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A Model of War Zone Stressors and Posttraumatic Stress Disorder

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We present a theoretical model of field placement, war zone stressors (fighting, death and injury of others, threat of death or injury to oneself, killing others, participating in atrocities, harsh physical conditions and insufficiency of resources in the environment) and posttraumatic stress disorder (PTSD). Theater veterans from the National Vietnam Veterans Readjustment Study were divided randomly into two subsamples of 599 each. The model was developed on the first subsample and cross-validated on the second using structural equation modeling. The model provides a theoretically and empirically satisfactory description of the anatomy of war zone stressors and their role in the etiology of PTSD, but it leaves unanswered important questions regarding the etiological role of insufficiency of resources in the environment.

KEY WORDS: war zone; stressors; trauma; PTSD; veterans.

Historically, less attention has been paid to codifying the nature of the stressors which constitute traumatic exposure in the war zone than codifying the nature of the psychological and physiological reactions to these stressors. With their attention focussed on trying to understand the pathological reactions to traumatic exposure, it is understandable that investigators have often been more interested in obtaining the most comprehensive assessment of the dose of traumatic exposure rather than the most differentiated assessment of the types of traumatic exposure (e.g., Foy, Sipprelle, Rueger, & Carroll, 1984; Keane et al., 1989; Laufer, Yager, Frey-Wouters,

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& Donnellan, 1981; Lee, Vaillant, Torrey, & Elder, 1995). This has led to the development of measures which are of heterogeneous composition and that have generally been referred to as combat scales. They have typically surveyed fighting, death of others, threat of death to self, and killing others. Further, Laufer and his colleagues have argued for expanding and differentiating the universe of stressors by including abusive violence (atrocities) as an additional, separate category of traumatic exposure (Laufer, Gallops, & Frey-Wouters, 1984). The landmark National Vietnam Veterans Readjustment Study (NVVRS) combined data on several types of stressors into one index of war zone stress, which included combat, death and injury of others, threat of death to oneself, abusive violence and physical deprivation (Kulka et al., 1990b). In addition, the NVVRS identified loss of meaning and control as another type of stressor. Most recently, King and his colleagues have combined physical deprivation and loss of meaning and control as exposure to a malevolent environment (King, King, Gudanowski, & Vreven, 1995; King, King, Foy, & Gudanowski, 1996).

The need for a conceptual model of the relationships among war zone stressors themselves and the links of war zone stressors to PTSD is highlighted by a surprising finding in King's 1995 study. That study reported that malevolent environment was the stressor that contributed most strongly to PTSD, eclipsing even combat in magnitude. The authors noted that malevolent environment was composed of "relatively low-magnitude stressors" that might better be called "daily hassles" rather than *traumatic* events. Although the investigators specified a direct effect between malevolent environment and PTSD, they did not provide a conceptual rationale for this choice. The essentially nontraumatic nature of malevolent environment, however, poses serious interpretive problems for the direct role of malevolent environment in the development of PTSD. Namely, if PTSD is first and foremost a reaction to *traumatic* events, then how can malevolent environment be truly more influential to the development of PTSD than combat? It is important, therefore, that a rational conceptual model be developed which specifies the nature of the relationships among war zone stressors themselves as well as their relationships to PTSD. Further, serving as ground troops and being stationed in the countryside could be expected to contribute to the dose of exposure to the war zone stressors themselves.

The first step to specifying such a model, however, is differentiating among the components of war zone stress precisely and specifically so as to eliminate conceptual overlap among them. As noted above, the constructs of combat and war zone stress have often included several components. We have separated what has traditionally been conceptualized as combat (or war zone) stress into five related experiences: fighting, threat of death or injury to oneself, death or injury to others, killing others, and

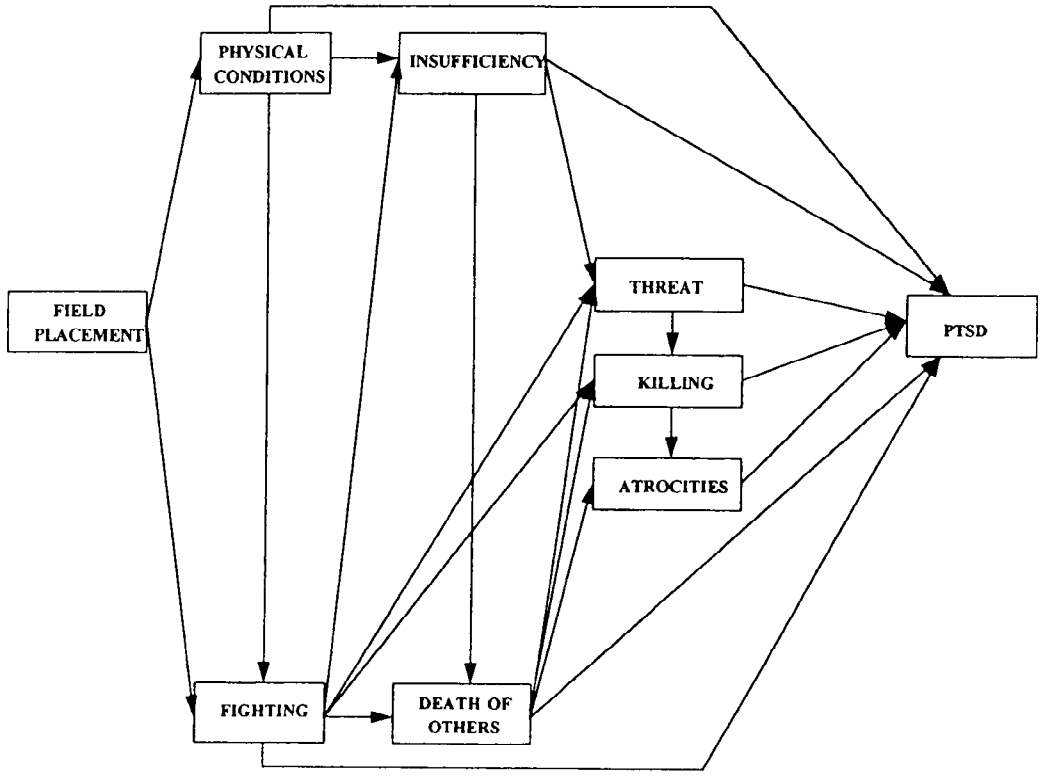

Figure 1. Theoretical model for the interrelationships among war zone stressors and their relationships to posttraumatic stress disorder.

committing atrocities. Similarly, we have separated malevolent environment into two components: the physical conditions of the environment and the conditions of insufficiency and constraint that often prevailed.

In addition to differentiating among the traumatic components, our theoretical model specifies a series of etiological relationships among themselves and with PTSD (see Figure 1). In this structural model, troops who are stationed in the field, that is who are serving as ground troops and arc stationed in the countryside, are posited to be exposed to more unpleasant physical conditions and to more fighting. The further out in the field that troops are stationed, the less is technology available to counter inclement weather, insects or dirt, and the closer is the perimeter of safety. Exposure to unpleasant physical conditions is specified to mediate between field placement and fighting and to contribute to the experience of insufficiency in the form of inadequacy of supplies and constraints on freedom of movement. In addition, a direct path is specified from physical conditions to PTSD to test whether or not there is a significant contribution from physical conditions aside from an indirect contribution.

Fighting is posited to contribute to exposure to the death and injury of others, the perceived threat of one's situation, and the killing of others.

In addition, fighting is posited to contribute to insufficiency because of the exhaustion of supplies and the need for heightened security. Further, King and his colleagues (1995) have noted that most of the items measuring insufficiency qualify as hassles rather than traumas and call for a subjective appraisal of the environmental conditions. Lazarus and Folkman (1984) have suggested that major life events might exacerbate or generate daily hassles. In addition, King's 1996 study reported direct effects from combat and atrocities to malevolent environment. We posit, therefore, that fighting both exacerbates and generates the extent to which shortages and constraints are experienced. A direct path is specified from fighting to PTSD as well, in order to test whether or not there is a significant contribution from fighting aside from an indirect contribution.

Insufficiency is posited to contribute to the perceived threat of the situation and exposure to the death and injury of others because of the increased vulnerability of one's unit due to the exhaustion of munitions and supplies. Following the work of King et al. (1995; 1996; in press), we specified a direct path from insufficiency to PTSD to test whether or not there is a significant contribution from insufficiency aside from an indirect contribution. Exposure to the death and injury of others is posited to contribute to the perceived threat of the situation, to killing others and to participating in atrocities. Perceived threat is posited to contribute to killing others, and killing others is posited to contribute to committing atrocities. Although emotional reactions are not measured specifically in this study and therefore cannot be evaluated directly, they provide the underlying theoretical rationale for the specification of many of the relationships among the components of combat.

We draw heavily upon Shay's (1995) account of the emotions, particularly as part of the "berserk" state, that are aroused by the various stressors of war. In the berserk state, a soldier is overwhelmed with grief and anger at the death of his comrades, and seeks revenge by engaging the enemy without precaution for his own or others' safety. Life, morality and other people "don't mean nuthin'." Specifically, we theorize that anger and the desire for revenge are major emotional reactions to the death of one's comrades, and that these emotions drive the relationship between witnessing the death of one's comrades and both killing others and committing atrocities. Moreover, killing others violates one of the strongest prohibitions of civilized society, and so we posit that killing others breaches one of the strongest restraints against committing atrocities. Further, we theorize that fear and the instinct for self-preservation are aroused by a threat of death or injury to oneself and that these emotions drive the association between threat and the killing of others.

Paths are specified from the death of others, the perceived theat to oneself, and killing others to PTSD to test whether there are direct contributions from these stressors to PTSD in addition to their indirect contributions. A direct path is posited from committing atrocities to PTSD, based on the guilt and moral repugnance of destroying people's homes, crops and animals and mutilating dead bodies.

Method

Participants

The National Vietnam Veterans Readjustment Study (NVVRS), conducted from 1986 to 1988, is the source of data for the present study. The NVVRS was conducted on a national sample of veterans who served in the U.S. armed forces during the Vietnam era. The sampling frame was a national screening sample of military personnel records and is described in detail in the original publication of the study (Kulka et al., 1990a). The NVVRS includes 1,198 male Vietnam theater veterans. Theater veterans are those who served in Vietnam or its surrounding waters or airspace for some period of time from 1964 to 1975. Black and Hispanic veterans were oversampled deliberately in the NVVRS in order to ensure stable values for prevalence estimation. Theater veterans averaged 40.1 (SD = 5.3) years of age, with 13.4 (SD = 2.4) years of education. Ethnically, 49% were white, 27% were black, 23% were Hispanic, and 1% were of other ancestry. In terms of their marital status, 71% were married, 21% were divorced or separated, and 7% had never been married. Using the unadjusted prevalence data from the NVVRS, 21% of the sample were suffering from PTSD at the time of the survey.

Procedure

For analytical purposes, the sample was divided into two random subsamples of 599 each. There were no significant differences between the subsamples on any of the model variables. Only veterans with complete data were retained for the analyses. Therefore, data were available for model parameter estimation for 567 and 550 veterans from the first and second subsamples, respectively.

Structural equation modeling is an extension of multiple regression analysis that is well-suited to the evaluation of a *set* of postulated interrelationships. Statistically, the extension involves the simultaneous solution of the set of equations expressing the interrelationships and the use of all

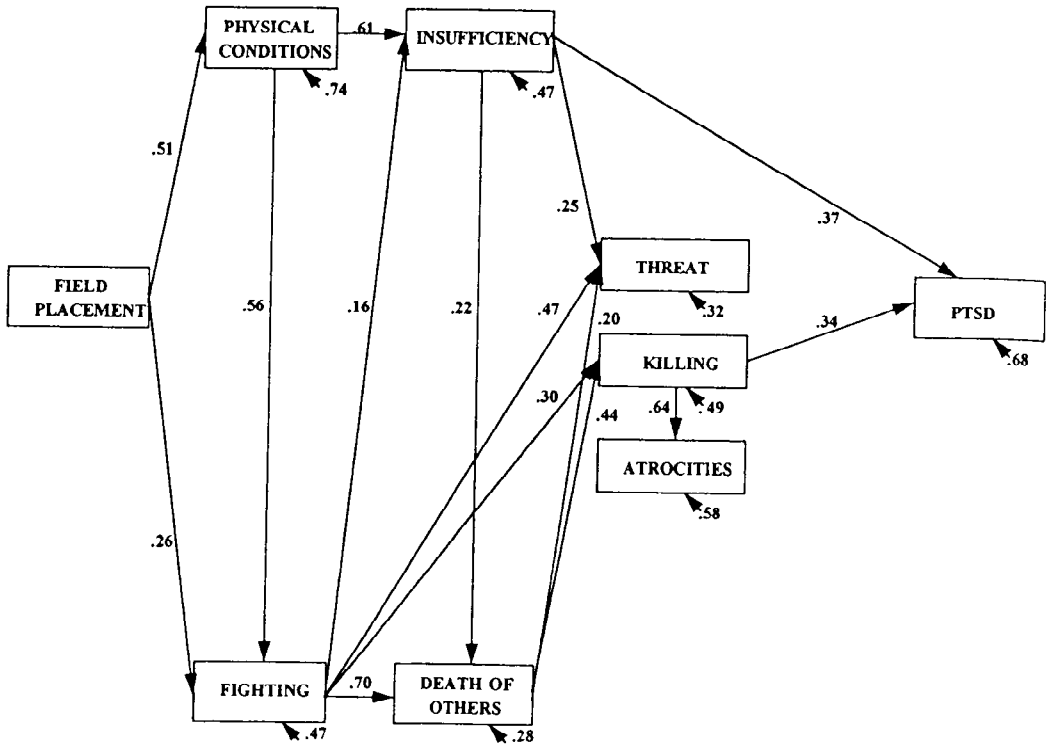

Figure 2. Cross-validated model for the interrelationships among war zone stressors and their relationships to posttraumatic stress disorder.

information in deriving each of the parameter estimates in the model (cf., Bollen, 1989; Hayduk, 1987; James, Mulaik, & Brett, 1982). Conceptually, the extension involves the specification of a model of linkages that serves as a map to the selection of variables to be included in each equation.

The data analysis proceeded by estimating the full model on the first subsample and then reducing it by setting nonsignificant paths to zero. This was done in two stages. At each stage, the reduction was evaluated by the differences in chi-square, comparative fit (Bentler, 1989) and parsimonious fit (Mulaik et al., 1989). Once reduction had determined the best fitting, most parsimonious model for the first subsample, it was replicated on the second subsample. Final parameter estimates are presented in Figure 2 as derived from the second sample.

The data were checked for outliers, with no cases detected requiring deletion. Parameter estimation was conducted by generalized least squares because the multivariate kurtosis (Mardia, 1970) was more peaked than normal in one of the subsamples. The CALIS procedure of the SAS software package (SAS Institute, 1989) was used to estimate model parameters on the covariance matrix. Bivariate correlations among the model variables are presented in Table 1 for the two subsamples. Prior to estimating the model's parameters, the data for death or injury to others were rescaled

Table 1. Bivariate Correlations among Model Variables

	Field Placement	Physical Conditions	Fighting	Insufficiency	Death of Others	Threat to Oneself	Killing Others	Committing Atrocities	PTSD
Field Placement	—	.47	.50	.27	.39	.43	.26	.17	.17
Physical Conditions	.51	—	.62	.70	.59	.62	.40	.29	.36
Fighting	.53	.68	—	.57	.80	.73	.63	.45	.39
Insufficiency	.39	.70	.57	—	.59	.57	.42	.33	.43
Death of others	.47	.66	.83	.62	—	.68	.63	.40	.44
Threat to oneself	.48	.69	.77	.62	.74	—	.45	.32	.37
Killing others	.30	.50	.66	.48	.67	.53	—	.65	.47
Committing atrocities	.18	.33	.44	.37	.49	.35	.65	—	.29
PTSD	.19	.39	.42	.48	.46	.45	.48	.37	—

Note. The first subsample (N = 567) is above the diagonal; the second subsample (N = 550) is below the diagonal. $r \geq .09$ significant at $p < .05$.

by dividing the scores for this variable by four in order to make the standard deviation comparable to those of the other variables. Conditioning of the data in this manner is recommended in order to obviate problems in estimation (Hatcher, 1989). The full model is diagramed in Figure 1. The small arrows that are attached to each variable but do not proceed from another variable indicate the disturbance (that is, the proportion of variance unaccounted for by the model) that is associated with each variable. The final model is diagramed in Figure 2. All significance levels are based on two-tailed tests.

Variables

(1) Field placement (M = 0.00, SD = 1.76) was created as the sum of service as ground troops and location in the countryside. These variables were correlated .55 with each other, and they were standardized with a mean of zero and a standard deviation of one prior to summation. Service as ground troops (M = 0.73, SD = 0.45) was measured as either being in the Army or Marines (1) or in the Air Force, Navy or Coast Guard (0). Location in the countryside (M = 2.36, SD = 0.69) was measured in three levels in terms of face-to-face proximity to the enemy. Most removed were troops who were stationed off shore or in a noncombatant Southeast Asian country (that is, other than Vietnam, Laos and Cambodia) (1). Intermediate in proximity were troops stationed in a Vietnam city (such as Saigon, Da Nang, Hue, Nha Trang, Qui Nhon, or Da Lat) (2). Closest in proximity were troops stationed in a Vietnam village or in the Vietnam countryside (such as the A Shau Valley, Duc Pho, Cong Son, Dak Pek, Nui Ba Den, or the Mekong Delta) (3).

(2) The physical conditions of the environment (M = 10.02, SD = 3.02) were measured by three items (alpha = .69) on 5-point scales: bad climate; insects, disease and filth; and lack of shelter from the weather.

(3) The insufficiency of the environment was measured as its shortages and constraints (M = 17.53, SD = 5.36) by seven items (alpha = .80) on 5-point scales: bad food, inadequate amount of food, inadequate amount of water, inadequate weapons or munitions, inadequate equipment or supplies, loss of freedom of movement, and lack of privacy. Excluded from the measurement of both physical conditions and shortages and constraints were traditional physical deprivation and loss of meaning items which measured a *reaction* to environmental conditions rather than some aspect of the environmental conditions themselves: being physically fatigued or exhausted, being emotionally worn out or exhausted, suffering from diseases and other medical problems, loss of sleep, feeling that the Vietnamese didn't really want us there, feeling that our military actions were not worthwhile, feeling out of

touch with the rest of the world, not counting as an individual, not knowing what was really going on, and a sense of purposelessness.

(4) Fighting (M = 0.00, SD = 1.88) was created as the sum of two combat scales as modified to remove overlapping constructs. These modified scales correlated .83 with each other, and they were standardized with a mean of zero and a standard deviation of one prior to summation. The two scales were represented by 8 of the 10 items from the Revised Combat Scale (Laufer et al., 1981) (M = 5.66, SD = 3.24), and 4 of the 7 items from the Combat Exposure Scale (Keane et al., 1989) (M = 8.38, SD = 6.21). For the most part, these scales measure traditional aspects of fighting such as firing on the enemy, being fired upon by the enemy, being ambushed and going on patrols. They also include other aspects of traumatic exposure, however. Therefore, two items were dropped from the Revised Combat Scale: seeing other troops killed or wounded and being wounded or injured oneself. Three items were dropped from the Combat Exposure Scale: percentage of men in one's unit that were killed, wounded or missing in action; number of times seeing someone wounded; and number of times oneself was in danger of being injured or killed.

(5) Exposure to death and injury of others (M = 29.35, SD = 12.45) was measured on 5-point scales by 12 items (alpha = .93): the sight and sound of dying men; seeing Americans being killed or injured; seeing Americans after they had been wounded in combat; seeing the bodies of dead Americans; knowing Americans who were killed or wounded; seeing Vietnamese or the enemy being killed or wounded; seeing the enemy after they had been wounded in combat; seeing the bodies of dead enemy soldiers; exposure to the sight, smell, or sound of dead and dying people; having a continual stream of casualties, taking care of people who later died, and being responsible for taking care of and/or evacuating casualties.

(6) Perceived threat of one's own death or injury (M = 17.48, SD = 4.90) was measured on 5-point scales by five items (alpha = .85): exposure to danger and risk of casualty, fear of being killed or injured, fear of surprise attack, feeling that one would never survive the combat situation, and danger of being killed or wounded.

(7) Killing/injuring others was measured by eight items of varying metrics asking whether the veteran either participated in or was responsible personally for killing or injuring someone else. The items did not permit a clear distinction between killing or injuring in the course of traditional warfare from doing so in the course of participating in abusive violence (e.g., atrocities). Each item was coded dichotomously as the veteran either participating or being personally responsible (2) or not (1) (M = 9.41, SD = 1.83, alpha = .80).

(8) Committing atrocities, aside from killing, was determined from two items which involved harassment of civilians, destruction of property or the mutilation of enemy bodies. The two items were considered jointly to code whether the veteran committed atrocities (1) or not (0) ($M = 0.26$, $SD = 0.44$). In general, continuous variables are preferred over dichotomous ones for structural equation modeling. In this case, however, the availability of only two items did not permit the creation of a continuous variable with acceptable psychometric properties.

(9) PTSD was measured as the predicted probability of being diagnosed with PTSD as computed by the NVVRS. This variable was derived in the NVVRS by optimizing the prediction of PTSD, as determined by psychiatric interview in a clinical subsample, from nine variables (including the Mississippi Scale for Combat-Related PTSD (Keane, Caddell, & Taylor, 1988)) that were available in both the clinical subsample and the total survey sample (Kulka et al., 1990b). The resulting logistic regression equation from the clinical subsample was then applied to the same variables in the survey sample to generate the probability of being diagnosed with PTSD. This variable represents the best estimate of PTSD caseness, and it is the basis for the estimates of prevalence generally cited from the study. The mean, before sociodemographic adjustment, was 0.21 ($SD = 0.32$).

Results

The first step was to determine the adequacy of the full model in the first subsample and to refine it so as to achieve the best fitting, most parsimonious representation of the theoretical linkages. The chi-square for the model was 50.21 (14, $N = 567$, $p < .0001$), with a comparative fit index of .931 and a parsimonious goodness of fit index of .381. These indices indicate that the fit of the model was good, but that its parsimony was relatively low. Inspection of the path coefficients revealed that seven coefficients were not significant at $p < .05$. Failing to reach significance were the paths from death or injury of others to committing atrocities, from perceived threat to killing others, and from physical conditions, fighting, death or injury of others, perceived threat and committing atrocities to PTSD. Modification indices suggested that these nonsignificant paths could be set to zero with only a minimal erosion of fit. When the full model was reduced by deleting these paths and reestimating the parameters, convergence was not possible within a reasonable number of iterations. Accordingly, the nonsignificant path from physical conditions to PTSD was retained. The chi-square for the reduced model was 57.59 (19, $N = 567$, $p < .0001$), with a comparative fit index of .927 and a parsimonious goodness of fit index of .516. The comparative fit

index suggested that the goodness of fit was affected only minimally, a suggestion supported by the nonsignificant incremental change in chi-square of 7.38 (5, $N = 567, p > .25$). The parsimony of the model, however, was improved considerably. Inspection of the path coefficients showed that an additional path failed to reach significance, namely, from death or injury to others to PTSD. Modification indices suggested that this path could be set to zero with only a minimal further erosion of fit, and so the model was reduced further by deleting this path and reestimating the parameters a second time. The chi-square for this model was 60.43 (20, $N = 567, p < .0001$), with a comparative fit index of .923 and a parsimonious goodness of fit index of .542. Again, the comparative fit index suggested that the goodness of fit was affected minimally. A test of the incremental chi-squares from the previous reduced model, χ^2 (1, $N = 567$) = 2.84, $p > .10$, and the full model, χ^2 (6, $N = 567$) = 10.22, $p > .10$, indicated that the erosion of fit was nonsignificant by both comparisons. The parsimony of the second reduced model was improved slightly, and only the path coefficient from physical conditions to PTSD was nonsignificant. We accepted this version, therefore, as the best fitting, most parsimonious representation of our theoretical model of the anatomy of war zone stressors and PTSD.

The second step was to evaluate the fit and parsimony of the most refined model in the first subsample in a cross-validation in the second subsample. Cross-validation produced a chi-square for the model of 63.52 (20, $N = 550, p < .0001$), with a comparative fit index of .902 and a parsimonious goodness of fit index of .541. Only the path coefficient from physical conditions to PTSD was nonsignificant. Goodness of fit and parsimony, therefore, were replicated in the second subsample at levels that were almost identical to those in the first subsample. Significant paths for the cross-validated model are diagramed in Figure 2.

Discussion

Several categories of war zone stressors have been asserted in the literature to contribute to the development of PTSD. These categories are related highly to each other, and so there is substantial redundancy among them. What is desired is an elucidation of the relative importance of the different categories of stressors to the development of PTSD, as well as an elucidation of the connections among the categories themselves. While simply using them to predict PTSD actuarially is satisfactory for some purposes, it is unsatisfactory to an understanding of the anatomy of traumatic stress in the war zone. Such an understanding requires a model of effects which imposes a conceptual structure on the relationships. In turn, the

model can be evaluated statistically for its correspondence to the actual pattern of relationships in the data. The path coefficients are standardized regression coefficients, thereby enabling comparison with each other for determination of their relative strengths.

The structural equation model in the present study was developed to address these needs explicitly. Most of the connections among variables that were specified theoretically were borne out empirically. Troops stationed in the countryside had less access to the amenities of civilization and thus received more exposure to harsh physical conditions. Also, troops stationed in the countryside encountered the enemy at closer range and had more constant occasions for contact with them. In turn, exposure to harsh physical conditions added specificity to where troops were stationed, exposing them to more fighting. Additionally, exposure to harsh physical conditions contributed to an insufficiency of supplies and equipment and constraints on freedom of movement and privacy. Harsh physical conditions, however, did not contribute to PTSD directly, once the indirect effects were taken into account.

Fighting contributed to the insufficiency of supplies and equipment and to constraints on freedom of movement. The more fighting veterans engaged in, the more ammunition, supplies, equipment, food and water are used up, and the more supply lines are disrupted in the attempts to replace these commodities. Also, the more the fighting, the greater is the need for tighter security necessitating restrictions on freedom of movement and less privacy. In addition, the more fighting one is exposed to, the more one is exposed to the death and injury of others, to the perception of threat to one's own safety, and to the need for one's own killing of others. While exposure to the death of others can occur outside of combat and the threat of death is omnipresent to some extent in a war zone, both of these and the need to kill other people are virtually inevitable consequences to the nature and severity of battle. Mediation of the effects of fighting on PTSD by these experiences was virtually complete, since fighting did not have significant direct effects on PTSD.

Insufficiency contributed to the death and injury of others and to the perceived threat of death or injury to oneself. As supplies, particularly munitions and weapons, are used up, the more vulnerable one's unit is to taking casualties and being overrun by the enemy. Although the effects of insufficiency on PTSD are mediated by these variables, insufficiency still has a large direct effect on PTSD. The contribution of a malevolent environment to PTSD, therefore, would not seem to reside as much in harsh physical conditions as in the shortages and constraints that are a function of those conditions and the fighting in which soldiers engage. It remains to be answered, however, just *how* these experiences of shortages and con-

straints contribute to PTSD. One possibility is that an insufficient environment contributes to the undermining of basic assumptions of the benevolence and meaningfulness of the world. According to Janoff-Bulman (1992), the extent to which people's belief in these assumptions is undermined, the more their belief in their own self-worth and their invulnerability to harm is shaken, thereby exacerbating and perpetuating their symptomatic reactions to trauma. We need to know more about the mechanisms by which an insufficient environment might potentiate the effects of trauma or might contribute an overlay of distress that is additive to that derived from trauma. The answers to these possibilities would seem to be important, not only for the etiology of PTSD but for the nature of PTSD itself.

Death of others contributed both to the perception of threat to oneself and to killing or injuring others. In this regard, Shay (1995) has described the "berserking" effect of having witnessed one's comrades being killed. Grief is transformed into uncontrollable rage and a lack of concern for one's own safety which are then both directed toward obtaining revenge. The restraints of civilization on injuring or killing anyone outside of one's own group (and sometimes within one's own group) are almost completely suspended. It is unlikely that all soldiers who witness the death of their buddies experience the full-blown berserking state, but it is quite possible that they all experience it to some degree. Contrary to our theoretical expectations, witnessing the death of others did not contribute to committing atrocities directly. Witnessing the death of others did have indirect effects on PTSD through mediation by killing others. Additionally, death of others did not contribute to PTSD directly, once its mediation by killing others was taken into account.

Perceived threat to one's own life and safety was affected by the amount of fighting one was exposed to, as well as insufficiency and death of others. Contrary to our theoretical expectations, however, it did not contribute to killing others or to PTSD, once other contributors were taken into account. Thus, the perception of threat to one's own life and safety appears to be a concomitant reaction to other war zone stressors, but it does not appear to be of substantial importance to the development of PTSD aside from these other stressors.

Killing or injuring others had a strong direct effect on PTSD. In addition, it contributed substantially to committing atrocities. Once the moral prohibition against killing others is breached, it appears that the inhibitory power of lesser prohibitions is weakened as well. Finally, committing atrocities was not found to make a substantial contribution to PTSD. This finding is at odds with findings from other studies in the literature. A major reason may be that, in the present study, killing others was not included as a component of committing atrocities because it was impossible from the data

to make a clear distinction of the situations in which killing others took place. Given that killing others is such a powerful contributor to PTSD, inclusion of this stressor as part of committing atrocities in other studies may well account for the difference in findings. In any case, the present study suggests that aspects of atrocities, aside from killing others, do not play a substantial role in the development of PTSD once other stressors have been taken into account.

It is important to acknowledge the limitations to our efforts. First, the retrospective nature of the data leaves them open to the operation of a reporting bias in which connections might have been introduced that did not exist historically. At the very least, however, our model describes the anatomy of war zone stressors as veterans are able to recall them. Second, the amount of variance in PTSD that was accounted for was 32%. This is quite respectable for studies of this type, but it means that war zone stressors, while crucial to understanding the etiology of PTSD, are not the whole story. Processing dead bodies for return to the United States is another category of traumatic exposure that has been mentioned in the literature but which is not included in our model (Sutker, Uddo, Brailey, Allain, & Errera, 1994). Processing dead bodies was not assessed by the NVVRS; but, even so, body handlers were most often stationed behind the lines where direct action in fighting was relatively rare. Processing dead bodies, therefore, would not be of much help in elucidating the relationships among the variables in the model and their relationships with PTSD. Nonetheless, there is evidence that this stressor contributes to PTSD. Other contributors to PTSD that are not included in our model are premilitary and postmilitary factors (e.g., Fontana & Rosenheck, 1993; 1994; King et al., 1996; King & King, in press). Third, it is not known how applicable the anatomy of war zone stressors in the present model is to modern wars in general. Without evidence to the contrary, it is reasonable to believe that it is applicable to other wars to the extent that troops have been exposed to similar stressful experiences. Everything considered, however, we believe that our model has value for its systematizing function in ordering most of the known war zone stressors conceptually in a rational way that accounts for both their interrelationships as well as their relationships with PTSD. This information can also be helpful in informing the selection of variables in future studies of war zone stressors.

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