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ABSTRACT

A soldier's occupation is a very stressful one, especially for junior enlisted soldiers who have little control over their highly-regimented work lives. This prospective study examined the relationship between soldier occupational stress and health and well-being 8 to 10 months later. Through an ongoing, longitudinal study of attitudes, health, and cohesion in Army units, extensive survey data were collected on lower enlisted soldiers. The 2,288 respondents with complete data on relevant variables at two time points in 1985 and 1986 were included in the analyses. The sample was divided into low, medium, and high occupational stress groups based on hours worked per week, days spent in the field away from home, and availability of free time. Illness outcome was represented by the number of doctor visits over the previous year and by an 18-item general well-being scale. Personality commitment and subjective/objective social support were considered as possible moderators of occupational stress. Analyses of covariance, controlling for Time 1 illness and psychological well-being, revealed a significant interaction effect for stress by commitment on Time 2 illness, and a significant 3-way interaction among stress, commitment, and subjective social support on Time 2 well-being. These results suggest that soldiers who characteristically view their jobs as important and meaningful are less at-risk for stress-related illness, an effect sometimes enhanced by a subjective sense of available social supports. (Author)

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OCCUPATIONAL STRESS, HEALTH,
AND GENERAL WELL BEING AMONG SOLDIERS *

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ABSTRACT

A soldier's occupation is a very stressful one, even in peacetime. This is especially true for junior enlisted soldiers, who have little control over their highly-regimented work lives. This prospective study examines the relation of soldier occupational stress to health and well being 8-10 months later. Through an ongoing, longitudinal study of attitudes, health and cohesion in Army units, extensive survey data on over 3,000 lower enlisted soldiers were available. The 2,288 respondents with complete data on relevant variables at two time points, mid-1985 and early 1986, were included in the present analyses. The sample was divided into low, medium, and high occupational stress groups based on hours worked per week, days spent in the field away from home, and availability of free-time. Illness outcome was represented by number of doctor visits over the previous year, and by an 18-item general well-being scale. Personality commitment and subjective/objective social support were considered as possible moderators of occupational stress. Analyses of covariance, controlling for Time 1 illness and psychological well-being, (1) a significant interaction effect for stress*commitment on Time 2 illness, and a significant 3-way interaction between stress, commitment, and subjective social support on Time 2 well being. These results suggest soldiers who characteristically view their jobs as important and meaningful are less at-risk for stress-related illness, an effect sometimes enhanced by a subjective sense of available social supports.

OCCUPATIONAL STRESS, HEALTH, AND GENERAL WELL BEING IN SOLDIERS

Various occupations entail different kinds of risks for the people working in them. The diverse health risks to workers of exposure to noxious and hazardous substances in the work environment has been amply documented (e.g., Mayers, 1969; Brouha, 1967; Stellman & Daum, 1973). As part of a generalized increase in sensitivity to the influence of psychosocial variables on health (cf. Elliot & Eisdorfer, 1982), more attention is being paid to the effects of psychosocial stressors in the workplace. For example, Baum et. al. (1982) recently reviewed the evidence that noisy and crowded environments can lead to ill-health. Other sources of stress in the workplace that have been identified include the time pressures and social isolation of many assembly-line type jobs (Wilensky, 1981), piece-work (Levi, 1964), equipment breakdowns (Frankenhaeuser, 1981), irregular hours or shift work (Levi, 1980), work overload or work "underload" (Frankenhaeuser & Gadeli, 1976), and a lack of control over job decisions (Karasek, 1979). Some researchers have suggested role conflict and ambiguity as an important source of stress in many occupations (Caplan & Jones, 1975). French, Caplan, & Harrison (1982) have emphasized the fit or misfit between the individual and his work environment as a critical aspect of work stress; "over-utilization" of workers is associated with higher levels of anxiety and irritation across various occupations, and under-utilization is associated with increased boredom and depression. This is similar to Csikszentmihalyi's (1975) concept of the "flow" experience, where satisfaction or "flow" comes when the

demands of a given activity closely match the skills of the person. A mis-match can result in boredom (when skills far outweigh task demands or challenges) or anxiety (when task demands overwhelm skills and abilities).

The negative impact of work stressors on health is perhaps most apparent in occupations where workers have been observed to suffer higher than normal rates of health problems commonly recognized as stress-related. For example, air traffic controllers have higher blood pressure than workers in other occupations, and higher rates of peptic ulcer (Cobb & Rose, 1973). After reviewing available evidence, Katz and Kahn (1978) concluded that blue-collar occupations are generally more stressful than white-collar ones. One of the earliest studies of Rosenman & Friedman (1958) found higher rates of coronary heart disease in inner-city London bus drivers, compared to those driving in the suburbs. Increased stress-related health problems have also been found in San Francisco bus drivers (Syme, 1983), and in Chicago bus drivers (Bartone, 1984). Looking at various occupational groups, Caplan, Cobb et. al. (1980) reported higher levels of occupational stress and related strain for unskilled blue-collar workers, compared to highly-skilled blue collar and various white collar groups. A blue-collar occupation that has been relatively neglected by stress researchers is that of the U.S. soldier in a peacetime Army. This neglect is difficult to understand in view of the large numbers of people currently engaged in Army jobs (275,000 active duty), the increasing numbers of women in the Army, and the apparent opportunities for role conflict, over-utilization, and under-utilization of persons' abilities inherent in this job.

The stressors most commonly associated with the occupation of soldiering are those of combat, and the field of military psychiatry is primarily concerned with the causes, cures and prevention of psychiatric breakdown in battle (Jones, 1982). But the soldier's job is becoming more of an occupation, and less of a temporary duty or calling (Moskos, 1977). And even in a peacetime army, it is clear that a soldier's job is a difficult one. In today's U.S. Army, the work day usually begins at 5 a.m., and often doesn't end until 7 at night. In most units, 7-day work weeks are the norm. Physical demands are often intense, including much physical exercise, running, and long road-marches carrying heavy packs. This puts great strain on young soldiers, whose minimum term of duty is 3 years.

The strain is especially severe for junior enlisted married soldiers and their families, as evidenced by a higher divorce rate for this group compared with that for the 18-24 year old civilian population. Recent data (Doering & Hutzler, 1982) indicate increasing numbers of women enlisted soldiers, and an increasing proportion of married soldiers. Additional burdens are placed on married soldiers and their families by extended field training exercises, which sometimes keep soldiers away from home for 3 weeks or more. In the lower ranks especially, the soldier's life is highly regimented and controlled. There is usually little opportunity for independent action or choice.

There are a few studies that bear on the special stressors of the military occupation, and the relation of military occupational stress to health. Many investigators have noted proportionally higher suicide rates in the military compared to civilian

populations (e.g., Durkheim, 1897; Datel & Jones, 1982; Rothberg, Holloway & Urbano, 1987). If suicide can be considered a poor health outcome, then it would seem there is something about military occupations that increases the risk of this most unhealthy event. Even though recent U.S. Army data indicate some reversals in this trend (Rothberg & Jones, 1987), there are still proportionally more male and female Army suicides in the 17-19 year age bracket than in the civilian population.

Some studies have found that a major source of damaging stress is the strict and dehumanizing organizational social climate found in many military units. Moos (1979) found higher sick call rates in basic training companies emphasizing strict organization and officer control, and de-emphasizing the soldier's status as an individual. But clearly, not all soldiers get sick or commit suicide. What accounts for individual differences in response to soldier occupational stress? There is some evidence to suggest that personality variables may interact with organizational, situational ones in military occupations to enhance or diminish the negative health effects of occupational stress. Looking at a small group of Army officers, Kobasa (1982) found that the association between stressful life events (many work-related) and symptoms was significantly stronger for those lacking a characteristic sense of control, commitment, and flexibility in life. Also, data on Israeli soldiers indicate that perceived social support, especially from superiors, can provide protection from the deleterious effects of combat stress (Solomon et. al., 1987). The present study utilizes a longitudinal design to explore the relation of occupational stress to the health and well-being of soldiers who have the least control

over their work lives - those in the bottom ranks. In addition, the possible moderating influences of personality commitment, and work social supports are investigated.

METHOD

The data for this study are taken from a large-scale longitudinal evaluation of the Army's experimental Unit Manning System, conducted by the Walter Reed Army Institute of Research. Over 9,000 soldiers have been tested in 6-month intervals for 2 years. A variety of items assess morale, general well-being, social support, and attitudes of soldiers toward their work, fellows, and supervisors.

Sample

The sample for the present study was made up of the 931 low ranking (E1-E4) respondents for whom complete Time 1 and Time 2 data were available. At Time 1, the median age of the sample was 20 years, with 95% below the age of 28. Twenty-nine percent were married, and the race breakdown was 69% white, 21% black, and 10% hispanic and other. Most (75%) respondents were stationed somewhere in the U.S. at Time 1, with the remaining 25% in Europe.

Measures

A composite measure of work-overload stress at Time 1 was constructed that included hours worked per-week, number of days per-month spent in the field, and reported availability of time for personal needs (e.g., shopping, medical appointments), for family needs, and for relaxation and entertainment. Most analyses considered low, medium, and high work-overload stress groups, trichotomizing the sample on the basis of the composite stress score

distributio: .

Two health outcome measures were taken from the Time 2 data. One was reported number of sick-call visits over the previous year. The other was an 18-item scale of General Well-Being, validated in a large national sample (Dupuy, 1973), and used extensively in military settings (e.g., Marlowe et. al., 1986; Martin, 1985; Martin & Ickovics, 1987). This scale assesses general psychiatric symptomatology, including anxiety, depression, and somatization. In all analyses, Time 1 levels on these health measures were controlled for.

A measure of personality commitment was assembled from available survey items. Two judges working together examined 107 items, and selected 12 that seemed to most closely reflect commitment to work, self, and society as conceptualized by Maddi and Kobasa (1984). Although no validity data are yet available for this scale, it was found to have acceptably high reliability (Cronbach's alpha = .84). The scale is listed in Appendix 1. For most analyses, soldiers scoring above the median on personality commitment were classified as high commitment, and those below the median were classified as low.

Two judges working independently selected items that represented "objective" (externally verifiable) social support from supervisors and peers, and "subjective" (not externally verifiable) social support. Interjudge agreement on classification of items as objective or subjective was 84%. Remaining disagreements were resolved by discussion. This process resulted in a 14-item measure of objective social support (Cronbach's alpha = .79), and a longer,

29-item subjective social support scale (Cronbach's alpha = .93). These scales are listed in Appendix 2. Respondents were classified as high (upper third of distribution), medium (middle third), or low (lower third) on these social support indicators.

RESULTS

Analysis of covariance was used to test for effects of stress, commitment, objective and subjective social support (assessed at Time 1), as well as interactions, on illness and general well-being at Time 2. In each analysis, the effects of Time 1 health were controlled for by entering the appropriate measure into the model as a covariate. With respect to illness (sick-call visits), there was a large main effect for Time 1 illness. After this effect was removed, there was a stress by commitment interaction effect. These results are represented in Figure 2. Soldiers low in commitment are also low in illness at low stress levels, but rise rather dramatically at medium and high stress levels. High commitment soldiers, though slightly higher in sick-call visits at low stress levels, rise only slightly at higher stress levels. The indications here are that personality commitment does play a role in moderating the impact of occupational stress on illness. No effects for social support on illness were seen.

A similar analysis was performed, looking at Time 2 General Well-Being (GWB). Again and not surprisingly, there was a large effect for Time 1 GWB. Controlling for this, the only other significant effect was a 3-way interaction between stress, commitment, and subjective social support (Figure 2). Soldiers high in both commitment and social support are highest overall in GWB.

FIGURE 1: PERSONALITY COMMITMENT AS A BUFFER OF SOLDIER STRESS

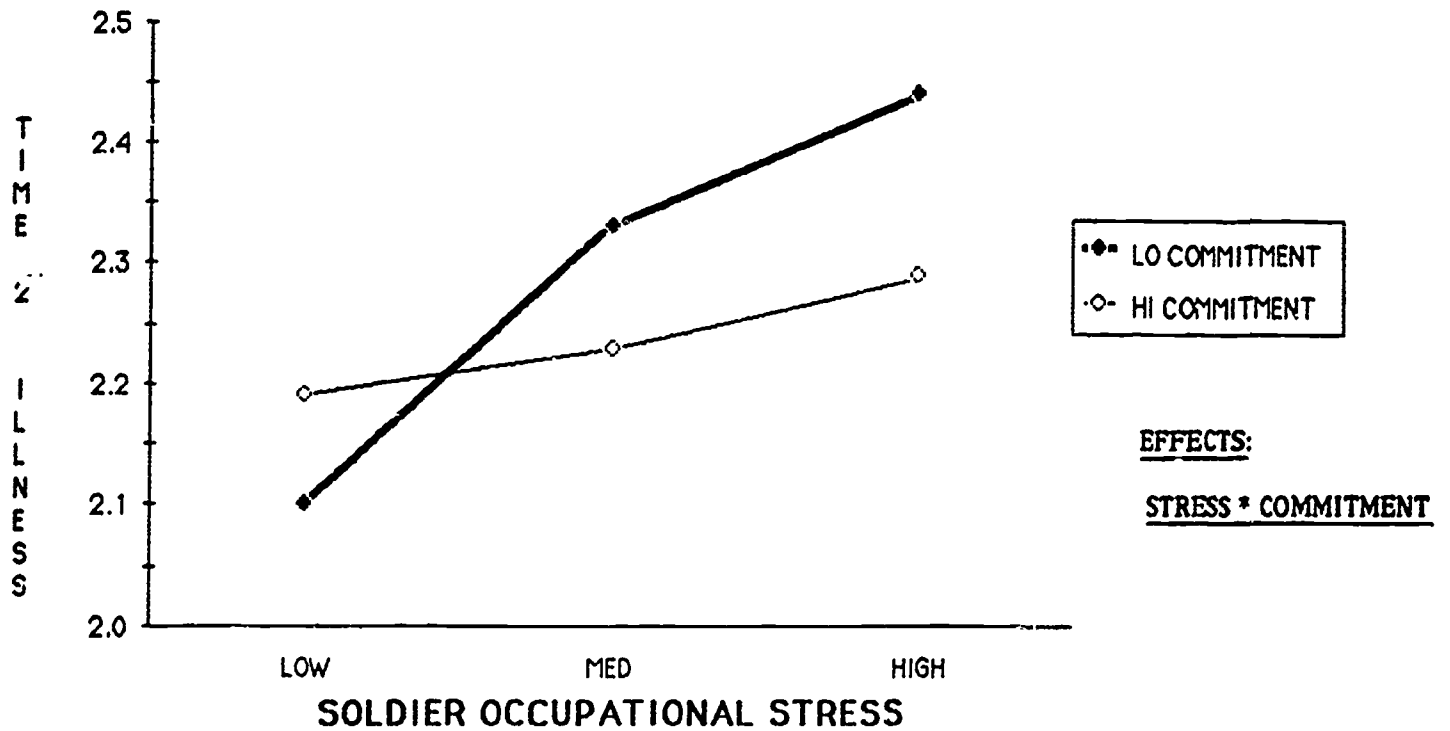
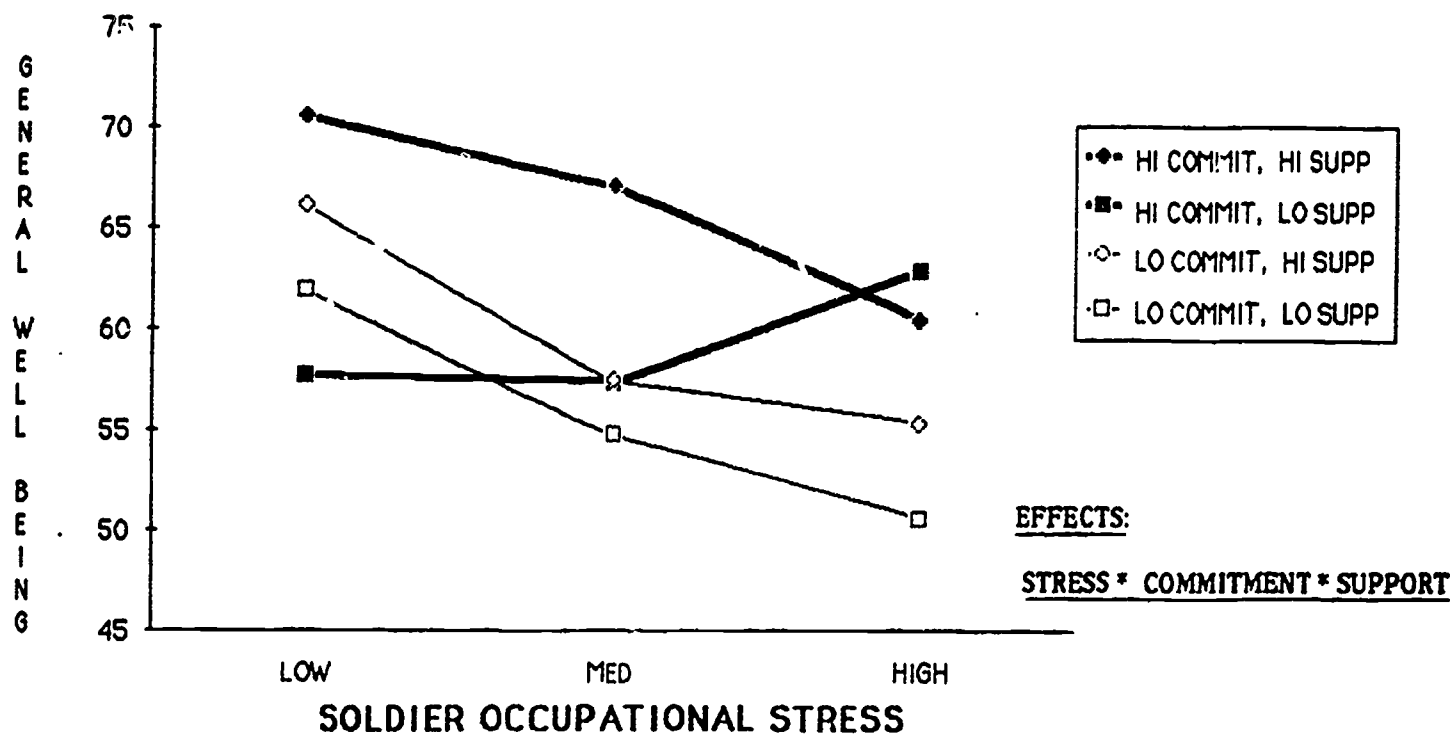


FIGURE 2: COMMITMENT AND SOCIAL SUPPORT AS BUFFERS OF STRESS



though diminishing with increased stress levels. Those low in both resources are lowest overall in GWB, and show the deepest declines with increased stress. Soldiers low in commitment but high in support display a very similar pattern, though somewhat higher in GWB overall. Those who are high in commitment but low in social support are lowest in GWB at low stress levels, but go up as stress increases. This group is highest of all in GWB at high stress levels.

DISCUSSION

Using a prospective design, this study has examined the effects of soldier occupational stress to illness and general well-being outcomes almost one year later. By controlling for Time 1 illness and GWB, the possibility that confounding variables such as neuroticism (Schroeder & Costa, 1984) would affect the results are minimized. Although there were no direct or main effects for stress on either health outcome variable, stress did interact with the resources of personality commitment and subjective social support to affect health.

Soldiers who are low in commitment, though also low in sick-call visits at low stress levels, show sharp increases at higher levels of stress. In contrast, soldiers high in commitment show only slight increases in sick-call visits with increasing stress. One possible interpretation is that sick-call visits do not reflect actual illness, but merely "illness behavior" (Mechanic, 1972). If this is the case, then low-commitment soldiers may be presenting to military medical clinics more frequently under high stress conditions, in an attempt to gain some relief from work overload

stress. Soldiers high in commitment don't respond to work overload stress with illness behavior, because they find their work interesting and meaningful, as they find life in general. High stress or work-overload for the high-commitment soldier may mean some discomfort (e.g., long periods in the field), but this is offset by the interest and challenge of the heightened activity.

Alternatively, the sick-call visits could represent real illness or injuries. To have a sense of purpose and meaning in life and work may confer some actual protection against such ailments. We do not have data on the specific reasons for these visits, but general epidemiological data on Army sick-call visits (Jellen & Rothberg, 1982) indicate 31% of visits are for primarily infectious ailments of the respiratory system (cold, flu), cardiovascular, genito-urinary, and epithelial systems, while 39% are for injuries and musculo-skeletal problems (e.g., torn ligaments). To the extent that the presenting complaints of soldiers in the current sample are real, personality commitment may afford some protection against infectious illness, against accidents and injuries, or both. If the former, some immune system response mechanism would be implicated. If it is primarily accidents and injuries that account for the higher sick-call rates of low commitment soldiers, some other explanation is necessary.

Perhaps health practices or physical conditioning, variables not considered in this study, are somehow involved. It may be that committed soldiers take better care of themselves generally, exercising more on their own for example, partly as a function of their greater commitment to themselves and their work roles. Being in better condition than their low-commitment counterparts, they are

then less prone to the injuries associated with the strenuous physical exertion of the Army life-style. Another possibility is that low-commitment soldiers are more accident-prone, because they don't attend as carefully to environmental stimuli. Personality commitment is essentially an existential concept (Kobasa & Maddi, 1977), and it implies an intense involvement in the experiential world. Those low in commitment have been characterized as "alienated" from work, self, others, and the world in general; it would follow that they attend less to experience in all of these areas. It remains for further research to investigate these possible explanations. But regardless of the mechanism(s) involved, the present findings make it clear that personality commitment is related to lower sick-call rates for soldiers under stress.

When psychiatric symptomatology (general well-being) is used as the illness outcome measure, a more complex set of findings emerge. Soldier occupational stress interacts with both personality commitment and social support to affect general well-being at Time 2. Most soldiers go down in well being as stress goes up, although those with both commitment and social support are at relatively higher levels than those without. Curiously though, only soldiers who are high in commitment but low in social support go up in general-well being when stress goes up.

In trying to understand this finding, it may be important to keep in mind that it was subjective social support, and not objective social support, that showed the interaction effect with commitment and stress. Caplan (1979) has suggested two dimensions that distinguish types of social support, and that these have

important implications for understanding the role of social support as a moderator of stress. One is the objective (observable) versus subjective (not observable) distinction, and the other involves actual, tangible help versus emotional or psychological support. The objective social support measure used in this study is composed largely of tangible supports (e.g., "when I first arrived, my leaders helped me to get settled"), while the subjective support measure is made up largely of emotional/psychological support items ("people in this company feel very close to each other"). Various investigators have argued that it is the perceived availability of emotional support, the impression that one is valued and loved, that is most critical to a person's well-being (Lipowski, 1969; Cobb, 1976; Kiritz & Moos, 1974). Some have even suggested that perceived social support may have more to do with early childhood experiences and characteristic ways of looking at the world than with aspects of the immediate social environment (Sarason et. al., 1987). In fact, here it was this perceived, subjective sense of available emotional support that showed effects with commitment and stress on general well being. Objective, tangible social support showed no such effects. And for those soldiers high in commitment and low in subjective social support, general well-being actually increases with increasing stress.

Evidence exists that the effects of social support are not always positive with respect to health and well-being. To the extent that social support represents a tendency to be emotionally involved with others, it could expose one to more interpersonal problems (cf., DiMatteo & Hays, 1981). Kobasa and Puccetti reported that social support from the family could have a negative impact on the

health of executives, and speculated that this might have to do with avoidance of problems at work. One possible interpretation of the present findings is that soldiers who are less emotionally involved with families and friends experience less conflict when spending long hours at work and in the field. Shils and Janowitz (1958) observed that German soldiers who were strongly attached to their families were more likely to desert and surrender, and interpreted this in terms of conflicting primary group identifications. Soldiers who do not experience such competing demands contribute more to the integrity and cohesion of the unit by identifying more closely with it. Segal (1986) has recently described the competing demands of family versus the Army for the soldier's time, suggesting that the conflict has become more acute.

An alternative explanation is that these high committed, low support soldiers are simply bored under low stress conditions, but thrive on the stimulation of increased work demands. Since they are relatively uninvolved socially, at least in a subjective, emotional sense, work challenges may be more important. A re-analysis of the data, looking separately at soldiers stationed in the U.S. versus those stationed in Germany, tends to support this interpretation. The reported effects were even more pronounced in the U.S. soldiers, but were not significant in the Germany troops. Being stationed in Germany usually means being engaged in more realistic and demanding soldier activities, whereas soldiers in the U.S. are often engaged in dull and repetitious training tasks. When the challenges are more uniform, the effects of social support may not be apparent. In fact, there was less variance in work stress scores for the Germany

sample, although mean levels were somewhat higher than for U.S. based troops. It is likely that more encompassing measures of occupational stress are necessary to understand the relation of stress to health in soldiers. Future iterations of survey data on these soldiers will consider other kinds of occupational stress (such as role conflict), and address some of the hypotheses suggested here.

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A. Subjective Social Support Scale Items (Alpha= .93)

1. How would you describe your unit's togetherness, or how "tight" are members of your unit? (very high, high, moderate, low, very low)*
2. The relationships between officers and the enlisted in your unit are: (very good, good, so-so, bad, very bad)*
3. There is alot of teamwork and cooperation among soldiers in my company (strongly disagree, disagree, can't say, agree, strongly agree)¹
4. Officers most always get willing and whole-hearted cooperation from soldiers.
5. NCOs most always get willing and whole-hearted cooperation from soldiers.
6. Outside normal company duties, soldiers in my company would do most anything for their officers.
7. Outside normal company duties, soldiers in my company would do most anything for their NCOs.
8. People in this company feel very close to each other.
9. I really know the people I work with.
10. There are many people in this company who are just out for themselves and don't care about others.
11. The officers in this company don't spend enough time with troops.*
12. If I have to go to war, the soldiers I regularly work with are the ones I want with me.
13. The NCOs in this company don't spend enough time with the troops.*
14. Most of the people in this company can be trusted.
15. My superiors make a real attempt to treat me as a person.
16. People in my company would support me in difficult situations.
17. In this company, you don't have to watch your belongings.
18. In this company, people really look out for each other.
19. Soldiers in this company have enough skills that I would trust them with my life in combat.
20. I can go to most people in my squad for help when I have a personal problem, like being in debt.
21. I can go to most people in my platoon for help when I have a personal problem, like being in debt.
22. Most people in my squad would lend me money in an emergency.
23. Most people in my platoon would lend me money in an emergency.
24. My officers are interested in my personal welfare.
25. My NCOs are interested in my personal welfare.
26. My officers are interested in what I think and how I feel about things.
27. My NCOs are interested in what I think and how I feel about things.
28. If we went to war tomorrow, I would feel good about going with my squad.
29. If we went to war tomorrow, I would feel good about going with my platoon.

¹ Response categories for items #3-30 range from strongly disagree (1) to strongly agree (5) on a Likert-type scale.

* Item is reverse-coded to be scored in a positive direction.

B. Objective Social Support Scale Items (Alpha= .79)

1. I get praise and recognition when I do a particularly good job (strongly disagree, disagree, can't say, agree, strongly agree).¹
2. I often have good ideas but my leaders never consider them.
3. When I first arrived, leaders helped me a lot to get settled.
4. I spend my after-duty hours with people in this company.
5. My closest friendships are with the people I work with.
6. In this company, people of different races mix during duty hours.
7. In this company, people of different races mix after duty hours.
8. I spend a lot of time with members of my squad after duty hours.
9. I spend a lot of time with members of my platoon after duty hours.
10. After duty hours, blacks tend to hang out with blacks, and whites with whites, and so on.²
11. My squad leader is often included in after-duty activities of other squad members.
12. My platoon sergeant talks to me personally outside normal duties.
13. My platoon leader talks to me personally outside normal duties.
14. The company commander talks to me personally outside normal duties.

¹ Response categories for all items range from strongly disagree (1) to strongly agree (5) on a Likert-type scale.

² This item was reverse-coded, so that 1 (strongly agree) = 5 (strongly disagree), etc.

C. Commitment Scale Items (Alpha= .84)

1. I really feel that I belong in my company (strongly disagree, disagree, can't say, agree, strongly agree).¹
2. What I do in the Army is worthwhile.
3. On the whole, the Army gives me a chance to "be all I can be."
4. My company will play a part in winning future conflicts.
5. It's worthwhile to make suggestions to my leaders.
6. Compared to other units, it's difficult to get something done in my unit.
7. I think this company would do a better job in combat than most other Army units.
8. I really like the work I do.
9. I think this company's job is one of the most important in the Army.
10. I would go for help with a personal problem to people in the company chain-of-command.
11. If I have to go into combat, I have a lot of confidence in myself.
12. Most soldiers in my platoon would do a good job if they were given a squad of soldiers and told to take charge of them in a combat mission under enemy fire.

¹ Response categories for all items range from strongly disagree (1) to strongly agree (5) on a Likert-type scale.