Emotional Aftermath of the Persian Gulf War

Veterans, Families, Communities, and Nations

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18 From Soldier to Civilian: Acute Adjustment Patterns of Returned Persian Gulf Veterans

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Although prior research has demonstrated a clear association between wartime exposure and subsequent readjustment (Card 1983; Figley 1978, 1985; Green et al. 1989; Kulka et al. 1988, 1990; Rundell et al. 1989), surprisingly little is known about differences in soldiers' post-war psychological recovery or the factors that differentiate the acute readjustment period from later recovery phases.

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To investigate soldiers' responses to deployment durin Operation Desert Storm, we developed the Ft. Devens ODS Reunion Survey, a detailed self-report survey that was adminis tered twice to a large sample of Persian Gulf War veterans wh were deployed from New England. The data address the rang of reported wartime stressors and a wide variety of soldiers' behavioral and psychological responses. Because of the wa in which the data were gathered, the project offers clinician and researchers some of the earliest and most systematicall collected information on acute war stress and readjustmen following modern warfare. The survey also provides the unique opportunity to compare the responses of male and female soldiers.

The data from this survey are especially useful because the potentially can help clinicians address questions that may be o interest in the evaluation and treatment of veterans of the Persian Gulf conflict. Some of these questions relate to distinctive characteristics of the Gulf War, such as consideration of the common types of wartime stressors from this deployment and whether these stressors differ from experiences typically described by veterans of other conflicts. Other questions deal more with clinical outcome. For example, what is the relationship between these deployment experiences and subsequent psychological and behavioral adjustment, specifically the development of traumatic stress disorders? What is the course of psychological reactions as they evolve over the first few months and years, and are different psychological interventions indicated? Finally, what, if any, is the relationship between special characteristics of the American Persian Gulf force—in particular, the broad inclusion of women in a wide variety of military occupational specialties—and subsequent readjustment? What can be said about differences between the experiences of men and women during this deployment, and is gender differentially linked to certain types of outcomes?

In this chapter we use data from our survey to help examine these questions. We explore patterns of readjustment as they relate to certain deployment stressors and investigating

changes in soldiers' responses early in the return process and over the subsequent 2 years.

Background of the Survey

Initial media reports from the Persian Gulf War suggested that the time-limited nature and relatively low intensity of this war would yield negligible rates of psychological stress, at least as compared with the Vietnam War (Kulka et al. 1990). Anecdotal reports of soldiers almost immediately, however, strongly suggested the presence of discrete war-zone stressors (Wolfe et al. 1993a) and the corresponding impact of numerous aspects of the deployment process, ranging from marked concerns with domestic separation and job disruption to aftereffects of anticipating biological warfare and health problems. By surveying nearly 3,000 soldiers early in the return process, we hoped to systematically delineate stressors associated with this conflict and their relation to sociodemographic characteristics and outcome before there was any substantial confound from intervening homecoming or life events.

To date, nearly all studies of military personnel, with the exception of certain Israeli studies (e.g., Solomon and Mikulincer 1988), have been conducted years or decades after the completion of soldiers' military service. As a result, data from those studies could reflect substantial recall bias stemming from the effects of retrospective reporting and the probable impact of residual (or cumulative) distress on subjective appraisal of functioning (for discussion of these methodological issues, see Sutker et al. 1991). By administering the first phase of this survey before soldiers returned home, we hoped to diminish the effects of these reporting biases. In addition, the survey offered the unusual opportunity to examine any differential effects of wartime deployment based on gender, because the Persian Gulf War marked the first time that male and female U.S. service personnel served side by side in any significant number across a variety of units.

Survey Design

Administration

Early Phase (Time 1)

To enhance the validity and reliability of our data collection, we designed the reunion survey to be administered in several phases, with the earliest phase (Time 1) taking place within 5 days of the soldiers' return to this country, before soldiers returned home to their families and friends.

The initial phase of the survey was administered at Ft. Devens (Ayer, Massachusetts) to units as they returned to the base and underwent administrative processing. Approximately 60% to 70% of soldiers deployed through Ft. Devens were surveyed. The remainder were not available because of routine scheduling issues (e.g., administrative outprocessing by the base). No selection bias was apparent. During the evaluation, soldiers completed a series of detailed standardized and experimental questions dealing with their background, war-zone and deployment stressors (both traditional and novel), psychological outcome (including posttraumatic stress and general psychological symptomatology), coping, and overall well-being. All soldiers completed the paper-and-pencil survey with their unit. In this survey we specifically sought to improve on earlier studies of veterans' wartime experiences by including measures of both traditional and expanded dimensions of stressor exposure (e.g., assessment of domestic stress; unit accidents), based on the assumption that certain aspects of this deployment might constitute new and unusual stressors for military personnel. In addition, because knowledge about posttraumatic stress disorder (PTSD) has evolved significantly in the last decade, more precise measurement of stress reactions was also employed.

Based on previous research showing the utility of scaled combat exposure measures, we used a traditional, Likert-scaled combat instrument: a minimally modified version of the widely used Laufer Combat Scale (Gallops et al. 1981). We also incor-

porated a structured war-zone checklist instrument (Rosenheck 1992) that allowed more valid representation and broader endorsement of the diverse range of war-zone events that typified the Persian Gulf War environment (e.g., alert for biochemical attack).

The primary psychological and behavioral outcome measures included the well-standardized Mississippi Scale for Combat-Related PTSD (Keane et al. 1988), the Brief Symptom Inventory (Derogatis and Melisaratos 1983), a PTSD checklist derived from the existing cardinal DSM-III-R (American Psychiatric Association 1987) symptoms of PTSD, and the Coping Responses Inventory (Moos 1988). We also obtained data relating to a range of background and sociodemographic factors (e.g., age, race, marital and family status, education, substance use, occupation), as well as information on attitudes toward the deployment experience (e.g., individual and unit preparedness, family support).

First Follow-Up Phase (Time 2)

The first follow-up phase of the survey (Time 2) was completed in 1993 and offers a wealth of data from the period of roughly 18 to 20 months after initial deployment.[1] Included in this phase were most of the original questions and measures, particularly those that were likely to evidence any change. In addition, as veterans began to voice particular concerns after their return (e.g., deteriorations in health status), we revised the proposed Time 2 follow-up survey slightly to include a number of additional measures pertaining to family functioning, unit cohesion, health appraisal, and social and vocational adjustment. Incidences of intervening critical life stressors were also obtained, because these have been shown to relate in a number of situations to both the occurrence of previous stressor exposure and the mediation of subsequent psychological response (Breslau et al. 1991).

[1]A second follow-up phase is in progress (Time 3: 1994–1995).

By the time of the follow-up (Time 2), a number of units had disbanded and about 15% of respondents had left military service. Consequently, nearly half of the original units were resurveyed face-to-face at unit meetings that we attended to collect this information. To those units or individuals who could not be contacted in person, we mailed follow-up surveys with detailed letters describing the purpose and importance of the survey and providing general information on the nature of postwar readjustment and referral processes. These letters appeared to have helped in allaying concerns about how the data would be used and in handling misgivings about participating in a government-related project. For example, after a second letter from the research team, one veteran completed the survey, adding,

> Sorry for the delay in responding. . . . I am quite upset at how our unit was treated; I would give up my life for my country, and some of the blame is not ours. . . . War is not nice. . . . We did a damn good job and not everybody seems to know this.

Because the mail phase yielded an initial return rate of just over 68%, we also instituted a phone survey that was specifically designed to track original participants who had not responded by mail or who could not be located through their unit. This phase resulted in an additional response rate of 11%, bringing the total percentage of survey returns for Time 2 to 79.3%. This number provides a sufficiently high level of reliability for the purpose of comparing the results of Time 2 with those of Time 1.

Interested readers are referred to the paper by Wolfe and co-workers (1993a) for a more detailed description of the reunion survey's content and design.

Sample Composition and Veterans' Background Characteristics

For Time 1, the data we refer to in this chapter are based on the responses of 2,344 individuals. Substantially more men than

women are represented: 2,136 men versus 208 women. Overall, these individuals represent a majority subset of those who completed the initial survey. A remaining subset involves several Special Forces units whose data are not included here because of the substantially different nature of their background, training, and deployment experiences.

Although the units tested at Time 1 constitute only about 60% of the troops actually deployed to the Gulf from Ft. Devens, comparisons between our sample and data available for the Ft. Devens population overall suggest that our respondents are representative of the military population stationed at the base during that time. In addition, the sample we studied is moderately diverse, containing a number of ethnic minorities (7.6% African American, 3.6% Hispanic) and representing more than 46 different units with a wide range of military occupational specialties, from service support (e.g., quartermaster) to combat support (e.g., combat engineering). Active-duty, reserve, and National Guard components are represented. Additional demographics are listed in Table 18–1.

At the time of the follow-up (Time 2), the sample comprised 1,853 respondents, including 1,697 men and 162 women. This number of respondents represents a surprisingly high response rate (79.3%), considering the transient nature of much of the sample (i.e., military life often involves redeployment, numerous moves, and so forth). Comparisons between participants at Time 1 and nonparticipants at Time 2 on a number of demo-

Table 18–1. Sample characteristics of Ft. Devens Operation Desert Storm Reunion Survey returnees

- More than 80% of the sample were Caucasian.
- Women were more likely to be unmarried than men.
- A greater percentage of women served as enlisted personnel rather than officers.
- Men were more likely to have had prior war-zone experience.
- The average age was 30 years, with men slightly older, on average.

graphic, exposure, and outcome variables did not show an significant differences.

Findings From the Survey

Initial Return (Time 1)

Exposure

The majority of respondents in our sample had low to moder ate levels of traditionally defined combat exposure, and ther were no significant differences in levels between men an women. Only 3% of either group would be designated as havin heavy combat exposure based on prior wartime distinction On the expanded Operation Desert Storm exposure checklis a measure designed to evaluate the distinctive experiences o the Persian Gulf war zone (e.g., hostile desert environment; ex posure to biochemical attack; civilian death), levels of exposur were higher for men but remained comparable for men an women. For both sexes, the three most commonly endorse stressors on the checklist were formal alert for chemical or bio logical attack, receipt of incoming fire from large arms, and wi nessing death or disfigurement of enemy personnel (Table 18–2 These events were endorsed by one-half to three-quarters of a participants.

When veterans were given the opportunity to describe thei single most stressful experience during deployment in an open ended format, a slightly different finding emerged. Althoug combat stressors remained primary (48% men, 38% women) noncombat war-zone stressors (e.g., accidental unit death) wer described as primary by nearly one-quarter of the sample (28 men, 24% women). Thus, interpretation of war-zone stress ap pears to require broadening to more adequately reflect the im pact of nontraditional stressor events (and potentially gender on psychological outcome. This need for a broader interpreta tion of war-zone stress is further supported by the fact that 25 of men and 20% of women in our sample reported domesti

Table 18–2. Deployment experiences of Ft. Devens Operation Desert Storm Reunion Survey returnees

- Combat exposure levels were moderately low overall.
- The three most common deployment stressors were (in order of most frequent reporting)
  —Formal biochemical alert
  —Receipt of incoming fire
  —Witnessing death or dismemberment of enemy
- 20% to 25% of respondents rated domestic crises as their primary stressor.
- For men and women, perceptions of combat and war-zone exposure increased significantly from initial return to 18-month follow-up.

stressors (e.g., dissolution of marriage, unexpected death of a loved one) as the primary source of trauma during their Gulf War service.

Psychological Outcome

PTSD symptomatology was measured by the Mississippi Scale for Combat-Related PTSD (Keane et al. 1988), a well-validated and reliable measure of war-stress symptomatology in veterans. Mean scores on immediate return were moderately low (mean = 62.3, SD = 13.5). These scores are well below the cutoff of 89 or higher that was used to identify wartime PTSD in a number of community-based samples of veterans from the Vietnam War era (Kulka et al. 1990). Nonetheless, scores for women were higher than those for men ($t[2,340] = 5.22$, $P < .001$) (Table 18–3). At Time 1, nearly 4% of men and 9% of women scored above the aforementioned cutoff ($\chi^2[1, N = 2,342] = 13.03$, $P < .001$. We have labeled this cutoff "presumptive PTSD" because more definitive diagnosis would require detailed, face-to-face diagnostic corroboration rather than exclusive reliance on symptom checklists.

Using a broader measure of general psychopathology, the General Severity Index of the Brief Symptom Inventory (Derogatis and Melisaratos 1983), we found that considerably higher

Table 18–3. Common responses of Ft. Devens Operation Desert Storm Reunion Survey returnees to Gulf War experiences

- Women significantly exceeded men on standard measures of posttraumatic stress disorder and general distress.
- Overall rates of clinical symptomatology increased two- to threefold at follow-up.
- Health complaints were prominent among returnees, particularly
  —General aches and pains
  —Headaches
  —Abnormal lack of energy

levels of distress were present: approximately 30% of soldiers scored in the clinically significant range. Once again, a greater proportion of women than men exceeded the cutoff; however, the difference was not statistically significant ($\chi^2[1, N = 2{,}337] = 1.24$). Thus, even though rates of presumptive PTSD appeared relatively low, considerable numbers of returnees described marked psychological distress in the early phase.

Examination of other characteristics associated with the presence of PTSD symptoms at initial return indicated that symptomatic returnees reported significantly more coping marked by cognitive avoidance ($t[106] = 8.62$, $P < .001$), resignation ($t[2{,}176] = 7.22$, $P < .001$), emotional discharge $t[2{,}181] = 13.08$, $P < .001$), total approach-based coping ($t[2{,}147] = 7.25$, $P < .001$), less unit cohesion ($t[71] = 4.58$, $P < .001$), and lower amounts of family cohesion ($t[56] = 2.55$, $P < .05$).

As expected from prior research (e.g., Keane et al. 1988; Kulka et al. 1990), there was a significant positive relationship between Operation Desert Storm war-zone exposure totals and Mississippi Scale for Combat-Related PTSD scores ($r[2{,}313] = .27$, $P < .001$).

Follow-Up Findings (Time 2)

A series of analyses focusing on individuals who responded to the survey at both times were performed to compare patterns of

responses on stressor and outcome variables. We anticipated that, as in other populations (Baum 1990; Green et al. 1990; Prince-Embury and Rooney 1988), readjustment following war stress might follow along a variety of paths, ranging from enhanced sense of well-being to delayed symptom onset. We hypothesized that the clinical status of some individuals would change from Time 1 to Time 2. Furthermore, we predicted that overall rates of psychological distress would have increased by Time 2, based on the very early point at which the survey was initially administered and the probable buffering effects of the positive support that was widely available for returnees at the outset.

Exposure

Comparing the same subjects at both times, we found that self-reported combat exposure levels increased overall from Time 1 to Time 2. Proportional increments were similar for men and women.

Psychological Outcome

Like the exposure scores, measures of psychological outcome also demonstrated a significant overall increase for both presumptive PTSD (based on the Mississippi Scale for Combat-Related PTSD) and general distress (measured by the General Severity Index of the Brief Symptom Inventory). As at Time 1, female soldiers' symptom reports exceeded those of men in number of symptoms. At Time 2, 11% of male respondents had scores that exceeded the clinical cutoff for presumptive PTSD, which constitutes a 2½-fold increase from Time 1, and 21% of female respondents had scores that exceeded the cutoff, an increase similar in magnitude to that for men between T1 and T2. More than 8% (n = 120) of men whose scores were below the PTSD cutoff at Time 1 had scores that surpassed the cutoff at follow-up, compared with nearly 15% (n = 19) of female respondents. Thus, a substantial number of individuals evidenced a negative change in the follow-up evaluation. Highly

similar increments were found on the General Severity Index and related PTSD checklist measures.

Other Behavioral Indices

At Time 2, 32.4% of all the respondents (31.8% men, 40.1% women) reported that their health had changed for the worse since serving in Operation Desert Storm. As one respondent noted,

> I feel very uneasy over how sick I have become. I was not like this before. I was sick for several days in Saudi, and now it has been months. I have a rash that won't go away. I have aches, pains, my joints hurt; something is wrong! I'm scared the government isn't being honest about what could be wrong with us—even about the medications we took . . .

An analysis of health complaints showed that their prevalence varied across individuals. Men and women who had scores that exceeded the clinical cutoff for PTSD had significantly more health concerns than did individuals whose scores fell below the cutoff ($t[217] = 23.61$ $t[64] = 13.05$, respectively, both $P < .001$). Mean numbers of health problems in men and women whose scores exceeded the PTSD cutoff were nearly triple those of other soldiers (means = 13.8 and 15.7 for men and women, respectively, whose scores were above the cutoff vs. means = 5.7 and 6.7 for nonclinical men and women). The three most commonly endorsed health problems at Time 2 were general aches and pains, headaches, and a lack of energy (Table 18–3), all of which differed significantly by PTSD status ($\chi^2[1, N = 1{,}602) = 82.29$; $\chi^2[1, N = 1{,}601) = 62.15$; and $\chi^2[1, N = 1{,}601) = 113.90$, respectively; all $P < .001$); that is, soldiers with PTSD symptoms reported significantly more health complaints.

An examination of other characteristics associated with the presence of PTSD symptoms at Time 2 again indicated that symptomatology was significantly associated with more avoidant and resigned forms of coping ($t[1{,}514] = 7.54$ and $t[1{,}515] = 6.05$, respectively; both $P < .001$), poorer unit cohesion ($t[232] =$

5.99, $P < .001$), and less family cohesion ($t[170] = 7.26$, $P < .001$). As expected, the highly significant positive correlation between war-zone exposure and PTSD symptoms remained ($r[1,844] = .36$, $P < .001$).

To examine factors contributing to changes in clinical classification at Time 2 in more detail, we conducted a stepwise discriminant function analysis using predictors derived from preceding univariate analyses and a standard exploratory discriminant analysis. Men and women were combined for this procedure because the smaller female sample size precluded independent analyses. The obtained discriminant function was highly significant ($F[5,989] = 35.01$, $P<.001$, Wilks' $\lambda = .84$) and yielded a canonical correlation of .39, which accounted for 15% of the total variance. The analysis correctly classified more than 90% of subjects as PTSD positive or negative. A number of variables significantly predicted the emergence of PTSD at Time 2, including higher Operation Desert Storm (but not traditional) war-zone exposure; female gender; avoidant coping; less social support; and poorer family cohesion.

Interpretation of the Findings

Although rates of presumptive PTSD at Time 1 were modest in our sample, these rates increased substantially at the 18-month follow-up, to the point where they were more directly comparable to traumatic stress levels found both in veteran populations from other eras (see, e.g., Brill and Beebe 1955; Kulka et al. 1988, 1990) and in a number of civilian samples after catastrophic life events (see, e.g., Baum 1990; Green et al. 1990). Despite our initial predictions that the time-limited and circumscribed nature of this war would yield few adverse psychological consequences, the data presented here and elsewhere (e.g., Labbate and Snow 1992; Sutker et al. 1993; Wolfe et al. 1993a) confirm that total wartime exposure and exposure to particular stressor components (e.g., witnessing violence, severe injury, and death; anticipatory alert), as in other settings, are particu-

larly aversive and affect the development of stress symptomatology in a noteworthy percentage of individuals (Green et al. 1989; Ursano and McCarroll 1990; Wolfe et al. 1993a; Yehuda et al. 1992). Although comments by some soldiers at follow-up revealed concern with perceived life threat associated with repeated military biochemical alert, the long-range impact of such events on recovery remains to be determined.

The emotional trauma described in the anecdotes and offhand comments appended to many surveys is especially striking. Particularly noteworthy are the strong similarities between the following remarks, from one of the respondents in our study, and those that often punctuate the memories of symptomatic Vietnam War veterans:

> I belonged to a hospital unit the whole time. . . . I saw and took care of many dead and wounded people, both military and civilian; children too. I have had nightmares of this time a lot. I would prefer to block it out and go on with my life. I don't know why—I can't.

Findings from returned soldiers are also consistent with several studies showing that acute stress levels often increase over time (Baum 1990; Prince-Embury and Rooney 1988; Sutker et al. 1993), whether as exacerbations of original stress reactions or in the form of delayed symptom onset. At present, the factors differentially associated with these alterations in both veteran and civilian populations are only partly understood and require substantially more study to determine their etiology (McFarlane 1992; D. Riggs, E. B. Foa, B. O. Rothbaum, et al., unpublished manuscript, 1993). Although supportive treatments may be especially effective during the early return period, the increases or chronicity of certain symptoms in our sample—for example, hyperarousal, sleep disturbance, and intrusive recollections—suggest preliminarily that more focused interventions such as cognitive-behavioral therapies and pharmacological agents are likely to be required in some instances.

In our sample we described a number of characteristics that

appeared to be associated with the observed temporal increases in PTSD, including avoidance-based coping and poor social support. Other investigators and clinicians have described a similar relationship between these variables and traumatic stress (e.g., Fairbank et al. 1991; Keane et al. 1985; Wolfe et al. 1993b). However, the relationship among these variables is not entirely clear. Impaired social functioning, diminished social cohesion, and poor coping, for example, may be epiphenomena of PTSD, reflecting the deleterious impact of PTSD symptoms on behavior rather than causal or etiological factors (Solomon and Mikulincer 1987). Regardless, these associated features are likely to cause difficulties for the treating clinician to the degree that they produce social withdrawal, treatment avoidance, or recurrent crises in daily living. Just as extended evaluations and the application of more sophisticated statistical models are needed scientifically to untangle chronological predictive and interactive effects, clinicians would be advised to monitor the effects of symptom interaction and exacerbation over the course of treatment (Table 18–4).

Our finding of an increase in perceived stressor levels at Time 2 warrants mention. Although exposure scores were significantly and positively related to symptom outcomes, we found a uniform increase in exposure reporting across the sample, extending in some cases to asymptomatic individuals. The study of the conditions under which reports and perceptions of stressor exposure vary is in its relative infancy. In one study involving a traumatic schoolyard shooting (Schwarz and Kowalski

Table 18–4. Suggestions for clinicians treating Operation Desert Storm returnees

- Recognize the broad spectrum of trauma, particularly sexual harassment of women during deployment.
- Assess the evolution of symptoms over time.
- Investigate contributions of premilitary and postmilitary stressors to psychological adjustment.
- Consider the broad range of health complaints and pursue appropriate referrals.

1991), the authors found that increments in the reporting of certain negative event characteristics (e.g., less proximity, greater life threat) were directly associated with PTSD symptoms. However, all subjects altered aspects of their recall during reevaluation. Thus, more investigation of the ways in which traumatic or stressful memories are encoded and retrieved is clearly indicated.

Based on data from a number of studies, the study of how pre- and postmilitary variables affect the course of adjustment over time is also critical (e.g., Vinokur et al. 1987). Although some evidence suggests that premilitary characteristics are of limited predictive value following intense combat (e.g., Foy and Card 1987), other studies have found that premilitary stresses exert independent, negative effects on postdeployment mental health (Vinokur et al. 1987), particularly under conditions involving stress that is of lower magnitude. As one returnee indicated,

> I think that some of my negative comments reflect the harshness of American life today. I'm supposed to be in early retirement and am working as a security person while trying to get a professional job! Lucky for me I have a great therapist. I am also trying to deal with the problem of low self-esteem and other issues that are still there from my childhood.

Other data substantiate the influence of certain sociodemographic characteristics. Hastings (1991) found that younger age at exposure adversely affected short-term outcome through lower psychosocial maturity and restricted vocational and psychosocial achievement. Green and co-workers (1990) similarly observed that lower levels of premilitary education and goal attainment had a negative effect on recovery for their sample of male Vietnam veterans. In older veterans, some adverse stressor effects seem to dissipate over the life span, particularly by mid- to late life, when a more solidly established sense of self and interpersonal relationships help to mitigate earlier traumatic

experiences (Elder and Clipp 1988, 1989; Norman 1988). Norman (1988), in a study of female Vietnam veterans, has suggested that more positive life experiences take precedence with the passage of time, superseding the effects of preceding stressors (see also Solomon et al. 1991). We did not systematically explore cohort effects by age or developmental stage. Still, given previous research, clinicians might find it useful to explore age-related and developmental life-stage factors (e.g., vocational opportunities, availability and adequacy of social networks) in evaluating veterans' readjustment to wartime stress and in conducting disposition planning.

Our findings suggest preliminarily that female personnel were more symptomatic both at initial return and at follow-up. In men, some studies have shown that male soldiers' exposure to earlier war trauma (Solomon et al. 1990) and highly stressful childhood events (Vinokur et al. 1987) can intensify reactions to subsequent wartime events. A number of women in our sample had had prior military and wartime exposure, and it is possible that these events influenced their current symptom reporting. One difficulty in making this determination is that we did not systematically measure all preceding or concurrent stressors, for example, childhood sexual or physical abuse. Available data increasingly show that rates of childhood and adult sexual victimization are exceedingly high in women (Kilpatrick 1992; National Victim Center 1992), and prior exposure to these events could affect women's abilities to deal with subsequent episodes involving perceived or actual life threat (Resnick et al. 1992).

Other data we collected strongly suggest that sexual victimization (defined as sexual harassment, attempted sexual assault, and/or completed sexual assault) transpired during the Persian Gulf deployment at rates that exceed those estimated in the civilian population (Wolfe et al. 1992). More than half of our female respondents described incidents of sexual harassment that marked their service or that of a cohort. Many spoke directly and graphically of these experiences and of PTSD-like reactions to them, as did this recently discharged woman:

> I was raped by two [men] in our compound. There was not enough military police protection . . . they got away with it. I have been hospitalized twice and am in therapy due to nightmares and recurring flashbacks. . . . it has taken me over a year and I am not well yet. This should not have been allowed to happen . . .

Preliminary analyses of empirical data from these respondents indicate that, when combat exposure during the Gulf War is controlled, the rates of PTSD found in female soldiers in our sample who had experienced attempted or completed assault are significantly higher than those found in women who have been sexually assaulted but have no military war-zone experiences. Thus, the delineation of relevant stressor events cannot be overemphasized in either scientific or clinical efforts to understand the recovery process.

The high rates of health complaints at Time 2 were also noteworthy. Solomon and Mikulincer (1992) and others (e.g., Cohen and Williamson 1991) have shown that somatic complaints are significantly increased with high levels of traumatic stress. However, the relationship among somatic concerns, health status, and psychological distress, particularly traumatic stress, remains obscure (Cohen and Williamson 1991; J. Wolfe, P. Schnurr, P. J. Brown, J. Furey, unpublished manuscript, 1993). One possibility is that health reports are influenced by interoceptive cues stemming from the physiological and autonomic changes that accompany PTSD (Litz et al. 1992; Shalev et al. 1990; J. Wolfe, P. Schnurr, P. J. Brown, J. Furey, unpublished manuscript, 1993). Alternatively, high levels of stress and arousal may increase vulnerability to existing exogenous pathogens (for review, see Cohen and Williamson 1991), a hypothesis supported by findings of demonstrable changes in immunological status after exposure to severe stress (e.g., Kiecolt-Glaser and Glaser 1987). In some cases, practitioners may find that returnees present with a predominance of physical complaints. These concerns should be exhaustively evaluated in both medical and psychiatric contexts as long as diagnostic uncertainty exists and the interrela-

tionship among these variables is equivocal.

Finally, the impact of postdeployment life events warrants mention. In our study, soldiers reported an average of 1.2 major life stressors since their return; for both men and women, the death of a friend or loved one was described as the most commonly occurring event. To date, at least one investigation has found an adverse impact of postwar stressors on veterans' adaptation (Miller et al. 1991). The way in which war stressors increase either exposure to or perceptions of subsequent critical life events, or, conversely, whether later events can retrigger previously well-managed stress reactions, will need careful evaluation as soldiers move ahead with their lives in civilian and military capacities.

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