Foy, Keane, & Fairbank, 1999). Descriptive statistics for the sample as a whole and for men and women separately are available in these prior research articles.

Traditional combat exposure. This 36-item measure assesses reports of stereotypical combat experiences. Effort was put forth to make this measure as objective as possible; that is, limiting items to those reflecting observable experiences and eliminating subjective judgments. Sample items are "How often did you fire a weapon?" and "How often were you under enemy fire?" Coefficient alpha for this scale was .94.

Atrocities or episodes of extraordinarily abusive violence. This nine-item scale measures exposure to war-related experiences that might be considered highly deviant or extreme, possibly morally questionable, or grotesque. Sample items are "Were you ever in a situation where a Vietnamese prisoner was injured or killed for any reason?" and "To what extent were you involved in terrorizing, wounding, or killing civilians?" Coefficient alpha for this measure was .88.

General milieu of a harsh or malevolent environment. Our measure of malevolent environment consists of 18 items that asked about perceptions of events or circumstances that made daily life in the war zone more difficult or aggravating, possibly to the degree of causing significant distress or feelings of helplessness. Sample items are "How unpleasant did you find this situation in Vietnam? The insects, disease, and filth," and "How unpleasant did you find this situation in Vietnam? Loss of sleep." Coefficient alpha for this scale was .91.

Subjective or perceived threat/anticipatory fear. This measure consists of 9 items that index veterans' personal judgments of threat and danger. The focus was on subjective emotional and cognitive appraisals regarding war-zone situations. Sample items are "Regardless of your main duties, how would you describe your exposure to danger and risk of casualty during your tour(s) of duty?" and "How often [if ever] did you find yourself in a combat situation in which you thought you would never survive?" Coefficient alpha for this measure was .83.

General life adjustment. General life adjustment was operationalized in terms of the same six measures used in Study 1: general life satisfaction, marital satisfaction, parenting satisfaction, job satisfaction, educational attainment, and occupational attainment.

PTSD symptom severity. Severity of PTSD symptoms was assessed by the Mississippi Scale for Combat-Related PTSD (Keane, Caddell, & Taylor, 1988). The Mississippi Scale is a 35-item self-report instrument that employs a 5-point Likert response scale. The three symptom clusters of PTSD—reexperiencing, avoidance and numbing, and hyperarousal (American Psychiatric Association,

1994)—as well as the associated features of depression, substance abuse, and suicidality are measured. The Mississippi Scale is a broadly used, well-recognized, and reliable and valid PTSD assessment device (see psychometric studies by Hyer, Davis, Boudewyns, & Woods, 1991; Keane et al., 1988; King, King, Fairbank, Schlenger, & Surface, 1993; Kulka et al., 1990a, 1990b; McFall, Smith, Mackay, & Tarver, 1990). Coefficient alpha was .94.

Analyses

As in Study 1, sample design weights were applied to all variables in the course of data analysis using the STATA software package (StataCorp, 1999). First, bivariate correlations were derived to assess relationships among study variables. Next, to evaluate associations between war-zone stressors and adjustment outcomes, six regression analyses were conducted, one for each outcome. All four war-zone stressor variables were entered simultaneously into each regression equation. As noted earlier, for comparison purposes, we also conducted parallel regression analyses using scores on the Mississippi Scale (Keane et al., 1988) as the dependent variable. All analyses were conducted separately for men and women.

Results and Discussion

Bivariate correlations among all variables are presented in Table 3. For both genders, correlations among the four war-zone exposure variables (upper left triangle) were moderate to moderately large and significant, while correlations among indicators of general life adjustment (lower right triangle, excluding the column for PTSD) varied from negligible to moderate, with a little over half of them (11) achieving statistical significance for men and slightly less than half (7) achieving statistical significance for women. For men, correlations between war-zone exposure variables and the four more subjective indicators of general life adjustment (general life, marital, parenting, and job satisfaction) were weak but statistically significant (range = $-.06$ to $-.20$), while correlations with the more objective indicators of general life adjustment (educational and occupational attainment) approached zero and were consistently nonsignificant.

For women, the pattern differed somewhat. Correlations between war-zone exposure variables and the facets of satisfaction were generally lower than the corresponding values for men and were largely nonsignificant (range = $.00$ to $-.17$), and those between war-zone exposure variables and educational and occupational attainment were stronger than the corresponding correlations for men, mostly significant and of opposite sign (range = $.07$ to $.17$). The directionality for women was such that higher levels of stressor exposure were associated with greater educational and occupational attainment. The correlations between the multiple dimensions of war-zone stressor exposure and PTSD were generally in

the moderate range and as expected from prior research (e.g., Fontana & Rosenheck, 1998; King et al., 1995).

For these NVVRS (Kulka et al., 1990a, 1990b) data, the bivariate correlations between the various measures of satisfaction and attainment and the total score on the Mississippi Scale (Keane et al., 1988) ranged between $-.15$ and $-.47$, and averaged $-.32$ for men. The corresponding bivariate correlations for women ranged between $-.02$ and $-.43$, and averaged $-.22$. Thus, it appears that general life adjustment indicators address constructs that do not simply represent a lack of psychopathology.

Table 4 summarizes the multiple regression analyses for each of the outcomes for men: the six general life adjustment variables, and, for comparison purposes, PTSD symptom severity. As shown in Table 4, the multiple correlation coefficients for the analyses involving the satisfaction measures were statistically significant, while those involving the achievement measures were not. Yet, across all general life adjustment outcomes, the optimally weighted composites of the four war-zone exposure variables accounted for only between 1% and 5% of the variance (or, using the multiple correlation coefficient as the index of effect size, between $.08$ and $.22$), generally consistent with the interpretation that these effects ranged from small to medium, but did not quite achieve the criterion necessary to be classified as medium-sized effects (Cohen, 1977). For the regression of general life satisfaction on war-zone exposure variables, combat exposure was related to more general life satisfaction, while exposure to atrocities and exposure to lower level stressors of a malevolent war-zone environment each were related to less general life satisfaction. Only exposure to atrocities was associated uniquely with marital satisfaction, with more exposure related to less marital satisfaction. The single unique predictor of parenting satisfaction was exposure to a malevolent environment, negatively related to this outcome. Finally, both exposure to atrocities and exposure to the malevolent war-zone environment were related to less long-term job satisfaction. For the PTSD symptom severity dependent variable, 36% of the variance (effect size = $.60$) was accounted for by the composite of war-zone stressors, with atrocities, malevolent environment, and perceived threat each uniquely contributing to the outcome. This effect size exceeds the necessary criterion ($r = .37$) to be classified as a large effect (Cohen, 1977).

Table 5 supplies comparable information on the multiple regression findings for women. The set of war-zone exposure variables significantly predicted only three of the general life adjustment outcomes: general life satisfaction, job satisfaction, and educational attainment. Across all six adjustment outcomes, the variance accounted for by this predictor set ranged from 2% to 5% (in the effect size metric, from $.17$ to $.22$), again indicating small to medium effects (Cohen, 1977). Within the set, only exposure to traditional combat and malevolent environment covaried uniquely with general life adjustment. Higher levels of combat exposure tended to be associated with more general life satisfaction and more job

Table 3

Bivariate Correlations Among All Variables for Men and Women

Variable	2	3	4
1. Traditional combat	.70*/.49*	.63*/.48*	.85*/.66*
2. Atrocities	—	.47*/.38*	.59*/.36*
3. Malevolent environment		—	.70*/.59*
4. Perceived threat			—
5. General life satisfaction			
6. Marital satisfaction			
7. Parenting satisfaction			
8. Job satisfaction			
9. Educational attainment			
10. Occupational attainment			
11. PTSD			

Note. Correlations for male veterans precede the slash mark (/); correlations for female
* $p < .05$.

satisfaction, whereas reports of exposure to the malevolent war-zone environment were associated with less general life satisfaction and less job satisfaction. Although the overall regression equation predicting educational attainment achieved statistical significance, none of the war-zone exposure variables independently contributed to this outcome. As with the men, the composite of war-zone stressors accounted for a much larger proportion of variance in PTSD symptom severity: 32% (effect size = .57, a large effect according to Cohen's guidelines for interpreting effect sizes), with atrocities, malevolent environment, and perceived threat once again contributing uniquely to the outcome.

Thus, the results of these bivariate correlations and multiple regression analyses generally suggest that veterans' reports of stressors encountered in the war zone have relatively little or no relationship to their long-term satisfaction and achievement. Proportions of variance accounted for in both the bivariate and multiple regression analyses were minimal, especially when judged against those involving PTSD symptom severity.

General Discussion

This two-part investigation examined associations between service in the Vietnam theater of war operations and indices of long-term general life

5	6	7	8	9	10	11
-.10*/-.01	-.14*/-.03	-.14*/-.01	-.07*/-.01	-.03/.17*	-.02/.16*	.46*/.29*
-.17*/-.12	-.17*/-.05	-.13*/-.01	-.11*/-.10	-.01/.14*	-.02/.13*	.48*/.40*
-.18*/-.17*	-.18*/-.11	-.20*/-.11	-.13*/-.15*	-.07/.13*	-.05/.07	.54*/.50*
-.13*/-.09	-.16*/.00	-.13*/-.09	-.06*/-.10*	-.03/.13*	.00/.12*	.50*/.41*
—	.45*/.38*	.34*/.40*	.36*/.35*	.15*/.09	.18*/.11*	-.47*/-.43*
	—	.31*/.28*	.19*/.01	.00/.07	.04/.08	-.41*/-.35*
		—	.25*/.11	.03/.10	.09*/.02	-.38*/-.18*
			—	.00/.04	.17*/.10*	-.28*/-.25*
				—	.42*/.34*	-.15*/-.05
					—	-.16*/-.02
						—

veterans follow the slash mark. PTSD = posttraumatic stress disorder.

adjustment using a nationally representative sample of male and female members of the Vietnam generation. In particular, the goal was to document relationships between exposure to potentially traumatic war-zone events and circumstances and aspects of satisfaction and attainment in later years.

In Study 1, we found reasonably high levels of satisfaction and attainment among those who served in Vietnam, levels that differed minimally, on average, from those who served elsewhere in the military as well as those who never served in the military. In Study 2's focus on the war-zone experiences of male and female Vietnam theater veterans, multiple dimensions of war-zone stressor exposure were only marginally related to long-term satisfaction and attainment. Overall, these findings were consistent with our hypothesis that there would be negligible to small associations between exposure in Vietnam and our indicators of general life adjustment. We believe these findings mandate rethinking about the status of Vietnam veterans in our society.

As is apparent in our presentation of results, we purposefully have recognized but not seriously emphasized statistical significance with regard to group differences and associations between exposure variables and adjustment outcomes. This is in contrast to earlier report by the NVVRS researchers (Kulka et al., 1990a, 1990b), whose initial, largely descriptive and categorical analyses of satisfaction and attainment data noted statistically significant differences in various

Table 4

Summary of Multiple Regression Analyses for Men

Variable	B	SE B	Partial r
General life satisfaction: $R = .22$, $R^2 = .05$, $F(4, 1174) = 7.26^*$			
Combat exposure	0.18	0.09	.06*
Atrocities	-0.14	0.04	-.10*
Malevolent environment	-0.03	0.01	-.08*
Perceived threat	-0.02	0.03	-.02
Marital adjustment: $R = .21$, $R^2 = .05$, $F(4, 1001) = 5.88^*$			
Combat exposure	0.12	0.09	.04
Atrocities	-0.14	0.05	-.08*
Malevolent environment	-0.02	0.01	-.06
Perceived threat	-0.03	0.03	-.03
Parenting satisfaction: $R = .21$, $R^2 = .04$, $F(4, 1063) = 5.81^*$			
Combat exposure	0.00	0.13	.00
Atrocities	-0.06	0.06	-.03
Malevolent environment	-0.04	0.01	-.10*
Perceived threat	0.01	0.04	.03
Job satisfaction: $R = .16$, $R^2 = .03$, $F(4, 1171) = 4.59^*$			
Combat exposure	0.04	0.11	.01
Atrocities	-0.15	0.07	-.07*
Malevolent environment	-0.04	0.01	-.09*
Perceived threat	0.04	0.03	.04
Educational attainment: $R = .10$, $R^2 = .01$, $F(4, 1174) = 1.01$			
Combat exposure	-0.05	0.15	-.01
Atrocities	0.06	0.09	.02
Malevolent environment	-0.03	0.02	-.05
Perceived threat	0.02	0.04	.02
Occupational attainment: $R = .08$, $R^2 = .01$, $F(4, 1172) = 1.18$			
Combat exposure	-2.20	2.88	-.02
Atrocities	-0.01	1.51	.00
Malevolent environment	-0.46	0.28	-.05
Perceived threat	1.18	0.70	.05

(table continues)

Table 4 (Continued)

Variable	<i>B</i>	<i>SE B</i>	Partial <i>r</i>
PTSD symptom severity: $R = .60$, $R^2 = .36$, $F(4, 1166) = 91.75^*$			
Combat exposure	-3.26	2.56	-.03
Atrocities	8.58	1.33	.19*
Malevolent environment	1.90	0.29	.19*
Perceived threat	1.80	0.75	.07*

* $p < .05$.

comparisons between and among groups using somewhat different variable operationalizations. Although in our results we do likewise find Vietnam veterans to be slightly less well-adjusted on some indicators, and we acknowledge statistical significance, our revisitation of these data and interpretations of the findings differ from past research. We conclude that the differences and associations are so small according to Cohen's (1977) guidelines for interpreting effect sizes as to be practically insignificant, challenging explanations that correspond to practical utility.

With highly overlapping confidence intervals or discrepancies in average ratings relative to scale ranges of only tenths or hundredths of points (Table 1), it is not unreasonable to speculate that most Vietnam veterans are about as satisfied with their lives and have achieved educationally and occupationally to a degree comparable to their matched generational peers. Furthermore, and perhaps equally intriguing, we note a wide divergence in the power of the war-zone stressor variables in Study 2 of this study to predict aspects of general life adjustment vis-à-vis the associations between these variables and PTSD symptomatology. Once more, as revealed in Tables 4 and 5, an optimally weighted composite of these stressor variables accounted for relatively scant amounts of individual differences in the adjustment outcomes, yet a fairly substantial proportion of variance in PTSD for both men and women.

Moreover, the pattern of associations of the war-zone stressors with satisfaction and attainment variables is more complex than their relationships with PTSD. Regarding the women, the consistently positive bivariate correlations between exposure and attainment (Table 3) might be explained from two perspectives. First, near the beginning of the Vietnam era, the Armed Forces shifted their requirements for entry into military nursing and emphasized the recruitment of registered nurses who had attained a 4-year baccalaureate degree. Older nurses, with longer military service and higher rank, were more likely to have entered the military with a 3-year hospital diploma. To some extent, lower ranking, junior-grade nurses would be more likely than their superiors to be in the

Table 5

Summary of Multiple Regression Analyses for Women

Variable	B	SE B	Partial r
General life satisfaction: $R = .22$, $R^2 = .05$, $F(4, 426) = 3.61^*$			
Combat exposure	0.25	0.12	.10*
Atrocities	-0.10	0.08	-.06
Malevolent environment	-0.03	0.01	-.13*
Perceived threat	-0.02	0.02	-.04
Marital adjustment: $R = .14$, $R^2 = .02$, $F(4, 233) = 1.14$			
Combat exposure	-0.03	0.15	-.01
Atrocities	-0.04	0.08	-.03
Malevolent environment	-0.03	0.02	-.13
Perceived threat	0.04	0.03	.08
Parenting satisfaction: $R = .14$, $R^2 = .02$, $F(4, 217) = 1.03$			
Combat exposure	0.18	0.17	.07
Atrocities	0.01	0.10	.00
Malevolent environment	-0.02	0.02	-.08
Perceived threat	-0.04	0.04	-.06
Job satisfaction: $R = .20$, $R^2 = .04$, $F(4, 416) = 3.14^*$			
Combat exposure	0.36	0.16	.11*
Atrocities	-0.13	0.11	-.06
Malevolent environment	-0.04	0.02	-.11*
Perceived threat	-0.04	0.03	-.06
Educational attainment: $R = .20$, $R^2 = .04$, $F(4, 426) = 2.98^*$			
Combat exposure	0.29	0.19	.07
Atrocities	0.09	0.11	.04
Malevolent environment	0.01	0.02	.03
Perceived threat	0.00	0.03	.00
Occupational attainment: $R = .17$, $R^2 = .03$, $F(4, 419) = 2.21$			
Combat exposure	4.04	2.79	.07
Atrocities	1.62	1.43	.06
Malevolent environment	-0.13	0.24	-.03
Perceived threat	0.23	0.49	.02

(table continues)

Table 5 (Continued)

Variable	<i>B</i>	<i>SE B</i>	Partial <i>r</i>
PTSD symptom severity: $R = .57$, $R^2 = .32$, $F(4, 425) = 33.65^*$			
Combat exposure	-6.69	4.01	.09
Atrocities	7.77	2.34	.16*
Malevolent environment	1.75	0.29	.28*
Perceived threat	1.93	0.60	.15*

* $p < .05$.

forward areas with more exposure to war-zone events and circumstances; hence, the observed positive, though weak, associations with educational attainment (see further comments by King, King, Foy, & Gudanowski, 1996). Also, the experience of combat nursing, military officer status, and feelings of self-efficacy following wartime service surely provided considerable credentials and advancement for a woman's postwar career, hence the observed positive, though also weak, associations with occupational attainment.

Another interesting pattern of associations was the apparent suppressor effect involving combat exposure in the multiple regression analyses predicting general life satisfaction for men and women and job satisfaction for women. In the bivariate case (Table 3), all war-zone exposure variables, including combat exposure, were negatively related to these satisfaction outcomes: More exposure was associated with less satisfaction. In the multiple regression analyses (Tables 4 and 5), the three partial coefficients for combat exposure were positive and significant. These findings harken to the aforementioned literature on posttraumatic growth (Tedeschi et al., 1998). After taking into consideration or accounting for other war-zone experiences that might be quite troubling (atrocities, malevolent environment, and perceived threat, all present in the multiple regression equations), exposure to combat has a very modest salutogenic (Antonovsky, 1979) effect on one's well-being. We make this statement with great caution since, once more, the effect sizes are small (partial correlations of .06, .10, and .11).

What might be the implications of these results in the broad context of Vietnam veteran mental health research? First, although exposure to a war zone and the kinds of traumatic experiences that surface there may be good predictors of chronic postwar stress symptom severity, they are not particularly good predictors of what we have framed as long-term general life adjustment. That is, reported prior war-zone exposure is obviously a key factor in explaining war-related PTSD, but it is not a key factor in explaining satisfaction and attainment many years after the war. While some individuals may experience deficits in adjustment following exposure to a highly stressful event, others may experience

an increase in adjustment, and still others may be relatively unaffected in the long run, as suggested by the growing literature on stress resistance (e.g., Antonovsky, 1979; Hobfoll, 1988, 1989; Hobfoll et al., 1995; Holahan et al., 1992; Kobasa, 1979; Schaefer & Moos, 1992).

Overall, null or nearly null relationships between extremely stressful experiences and general life adjustment outcomes—such as those observed in this study—may result, and the researcher is tasked to search out other explanatory factors. Perhaps, 10 to 20 years after exposure, some of those suffering from PTSD symptoms might have reached a degree of accommodation to their chronic condition such that symptoms are expected, managed, or compartmentalized to allow for reasonably successful functioning across important domains of life. For others, of course, this accommodation has not materialized. As there are obviously individual differences in symptom severity, there are likely individual differences in the ability to accommodate these symptoms as well. Concepts such as hardiness (Kobasa, 1979) and coping styles (Holahan et al., 1996; Schaefer & Moos, 1992) are clearly relevant in this context.

In addition to recognizing and studying the kinds of resilience factors that buffer the onset of chronic PTSD, we might also search for clues to resilience mechanisms underlying this kind of long-term reconciliation of one's distressing psychological condition. Although in the present study, our goal was simply to document associations between the war-zone experience and adjustment outcomes, we recognize a need for further research to examine how, as examples, prewar risk and resilience factors (e.g., early family functioning, childhood abuse or neglect) and postwar influences (e.g., homecoming and current social support) might moderate the relationship between war-zone exposure and long-term adjustment. This is particularly important, given the weak associations reported in this study, and we recommend the testing of more complex models to understand the link between exposure to traumatic events and general life adjustment. Of course, we recognize the possibility that general life adjustment outcomes (e.g., life satisfaction, marital satisfaction, parenting satisfaction) may not be well predicted by prior events, but may be more responsive to aspects of the immediate environment. However, this is precisely the point that we wish to make. Evidence for a positive relationship between exposure to stressful or traumatic events and psychopathological outcomes does not necessarily imply deficits in other areas of functioning, such as life satisfaction and attainment.

We encourage trauma researchers and practitioners to balance their array of outcome assessments, to go beyond a restricted concern for psychopathology, and to explore various aspects of more general psychosocial adaptation. In addition to satisfaction and attainment, as examined in this study, we recommend evaluation of other indicators of trauma survivors' subjective well-being (e.g., optimism and hope for the future, perceived quality of life), positive individual traits (e.g., hardiness, coping styles, sense of coherence, integrity, altruism, insight), and

general posttraumatic growth (Linley, 2000; Seligman & Csikszentmihalyi, 2000; Tedeschi et al., 1998).

What types of persons can endorse moderate to severe stress symptomatology, yet also report satisfaction with aspects of their day-to-day lives and accomplishments in more objective life domains? Approached from another perspective and drawing from the literature on affect (e.g., Feldman Barrett & Russell, 1998) and mood (e.g., Sinclair, Soldat, & Ryan, 1997), as well as the work of Jahoda (1958) and more recently that of Ryff and Keyes (Keyes, 2002; Ryff & Keyes, 1995), one might seek to determine under which conditions two outcomes obtain. First, what are the conditions under which negative and positive consequences are unidimensional, bipolar, and highly negatively correlated and thus cannot coexist to the same extent and with the same valence within an individual? Second, what are the conditions under which these consequences are multidimensional, with a person's standing on a particular negative or psychopathological outcome (e.g., PTSD) relatively independent of the person's standing on an indicator of more general psychosocial adaptation?

Mental health and mental illness are multifaceted. Trauma exposure might predict one distressed condition (e.g., PTSD, depression) reasonably well, but not account for what semantically suggests an opposite state of positive adjustment (e.g., life satisfaction or success). Accordingly, presence of the former does not necessarily preclude presence of the latter; and absence of the latter does not necessarily insure the former. Of course, this does not diminish recognition of the devastating short- and long-term effects of trauma on a significant minority of its victims, with negative consequences cutting across many domains of life. A broader perspective on functioning and increased knowledge about adaptation and coping with trauma symptomatology should better inform the treatment of those who are most afflicted.

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