A Model of Unit Climate and Stress for Canadian Soldiers on Operations

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fulfilment of the requirements for the degree of**

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Abstract

Although high morale, unit cohesion, and confidence in leadership are considered by military leaders to be essential elements for victory on the battlefield, research indicates that officer assessments of these variables are generally inaccurate. To assist commanding officers in these assessments, the Unit Climate Profile was developed for use with Canadian soldiers in deployed operations. Using data collected from soldiers in Bosnia over a three-year period, the present study was designed to test a model of the relations between morale, cohesion, confidence in leadership, coping strategies, stress, and strain. It was hypothesized that as morale, cohesion, and confidence in leadership are conceptually similar to social support, they would moderate the relation between stress and strain. Structural equation modelling and hierarchical regression were used to test the proposed model and several moderating effects. Results indicate that positive coping, task cohesion, and social cohesion moderate the relation between stress and strain such that those individuals who reported using or seeking higher levels of these resources experienced lower strain. Conversely, negative coping was found to moderate the relation between stress and strain such that those individuals who reported using negative coping strategies tended to report experiencing more strain compared to people who used positive strategies. Finally, positive coping, confidence in one's platoon commander and company commander were found to play underlying or mediating roles in the generation of the interaction between cohesion variables and strain. Implications for policy, training and future research are discussed.

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A Model of Unit Climate and Stress for
Canadian Soldiers on Operations

Throughout the history of warfare, high morale, unit cohesion, and capable command have been considered by military leaders to be essential elements for victory on the battlefield (e.g., Kellett, 1982; Mengelsdorff, 1999; Richardson, 1978). According to Wintle's (1989) collection of historical military writings, Xenophon (circa 394 B.C.) was sure the army "stronger in soul" would be victorious in battle, and Napoleon felt that "moral considerations" accounted for three quarters of the outcome in war. It is clear little had changed the minds of 20th century leaders when Montgomery (1958) stated that "the morale of the soldier is the greatest single factor in war" (p. 36). But how did these leaders assess the level of morale in their own forces and in those of their opponents? How did they understand the relation between morale and physical and mental health? How did they gauge the importance of leadership? Although we have little historical data to examine these questions, we can examine how present day military leaders monitor these variables and the accuracy of their assessments.

American, European, and Canadian research indicates that officer perceptions of soldier morale, cohesion, and confidence in leadership are generally inaccurate. For example, Stouffer and his colleagues (Stouffer, Suchman, DeVinney, Star, & Williams, 1949a) found that US Army officers in World War II (WW II) had consistently inflated views of their subordinates' attitudes toward a range of military issues including pride in the outfit, desire to be a soldier, satisfaction with the job and the importance of the infantry. Similarly, Korpi (1965) found that Swedish officers had "very unreliable

notions of the opinions in their units” (p. 302) and that officers were generally unaware that their perceptions of subordinate morale might be inaccurate. Interestingly, the greater confidence officers expressed in their assessments the larger the error in their predictions.

More recently, Canadian officers have fared no better. Eyres (1998) found that although all ranks were generally satisfied with leadership at the non-commissioned member (NCM) levels within the unit, this was not the case for leadership at the officer level. While officers expressed general satisfaction with the leadership they provided, NCMs reported they were, at best, indifferent to officer leadership.

The consequences of such variation between the perceptions of officers and soldiers can be tragic. Indeed, Winslow (1997) attributed the murder of a Somali teenager by Canadian soldiers to a failure by some commanders to accurately perceive the prevailing attitudes, norms, and values in some unit subcultures. According to Winslow (1997), it was this failure that led to erroneous judgements with respect to the unit’s readiness for peace support operations.

In part due to the disturbing events in the Canadian contingent in Somalia, the Canadian Forces (CF) expressed an interest in developing a psychometric instrument that could be used by commanding officers (COs) to measure the human dimensions of combat readiness within units before and during deployment (Farley, 1996). The instrument was to be developed with the ultimate goal of allowing COs to administer, score, and interpret it with or without specialist advice. Important variables in military psychology such as morale, cohesion, and confidence in leadership were to be examined. As previous research

indicated a strong relation between morale and signs of illness in deployed Canadian soldiers (Farley, 1995), other variables such as stressors, strain, and methods of coping were also to be included for future analysis. Known as the Unit Climate Profile (UCP; Murphy & Farley, 2000) the instrument was introduced in 1997 and has been completed by Canadian soldiers on operations in Bosnia, Haiti, Kosovo, and Eritrea.

Previous research on the UCP and related scales has focused primarily on its psychometric properties (Dobrev-Martinova, 1998a, 1998b, 1999a, 1999b) and group differences on several variables (Izzo, Lapointe, Vileneuve, & Columbe, 2000). For example, Izzo et al. (2000) observed a tendency for strain to increase with operational experience and to be higher for junior officers, widowed, and older members. Morale, cohesion, and confidence in leadership also tended to be highest in younger soldiers although women reported significantly less confidence in their leaders than did men.

The purpose of this study was to extend previous military stress research in two important ways. First, this study tested a model of stress paying particular attention to the direct and indirect effects of morale, cohesion, confidence in leadership, and individual coping strategies on the strain experienced by Canadian soldiers in operations. Heretofore, the possible buffering effects of soldiers' confidence in leadership on the relation between stress and strain has not been examined. Moreover, as most previous military stress research has tended to focus on non-operational settings, the present research examines these processes in an active theatre of operations. The second purpose of the study was to confirm the psychometric properties of the UCP and associated scales. Findings of the study have implications for how military psychologists and

commanders interpret elements of unit climate and offers suggestions for buffering the short- and long-term effects of stress experienced by soldiers in deployed operations.

In preparation for a discussion of the proposed model, the next section will provide a fuller appreciation of the major variables in military psychology. The discussion will then shift to a review of the major approaches to the study of occupational stress setting the stage for an examination of related military stress research. Based on the literature review and description of the model, several hypotheses will then be presented and tested. Tests include several techniques such as hierarchical regression and structural equation modelling. Finally, a discussion of the findings will be presented.

Military Psychology

Military psychology may be viewed as the application of psychological principles, theories, and methods within a military environment (Mangelsdorff, 1999). It derives its knowledge from many well-established fields (e.g., experimental, social, clinical, industrial and organizational, psychometrics, and psychophysiology) and focuses on critical issues with very special populations.

Yerkes (1917), then president of the American Psychological Association, was the first psychologist to describe the relation of psychology to modern (20th century) military activities. In response to the mass recruiting practices and quickly changing technology of WW I, he saw an important role for psychologists in the recruiting, selection, and training of new personnel for tasks to which they were best suited. In fact, Yerkes (1917) believed that the future of psychology as a science rested on the ability of the discipline to apply itself to military problems.

“If psychologists – experts in the study of behavior that they should be – are not able to render signal service to the nation by discovering and indicating in practical ways the relations of human characteristics to special tasks, they certainly will deserve and receive but little consideration from their fellow men of science” (p. 356).

In addition to recruiting, selection and training, the massive expansion of military forces in WW II generated intense interest in areas of social psychology such as leadership, leader development, morale, and motivation (e.g., Stouffer et al., 1949a, 1949b; Stouffer et al., 1950). Since WW II, psychologists have helped military forces to select, classify, place, manage, motivate, maintain, and retain military personnel both for combat and noncombat environments (Mangelsdorff & Gal, 1991). The *Handbook of Military Psychology* (Gal & Mangelsdorff, 1991) includes sections on these and other related functions such as the development of programs to deal with special (covert) operations, psychological operations, resistance to interrogation, counterterrorism, and psychological assessments of operational readiness.

Interest in military psychology in Canada also remains high. A recent special issue of the *Canadian Journal of Behavioural Science* (Sulsky, 2002) was dedicated to industrial-organizational psychology research in the CF. Article topics included occupational role stress, personality correlates of leadership development in officers and predicting work performance in the CF. Regardless of the speciality, however, historical, theoretical, and empirical evidence continues to point to three concepts that are at the very foundation of all military activity. These essential concepts are morale, cohesion,

and confidence in leadership. The term *unit climate* has been recently used to describe the level of these resources present in a given unit (e.g., Farley & Murphy, 1996; Murphy & Farley, 2000).

Morale and Cohesion

Morale is often considered to be an individual level attribute or affective state (e.g., Baynes, 1967). The US Army (1983) for example defined morale as “.. the mental, emotional, and spiritual state of the individual. It is how he feels – happy, hopeful, confident, appreciated, worthless, sad, unrecognized, or depressed” (p. 228). Several authors have gone further in their definitions to add the condition that the individual be a member of a goal-oriented group (e.g., Grinker & Spiegel, 1945; Manning, 1991; Shibutani, 1978; Smith, 1985). According to Manning (1991) for example, “morale is the enthusiasm and persistence with which a member of a group engages in the prescribed activities of that group” (p. 455).

Manning (1991) categorized the determinants of morale into individual factors and group factors. Individual biological needs are basic requirements such as good health, good food, adequate rest and sleep, clean and suitable clothing, and equipment and protection from the elements. Individual psychological needs include clear goals, a role with little conflict and ambiguity, and self-confidence built upon success in training. In addition, Manning (1991) considered group level factors such as social background and shared experiences to be important determinants of morale.

A construct closely related to individual morale is group cohesion. According to Siebold (1999), “...*cohesion* comes from the Latin, *cohaerere*, to stick together; it is also

related to the Latin, *cohors*, an enclosure or court, from which was derived the term *cohort*, a light-infantry-battalion-sized unit of 400 to 500 men, about one tenth of a Roman legion” (p. 9).

The concept of the cohesive and organized small unit combat formation (platoon to company¹) is still of great value for the development of tactics and synchronization of individuals and teams (e.g., Mangelsdorff, 1999). Indeed, military leaders have long considered troop cohesion as an important element for unit readiness, combat effectiveness, and stress buffering (Griffith & Vaitkus, 1999; Henderson, 1985; Kellett, 1982; Little, 1964; Mangelsdorff, 1999; Marshall, 1966; Rosen & Martin, 1997; Rosen et al., 1999; Siebold, 1999). Siebold (1999) argued that a renewed interest in military unit cohesion in the last two decades of the 20th century resulted from four changes in modern warfare. These changes included the intensive lethality and terror possible on the modern battlefield which threatened a drastic increase in stress casualties; the use of numerically smaller forces against larger forces which called for the development of methods to increase efficiency; the ineffectiveness of the individual replacement model used in the American army during the war in Vietnam; and, organizational design issues which required the deployment of fairly autonomous, highly trained units to world trouble spots on very short notice.

True to the nature of military psychology, the scientific study of cohesion has its roots in many areas including social psychology, group dynamics, organizational behaviour, and sport psychology. Many early academic definitions of cohesion tended to

¹ A platoon consists of 30-35 personnel. A company consists of three platoons.

emphasize the quality of the social relationships among group members (Festinger, 1950; Lott & Lott, 1965). For example, Lott and Lott (1965) saw cohesion as “that group property which is inferred from the number and strength of mutual positive attitudes among the members of a group” (p. 259). Military definitions, in contrast, tend to define cohesion in the context of the combat mission. According to Henderson (1985) for example,

“cohesion exists in a unit when the primary day-to-day goals of the individual soldier, of the small group with which he identifies, and of the unit leaders, are congruent – with each giving his primary loyalty to the group so that it trains and fights as a unit with all members willing to risk death to achieve a common objective” (p. 4).

Early evidence suggested strong relations between cohesion and several important outcome variables such as casualty rates (Stouffer et al., 1949b); survivor rates in prisoner of war camps (Nardini, 1952); physical, psychological, and behavioural signs of stress (Izzo et al., 2000); and unit performance (Manning & Ingraham, 1987). For example, survey studies conducted by Stouffer and his colleagues (1949b) found significant negative relations between pre-D-Day invasion levels of cohesion and the number of combat soldiers who became ineffective for reasons other than wounds or other battle injuries (i.e., the non-battle casualty rate).

Although investigators have developed measures of cohesion with adequate reliability (e.g., Siebold & Kelly, 1988), a more persistent problem involves construct validity. Early theorists argued that cohesiveness is a unitary construct and, therefore,

that the effects of cohesiveness on any criterion variable would be the same regardless of component sources (Back, 1950; Schachter, 1951). For example, Schachter (1951) stated that “whether cohesiveness is based on friendship, the valence of the activity mediated by the group, or group prestige, the consequences of increasing group cohesiveness are identical” (p. 192).

More recently several theorists have argued that cohesiveness should be considered as a multidimensional rather than unitary construct. The most common distinction is between social cohesion and task cohesion (Griffith, 1988; Mudrack, 1989; Mullen & Copper, 1994; Siebold & Kelly, 1988; Zaccaro & McCoy, 1988). According to Griffith (1988) for example, social cohesion refers to the nature and quality of the emotional bonds of friendship, liking, caring, and closeness among group members. A group is socially cohesive to the extent that its members like each other, prefer to spend their social time together, enjoy each other’s company, and feel emotionally close to one another. Task cohesion, on the other hand, refers to the shared commitment among members to achieving a goal that requires the collective efforts of the group. A group with high task cohesion is composed of members who share a common goal and who are motivated to coordinate their efforts as a team to achieve that goal.

Group cohesion has often been studied with respect to its relation to performance. In an effort to clarify the multidimensional nature of cohesion in relation to performance, Mullen and Copper (1994) conducted a meta-analysis of 49 experimental and correlational studies. Overall, these researchers found that the group cohesiveness – performance effect was highly significant but of small magnitude. The cohesiveness –

performance effect also appeared to be stronger in correlational studies compared to experimental studies and in smaller groups compared to larger groups. Moreover, the cohesiveness effect was due primarily to task cohesion rather than social cohesion.

Mullen and Copper (1994) suggested that group members may not strive toward excellence for the sake of well-liked group members or for the sake of belonging to the more prestigious, successful group. Rather, performance might be more of “a means to an end” (p. 225) for the social component of cohesion: the end of spending time with other group members.

Interestingly, cohesion and social support constructs are similar in many ways. Both cohesion and social support are conceived of as multidimensional and the dimensions of each appear to overlap considerably. For example, cohesion is often defined in terms of communication, teamwork, and collective action (Siebold, 1993). In a similar way, social support is seen in terms of giving tangible support in the form of material assistance or information, advice, and guidance (Cutrona, 1990). Moreover, cohesion includes both attraction to the group (Widmeyer, Brawley, & Carron, 1985) and an emotional component indicated by the degree of trusting, caring and liking, or interpersonal support (Siebold, 1993) which are similar to social support characteristics emphasizing the individual in the context of the group such as social companionship (Flannery, 1990) and interpersonal connectedness (Sarason, Sarason & Pierce, 1990). According to Griffith and Vaitkus (1999), cohesion and social support function similarly in facilitating the productivity of the group member and successful interaction of the group as a whole.

Confidence in Leadership

According to Bartone and Kirkland (1991), optimally effective leaders in small army units capitalize on general processes of social influence, such as the power of the peer reference group. These leaders model behaviour that demonstrates competence in soldier skills, caring for the welfare of unit members, respect for subordinates as worthy and competent members of the unit, commitment to the importance of group goals and activities, and open sharing of information. Thus, from this perspective leadership is viewed as an important social support mechanism. Interestingly, however, research shows that leaders and those they lead have often very different views on the quality of the leadership experience (Eyres, 1998; Gabriel, 1985; Korpi, 1965; Stouffer et al., 1949a).

For example, in their post-WW II study, "The American Soldier," Stouffer et al. (1949a) reported a consistent pro-organizational bias in US Army officers' assessments of subordinates' opinions. That is, they reported a tendency for the officers to believe that their subordinates' opinions on several issues were more positive than anonymous questionnaires showed them to be. In each of 53 rifle companies in the US, the company commander was asked several questions regarding their estimate of soldier's pride, desire to be a soldier, satisfaction with job, and importance of their job. For example, commanders were asked "How many of your enlisted men would you say feel proud of their company?" Responses were recorded on a five-point scale ranging from "Almost none of them" through "About half of them" to "Almost all of them". Similarly, the soldiers in the same company were asked a number of corresponding questions like "Do you feel proud of your company?" and recorded their answers on five-point scales ranging from "Yes, very proud" to "No, not

proud". A commander was considered correct if his answer was "almost all of the men" and over 87.5% of the soldiers checked either "very proud" or "fairly proud". If 62.5% to 87.5% of the soldiers checked "very proud" or "fairly proud", the commander was considered correct if he checked "about three fourths" and so on.

Stouffer et al. (1949a) reported that 8 of the 53 commanders estimated their soldiers' responses correctly. However, 43 overestimated the proportion of their soldiers who would say they were proud of their company, as contrasted with only two who underestimated. The same tendency was seen with respect to all other items. Stouffer et al. (1949a) suggested that "this habit of officers overestimating their men's favorable attitudes was a product of the tendency to project one's own attitudes upon the men" (p. 393). To support this idea, they presented other data that showed large differences in the general attitudes of officers and enlisted soldiers. For example, when asked "In general, how would you say you feel most of the time, in good spirits or in low spirits?" 53% of officers reported to be "usually in good spirits" although only 24% of enlisted soldiers reported feeling the same way. Similarly, when asked "How many of your officers are the kind who are willing to go through anything they ask of their men to go through?" 92% of officers said "all" or "most" while only 37% of enlisted soldiers rated their officers this highly.

Thirty-five years after Stouffer et al.'s (1949a) research, Gabriel (1985) reported similar findings based on the 1984 results of an annual survey in the US Army:

In 1974, 58 percent of soldiers interviewed believed that their officers were competent; ten years later, that number had fallen to 48 percent ... Equally important is the soldier's impression that his officers do not truly care for him.

About 42 percent believe that the officers truly care for their men, a general decline since 1974, when 48 percent felt that the officers cared for their men ...

The soldiers' perceptions that the officers are of poor quality stand in sharp contrast to the perceptions of the officers themselves, who, in general, believe that they are doing an adequate job of establishing a bond with their men (p. 22).

He concluded that "... the army seems to admit that its studies of morale and leadership have reached the same conclusion for a decade: soldiers do not hold their leaders ... in particularly high regard" (p. 22)

Korpi (1965) observed similar results in the Swedish Army. In a study of conscripts and their leadership cadre, he observed that leaders at all levels, from platoon sergeants to company commanders, consistently tended to over-estimate the favourableness of subordinates' responses to 21 morale-related questions. Not only was there an average absolute error of 22-25% per question, the degree of positive bias was generally observed to increase with rank/position. Significantly, having asked leaders to rate their confidence that they had accurately assessed opinion in their unit, he found that the more confidence they expressed in their accuracy, the less accurate their perceptions of morale actually were.

Eyres (1998) found similar relations between the opinions of leaders and those being led ($N = 913$) in the Canadian army. The mean scale scores at each of the four respondent rank-levels (Junior NCM, Senior NCM, Junior Officer, and Senior Officer) suggested that all ranks were generally satisfied with leadership at the Junior NCM and Senior NCM levels within the unit. This was not the case, however, for leadership at the officer level. Whereas officers reported general satisfaction with the leadership they provided, that opinion was not

generally shared by NCMs. Non-commissioned members reported they were at best indifferent to officer leadership. In fact, for all relevant questionnaire items, NCMs' opinions of Senior officer leadership and Junior officer leadership were significantly lower than those expressed by the officers; additionally, subordinate perceptions of superiors' leadership were significantly lower than those of their superiors at all levels. As well, Junior NCM perceptions of Senior NCM leadership were significantly more negative than those of officers or Senior NCMs. According to Eyres (1998), it appeared that the opinions of the junior NCMs, in particular, had the effect of "dragging down" the NCM group perceptions. That is, Junior NCMs' perceptions were more negative than were those of Senior NCMs. Additional analyses found significant differences between the various rank levels in terms of perceptions of differential treatment under the military justice system. More senior ranks were less likely to report perceptions of differential treatment than were more junior ranks.

Similar to research in other armies, Eyres (1998) concluded these officers were not having the positive leadership effect on their subordinates that they thought they had. Moreover, these results confirmed the findings of an earlier internal report (Canadian Forces, 1995) that was designed to assess morale in the army. That report concluded that "leaders have lost touch with the soldiers ... [and this represents] a serious loss of confidence and loyalty on the part of members towards military leadership, which carries with it the danger of a negative impact on operational effectiveness" (p. 87).

The tendency for officers to overestimate positive responses from soldiers might also be understood in the context of a stream of research on confidence in subjective judgements (e.g., Gigerenzer, Hoffrage, & Kleinbolting, 1991; Lichtenstein & Fischhoff,

1977; Lichtenstein, Fischhoff, & Phillips, 1982). Experiments in this area often ask respondents to indicate which of two alternative responses to an item is correct and to state the probability that the chosen alternative is, in fact, correct (e.g., Lichtenstein & Fischhoff, 1977). According to Gigerenzer, Hoffrage, and Kleinbolting (1991), this research points to two fairly stable effects. The over-confidence effect occurs when the confidence judgements are larger than the relative frequencies of correct answers. The hard-easy effect occurs when the degree of overconfidence increases with the difficulty of the questions. Difficulty is measured by the percentage of correct answers. Lichtenstein & Fischhoff (1977) found that when an individual's knowledge of a particular area is low (less than 60% of items correct), the tendency was to be overconfident about the correctness of his or her responses. With increasing knowledge over-confidence decreased until very knowledgeable respondents (>80% of items correct) actually demonstrated moderate under-confidence in their responses. The term *calibration* refers to the degree to which an individual's probability assessments are similar to the accuracy of the responses. An individual is perfectly calibrated if, "over the long run, for all propositions assigned the same probability, the proportion true is equal to the probability assigned" (Lichtenstein & Fischhoff, 1977; p. 161).

In the context of confidence research then, officer over-confidence might indicate poor calibration. That is, a lack of knowledge about or experience with unit climate issues results in an overestimation, or positive bias, about these issues. According to Yates (1990), "...a major lesson of experience is the limits of our abilities. Perhaps overconfident individuals have had insufficient experience with the specific judgement domain to learn

how little they actually know” (p. 99). Lichtenstein, Fischhoff, and Phillips (1982) suggested that people could be trained to become better calibrated by receiving outcome feedback. As will be seen, an important function of the UCP is to provide commanders with this kind of information.

Summary of Military Psychology

Clearly, the importance of high morale and cohesion together with strong confidence in leaders continues to be a topic of interest within the study of military psychology. The general underlying theme of this section is that these variables represent strong social support mechanisms that, as will be seen in the discussion of occupational stress, are understood to buffer the effects of stress on strain. It follows that it should be possible to measure the effects of these variables on the experience of stress for soldiers on deployed operations. What has been missing in the military literature so far is a comprehensive model of the relations among morale, cohesion, and confidence in leadership in the context of a stress, coping, and strain framework. Such a model, however, must be seen in the larger context of the occupational stress literature. Indeed, stress in military operations can be viewed as a special case of occupational stress. Therefore, the discussion will now turn to a review of the major theoretical approaches to the study of occupational stress.

Theoretical Approaches to Occupational Stress

Research into occupational stress² has increased dramatically since the 1970s. Spielberger and Reheiser (1995) reported that the number of occupational stress articles in the medical, psychological, and organizational literature increased “more than fifty-fold” (p. 52) during the period 1971-1992 alone. In fact, the number of studies in 1992 ($N = 169$) was more than 8 times greater than all the articles published on the subject during the entire decade of the 1970s ($N = 19$). Research in occupational stress continues to be popular in many applied work areas such as transportation (Hanock & Desmond, 2001), corrections (Lariviere, 2001), and the military (Day & Livingstone, 2001; Dobрева-Martinova, Villeneuve, Strickland, & Matheson, 2002).

A major distinction in occupational stress research appears to stem from the fact that some investigators have focused on antecedent conditions and pressures associated with the characteristics of a particular job (person-environment fit) while others have been primarily concerned with the individual’s interpretation of work-related stress (transactional approach). A more complete appreciation of the complex relations between stress and strain in the context of work will require knowledge derived from both approaches. To that end, this section will review the merits and limitations of both theoretical approaches.

Transactional Approach

The transactional approach to the study of occupational stress (Lazarus, 1995) was developed within the context of Lazarus’ general theory of stress (Lazarus &

² Occupational stress, work stress, and job stress appear to be used interchangeably in the literature.

Folkman, 1984). According to Lazarus (1995), occupational stress is a process involving a *transaction* between the individual and his or her work environment. This understanding of stress as a process assumes that the relationships between the person and the environment are not constant over time or across different situations. Rather than attempting to simply identify the adverse conditions of work, the transactional approach focuses on the individual patterns of response to various working conditions in order to understand stress in the workplace. Therefore, Lazarus (1995) argued that it is necessary to employ intra-individual research designs in addition to inter-individual ones. The basic mechanisms of transaction theory are the individual's appraisal of the stressor and the coping strategy used by the individual to buffer the relation between stress and strain.

Stress and strain. Selye (1952, 1974, 1985) conceptualized stress as any demand made upon the body and identified the physiological mechanism by which the body reacts to stress. According to Selye (1974), physical and psychological stressors may lead to diseases of adaptation via a series of non-specific biological responses he called the General Adaptation Syndrome (GAS). As its name implies, the GAS is an adaptive response of the body to threat, designed to prepare the individual for fight or flight. Briefly, the GAS involves increased secretions of adrenocorticotrophic releasing hormone by the pituitary gland and includes three stages: an alarm reaction, a stage of resistance, and a stage of exhaustion. These secretions in turn stimulate the production of glucocorticoids by the cortex or outer shell of the adrenal glands. Similarly, the adrenal medulla is stimulated to release adrenaline. The result for the individual is a generalized heightened state of arousal necessary to meet the demands of the stressor. However,

without a significant energy expenditure to terminate the GAS, the chemical by-products of the response can, over time, suppress the immune system causing disease states, cognitive impairment, or serious psychological distress. Collectively, these negative outcomes are known as strain (e.g., Rice, 1992).

The idea that chronic stress suppresses the immune system in humans is well supported in the literature. For example, a link between conjugal bereavement and altered measures of the immune system (mitogen-stimulated lymphocyte proliferative responses) was found by Bartrop, Lazarus, Luckherst, and Kiloh (1977). Bereaved individuals had lower responses compared to controls indicating a suppression of the immune system. Similarly, in a longitudinal study of spouses of women with advanced breast cancer, lymphocyte stimulation responses were significantly lower during the first two months following bereavement compared with pre-bereavement responses (Schleifer, Keller, Camerino, Thorton, & Stein, 1983).

Psychiatric illnesses such as posttraumatic stress disorder (PTSD) and brief reactive psychosis (BRP) are two syndromes specifically identified as responses to extraordinary stressors that are “outside the range of usual human experience” (Rabkin, 1993, p. 484). The two illnesses are distinguished from each other by criteria regarding the interval between stressor and illness onset, duration, and the type of symptoms. The BRP is characterized by a sudden onset immediately following exposure to the stressor and lasts from a few hours to a few weeks. Emotional distress and psychotic symptoms are common indicators of BRP. In contrast to BRP, PTSD is an anxiety disorder that may occur months or years after the precipitating event and last indefinitely. Indicators

of PTSD include recurrent dreams or daytime flashbacks in which the trauma is reexperienced; emotional numbing; and one or more of several other symptoms such as survivor guilt, insomnia, or impaired concentration.

The fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM IV) estimates the prevalence of PTSD in the US general population at about 8%. However, Nathan, Gorman, and Salkind (1999) suggested the rate of PTSD among American war veterans was as high as 30%. Similarly, a recent study into the prevalence of PTSD in the CF estimated as many as 20% of members returning from overseas missions suffer from the disorder (Canadian Forces, 2002).

Appraisal. Building on Selye's (1952, 1974, 1985) work, Lazarus and Launier (1978; Lazarus & Folkman, 1984) saw stress as a process or transaction between the person and the environment stemming from both physical and psychological stimuli. Moreover, they identified an intervening psychological process which they hypothesized had the effect of controlling the initiation of the GAS response. According to the authors, this *appraisal process* depends on the balance between the individual's perception of the demand and the perception of one's capability to meet the demand.

Primary appraisal gives the initial evaluation about the type of situation. Secondary appraisal judges the match between coping resources and situational demands. When the match between coping resources and situational demands is in balance, stress resistance is enhanced and resulting strain will be minimized. However, when coping resources are judged to be insufficient to meet the situational demands, resistance to

stress will be low and strain will result. Therefore, coping processes are central to stress resistance (Holahan, Moos, & Schaefer, 1995).

Transactions. The Work Stress Inventory (WSI; Barone, Caddy, Katell, Roselone, & Hamilton, 1988) and the Job Stress Survey (JSS; Spielberger & Reheiser, 1994) are measures based on a transactional view of work stress. In addition to inventories alone, several other methods and combinations have been used in to examine transactions. For example, Dewe (1989) used a two-stage approach; open-ended interviews were used to identify items reflecting local conditions and concerns followed by a questionnaire on the appraisal of stressors and coping strategies. This approach is consistent with a transactional view in that the author developed his measure based on local transactions with a small sample to get an authentic picture of the stress experienced by these workers. He followed this step by administering the questionnaire to a much larger sample. To get a clearer view of individual transactions, methods such as structured interviews (Brown, 1990) and the use of stress diaries (Weber & Laux, 1990) have also been used.

Coping. According to Holahan, Moos, and Schaefer (1995), “Resilience in the face of adversity involves a dynamic interplay between personal and social resources and coping efforts. Moreover, personal and social resources are linked to staying healthy under adaptive challenge in significant part because they encourage more adaptive coping strategies” (p. 30). This is consistent with Lazarus and Folkman’s (1984) idea that resources are what an individual “draws on to cope” (p. 158).

A number of dispositional factors appear to be important personal coping resources. These include self-efficacy (Bandura, 1982), optimism (Scheier, Weintraub, & Carver, 1986), and hardiness (Kobasa, Maddi, & Kahn, 1982). For example, persons with higher levels of self-efficacy tend to approach challenging situations in an active and persistent style, whereas those with lower levels of self-efficacy are less active or tend to avoid such situations (Bandura, 1982).

Kobasa et al. (1982) described psychologically hardy individuals as less likely than non-hardy individuals to fall ill as a consequence of stressful life events. According to these authors, hardiness consists of three components. First, hardy individuals are high in commitment or a “tendency to involve oneself in (rather than experience alienation from) whatever one is doing or encounters” (Kobasa et al., 1982; p. 169). In addition, hardy individuals are high in challenge: a “belief that change rather than stability is normal in life and that the anticipation of changes are interesting incentives to growth rather than threats to security” (Kobasa et al., 1982; p. 169). Finally, hardy individuals are high in perceived control or a “tendency to feel and act as if one is influential (rather than helpless)” (Kobasa et al., 1982; p. 169).

People who are optimistic tend to use problem-focused coping strategies, whereas people who have a pessimistic outlook prefer emotion-based strategies, such as denial and fatalism (Scheier, Weintraub, & Carver, 1986). Lazarus and Folkman (1984) found that this two-dimensional conceptualization of coping was the most prominent in their review of the coping research to that time. In fact, Parker and Endler (1996) stated that “almost all coping measures developed in the past few decades include scales that assess

these two coping dimensions” (p. 9). One measure that was designed to examine both problem-focused and emotion-focused coping strategies is the COPE Inventory (Carver, Scheier, & Weintraub, 1989). The COPE Inventory (Carver et al., 1989) is a multidimensional coping scale that incorporates 13 conceptually distinct subscales. Problem-focused strategies are all considered to be functional and include, active coping, planning, suppression of competing activities, restraint coping, and seeking social support for instrumental reasons (e.g., seeking advice for action). In contrast, emotion-focused strategies may be either functional or dysfunctional and include seeking social support for emotional reasons (getting moral support or sympathy), positive reinterpretation and growth, focus on and venting of emotions, acceptance, and denial.

Social support. House’s (1981) conceptualization of social support is frequently used in the occupational stress literature. House (1981) differentiated between four kinds of support: instrumental support (giving direct help), emotional support (showing interest in or sympathy with a person’s difficulties), informational support (giving the person information that may help him or her deal with problems), and appraisal support (providing feedback about the person’s functioning that may enhance his or her self-esteem).

According to Cooper, Dewe, and O’Driscoll (2001), social support may exert an influence on stressor-strain relations in three ways. There may be a main effect where increases in support are directly associated with reduced strain regardless of the number or intensity of stressors encountered by the individual. Social support may also act as a mediator in the stressor-strain relation. In this model, stressors may alert the individual to

engage support resources which in turn help in reducing the amount of strain experienced. Finally, the stress-buffering or moderating model proposes that the relationship between stressors and strains will differ depending on the level of support the individual utilizes.

For example, Ganster, Fusilier, and Mayes (1986) examined employees' perceptions of the amount of social support they received from three sources; supervisors, colleagues, and family/friends. Consistent with the stress-buffering hypothesis, these researchers predicted that the positive relationship between six job stressors and strain variables would be moderated by various sources of support. Significant relations were found between lack of social support and all of the strain variables. Of the various sources of support, those in the workplace, especially supervisory support, exhibited the strongest negative relationship with strain. Compared with the stressors, however, a fairly small percentage of the variance in strain scores (6%) was accounted for by social support variables. However, hierarchical regressions generated few significant interactions between stressors and support, indicating a weak buffering effect at best.

More recent evidence suggests a stronger support buffering effect at work (Lim, 1996; Moyle & Parkes, 1999). For example, Lim (1996) assessed the relationship between job insecurity and several work-related outcomes. Using hierarchical regression analyses, she found that work-based support and nonwork-based support significantly moderated the relationships between job insecurity and several outcome variables including job dissatisfaction, proactive job search, and noncompliant job behaviours. These relations were such that those respondents who reported high levels of both work-

based and nonwork-based support reported experiencing lower levels of dissatisfaction than did respondents who reported low levels of support. Lim (1996) concluded that support from colleagues and supervisors as well as from family and friends helped buffer the individuals from the strain of job insecurity.

There is some evidence that suggests the buffering effects of social support may erode over time. Although not conducted in an occupational setting, Lepore, Evans, and Schneider (1991) found a buffering influence of social support from roommates on the effects of household crowding on distress at a two-month time period. However, continued crowding led to a deterioration in the perceptions of support and a corresponding increase in strain. The authors suggested that with continued exposure to a chronic stressor the role of support may shift from being a moderator to a mediator. They explained that, at the onset of a stressor or under acute stressful conditions, support may be a resource that buffers, or moderates the negative effects of a stressor on mental health. As a moderator, this resource is presumed to be independent of the type or amount of stress confronting an individual. However, if stress is protracted, support may deteriorate, losing its buffering capacity. Thus, social support at times can be directly affected by the level or type of stressor challenging a person and these stress-induced changes in support may, in turn, account for the stressor's effects on psychological distress. When support functions as an intervening link between a stressor and psychological distress it acts as a mediating variable.

Limitations of the transactional approach. Brief and George (1995) agreed with Lazarus (1995) that stress essentially occurs at the individual level, but they also believed

in the usefulness of discovering working conditions that are likely to adversely affect groups of employees exposed to such conditions. They argued that researchers have limited resources and, at the same time, responsibilities to society and science. Therefore, “by searching for those conditions of work likely to adversely affect most workers exposed to them (rather than more fully attending to intra-individual processes) and, thereby, seeking to construct a taxonomy of stressful job conditions, we better fulfill our societal responsibilities” (Brief & George, 1995, p. 16). For example, they argued that economic, safety, and security issues that can have profound negative effects on most people. Thus, by discovering ways to mitigate these specific variables, researchers might better serve greater numbers of workers.

Similarly, Harris (1995) argued that the adaptation of the transaction model to occupational stress requires consideration of the effects of the organization. He saw that, at the level of the paradigm, the reduction of the stress concept to an individual level with an individual transaction as the unit of analysis was problematic for the study of occupational stress. In particular, this level of analysis limits the ability of researchers to make generalizations about the stress response and the usefulness of particular interventions.

The Person-Environment Fit Approach

The person-environment (P-E) fit model (French & Caplan, 1972; Van Harrison, 1978) postulates that a lack of fit between the person and his or her immediate environment can lead to unmet individual needs or unmet job demands, and therefore to experiences of stress. Responses to stress would include those activities that reduce

misfit in a manner that better allows for the individual needs to be adequately met.

According to Van Harrison (1978) there are two kinds of fit between the individual and the environment; the extent to which the job environment provides supplies (e.g., pay, amenities, esteem from others) to meet the individual's needs and, the extent to which the person's skills and abilities match the demands and requirements of the job.

With respect to the job environment providing supplies to meet the individual's needs, P-E fit theory states that the expectation of inadequate supplies for goals will result in arousal similar to that produced by the actual condition of insufficient supplies. In this case, "the 'stress' on an individual can be conceived as the sustained tension which occurs when the environment either does not provide or threatens not to provide the goals which the individual seeks" (Van Harrison, 1978; p. 181).

To address the extent to which the person's skills and abilities match the demands of the job, P-E fit theory draws heavily on social role theory. Whenever the individual is unable to meet the demands of a role, stress results.

Like transaction theory, social role theory sees individual mechanisms such as appraisal and coping to be important in understanding stress but also attributes great importance to environmental factors in determining the stressor – strain relationship (Davis, 1996). According to social role theory, every employee holds various roles that are defined by the organizational culture or by the subculture of a particular work group. Within the organizational context, role is defined as a set of expectations applied to the incumbent of a particular position by the incumbent him or herself and by others within the organization whose expectations are relevant to the performance of the role (Van Sell,

Brief, & Schuler, 1981). Occupational stress is seen within social role theory as an inevitable consequence of playing various roles in an organization. According to Tetrick (1992), role stress is generated by characteristics of both the individual and the environment resulting in perceptions of ambiguity, conflict, and overload. In general, research indicates that role-based stressors have an impact on the psychological and physical well-being (or strain) and performance of the worker (McGrath, 1976). Role stress has been found to be related to individual tension, somatic complaints, anxiety, depressed mood, low self-esteem, and dissatisfaction (Rice, 1992). The most researched dimensions of role stress are role conflict, role ambiguity, and role overload (Hughes, 2001; Jones, Flynn & Kelloway, 1995; King & King, 1990; Van Sell, Brief, & Schuler, 1981; Yousef, 1999).

Role conflict. Role conflict was defined by Van Sell et al. (1981) as an incongruity of the expectations associated with a role. Role conflict can occur when the role holder is required to perform tasks which are mutually exclusive or incompatible with each other (intra-sender conflict) or when supervisors want the role holder to do different things (inter-sender conflict). Role conflict may also occur when the demands and expectations of the work role conflict with pressures from membership in other groups (inter-role conflict) or when the needs and values of the individual conflict with his or her role requirements (person-role conflict).

Role ambiguity. King and King (1990) defined role ambiguity as deficient or uncertain information about role behaviours available to a given organizational position and can be seen to arise from both environmental and individual sources. The deficient

or uncertain information may relate to the expectations associated with the role, the methods for fulfilling known role expectations, or the consequences of role performance. Stress arising from role ambiguity has been shown to lead to lower job performance (Babin & Boles, 1996), job dissatisfaction, lack of self-confidence, lowered self-esteem, and intention to leave the job (Hughes, 2001).

Role overload. Role overload refers to the number of different roles a person has to fulfil (Cooper, Dewe, & O'Driscoll, 2001). Role overload can be both quantitative (the amount of work) and qualitative (the nature of work). Quantitative overload refers to the amount of time available to complete the tasks required by the role, and qualitative overload is related to the skill level of the role holder. Role overload has been shown to be a major correlate of job strain affecting workers' health, attitudes toward work, and work performance (Jones et al., 1995).

Limitations of the P-E fit approach and social role theory. One major criticism of the P-E fit approach as an integrative framework is a lack of internal consistency with regards to apparent logical contradictions in the model (Eulberg, Weekley, & Bhagat, 1988). According to Eulberg et al. (1988), the potential for inconsistency exists because of the underlying conceptualization of job stress. According to the model, a job is stressful to the extent that the incumbent's needs are not met by available supplies in the environment, or to the extent the incumbent is unable to meet job demands which, in turn, is a requirement for receiving supplies. Either way, job stress is hypothesized to occur whenever needs are not fulfilled. However, the model is not clear about how misfit results in need deprivation. According to Eulberg et al. (1988) it is conceivable that an

individual's needs could be met even though there is a misfit with the environment. As need fulfilment ultimately defines stress, an inconsistency within the P-E model is apparent.

The construct validity of role conflict and role ambiguity has also been criticized. A large number of early studies used measures of role conflict and ambiguity developed by Rizzo, House, and Lirtzman (1970). These scales were subsequently found to be lacking construct validity (Tracy & Johnson, 1981; House, Schuler, & Levanoni, 1983). In a review of the construct validity of these scales, King and King (1990) seriously challenged the continued use of the Rizzo et al. (1970) scales and concluded "We firmly believe that partial responsibility for the inconsistencies in research findings about role conflict and role ambiguity is due to deficiencies in their measurement" (p. 62).

Summary of Occupational Stress

In summary, the transactional approach and P-E fit approach both have merit and limitations. The transactional approach has been instrumental in understanding more clearly the interaction between the person and the environment including primary and secondary appraisal and coping. At the same time, the transactional approach appears limited by its particularly strict focus on the individual while ignoring systemic sources of stress arising from the organization.

The concept of P-E fit is widespread in organizational behaviour research. As an organizing framework applied to stress, P-E fit draws from social role theory to view role stress as a result of conflict, ambiguity, and overload arising from characteristics of the

individual *and* the work environment. However, the P-E fit approach to occupational stress has been criticized for logical inconsistencies and construct validity problems.

Speilberger and Reheiser (1995) suggested that the P-E fit and transactional approaches should be seen as complementing rather than contradicting each other. In particular, sources of stress outside the individual as well as the interpretation of stressors should be studied.

For the purposes of the present paper, stress and strain measures take into account important ideas from both transactional and P-E fit approaches. Consistent with the transactional view, for example, the development of the Stress in Military Service Questionnaire (SMSQ) used a two-stage approach similar to Dewe (1989); focus groups in-theatre were used to identify items reflecting local conditions and concerns followed by a questionnaire on the appraisal of stressors and coping strategies. From the P-E fit perspective, lack of fit resulting from immediate environment issues such as work roles and the extent to which the environment meets the individual's needs and their relation to cohesion and confidence in leadership are also included in the present conceptualization. Previous research (Dobrevva-Martinova, 1998a) indicates strong linear relations between all stressor categories contained in the SMSQ and strain (Signs Scale). That is, respondents who reported experiencing a greater amount or degree of stressors also tended to report experiencing a greater number or degree of strain.

*Military Stress Research**Predictors of Strain*

Military studies of stress tend to consider the appraisal of stress an important theoretical concern while also attending to antecedent sources of stress. With respect to sources of stress, military stress studies can be categorized generally as focusing on either external (outside the unit) sources of stress or internal (inside the unit) sources of stress. According to Stein (1976), external stress may promote cohesion, whereas internal stress related to group structure and role or task assignment often decreases cohesion. Overall, most studies have focused on external stress conceptualized as actual combat (e.g., Wright, Marlowe, & Gifford, 1996) or training (e.g., Kruger, 1991). With respect to internal stress, military studies have most often focused on leadership (e.g., Kirkland, Bartone, & Marlowe, 1993) and role characteristics such as role conflict, overload, and ambiguity (e.g. Farley, 1995).

Stress measures for combat have included number of days in combat, intensity (amount of fire), and intermittent versus continuous bombardment (e.g., Noy, 1987). In addition to objective measures, questionnaires have also been used to measure combat exposure and other stressors experienced by soldiers in the Persian Gulf War (Adler, Vaitkus, & Martin, 1996) and on peacekeeping duties in Bosnia (Farley, 1995; Dobрева-Martinova, 1998a). For example, to determine the type, frequency, and intensity of stressors experienced by Canadian soldiers in operations, SMSQ (Dobрева-Martinova, 1998a) was developed in the context of the UCP. In addition to the SMSQ, other aspects of the small group environment such as personal morale, cohesion, confidence in

leadership, and strain were taken into account in the development of the UCP (Dobrevá-Martinova, 1999a; Farley, 1996; Reeves & Hansen, 1989; Wild, 1988).

The UCP was developed within a conceptual framework proposed by Wild (1988) which postulated that the human dimension of operational readiness was founded on several antecedent variables including aptitude level, combat proficiency, understanding of the task, motivational environment, and motivation. The motivational environment comprises of both individual factors such as personal morale, professional morale, ideology and group factors such as small group morale, cohesion, stability of unit, and cooperation. According to Wild (1988), the presence of antecedent variables alone was not sufficient to ensure a high level of performance. In addition, he saw leadership as “the filter through which the antecedent variables are integrated into a unified whole” (p. 11).

Izzo and her colleagues (Izzo et al., 2000) examined the UCP responses of 1,970 soldiers who were in operations between 1997 and 1999. As seen in Table 1, these researchers found significant negative correlations between climate dimensions (morale/cohesion and confidence in leadership) and strain measures or signs (physiological, psychological, and behavioural).

According to rank, officers (lieutenants and captains) reported significantly higher mean scores than all other ranks on morale/cohesion and confidence in leadership scales. Interestingly, this group also reported experiencing significantly higher levels of physiological, psychological, and behavioural strain than all other groups.

Table 1

Pearson Correlation Coefficients for Physiological Signs, Psychological Signs, Behavioural Signs, Cohesion/ Morale, and Confidence in Leadership Measures derived from the UCP and Signs Scale (N = 1,970).

Variable	(1)	(2)	(3)	(4)	(5)
(1) Physiological Signs	1.00				
(2) Psychological Signs	.80***	1.00			
(3) Behavioural Signs	.80***	.82***	1.00		
(4) Morale/Cohesion	-.10***	-.19***	-.14***	1.00	
(5) Conf. in Leadership	-.04***	-.12***	-.07***	.59***	1.00

Note. Adapted from Izzo et al. (2000). *** = $p < .001$.

Similar to Eyres (1998), Korpi (1965) and Stouffer, et al. (1949a) the authors suggested that this group of officers might evaluate the morale/cohesion dimension among the soldiers under their command while indirectly assessing their own ability to promote morale/cohesion. "If so, the presence of a social desirability bias may unwillingly lead junior officers to overestimate levels of morale/cohesion as a function of their own competence" (Izzo et al., 2000, p. 9). The authors also suggested that higher strain levels in this group are likely due to the imbalance between high job demands and low control over allocation of resources or initiation of action.

Consistent with Selye's (1974; 1985) idea that the effect of stressors accumulates over time, the results also indicated that there was a cumulative effect of stress with increasing numbers of previous missions. Those soldiers with several previous missions

reported significantly more strain than did soldiers with less operational experience. However, the progression of behavioural symptoms seemed to be slower than physiological and psychological symptoms.

Age also appeared to play a role in how participants perceived morale/cohesion, confidence in leadership, and the experience of strain. Morale/cohesion and confidence in leadership was highest in the youngest group (17-21) but decreased significantly as subjects got older. The authors explained this finding in terms of a higher need for affiliation and identification among younger soldiers. Older soldiers (37+) reported experiencing significantly higher psychological, behavioural, and physiological strain compared to any of the younger groups. This latter finding makes sense in that older soldiers are likely to have more operational experience than younger soldiers. A clearer view of this relationship will require controlling for operational experience (number of tours) when examining the moderating effects of variables on different age groups.

Izzo et al. (2000) found that women differed from men only in their reporting of confidence in leadership. Specifically, women had significantly lower confidence in their leaders compared to men. The authors suggest that women may “not use the same type of leadership and consequently may not use the same criteria to evaluate this dimension of unit climate” (p. 11).

With respect to marital status, soldiers did not differ in their morale/cohesion and confidence in leadership scores. However, single soldiers reported significantly lower strain (all scales) than both groups of married (civilian and military spouse) soldiers and widowers. Widowers reported the highest strain levels. Differing perceptions of the

deployment caused by family and financial commitments at home might explain differences between single and married soldiers' level of strain. For widowed soldiers, unresolved grief issues together with increased family responsibilities likely conspired to produce higher reported strain levels in this group.

In summary, Izzo et al.'s (2000) study revealed a tendency for strain to increase with operational experience and to be higher for officers, widowed and older members. Morale, cohesion and confidence in leadership also tended to be highest in younger soldiers although women reported significantly less confidence in their leaders than did men. Although these results are suggestive of an interaction between these variables and stress, Izzo et al. (2000) did not investigate directly how either these variables or explicit coping strategies might moderate or buffer the experience of strain for soldiers in operations.

Although not in the context of the UCP, Day and Livingstone (2001) used the COPE scale to investigate the moderating effects of individual coping strategies with a sample of Canadian military personnel ($N = 521$) in non-operational settings. These researchers found that negative coping styles such as denial or disengagement exacerbated the negative effect of stressors on strain outcomes, although positive styles such as problem-focused coping had very little influence on reported health symptoms. The lack of a moderating effect for positive coping strategies might be due to the retrospective nature of the study. That is, soldiers were asked to recall and indicate whether they had been directly involved in 15 tragic or life-threatening incidents that

were directly related to their military service (e.g., being held hostage, being threatened with death, etc.).

Similar findings were reported by Dobрева-Martinova et al. (2002) in their study of CF personnel (1,068) in non-operational settings. These researchers predicted that role conflict and ambiguity (role stress) would be associated with greater strain and that coping strategies, workplace leadership, and perceived organizational support would moderate the relation between role stress and strain. Although role stress was found to be a significant predictor of strain and coping was a significant independent predictor of strain, none of the interactions assessing the moderating effects of coping, leadership, or perceived organizational support were significant. Among the coping strategies however, the more avoidance coping used, the more strain was evident. According to the authors, the lack of moderating effects might have been due to “the only moderate levels of occupational stress and well-being experienced by the respondents” (p. 119). However, the stressors faced by soldiers in *operational settings* might be more salient than those experienced in non-operational settings and, therefore, might require a more active use of coping strategies. The moderating effects of individual coping strategies, morale, cohesion, and confidence in leadership on strain for soldiers *in operations* has not been examined.

Griffith (1997; Griffith & Vaitkus, 1999) proposed a model to study the buffering effect of cohesion on the relation between stress and strain in soldiers. In this model, strain or the amount of psychological distress and psychosomatic symptoms experienced by the individual is dependent on both the intensity of stressful events and on the amount

of cohesion available to the individual. The model also makes a distinction between strain and disintegration and their presumed effects on individual and group performance. Strain represents the experience of stress at the individual level, whereas disintegration represents group-level experience of stress.

According to Griffith (1997; Griffith & Vaitkus, 1999), an intense stressor in combination with low levels of cohesion and, hence, theoretically high strain results in diminished individual performance. That is, because of psychological distress and psychosomatic symptoms (too much strain), the person is unable to perform individual daily tasks. Similarly, intense stressors in combination with low levels of cohesion results in diminished group performance. That is, lack of emotional support combined with hypothesized preoccupation with psychological distress and psychosomatic symptoms disrupt group structure and integration (too much disintegration), and group members become unable to perform their group tasks.

Griffith (1997) conducted a test of the model on data collected from 9,013 American enlisted (non-commissioned) soldiers serving in non-operational (US) settings. The stress measure consisted of a self-report of number of hours worked in the previous week (Bliese & Halverson, 1996). Cohesion was measured using items taken from the Israeli Defence Forces Combat Readiness Morale Questionnaire, (Gal, 1986) and the Company and Squad/Platoon Perceptions Questionnaire (Manning & Ingram, 1987). Items were selected to assess both task support and emotional support. The 18-item version of the General Well-Being Scale (Cohen & Wills, 1985) was used to measure strain. Two measures of perceived combat performance corresponding to two levels

(individual and group) were used. Individual combat performance was assessed by three survey items regarding the soldier's confidence in: himself or herself in the event of war, his or her skills and abilities in operating weapons and equipment, and his or her fighting ability in war. Perceptions of group combat performance were assessed using three items that asked soldiers to rate their unit's readiness for combat, fellow soldiers' readiness to fight, and how well their unit would perform in combat. Griffith (1997) measured disintegration by using three specially designed items to assess the extent to which soldiers felt a part of the unit and larger organization. Items asked whether the soldier would leave the unit today, whether the soldier would serve their entire enlistment in his or her current unit, and whether the soldier would reenlist.

To examine the extent to which strain, cohesion, and disintegration moderated the relation between stress and performance, Griffith (1997) ran several regressions to test the two-way interactions implied by the model. First, main effects of stress, cohesion, strain, and disintegration accounted for 17.2% and 51.7% of the total variance in perceived individual combat performance and perceived group combat performance, respectively. Four significant interaction terms predicted perceived individual combat performance. Team task support (cohesion), strain, and disintegration moderated the relation of stress to perceived individual combat performance. Only disintegration moderated the relation between stress and perceived group combat performance. Further analysis found that the relation between stress and perceived individual combat performance was less negative when soldiers reported higher levels of team task support, well-being (less strain), and lower levels of disintegration.

To test the mediating effects of strain, cohesion, and disintegration on perceived combat performance, Griffith (1997) ran four separate path analyses substituting team task support for peer emotional support in predicting, first, perceived individual combat performance and, second, perceived group combat performance. Results showed that the model fit the data with strong continuous paths from stress through strain to disintegration and perceived combat performance and from stress through team task support to perceived individual and group combat performance. All other paths were significant with the exception of the relation between the emotional component of cohesion to group combat performance.

Although instructive with respect to the relations between cohesion and outcome variables, Griffith's (1997) model does not take into account the potential social support dimensions of confidence in leadership. Moreover, the effects of individual level coping strategies on the relation between stress and strain were left unexamined. As leadership and individual coping are thought to be critical dimensions of unit success in operational settings (Izzo et al., 2000) these constructs merit more detailed consideration.

Proposed Model of Military Stress

As can be seen in Figure 1, the model proposed in the present study is similar to Griffith's model (1997; Griffith & Vaitkus 1999) but focuses on the moderating effects of new components on the relation between stress and strain. Specifically, the proposed model extends the notion of social support to include soldiers' confidence in leadership. Given the importance of leadership in the military psychology literature, confidence in leadership should also function like social support. That is, confidence in leadership

should buffer the effect of stressors on strain. Individual level coping strategies (Carver et al., 1989) are new to the present model and can be seen to have similar properties. Increasing rank (soldier vs. officers) and time (early in tour vs. late in tour) are also new and are seen to work against the positive effects of other moderators. Most importantly, and unlike Griffith's (1997) research, the data used to test the proposed model are collected from soldiers officers actually *serving in an active theatre of operations*.

Figure 1

Proposed Model of the Relations Between Stress, Coping, Confidence in leadership, Morale/cohesion, and Strain.

Note. Adapted from Griffith and Vaitkus (1999).

Hypotheses

Based on the literature review and description of the proposed model, several hypotheses are evident. Consistent with both the transactional and P-E fit approaches, the model predicts positive relations between stress and strain. Moreover, previous research with UCP data found strong linear relations between all stressor categories and strain (Dobrevva-Martinova, 1998a) and significant negative correlations between unit climate dimensions (morale/cohesion and confidence in leadership) and strain (Izzo et al., 2000). Therefore, for the present study it was hypothesized that:

- 1. Stressors will influence directly the levels of strain, individual coping, confidence in leadership, and morale/cohesion reported by soldiers.*

Although morale/cohesion is expected to be important in the relation between stress and strain for soldiers, officers might be immune to such effects. Recall that officers reported significantly higher mean scores than all other ranks on morale/cohesion and confidence in leadership scales and also reported experiencing significantly higher levels of physiological, psychological and behavioural strain than all other groups (Izzo et al., 2000). Therefore, it was hypothesized that:

- 2. Rank will moderate the relation between stress and strain. Specifically, morale/cohesion will not play an effective role in the relation between stress on strain for officers.*

Consistent with Selye's (1974, 1985) idea that the effect of stress accumulates over time, it was shown that there was a cumulative effect of stress with increasing numbers of missions (Izzo et al., 2000). Moreover, in the face of a chronic stressor, research suggests that the buffering effects of social support might erode over time (Lepore, Evans & Schneider, 1991). Therefore, it was hypothesized that:

3. *Time will moderate the relation between stress, strain, morale/cohesion and confidence in leadership. Specifically, the relations between these variables will become weaker over time within the same tour of duty.*

Recall that, according to transaction theory, coping can be conceptualized as a two-dimensional construct consisting of problem-focused and emotion-focused strategies. In general, problem-focused strategies are thought to buffer the relation between stress and strain while emotion-focused strategies often exacerbate the relationship. However, research findings with military personnel in non-operational settings have been mixed. Day and Livingstone (2001) found that problem-focused strategies had little influence on the relation between stress and strain although emotion-focused strategies like denial appeared to make things worse. Similar findings were reported by Dobрева-Martinova and her colleagues (2002). These researchers suggested that the lack of moderating effects might have been due to overall low levels of stress reported by the respondents. As the present study will be conducted using data collected from soldiers in an active theatre of operations, overall levels of stress might be higher than those experienced by

soldiers in non-operational settings. Certainly, estimated rates of PTSD (Canadian Forces, 2002) among returning soldiers suggest that this is the case. It follows then, that soldiers in operations might require a more active use of coping strategies. Therefore, for the present study it was hypothesized that:

4. *Individual coping style will moderate the relationship between stressors experienced by soldiers in operations and strain such that positive coping styles will reduce strain.*

Cohesion, confidence in leadership, and social support constructs were shown to be similar in many ways. Research with civilian groups has shown support for the buffering role of social support at work including support from colleagues and supervisors (Lim, 1996). Military research has also pointed to a buffering effect of cohesion on the relation between stress and strain (Griffith, 1997; Griffith & Vaitkus, 1999) and significant negative relations between confidence in leadership and strain (Izzo et al., 2000). Finally, then, consistent with previous civilian and military research it was hypothesized that:

5. *Morale/cohesion will moderate the relationship between stressors experienced by soldiers in operations and strain such that high levels of morale/cohesion will reduce strain; and,*

6. *Confidence in leadership will moderate the relationship between stressors experienced by soldiers in operations and strain such that high levels of confidence will reduce strain.*

Method

Subjects

A total of 4,673 subjects have participated in UCP research from 1997 to 2002. Although accurate data on participation rate was not kept, in-theatre researchers reported that close to 100% of soldiers invited to participate in the study agreed to participate. All subjects were members of units on operations in one of several locations including Haiti, Bosnia, Kosovo and Eritrea. Of the total number, complete data from 2,012 participants serving in Bosnia from the period 1999 to 2001 has yet to receive any form of analysis and formed the data set for the present study.

An examination of the sample data indicated that the vast majority of respondents were anglophone (93.28%) and male (91.00%). Table 2 provides a description of biographic variables for the present sample and a comparison to data collected from previous missions in Bosnia (Murphy & Farley, 2000). For the present sample, all rank categories and age groups were represented in the data set. As expected, Junior NCM was the largest rank group as is the 22 – 26 age group. Interestingly, over 89% of soldiers reported at least one previous operational tour of duty. In addition, the majority of respondents were married (53.63%) compared to single members (39.35%), those who were separated or divorced (4.99%) and those who were widowed (2.03%).

Table 2

Current Data (N = 2,012) and Previous Data (1,105) Description of Biographic Variables.

Variable	Current data %	Previous data %	Variable	Current data %	Previous data %
<u>Rank</u>			<u>Marital Status</u>		
Private	16.30%	20.05%	Married	53.63%	49.23%
Junior NCM	59.12%	56.60%	Single	39.35%	44.55%
Senior NCM	17.62%	15.42%	Sep/div	4.99%	5.21%
Officer	6.96%	7.93%	Widowed	2.03%	1.01%
<u>Age</u>			<u>Tours</u>		
17 – 21	11.28%	13.33%	0	10.89%	6.73%
22 – 26	27.14%	27.02%	1	44.53%	43.09%
27 – 31	22.52%	21.22%	2	21.32%	20.91%
32 – 36	20.18%	19.73%	3	13.72%	20.18%
37+	18.89%	18.70%	4+	9.54%	9.09%
<u>Language</u>			<u>Sex</u>		
English	93.28%	90.44%	Male	91.00%	92.25%
French	6.72%	9.56%	Female	9.00%	7.75%

Note. Tours = number of previous operational tours of duty.
 Sep/div = Separated/divorced.

A comparison to the previous data revealed very similar characteristics. Similar to the data set for the current study, Junior NCM is the largest rank group as is the 22-26 age group. However, the respondents in previous tours appeared to have slightly more operational experience (93.27%) than the current study group (89.11%). In terms of marital status, the proportion of married members was still the largest in previous groups (49.23%) although the proportion of single members was larger (44.55%) compared to

the current study group (39.35%). Finally, anglophones and males far outnumbered francophones and females in both data sets.

Instruments

Importantly, data from the present sample includes all components of the proposed model. Specifically, morale/cohesion was measured using the morale/cohesion subscale of the UCP and confidence in leadership was measured using the confidence in platoon commander leadership and confidence in company commander leadership subscales of the UCP (Dobrevá-Martinova, 1999a). Stress was measured using the Stress in Military Service Questionnaire (SMSQ; Dobrevá-Martinova, 1998a) and strain was measured using the Signs Scale (Dobrevá-Martinova, 1998b). Individual level coping was measured using the COPE Inventory (Carver et al., 1988). Appendix A summarizes the development, description and known psychometric properties of these instruments based on data collected from soldiers on previous tours of duty. A complete copy of the questionnaire is contained in Appendix D.

Procedure

All surveys were administered by the in-theatre military psychologist in accordance with CPA ethical principles and approved procedures of the Department of National Defence regarding research with human subjects (Canadian Forces, 2002)³. In particular, participants were informed by the administrator of the nature of the research and that completion of the survey was voluntary. Similar information appeared on the

³The author conducted the pilot test, refinement, and implementation of the UCP (Farley, 1996) and established the data collection system in Bosnia during his tour of duty as the Force Military Psychologist from January to July 1997. During this tour of duty he collected 1146 questionnaires. As the army officer

front cover of the survey (see Appendix D). Due to the short questionnaire administration period and frequently changing situation in-theatre, a random stratified sampling procedure was not possible. Therefore, data was collected based on the availability of personnel within company groups.

Briefly, the military psychologist attempted to collect data at two or three specific times within the same six-month period. About two weeks prior to each data collection, the military psychologist informed administration officers at each camp location of the date and time of the upcoming data collection and answered any questions. In turn, the administration officers informed camp personnel through daily briefings of the proposed time and were responsible to secure a common area such as the kitchen for the data collection.

Soldiers were told that they would receive a briefing by the military psychologist on a topic of interest (such as hostage survival techniques or family re-integration issues when going home) and would be asked to anonymously fill in the survey. Attendance at the briefing and survey completion was voluntary.

The completed questionnaires were collated by the military psychologist and returned to researchers at the Directorate of Human Resource Research and Evaluation (DHRRE) in Canada by military aircraft. Once there, data were entered in SPSS data files and sent electronically back to the military psychologist in-theatre for UCP output production (see Appendix A for example of UCP output).

responsible for the UCP project, he remained in direct control of all data collection in all locations from January 1997 to September 2000.

The military psychologist in-theatre used SPSS on a laptop computer to generate the UCP output. A copy of the raw data was retained at DHRRE for further analysis. Once a UCP output was prepared for each sub-unit, the military psychologist arranged a meeting with the appropriate commander to discuss the results. Results were reported in the aggregate and there was no way individual members could be identified. As a rule, UCP production and briefing of commanders for one session was to be complete before data collection could commence for the next session.

Data Analyses and Results

The analyses for the present study were conducted in the following stages: (1) factor structure confirmation of all scales and construction of a scale correlation matrix; (2) testing for group effects; (3) testing of the proposed model; and, (4) examination of moderating effects.

Factor Structure Confirmation of All Scales and Construction of a Scale Correlation Matrix

Data screening for the each scale was conducted using the procedures recommended by Kline (1997). Univariate normality was checked using skewness and kurtosis. According to Kline (1997), skewness values greater than an absolute value of 3 and kurtosis values greater than an absolute value of 8 indicate univariate normality problems. The mean, standard deviation, kurtosis, and skewness for items in each scale are presented in separate tables. Scatterplots were examined to check for bivariate normality and linearity. Multivariate normality was assessed by examining the probability plot for each variable. Diagonal lines indicate multivariate normality. Univariate outliers were identified by examining frequency distributions of standardized scores. Standardized scores greater than an absolute value of 3 indicate a univariate outlier. For the factor analysis of the instruments, outliers on individual items were removed. As a case might be an outlier on a single item but not the entire scale, only outliers on scale scores were removed for subsequent analyses using scales developed from the factor analyses. To test for multicollinearity, a correlation matrix of all items within each scale was constructed. Values above .80 indicate multicollinearity. To be

suitable for factor analysis (factorability) the correlation matrix for each scale should contain a majority of correlations above .30. Singularity was tested by examining the communality values. A variable with a communality score exceeding a value of 1 may cause the covariance matrix to be singular (Kline, 1997).

Once the data for each scale were screened, the factor analysis procedure in EQS was used to confirm the factor structure of each scale. For comparison to previous studies, the rotation (orthogonal or oblique) for each analysis was consistent with each analysis outlined in Appendix A. The cutoff for factor loadings to be included in a factor was set at .4. Eigenvalues (greater than 1) and scree plots were examined to determine the number of factors in each scale. When an eigenvalue for a factor is divided by the total number of items, the *unrotated* proportion of variance for that factor is derived. However, as factor rotation was used for each analysis, the variance reported was the rotated variance for each factor. Internal consistency values (Cronbach's alpha) were calculated for each factor. Factor structure tables for each scale were constructed and include item name, variance accounted for by factor and full scale, eigenvalues and Cronbach's alpha for each factor, loading and communality values for each item. Finally, a correlation matrix for subscales identified in the factor analysis stage was constructed.

Stress in Military Service Scale (SMSQ) Screening and Factor Analysis

Screening. The 35 SMSQ items were screened in accordance with the procedures outlined above. As can be seen in Table 3, all items were satisfactory with respect to skewness values (.08 to 2.97) although six items showed high kurtosis values (9.00 to 13.10). These items dealt with combat stress issues and, together with low mean scores

and higher skewness values indicate a uniformly low occurrence for these items. As high skewness and kurtosis did not both occur in any single item, all items were retained for analysis. A total of 15 (0.75%) univariate outliers were identified and removed leaving 1,997 cases for examination.

Table 3

Descriptive Statistics of the 35-Item SMSQ (N = 1,997).

Items	Mean	Standard Deviation	Kurtosis	Skewness
Conds of service	2.74	1.42	2.10	0.96
Adm support	2.67	1.32	2.10	0.90
Career issues	2.93	1.43	0.86	0.56
Training issues	2.93	1.36	1.45	0.61
Your workload	2.35	1.27	2.98	1.19
Boredom at work	2.44	1.36	2.18	1.26
Control over task	2.32	1.28	3.27	1.26
Uncertainty role	2.18	1.33	4.52	1.63
Boredom off duty	2.14	1.31	3.82	1.52
? comp of others	2.66	1.31	2.73	1.04
Quality equipment	2.58	1.40	1.44	0.91
Feedback about wrk	2.23	1.29	5.12	1.65
Leadership concerns	2.54	1.33	1.73	0.92
CF policies	2.64	1.39	1.84	0.96
Unit policies	2.77	1.43	0.56	0.66
Lack cohesion	2.34	1.29	4.41	1.49
Time away	2.91	1.41	0.43	0.57
Problems in family	1.97	1.27	5.62	1.88
Comms with family	2.01	1.30	4.05	1.66
Deploy on family	2.40	1.41	2.36	1.21
Support outside	2.80	1.47	1.20	0.08
Lack of privacy	2.67	1.37	2.33	1.04
People external	1.95	1.98	9.02	2.27
Men/phys fatigue	2.08	1.23	7.74	2.06
Harsh conditions	2.12	1.26	6.28	1.89
Threat of injury	2.04	1.24	9.00	2.30
Double standards	3.02	1.48	0.86	0.51
Living condition	2.30	1.30	3.99	1.47
Lack of recreation	2.26	1.32	5.34	1.72
? end of mission	2.44	1.51	2.38	1.27
Seeing suffering	1.92	1.19	11.41	2.59
Seeing inhumanity	1.98	1.24	9.48	2.37
Different culture	1.86	1.19	12.65	2.81
Seeing death	1.80	1.24	13.10	2.97
Risk of disease	2.23	1.32	5.61	1.79

Note. Each item was marked as an answer to the question, "Please indicate to what extent these stressors have caused you trouble or concern during the last month" on a scale from 1 (no trouble or concern) to 5 (very much trouble or concern). ? = "Uncertainty about ...".

SMSQ factor analysis. A factor analysis for the SMSQ using oblique (direct oblimin) rotation was conducted resulting in a five-factor solution (Table 4) very similar to that reported by Dobрева-Martinova (1999a). Total variance accounting for by the present solution was 59.94% compared to 54.69% for the previous analysis. The reliability coefficients (Cronbach's alpha) for the five factors ranged from .86 (living conditions, career issues) to .92 (combat stressors). The factor accounting for the most variance (combat stress, 13.89%) combined combat and peacekeeping stressors such as seeing widespread suffering and seeing instances of inhumanity. Career issues such as conditions of service appeared in the second factor (service/career issues, 12.88%). Work environment issues such as role ambiguity and control over task were represented in the third factor (12.50%). The fourth factor dealt with issues concerning the family (family concerns, 10.62%) such as time spent away from home and lack of communication with family. Finally, the fifth factor contained items representing living conditions such as lack of privacy, harsh conditions, and mental/physical fatigue (10.05%). Similar to Dobрева-Martinova's (1999a) solution, the item "your workload" did not load on any factor. Unlike the previous analysis, three other items failed to meet the .4 cutoff for present analysis. These were, "dealing with people external to the CF", "uncertainty about end-of-mission date", and "unit policies".

Scale scores for subsequent analyses were derived by computing the average (unweighted) score for all contributing items in a scale.

Table 4

Rotated (Direct Oblimin) Five Factor Solution for SMSQ (N = 1,997).

Item	Eigenvalue	Variance	Alpha	LD	COM
Factor 1					
Combat Stress	2.55	13.89%	.90		
26	Threat of serious injury.			.41	.29
31	Seeing widespread suffering.			.80	.49
32	Seeing instances of inhumanity			.91	.54
33	The impact of a different culture (e.g., attitudes toward women, death, time).			.84	.48
34	Experience with death (e.g., seeing someone die, handling corpses).			.88	.53
35	Risk of contracting a serious disease			.64	.37
Factor 2					
Career Issues	14.71	12.88%	.86		
1	Conditions of service matter (e.g., pay, allowances).			.67	.62
2	Administrative support.			.74	.65
3	Career issues (e.g., promotions, postings).			.66	.63
4	Training issues (e.g., repetition).			.63	.63
11	The quality of your personal clothing and equipment.			.48	.59
14	CF policies that impact on your work.			.44	.68
21	Level of support shown by those outside the CF (e.g., government, media).			.56	.63
27	Double standards (e.g., in supply, applying rules, receiving privileges).			.47	.66
Factor 3					
Work Environment	1.17	12.50%	.87		
6	Boredom while at work.			.58	.31
7	Degree of control over your work tasks.			.57	.24
8	Uncertainty about what your work role is or will be (e.g., mission, ROEs).			.48	.33
9	Boredom while off duty.			.53	.43
10	Uncertainty about the competence of other you rely on to do their job.			.64	.45
12	The feedback you receive about your work.			.50	.50
13	Leadership concerns.			.57	.48
16	Lack of cohesion among your work colleagues.			.69	.39

Item	Eigenvalue	Variance	Alpha	LD	COM
Factor 4					
Family Concerns	1.48	10.62%	.87		
17				.75	.49
18				.83	.54
19				.81	.52
20				.80	.50
Factor 5					
Living Conditions	1.05	10.05%	.86		
22				.55	.31
24				.40	.39
25				.53	.26
28					
29				.66	.37
				.59	.35

Note: LD = item loading. COM = Communality. Total variance explained = 59.94%.

Signs Scale Screening and Factor Analysis

Screening. The 21 Signs Scale items were screened in accordance with the procedures outlined above and descriptive statistics are presented in Table 5. Four of 21 items (“shortness of breath”, “crying”, “taking medication to sleep”, and “feeling that life is pointless”) showed high skewness values (3.02 to 4.54) and kurtosis values (8.99 to 21.54). These four items also had low mean scores (1.08 to 1.13) indicating a uniformly low occurrence for these items. As only four of 21 items were concerned, a transformation of the entire scale was not warranted. A total of 85 (4.22%) univariate outliers were identified and removed leaving 1,927 cases for examination.

Table 5

Descriptive Statistics of the 21-Item Signs Scale (N = 1,927).

Items	Mean	Standard Deviation	Kurtosis	Skewness
Cold or flu	1.78	0.70	0.74	0.74
Dizziness	1.20	0.44	4.32	2.22
General aches	1.79	0.77	0.40	0.88
Sweating hands	1.30	0.78	5.07	0.82
Headaches	1.75	0.70	0.84	0.82
Muscle twitch	1.33	0.58	3.58	1.85
Nervous/tense	1.51	0.66	0.83	1.11
Rapid heartbeat	1.16	0.41	6.42	2.60
Short of breath	1.13	0.37	8.99	3.02
Skin rash/itch	1.35	0.64	4.02	2.00
Upset stomach	1.51	0.66	1.51	1.26
Trouble sleeping	1.85	0.84	0.17	0.83
Feel depressed	1.52	0.68	1.50	1.26
Di/concentrating	1.44	0.69	1.29	1.24
Crying	1.10	0.32	9.60	3.14
Lack of appetite	1.35	0.58	2.60	1.67
Loss of weight	1.25	0.51	4.44	2.13
Meds to sleep	1.08	0.30	21.54	4.54
Overly tired	1.57	0.67	0.96	1.07
Loss of interest	1.43	0.65	2.06	1.51
Life is pointless	1.13	0.38	9.95	3.17

Note. Each item was marked as an answer to the question, "Using the given scale, please indicate how often you have experienced each of these **over the last month**" on a scale from 1 (Never) to 4 (Very often).

Signs Scale factor analysis. As can be seen in Table 6, a factor analysis (orthosim rotation) was conducted on the Signs Scale data resulting in a four-factor solution accounting for 45.56% of the total variance compared to 42.8% for the previous study (Dobрева-Martinova 1998b). The factor structure appeared to be similar to Bartone et al.'s (1989) findings and the solution reported by Dobрева-Martinova (1998b). Reliability coefficients ranged from .59 (somatic complaints) to .80 (depression). The first factor contained items related to depression such as feeling depressed and loss of interest in things and accounted for 15.48% of the variance. Items related to hyper-alertness such as feeling nervous or tense, dizziness and sweating hands were represented in the second factor (12.83%). Somatic complaints such as headaches and upset stomach appeared on the third factor (10.25%) and generalized anxiety items such as crying and lack of appetite appeared on the fourth factor (8.01%). All 21 items loaded on one factor each.

Scale scores for subsequent analyses were derived by computing the average score for all contributing items in a scale.

Table 6

Rotated (Orthosim) Four Factor Solution for Signs Scale (N = 1,927).

Item	Eigenvalue	Variance	Alpha	LD	COM
Factor 1					
Depression	6.11	15.48%	.80		
12				.58	.59
13				.75	.63
14				.70	.60
19				.67	.67
20				.70	.63
Factor 2					
Hyper-alertness	1.36	12.82%	.73		
2				.57	.44
4				.57	.57
6				.54	.47
7				.43	.46
8				.67	.55
9				.67	.69
18				.43	.29
Factor 3					
Somatic complaints	1.20	10.25%	.59		
1				.52	.34
3				.49	.34
5				.64	.47
11				.60	.40
10				.40	.22
Factor 4					
Generalized anxiety	1.11	8.01%	.61		
15				.46	.30
16				.53	.30
17				.61	.51
21				.49	.22

Note. LD = Loading. COM = Communality. Alpha = Cronbach's Alpha. Total variance accounted for = 45.56%.

Unit Climate Profile (UCP) Screening and Factor Analysis

Screening. The 62 items of the UCP were screened in accordance with the procedures outlined above. Descriptive statistics are presented in Table 7. All 62-items showed satisfactory skewness (-0.17 to 1.85) and kurtosis (0.79 to 7.60) values. A total of 13 cases (0.65%) were identified as outliers and removed leaving 1,999 cases for examination.

Table 7

Descriptive Statistics of the 62-Item UCP (N = 1,999)

Items	Mean	Standard Deviation	Kurtosis	Skewness
1. My platoon is ready for combat	3.57	1.20	3.61	0.59
2. Soldiers know what is expected	3.94	1.01	5.70	0.58
3. Confident in the combat abilities	3.60	1.15	4.64	0.86
4. It feels good to be part of platoon	3.92	1.22	2.80	0.46
5. Morale in my platoon is high	3.49	1.21	2.80	0.46
6. My platoon is effective in training	4.00	1.00	7.19	0.97
7. I am satisfied with social events	3.42	1.16	4.66	0.80
8. My friends are ready to go to combat	3.73	1.15	5.03	0.85
9. I would rather go with my platoon	3.60	1.36	1.82	0.30
10. Soldiers encourage each other	3.67	1.15	4.60	0.71
11. Soldier know what to accomplish	3.54	1.15	4.62	0.73
12. My personal morale is very high	3.76	1.18	2.55	0.19
13. Soldiers are proud to be in unit	3.48	1.16	4.60	0.84
14. My job is important to the mission	3.96	1.04	4.30	0.36
15. Soldiers would stick together in cbt	3.85	1.06	5.16	0.74
16. My platoon is effective in garrison	3.86	1.02	7.60	1.24
17. There is a lot of togetherness	3.61	1.15	5.15	0.92
18. Supervisor doesn't pay attention	2.34	1.34	3.25	1.37
19. Supervisor gives big jobs late	2.26	1.24	5.51	1.65
20. Supervisor encourages soldiers	4.03	1.04	5.33	0.62
21. Supervisor maintains high standards	3.89	1.04	3.80	-0.04
22. Supervisor offers new ideas	3.77	1.03	3.99	0.19
23. Supervisor is willing to listen	3.98	1.03	3.47	-0.17
24. Supervisor refuses to explain	2.39	1.19	5.82	1.57
25. Supervisor puts suggestions	3.64	1.04	5.67	0.70
26. Supervisor makes role understood	3.80	0.99	4.77	0.38
27. Supervisor acts without consulting	2.84	1.17	4.63	1.12
28. Supervisor makes us work extra hrs	2.30	1.16	7.13	1.80
29. Supervisor lets others interfere	2.36	1.24	5.09	1.52
30. Platoon warrant stands up for troops	3.60	1.43	2.59	0.56
31. Platoon warrant is respected	3.55	1.42	2.43	0.54
32. I have confidence in Pl warrant	3.67	1.41	2.43	0.46
33. Sr NCOs stay with us in the field	3.92	1.20	4.99	0.95
34. Sr NCOs go to bat for troops	3.78	1.22	4.42	0.76
35. Sr NCOs trust the soldiers	3.70	1.19	5.91	1.15
36. Platoon comd is respected	3.53	1.31	3.38	0.63
37. Platoon comd stands up for troops	3.56	1.29	3.51	0.62
38. I have confidence in Platoon comd	3.50	1.36	2.86	0.59
39. Coy comd stands up for troops	3.56	1.22	4.42	0.79
40. Coy comd is respected	3.57	1.24	4.21	0.78
41. I have confidence in Coy comd	3.66	1.29	3.87	0.73
42. Section comd is respected	3.95	1.33	4.99	1.29
43. Section comd stands up for troops	3.97	1.28	5.22	1.30
44. I have confidence in section comd	4.01	1.32	4.74	1.20

Items	Mean	Standard Deviation	Kurtosis	Skewness
45. CO stands up for the troops	3.62	1.19	5.36	1.03
46. CO is respected	3.58	1.19	4.80	0.88
47. I have confidence in CO	3.66	1.18	4.51	0.69
48. CSM stands up for troops	3.68	1.20	4.77	0.90
49. CSM is respected	3.68	1.24	4.58	0.95
50. I have confidence in CO	3.77	1.22	4.82	0.92
51. I would perform better in battle	3.66	1.15	7.54	1.85
52. I am making contribution to Canada	4.02	1.11	4.85	0.55
53. I am confident in my abilities	4.35	0.87	9.74	1.41
54. I am proud to be a soldier	4.23	1.06	4.57	0.26
55. I am better trained than others	3.80	1.15	4.40	0.78
56. The army has an important job to do	3.84	1.25	3.06	0.35
57. Differences in rank not important	3.50	1.41	1.09	0.28
58. Private life should be of no concern	3.70	1.38	1.08	0.15
59. Off duty none of military's business	3.58	1.43	1.00	0.29
60. I plan on making cdt arms my career	3.09	1.63	0.79	0.54
61. I would encourage friends to enlist	3.31	1.30	2.52	0.48
62. A career in the CF is worthwhile	3.81	1.13	3.67	0.31

Note: Each item was marked as an answer to the question, "Using the scale beside each question please fill in the circle that corresponds with your level of agreement/disagreement with the given statement" on a scale from 1 (Strongly disagree) to 5 (Strongly agree).

UCP factor analysis. A factor analysis (direct oblimin rotation) was conducted on the 62-items (Table 8) resulting in a 12-factor solution accounting for 69.41% of the variance compared to a very similar 12-factor (66.38%) solution reported by Dobрева-Martinova (1999a). Reliability coefficients ranged from .71 for positive ethos to .95 for three factors; morale/cohesion, confidence in section commander and confidence in platoon commander. The first factor contained mostly cohesion items such as “I am confident in the combat abilities of the soldiers in my platoon/troop” and “The soldiers in my platoon/troop encourage each other to work together as a team” and accounted for 12.85% of the variance. Interestingly, and similar to Dobрева-Martinova’s (1999a) analysis, the item “my personal level of morale is very high” did not load on this factor. However, as she pointed out, “it seems that only [this item] does not suggest any reference to group belonging” (Dobрева-Martinova, 1999a, p. 14).

Three other items dealing with confidence in senior non-commissioned member leadership did not meet the loading cut-off for the present analysis although the highest values appeared on the confidence in platoon warrant officer factor (.35, .39, .33). In Dobрева-Martinova’s (1999a) study, the items “The senior NCOs in my platoon/troop stay with us in the field when conditions are terrible”, “The senior NCOs in my platoon/troop to bat for their troops to get things they deserve”, and “The senior NCOs trust the soldiers in this platoon/troop” all loaded strongly with the items dealing with confidence in platoon warrant officer. For the present study confidence in platoon warrant officer emerged as a distinct factor.

Negative leadership items such as “my immediate supervisor lets other supervisors interfere with my work group” and “When I talk to my immediate supervisor, s/he doesn’t pay attention to what I’m saying” appeared on the second factor and accounted for 5.55% of the variance. Professional morale items such as “I am better trained than soldiers from other nations” and “I feel the Army has an important job to do in defending Canada” were contained on the next factor (5.04%).

The sixth factor accounted for 7.84% of the variance and contained positive leadership items such as “My immediate supervisor encourages soldiers to give their best efforts” and “My immediate supervisor offers new ideas for solving job-related problems”. Factor eight contained negative ethos items such as “What a member does in off duty hours is none of the military’s business” and “differences in rank should not be important after hours”. Confidence in platoon commander (factor 9, 6.42%), confidence in company sergeant major (factor 3, 6.04%), confidence in platoon warrant officer (factor 7, 5.72%), confidence in company commander (factor 10, 2.55%), confidence in section commander (factor 5, 4.84%), and confidence in commanding officer (factor 11, 3.61%) all contained 3 items each. Finally, factor 12 (5.24%) contained positive military ethos items including “I plan on making the combat arms my career” and “I would encourage my civilian friends to enlist in the Army”.

Table 8

Rotated (Direct Oblimin) Twelve Factor Solution for the Unit Climate Profile (N = 1,999).

Item	Eigenvalue	Variance	Alpha	LD	COM
Factor 1					
Morale/cohesion	20.98	12.85%	.95		
1	My platoon/troop is ready for combat.			.79	.67
2	Soldiers in my platoon/troop know what is expected of them.			.68	.70
3	I am confident in the combat abilities of soldiers in my platoon/troop.			.80	.67
4	It feels good to be part of my platoon/troop.			.59	.74
5	The level of morale of my platoon/troop is very high.			.45	.64
6	Overall, my platoon/troop is effective infield training exercises.			.72	.67
7	I am satisfied with the social events in my platoon/troop.			.46	.66
8	In my platoon/troop my friends are ready to go to combat, if and when necessary.			.76	.65
9	I we were going to war, I would rather go with my platoon/troop than with any other platoon/troop I know.			.75	.65
10	The soldiers in my platoon/troop encourage each other to work together as a team.			.61	.69
11	The soldiers in my platoon/troop know what the unit is trying to accomplish.			.45	.69
13	The soldiers in my platoon/troop are proud to be in this unit.			.49	.70
15	Soldiers in my platoon/troop would stick together in a combat situation.			.72	.71
16	Overall, my platoon/troop is effective in garrison (for example, inspections, individual task training, physical fitness).			.60	.66
17	There is a lot of togetherness in my platoon/troop.			.60	.66
Factor 2					
Negative Leadership	4.27	5.55%	.84		
18	When I talk to my immediate supervisor, s/he doesn't pay attention to what I'm saying.			.73	.63
19	My immediate supervisor gives us big jobs late in the day and wants them done before we leave work.			.80	.66
24	My immediate supervisor refuses to explain his/her actions			.70	.71
27	My immediate supervisor acts without consulting the soldiers in the platoon/troop.			.71	.62
28	My immediate supervisor makes us work a lot of extra hours.			.80	.65
29	My immediate supervisor lets other supervisors interfere with my work group.			.66	.60
Factor 3					
Confidence in Company Sergeant Major	3.37	6.04%	.94		
48	My CSM/SSM stands up for the troops.			.91	.55
49	My CSM/SSM is respected by those in the company.			.97	.48
50	In the event of combat I have confidence in the CSM/SSM.			.91	.68

Item	Eigenvalue	Variance	Alpha	LD	COM
Factor 4					
Professional Morale	2.77	5.04%	.83		
52	I feel I am making a contribution to Canada by serving in the Army.			.71	.40
53	I am confident in my abilities as a soldier.			.52	.46
54	I feel proud to be a soldier in the Canadian Army.			.63	.47
55	I am better trained than soldiers from other nations.			.67	.40
56	I feel the Army has an important job to do in defending Canada.			.79	.52
Factor 5					
Confidence in Section Commander	2.16	4.84%	.95		
42	My section commander is respected by section members.			.79	.44
43	My section commander stands up for the troops.			.79	.43
44	In the event of combat I have confidence in my section commander.			.79	.30
Factor 6					
Positive Leadership	1.78	7.84%	.91		
20	My immediate supervisor encourages soldier to give their best efforts.			.68	.33
21	My immediate supervisor maintains high standards of performance.			.84	.52
22	My immediate supervisor offers new ideas for solving job-related problems.			.89	.46
23	My immediate supervisor is willing to listen to any problems.			.77	.56
25	My immediate supervisor puts suggestions by soldiers of the platoon/troop into operation.			.73	.36
26	My immediate supervisor makes sure his/her role in the unit is understood by the soldiers.			.77	.40
Factor 7					
Confidence in Platoon Warrant Officer	1.65	5.72%	.93		
30	My platoon/troop warrant stands up for the troops.			.89	.43
31	My platoon/troop warrant is respected by platoon/troop members.			.89	.42
32	In the event of combat I have confidence in my platoon/troop warrant.			.86	.37
Factor 8					
Negative Ethos	1.53	3.71%	.81		
57	Differences in rank should not be important after hours.			.72	.30
58	What a member does in private life should be of no concern to his supervisor/commander.			.90	.43
59	What a member does in off duty hours is none of the military's business.			.90	.43

Item	Eigenvalue	Variance	Alpha	LD	COM
Factor 9					
Confidence in Platoon Commander	1.31	6.42%	.95		
36	My platoon/troop commander is respected by platoon/troop members.			.85	.44
37	My platoon/troop commander stands up for the troops.			.85	.44
38	In the event of combat I have confidence in my platoon/troop commander.			.84	.45
Factor 10					
Confidence in Company Commander	1.16	2.55%	.93		
39	My company commander stands up for the troops.			.56	.19
40	My company commander is respected by those in the company.			.59	.13
41	In the event of combat I have confidence in the company commander.			.56	.16
Factor 11					
Confidence in Commanding Officer	1.04	3.61%	.92		
45	My commanding officer stands up for the troops.			.78	.34
46	My commanding officer is respected by those in the battalion/regiment.			.83	.38
47	In the event of combat I have confidence in the commanding officer.			.80	.38
Factor 12					
Positive Ethos	1.00	5.24%	.71		
60	I plan on making the combat arms my career.			.65	.48
61	I would encourage my civilian friends to enlist in the Army.			.66	.40
62	A career in the Canadian Forces is worthwhile.			.60	.54

Note. LD = Loading. COM = Communality. Alpha = Cronbach's Alpha. Total variance accounted for = 69.41%.

Morale/cohesion factor analysis. As was the case with Dobрева-Martinova's (1999a) analysis, the first factor "morale/cohesion" appears to contain both task cohesion and social cohesion items and does not contain the personal morale item. Similarly, and contrary to previous research, item 14 "My job is important to the unit" did not load on this factor. Research indicates cohesion might best be considered a multi-dimensional rather than unitary construct (Griffith, 1988; Mudrack, 1989; Mullen & Copper, 1994; Seibold & Kelly, 1988; Zaccaro & McCoy, 1988). To determine if this UCP factor was really two distinct scales, another factor analysis was conducted on these items alone (including the two items that did not load on this factor); that is, not in the context of the entire UCP. As can be seen in Table 9, this solution accounted for 62.56% of the total variance in these 17 items and reliability coefficients were both very high (.92 and .91). As predicted, clear distinctions can be made between task and social cohesion constructs. Factor one accounts for 35% of the variance and contains items that are clearly task related (e.g., "My platoon/troop is ready for combat"). Factor two (27.56%), on the other hand, is more morale and social cohesion oriented including items such as "My personal level of morale is very high" and "It feels good to be part of my platoon/troop".

Scale scores for subsequent analyses were derived by computing the average score for all contributing items in a scale.

Table 9

Rotated (Direct Oblimin) Two Factor Solution for Morale/Cohesion Scale of UCP (N = 1,999).

Item	Eigenvalue	Variance	Alpha	LD	COM
Factor 1					
Task Cohesion	9.60	35.00%	.92		
H1	My platoon/troop is ready for combat.			.93	.76
H2	Soldiers in my platoon/troop know what is expected of them.			.69	.78
H3	I am confident in the combat abilities of soldiers in my platoon/troop.			.94	.77
H6	Overall, my platoon/troop is effective in field training exercises.			.74	.76
H8	In my platoon/troop my friends are ready to go to combat, if and when necessary.			.81	.74
H9	If I were going to war, I would rather go with my platoon/troop than with any other platoon/troop I know.			.63	.76
H15	Soldiers in my platoon/troop would stick together in a combat situation.			.62	.81
H16	Overall, my platoon is effective in garrison (for example, inspections, individual task training, physical fitness).			.52	.74
Factor 2					
Morale/Social Cohesion	1.25	27.56%	.91		
H4	It feels good to be part of my platoon/troop.			.57	.54
H5	The level of morale of my platoon/troop is very high.			.77	.53
H7	I am satisfied with the social events in my platoon/troop			.58	.49
H10	The soldiers in my platoon/troop encourage each other to work together as a team.			.47	.67
H11	The soldiers in my platoon/troop know what the unit is trying to accomplish.			.44	.49
H12	My personal level of morale is very high.			.92	.48
H13	The soldiers in my platoon/troop are proud to be in this unit.			.54	.35
H14	My job is important to the unit.			.75	.37
H17	There is a lot of togetherness in my platoon/troop.			.50	.41

Note. LD = Loading. COM = Communality. Alpha = Cronbach's Alpha. Total variance accounted for = 62.56%.

COPE Inventory Screening and Factor Analysis

Screening. The 56 items of the COPE Inventory were screened in accordance with the procedures outlined above. Descriptive statistics are presented in Table 10. Two items dealing with drug use “I take prescribed drugs in order to think less about my concerns”(COPE 28), and “I take non-prescribed drugs in order to think about my concerns less” (COPE 56) showed high skewness (5.17, 5.17) and kurtosis levels (29.10, 28.99). Both of these items had low mean scores (1.09, 1.08) indicating very low occurrence. All other items were satisfactory so transformation of the scale was not warranted. A total of 70 cases (3.5%) were identified as outliers and removed leaving 1,942 cases for examination.

Table 10

Descriptive Statistics of the 56-Item COPE Inventory (N = 1,942).

Items	Mean	Standard Deviation	Kurtosis	Skewness
1. I take additional action	2.72	0.95	-0.79	-0.29
2. I try to come up with a strategy	2.97	0.86	-0.40	-0.51
3. I put aside other activities	2.69	0.89	-0.61	-0.25
4. I force myself to wait for right time	2.34	0.89	-0.77	0.09
5. I ask people what they did	2.78	0.94	-0.70	-0.39
6. I talk to someone about how I feel	2.23	0.97	-0.87	0.33
7. I look for something good	2.79	0.91	-0.70	-0.32
8. I learn to live with it	3.04	0.85	-0.41	-0.55
9. I seek God's help	1.65	0.89	0.65	1.27
10. I get upset and let my emotions out	1.65	0.77	0.76	1.11
11. I refuse to believe what happened	1.30	0.59	5.06	2.22
12. I give up trying to get what I want	1.56	0.78	1.20	1.35
13. I turn to work on other activities	2.34	0.95	-0.87	0.16
14. I drink alcohol in order to think less	1.25	0.60	8.06	2.82
15. I concentrate my efforts	2.74	0.88	-0.61	-0.27
16. I make a plan of action	2.78	0.90	-0.58	-0.34
17. I focus on dealing with main prob	2.38	0.88	-0.71	0.04
18. I hold off doing anything	2.11	0.87	-0.53	0.40
19. I try to get advice from someone	2.66	0.88	-0.68	-0.16
20. I try to get personal support	2.35	0.92	-0.80	0.16
21. I try to see things in diff light	2.74	0.88	-0.63	-0.25
22. I accept what has happened	2.46	0.95	-0.88	0.03
23. I put my trust in God	1.71	0.96	0.27	1.18
24. I let my feelings out	1.91	0.88	0.72	-0.28
25. I pretend things haven't happened	1.40	0.67	2.62	1.73
26. I just give up trying	1.49	0.74	1.73	1.51
27. I try to watch a video	2.30	0.93	-0.80	0.22
28. I take prescribed drugs	1.09	0.39	29.10	5.17
29. I do what has to be done	2.95	0.81	-0.81	-0.48
30. I think hard about steps to take	2.79	0.84	-0.42	-0.33
31. I stop from getting distracted	2.37	0.83	-0.55	0.04
32. Not make worse by acting soon	2.60	0.85	-0.56	-0.17
33. I talk to someone to find out more	2.87	0.86	-0.32	-0.48
34. I discuss how I feel with someone	2.20	0.94	-0.79	0.33
35. I try to learn from negative experience	3.03	0.85	-0.25	-0.59
36. I ... negative events do happen	2.79	0.89	-0.61	-0.33
37. I try to find comfort in religion	1.53	0.83	1.70	1.59
38. I find myself venting my stress a lot	1.85	0.86	0.08	0.84
39. I ... negative events haven't happen	1.46	0.70	2.10	1.58
40. I can't deal with concerns and quit	1.36	0.61	3.08	1.81
41. I daydream about things	1.75	0.85	0.14	0.95
42. I go on a drinking binge when I can	1.35	0.72	4.72	2.29
43. I take direct action to solve problems	2.96	0.80	-0.16	-0.48
44. I ... how I might best handle problem	3.07	0.77	0.02	-0.57

Items	Mean	Standard Deviation	Kurtosis	Skewness
45. I prevent other things from interfering	2.76	0.84	-0.39	-0.32
46. I restrain myself from doing quickly	2.52	0.80	-0.41	-0.06
47. I talk to someone ... to do something	2.56	0.91	-0.74	-0.13
48. I seek understanding from someone	2.21	0.92	-0.73	0.31
49. I try to develop as a person	2.95	0.86	-0.34	-0.52
50. I accept the reality of the facts	2.99	0.82	-0.26	-0.52
51. I pray more than usual	1.40	0.72	3.72	2.01
52. I get upset, and am really aware	1.89	0.87	-0.29	0.69
53. I say to myself: "this isn't real"	1.34	0.64	4.32	2.09
54. I reduce the amount of effort	1.45	0.71	2.40	1.67
55. I sleep more than usual	1.57	0.77	1.25	1.33
56. I take non-prescription drugs	1.08	0.35	28.99	5.17

Note: Each item was marked as a response to the following instructions "Please indicate what you generally have done and how you have generally responded when faced with difficult or trying events during the last month. Use the given scale to indicate how often, if at all, you have used these responses." The scale was from 1 "I usually don't do this at all" to 4 "I usually do this a lot".

COPE Scale factor analysis. A factor analysis (direct oblimin rotation) was conducted on the 56-items (Table 11) resulting in an 11-factor solution accounting for 58.86% of the total variance compared to a 13-factor solution (59.80%) reported by Dobrev-Martino (1999b). Reliability coefficients ranged from .58 (for factor 9, restraint coping and factor 11, mental disengagement) to .92 (factor 3, turning to religion). Similar to Dobrev-Martino (1999b) and unlike Carver et al.'s (1989) findings, the first factor in the present analysis (factor 1, problem focused coping1, 8.65%) combined different problem solving strategies (active coping, planning, suppression of competing activities and restraint coping). Similarly, seeking social support items (for instrumental and emotional reasons) loaded on a single factor (factor 4, seeking social support, 9.02%). Using alcohol (factor 8, 3.47%) and using drugs (factor 10, 3.08%) appeared as separate factors.

Similar to the first factor (problem focused coping1), the seventh factor (problem focused coping 2, 7.11%) contained items from three main problem focused categories as

defined by Carver et al. (1989): active coping (e.g., I take additional action to try to get rid of the problem), planning (e.g., I try to come up with a strategy about what to do), and suppression of competing activities (I put aside other activities in order to concentrate on the main problem).

Six other factors were similar to both previous analyses: denial (factor 2, 4.33%), turning to religion (factor 3, 6.35%) acceptance (factor 5, 5.78%), venting of emotions (factor 6, 4.22%), restraint coping (factor 9, 3.09%), and mental disengagement (factor 11, 3.76). Three items did not make the loading cut-off for any factor ("I just give up trying to reach my goal or have my concerns satisfied" highest loading .36 on factor 2 denial; "I try to develop as a person as a result of my experience" highest loading .32 on factor 1 problem focused1; and, "I reduce the amount of effort I put into solving my problems" highest loading .25 on factor 10 using drugs).

Scale scores for subsequent analyses were derived by computing the average score for all contributing items in a scale.

Table 11

Rotated (Direct Oblimin) Eleven Factor Solution for COPE Inventory (N = 1,942).

Item	Eigenvalue	Variance	Alpha	LD	COM
Factor 1					
Problem focused1	12.24	8.65%	.88		
29				.56	.61
30				.61	.70
31				.59	.58
32				.67	.60
43				.50	.60
44				.57	.70
45					
				.57	.68
46				.65	.58
Factor 2					
Denial	5.54	4.33%	.70		
11				.40	.51
25				.63	.40
39				.70	.42
40				.39	.53
53				.42	.53
Factor 3					
Turning to religion	2.96	6.35%	.92		
9				.93	.63
23				.92	.61
37				.91	.60
51				.87	.57
Factor 4					
Seeking social support	2.46	9.02%	.79		
5				.56	.36
6				.82	.48
19				.65	.30
20				.76	.40
33				.50	.37
34				.82	.48
47				.65	.38
48				.77	.38

Item	Eigenvalue	Variance	Alpha	LD	COM
Factor 5					
Acceptance	1.98	5.78%	.80		
7 I look for something good in what is happening.				.42	.39
8 I learn to live with it.				.68	.37
21 I try to see things in a different light, to make things seem more positive.				.41	.29
22 I accept what has happened and that things can't be changed.				.67	.32
35 I try to learn something from negative experiences.				.51	.30
36 I get used to the idea that negative events do happen.				.69	.49
50 I accept the reality of the fact that these things have happened.				.57	.40
Factor 6					
Venting emotions	1.56	4.22%	.71		
10 I get upset and let my emotions out.				.80	.43
24 I let my feelings out.				.56	.26
38 I find myself venting my stress a lot.				.66	.49
52 I get upset, and am really aware of how upset I am.				.65	.43
Factor 7					
Problem focused2	1.44	7.11%	.84		
1 I take additional action to try and get rid of the problem.				.76	.36
2 I try to come up with a strategy about what to do.				.74	.29
3 I put aside other activities in order to concentrate on the main problem.				.72	.28
15 I concentrate my efforts on doing something about my concerns.				.44	.30
16 I make a plan of action.				.53	.29
17 I focus on dealing with the main problem, and if necessary let other things slide by a little.				.54	.16
Factor 8					
Using alcohol	1.38	3.47%	.67		
14 I drink alcohol in order to think less about my problems.				.74	.21
42 I go on a drinking binge when I can.				.83	.42
Factor 9					
Restraint coping	1.22	3.09%	.58		
4 I force myself to wait for the right time to do something.				.41	.16
18 I try holding off doing anything until the situation permits.				.49	.12
Factor 10					
Using drugs	1.17	3.08%	.69		
28 I take prescribed drugs in order to think less about my concerns.				.67	.25
56 I take non-prescribed drugs in order to think about my concerns less.				.73	.31

Item	Eigenvalue	Variance	Alpha	LD	COM
Factor 11 Mental disengagement	1.03	3.76	.58		
13 I turn to work or other substitute activities to take my mind off things.				.48	.29
27 I try to watch a video, listen to music or read, to think less about things.				.56	.23
41 I daydream about things other than my difficulties.				.60	.29
55 I sleep more than usual.				.64	.39

Note. LD = Loading. COM = Communality. Alpha = Cronbach's Alpha. Total variance accounted for = 58.86%.

Defining positive and negative coping. For the purposes of the present study, positive and negative coping strategies were defined empirically, in order to reduce model complexity in the SEM analysis. Therefore, based on the subscale correlation matrix, those strategies that showed a significantly positive correlation with the strain scale were defined as negative strategies. However, because the response options of the strain scale ranged from 1 = never to 4 = very often, there was little variability for positive coping strategies to correlate negatively with the scale. Therefore, a zero or negative correlation between coping strategies and the strain scale indicated a positive strategy. To reduce the possibility of a dependency between the selection of the coping categories and a subsequent complete test of the model, only one half of a random split of the data were used for the construction of the correlation matrix ($N = 944$).

A review of all the scale descriptive statistics for this random half-split of the sample ($N = 944$) indicated only the "using drugs" (COPE10) factor showed both high skewness (4.20) and kurtosis (18.30) values. This is consistent with the individual item

descriptive statistics for the factor analysis of the COPE Inventory (Table 10) and indicates a uniformly low occurrence of these items. A LOG10 transformation of the scale did not greatly reduce the skewness and kurtosis values (3.98, 13.70). Similarly, the normal probability plot for this scale did not improve with transformation. As it is reasonable to assume that a low occurrence of drug use accurately reflects the situation with this population in such an isolated and controlled location, the non-transformed COPE10 scale was used in the present analysis.

Several important relations are evident in the matrix. First, as can be seen in Table 12 below, seven of the 11 COPE scales correlate significantly (positive) with the strain full-scale. Therefore, these coping strategies were grouped into the negative coping component for subsequent analyses (see Table 13). In contrast, four of the 11 COPE scales have zero correlations with the strain full-scale and are grouped into the positive coping component for subsequent analyses. Moreover, and as can be seen in the matrix, all negative coping strategies have significantly positive correlations with the stress full-scale. Positive coping strategies on the other hand, have zero correlations with the stress full-scale.

The breakdown of coping strategies into positive and negative groups is fairly similar to Carver et al.'s (1989) description of functional vs. dysfunctional categories. As can be seen in Table 13, Denial, Venting of emotions, Using alcohol, Using drugs, and Mental disengagement are consistent with Carver et al.'s (1989) dysfunctional strategy category. Turning to religion was considered by Carver et al. (1989) to be either functional or dysfunctional depending on whether or not it led to some form of problem focused coping. Restraint coping appears in the negative coping group here although was

considered by Carver et al. (1989) as generally functional. However, the Restraint coping factor derived by factor analysis for the present study included only two items from Carver et al.'s (1989) *a priori* assignment of items to strategies (“I force myself to wait for the right time to do something” and “I try holding off doing anything until the situation permits”). Other restraint items appeared in Problem focused 1 (e.g., “I make sure not to make matters worse by acting too soon). It might be that, in the context of a quickly changing operational environment, a unique restraint coping strategy acts to exacerbate problems that need immediate rather than delayed solutions – thus resulting in increased strain for the individual.

For the positive coping group, Problem focused 1 and Problem focused 2 appear very similar to each other and consist of items considered by Carver et al. (1989) to be functional. Seeking social support consists of both emotion focused (“I seek understanding from someone”) and problem focused (“I ask people who had similar experiences what they did”) social support seeking items. Although emotion focused items as a unique strategy were not considered functional by Carver et al. (1989), when combined with problem focused social support seeking as seen here, their relation to strain is not significant. Finally, the Acceptance factor is placed in the positive coping group as would be expected by Carver et al. (1989).

Table 12

COPE Inventory subscale correlation matrix (N = 944).

Scale	COPE1	COPE2	COPE3	COPE4	COPE5	COPE6	COPE7	COPE8	COPE9	COPE10	COPE11	StressF	StrainF
COPE1	1.00												
COPE2	0.04	1.00											
COPE3	.19***	.19***	1.00										
COPE4	.55***	.06*	.22***	1.00									
COPE5	.62***	.02	.19***	.50***	1.00								
COPE6	.22***	.29***	.27***	.40***	.24***	1.00							
COPE7	.68***	.04	.14***	.51***	.53***	.27***	1.00						
COPE8	-.14***	.32***	.06	-.06	-.05	.14***	-.07*	1.00					
COPE9	.42***	.19***	.10**	.31***	.33***	.20***	.57***	.05	1.00				
COPE10	-.08*	.39***	.18***	-.07*	-.10**	.21***	-.08*	.37***	.08*	1.00			
COPE11	.12***	.33***	.12***	.21***	.24***	.31**	.15***	.29***	.17***	.12***	1.00		
StressF	-.02	.21***	.07*	.02	-.05	.23***	.02	.16***	.09**	.17***	.20***	1.00	
StrainF	-.01	.27***	.07*	.00	.00	.29***	.01	.35***	.08**	.36***	.32***	.43***	1.00

Note: COPE1 = problem focused1, COPE2 = denial, COPE3 = turning to religion, COPE4 = seeking social support, COPE5 = acceptance, COPE6 = venting emotions, COPE7 = problem focused2, COPE8 = using alcohol, COPE9 = restraint coping, COPE10 = using drugs, COPE11 = mental disengagement, StressF = stress full scale, StrainF = strain full scale. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 13

Relations of COPE scales to Strain full-scale (N = 944).

Variable	Pearson r with StrainF	Probability
<i>Negative coping</i>		
Denial	r = .27	$p < .001$
Turning to religion	r = .07	$p < .05$
Venting emotions	r = .29	$p < .001$
Using alcohol	r = .35	$p < .001$
Restraint coping	r = .08	$p < .01$
Using drugs	r = .36	$p < .001$
Mental disengagement	r = .32	$p < .001$
<i>Positive coping</i>		
Problem focused 1	r = -.01	ns
Seeking social support	r = .00	ns
Acceptance	r = .00	ns
Problem focused 2	r = .01	ns

Note: Pearson r = Pearson correlation. ns = not significant. StrainF = Strain full-scale.

Independence of Observations

Many standard statistical tests assume independence of observations (Stevens, 2002). However, due to the effects of the social environment on the behaviour of individuals, known as *group effects*, the responses of any individual may not be independent of the relationships he or she has within the group. For example, it is possible that the quality of interpersonal relationships in an infantry company will influence a soldier's responses on the variables of cohesion and confidence in leadership. When non-independence is present, the average correlation (intra-class correlation) between variables measured on soldiers from the same company will be higher than the average correlation between variables measured on soldiers from different companies. As much social science research is concerned with how individual behaviour is modified by group contexts, Stevens (2002) argued that non-independence of observations is actually quite common. When the assumption of independence is violated, however, the estimates of the standard errors in many statistical tests are too small and may result in spurious significant results (Type I error). Thus, when non-independence is present, Stevens (2002) recommends testing at a more stringent level of significance.

The data from 357 soldiers in thirteen companies were used to test the assumption of independence. The number of completed questionnaires per company ranged from 14 to 47 with an average of 27.5. These companies were chosen for this analysis because they represent both early and late administrations of the questionnaire in two separate rotations (seven companies and six companies respectively). The seven companies of the first rotation were measured after two months in-theatre and the six companies of the

second rotation were measured after almost six months in-theatre. Thus, if group effects were present, they should have been evident in this sample of companies.

Following Griffith (1997), four statistical procedures were used to examine the agreement among soldiers in the same company regarding perceptions of stress, strain, coping strategies, task cohesion, morale/social cohesion, and confidence in leadership. Traditional one-way ANOVAs were conducted in which company membership served as the independent variable and study scales served as the dependent variables. Then, using the information produced in the ANOVA (i.e., sums-of-squares and mean square), other relevant statistics were calculated (see Table 14).

Table 14

Equations for Tests of Group Differences.

<i>Equations for tests</i>
$\text{One-way ICC (1)} = (MSB - MSW) / (MSB + [J - 1] MSW)$
$\text{One-way ICC (2)} = (MSB - MSW) / MSB$
$\eta_{(bn)} = \sqrt{SSB / SST}$
$\eta_{(wn)} = \sqrt{SSW / SST}$
$E \text{ Test} = \eta_{(bn)} / \eta_{(wn)}$
$\text{Traditional ANOVA } F = (MSB / MSW)$
$\text{Corrected } F = 1 / F$
<i>Note.</i> ICC = intraclass correlation, MSB = mean square between, MSW = mean square within, J = number of groups, ANOVA = analysis of variance.

The Intraclass Correlation Coefficient 1, or ICC (1), assesses whether soldiers in the same company reliably “agree” in their responses. The ICC (1) has values that range from .00 to .50, with a median of .12 (James, 1982). An ICC (1) value of .12 or greater indicates reliable agreement. The ICC (2) measures how reliably companies can be differentiated based on scale scores (Bartko, 1976). The closer ICC (2) is to 1.00, the better the measurement indicates whether the companies can be reliably distinguished in terms of individual perceptions on the variable of interest.

Following Griffith (1997), the criterion of .85 or higher was used as an indicator of between-company differences. The E-tests (a ratio of the between-eta and within-eta) of practical significance provides an index of the magnitude of the effects (within- and between-group analysis - WABA; Yammarino & Markham, 1992). The test of significance for the E-Test is not dependent on degrees of freedom but is geometrically based. Briefly, a 90° angle representing the relationship between two sets of scores indicates that the scores are orthogonal. The smaller the angle becomes, the stronger the observed relationship. In WABA, angles are considered for between versus within etas. The difference between the pair of angles in each case is what is tested. Thus, the larger the angular difference, the more likely that the etas are significantly different. Dansereau, Alutto and Yammarino (1984; p. 170) provide values for the range of 0° , 15° , and more conservative, 30° tests. The complete results of for the analysis of variance between and within groups are presented in Table 15.

Table 15

Within and Between Company Differences (N = 310).

Variable	ICC(1)	ICC(2)	eta ² _{bn}	eta ² _{wn}	E Test	Traditional F Test	Corrected F Test
Task cohesion	.28	.81	.43	.19	.81	6.08***	.19 (ns)
Social cohesion	.26	.80	.42	.18	.83	5.59***	.18 (ns)
ConfPLCom	.25	.81	.42	.18	.83	5.25***	.19 (ns)
ConfCoyCom	.31	.85	.46	.21	.78	6.80***	.15 (ns)
Stress (FS)	.00	.30	.23	.05	.94	1.42 (ns)	.70 (ns)
Strain (FS)	.00	.35	.24	.06	.94	1.54 (ns)	.65 (ns)
Pos Coping	.00	.25	.21	.07	.93	1.54 (ns)	.55 (ns)
Neg Coping	.00	.42	.14	.02	.98	.53 (ns)	1.92 (ns)

Note: 310 soldiers in 13 companies. F values resulted from one-way ANOVAs in which company membership served as the independent variable and study scales served as the dependent variables. (ns) not significant. * $p < .05$. *** $p < .001$. †† = 30° Test. ConfPLCom = Confidence in Platoon Commander, ConfCoyCom = Confidence in Company Commander, Stress (FS) = Stress full scale, Strain (FS) = Strain full scale, Pos Coping = Positive Coping, Neg Coping = Negative Coping.

As shown in the table, ICC (1) results indicate that there is agreement within groups about task cohesion, social cohesion and confidence in leadership issues. Stress, strain, and coping variables show no similar agreement. This makes sense in that stress, strain, and coping items focus on the individual, whereas cohesion and confidence items focus on individual perceptions *in the context of the group*.

Only one variable, Confidence in company commander meets the ICC (2) requirement (.85) that indicates between group differences. For all eight variables the within-groups etas are larger than the between-groups etas. The eta-squared values (equivalent to an R^2 measure) indicate that at least 78% of the variance for each variable is within groups.

The E tests are all *practically* significant (30^0 test), suggesting that the variation within groups is significantly greater than the variation between groups. Four of eight traditional F tests (for Task Cohesion, Morale/social cohesion, Confidence in platoon commander, and Confidence in company) indicate between-groups differences on these variables. However, as indicated by Dansereau, Alutto and Yammarino (1984), the F test should be used as a test of the larger of the two eta correlations. In cases in which the within-groups eta is the larger of the two, as in the present results, a corrected F test is the appropriate indicator of the significance of the within-groups effect. As shown in Table 14, the test is the inverse of the traditional F test. For the present results, none of the corrected F tests is *statistically* (rather than *practically*) significant, suggesting that, although there is much more variability within groups than between groups (as shown by the E test), the variation within groups is about the same in each group.

When all statistics are considered, only the variable confidence in company commander meets all the criteria for group effects. In contrast, the inferences for task cohesion, morale/social cohesion, confidence in platoon commander, stress, strain, and coping are that the results are nongrouped effects. That is, individual differences are more likely than group-based effects for these variables. Upon further consideration of the items and the grouping variable (company), these results seem reasonable. In the UCP, morale and cohesion items are set in the context of the platoon/troop⁴ (e.g., The soldiers in my platoon/troop encourage each other to work together as a team), not the company. As there are 3 platoons in a company, analysis at the company level for between platoon differences is inappropriate. An analogy would be looking for between classroom differences at the school level. Only confidence in company commander items agree with the grouping variable and show differences at this level. Unfortunately, data indicating platoon membership does not exist in the present data set.

Therefore, as the focus of the present study is the effects of variables on the relation between stress and strain (individual level), it was decided that, for consistency in the level of analysis, subsequent analyses would be conducted at the individual (nongrouped) level. That is, data would not be considered at the group (company) level. In particular, for the SEM analysis a single level rather than a multi-level path analysis was indicated. Moreover, analyses at the individual level meant that for tests of statistical significance, alpha would be set at .05 (Stevens, 2002).

⁴ A troop is the armored corps equivalent to an infantry platoon consisting of 30-35 personnel.

Testing of the Overall Model – Hypothesis 1

Stressors will influence directly the levels of strain, individual coping, confidence in leadership, and morale/cohesion reported by soldiers.

Prior to SEM analysis, the complete data set was screened in accordance with the procedures outlined above. A total of 99 univariate and 16 multivariate outliers were identified and removed leaving 1,897 cases for analysis. A review of all the scale descriptive statistics for the full sample (Table 16) revealed characteristics very similar to the random half-split of the sample ($N = 944$). Again, only the “using drugs” factor showed both high skewness (4.53) and kurtosis (21.43) values. This is consistent with the individual item descriptive statistics for the factor analysis of the COPE Inventory (Table 11) and indicates a uniformly low occurrence of these items. For the same reasons outlined in the random half-split analysis, the non-transformed drug use scale was used in the present analysis.

The overall matrix (Table 17) appeared suitable for SEM analysis with all variables but one (“turning to religion”) containing a number of correlations greater than .30. For this complete sample, as was the case for the previous analysis, the highest correlation for the variable “turning to religion” was with “venting emotions” ($r = .29, p < .001$).

Annex B describes the SEM procedure used for this study using the overall model as an example. Briefly, the procedure consists of five steps (Kline, 1997): model specification, model identification, analysis of the model, evaluating model fit, and, model re-specification. With respect to model re-specification, only theoretically relevant changes were made and are discussed in each case. All models were tested using the same

procedure. Evaluating model fit and model re-specification is the focus of the present section.

Table 16

Descriptive Statistics of Scale Scores Derived for Test of Overall Model (N = 1,897).

Items	Mean	Standard Deviation	Kurtosis	Skewness
Stress1	2.74	0.92	-0.67	0.10
Stress2	1.90	0.78	0.32	0.88
Stress3	2.28	1.02	-0.35	-0.67
Stress4	2.30	0.80	-0.35	0.41
Stress5	2.24	0.87	-0.11	0.57
Strain1	1.89	0.63	1.33	1.15
Strain2	1.11	0.32	6.38	2.22
Strain3	1.38	0.40	1.17	0.92
Strain4	1.51	0.43	11.51	2.80
COPE1	2.75	0.60	0.15	-0.27
COPE2	1.38	0.45	2.38	1.44
COPE3	1.59	0.78	1.10	1.37
COPE4	2.49	0.45	-0.43	0.08
COPE5	2.85	0.61	-0.13	-0.22
COPE6	1.84	0.63	0.80	0.83
COPE7	2.69	0.63	-0.08	-0.25
COPE8	1.30	0.57	6.97	2.50
COPE9	2.23	0.76	-0.02	0.30
COPE10	1.09	0.33	21.43	4.53
COPE11	1.60	0.50	-2.32	0.31
Taskco	3.73	0.70	0.18	-0.43
Socialco	3.61	0.70	-0.29	-0.35
Confplco	3.50	1.04	0.01	-0.60
Confcoyc	3.52	0.97	0.32	-0.54

Note: Stress 1 = career issues, Stress 2 = combat stress, Stress 3 = family concerns, Stress 4 = work environment, Stress 5 = living conditions, Strain 1 = depression, Strain 2 = hyper alertness, Strain 3 = somatic complaints, Strain 4 = generalized anxiety, COPE 1 = problem focused1, COPE2 = denial, COPE3 = turning to religion, COPE 4 = seeking social support, COPE 5 = acceptance, COPE 6 = venting emotions, COPE7 = problem focused2, COPE8 = using alcohol, COPE9 = restraint coping, COPE 10 = using drugs, COPE11 = mental disengagement, Taskco = task cohesion, Socialco = social cohesion, Confplco = confidence in platoon commander, Confcoyc = confidence in company commander.

Table 17

Overall Model Correlation Matrix (N = 1,897).

Scale	Conf Plco	Conf Coyc	Stress1	Stress2	Stress3	Stress4	Stress5	Strain1	Strain2	Strain3	Strain4	COPE1	COPE2	COPE3	COPE4
Confplco	1.00														
Confcoyc	.40***	1.00													
Stress1	-.20***	-.15***	1.00												
Stress2	.01	-.03	.36***	1.00											
Stress3	-.08*	-.08*	.44***	.41***	1.00										
Stress4	-.27***	-.19***	.70***	.37***	.47***	1.00									
Stress5	-.16***	-.10**	.62***	.53***	.52***	.60***	1.00								
Strain1	-.13***	-.06*	.31***	.29***	.29***	.37***	.43***	1.00							
Strain2	-.08*	-.05	.24***	.32***	.20***	.27***	.39***	.43***	1.00						
Strain3	-.04	.00	.27***	.25***	.21***	.26***	.32***	.55***	.53***	1.00					
Strain4	-.09***	-.07*	.16***	.24***	.17***	.24***	.29***	.63***	.56***	.45***	1.00				
COPE1	.11**	.06	.00	.06	-.04	-.07*	-.02	-.03	-.02	-.02	-.01	1.00			
COPE2	-.04	-.05	.10**	.21***	.14***	.19***	.22***	.21***	.27***	.16***	.27***	.06	1.00		
COPE3	.06*	.12***	.00	.14***	.06*	.03	.04	.04	.05	.08*	.10**	.20***	.21***	1.00	
COPE4	.12***	.11**	-.02	.10**	.03	-.03	.06	-.03	.03	.01	-.01	.58***	.07*	.24***	1.00

Scale	Conf Plco	Conf Coyc	Stress1	Stress2	Stress3	Stress4	Stress5	Strain1	Strain2	Strain3	Strain4	COPE1	COPE2	COPE3	COPE4
COPE5	.17***	.10**	-.01	-.02	-.06	-.06	-.07*	-.02	.00	.03	-.02	.63***	.04	.22***	.53***
COPE6	.06*	.01	.18***	.21***	.14***	.19***	.20***	.25***	.27***	.22***	.23***	.23***	.26***	.29***	.43***
COPE7	.09**	.08*	.05	.02	-.02	.00	.01	.01	.04	-.03	.00	.60***	.05	.19***	.54***
COPE8	-.13***	-.05	.13***	.09**	.09**	.17***	.15***	.30***	.32***	.25***	.28***	-.17***	.34***	.03	-.05
COPE9	.02	.00	.09**	.04	.02	.11**	.07*	.06	.10**	.04	.08*	.42***	.18***	.11**	.38***
COPE10	-.09**	-.10**	.09**	.20***	.10**	.15***	.14***	.23***	.38***	.24***	.40***	-.08*	.44***	.15***	-.09**
COPE11	-.01	-.01	.14***	.14***	.14***	.19***	.20***	.31***	.24***	.26***	.24***	.07*	.35***	.12***	.22***
Taskco	.40***	.32***	-.25***	-.05	-.11**	-.34***	-.15***	-.19***	-.11***	-.12***	-.10**	.11**	-.03	.02	.12***
Socialco	.54***	.34***	-.30***	-.02	-.16***	-.44***	-.22***	-.30***	-.17***	-.18***	-.19***	.19***	-.08*	.05	.15***

Note: Confplco = confidence in platoon commander, Confcoyc = confidence in company commander, Stress 1 = career issues, Stress 2 = combat stress, Stress 3 = family concerns, Stress 4 = work environment, Stress 5 = living conditions, Strain 1 = depression, Strain 2 = hyper alertness, Strain 3 = somatic complaints, Strain 4 = generalized anxiety, COPE 1 = problem focused1, COPE2 = denial, COPE3 = turning to religion, COPE 4 = seeking social support, COPE 5 = acceptance, COPE 6 = venting emotions, COPE7 = problem focused2, COPE8 = using alcohol, COPE9 = restraint coping, COPE 10 = using drugs, COPE11 = mental disengagement, Taskco = task cohesion, Socialco = social cohesion. * $p < .05$. ** $p < .01$. *** $p < .001$.

Scale	COPE5	COPE6	COPE7	COPE8	COPE9	COPE10	COPE11	Taskco	Socialco
COPE5	1.00								
COPE6	.22***	1.00							
COPE7	.54***	.17***	1.00						
COPE8	-.05	.19***	-.02	1.00					
COPE9	.35***	.14***	.50***	.05	1.00				
COPE10	-.10**	.22***	-.07*	.38***	.08*	1.00			
COPE11	.24**	.33***	.11***	.30***	.15***	.15***	1.00		
Taskco	.11**	-.01	.06	-.03	.03	-.07*	-.07*	1.00	
Socialco	.18***	.01	.16***	-.18***	.03	-.13***	-.11**	.74***	1.00

Note: Confplco = confidence in platoon commander, Confcoyc = confidence in company commander, Stress 1 = career issues, Stress 2 = combat stress, Stress 3 = family concerns, Stress 4 = work environment, Stress 5 = living conditions, Strain 1 = depression, Strain 2 = hyper alertness, Strain 3 = somatic complaints, Strain 4 = generalized anxiety, COPE 1 = problem focused1, COPE2 = denial, COPE3 = turning to religion, COPE 4 = seeking social support, COPE 5 = acceptance, COPE 6 = venting emotions, COPE7 = problem focused2, COPE8 = using alcohol, COPE9 = restraint coping, COPE 10 = using drugs, COPE11 = mental disengagement, Taskco = task cohesion, Socialco = social cohesion. * $p < .05$. ** $p < .01$. *** $p < .001$.

Goodness of fit indices for the overall model and improvements as well as optimal values can be seen in Table 18.

Table 18

Goodness of Fit Indices for Overall Model (N = 1,897).

	X^2	X^2/df	GFI	AGFI	NFI	NNFI	RMSR
Optimal fit		<3	>.90	>.90	>.90	>.90	<.10
Model 1	3264.77	13.44	.86	.81	.77	.75	.09
Model 2	2677.98	7.92	.88	.86	.88	.88	.08
Model 3	2053.74	6.22	.91	.90	.91	.91	.05

Note: X^2 = Chi-square. df = degrees of freedom. GFI = Goodness of fit. Adjusted Goodness of fit. NFI = Normed fit index. NNFI = Non-normed fit index. RMSR = Root mean square residual.

As can be seen in Table 18, Model 1 (Figure 2) did not provide an adequate fit to the data. Of particular concern was the observed relation between confidence in leadership and strain. Although the correlational analyses indicated negative relations between confidence in leader components and strain, when combined into one factor the SEM analysis indicated a positive relation. That is, the standardized regression coefficient of .19 between confidence in leadership and strain indicated that strain would increase .19 of a standard deviation for a full standard deviation increase in confidence in leadership. A careful examination of the data indicated that scale scores were entered in the analysis correctly.

As confidence in platoon commander and confidence in company commander are ratings at different organizational levels, it might be that treating them similarly (i.e., in

the same factor) is not appropriate. Therefore, it was decided to decompose the confidence in leadership factor into its components and re-analyze the model.

Figure 2

Overall Model 1 (N = 1,897).

Note: * $p < .05$.

When Model 1 was re-analyzed with these new components, the separate paths from confidence in platoon commander and confidence in company commander to strain were not significant and were removed. In addition to the decomposition of confidence

in leadership to individual components, the Wald W Test indicated that paths from stress to positive coping and from positive coping to strain be dropped, that is, they were not significant. The LM test indicated that further reductions in X^2 values could be achieved by adding a path from positive coping to Cope 9 (restraint coping). As restraint coping can be seen to be beneficial in some instances, the path was added. The results of this analysis can be seen in Table 18 Model 2 and Figure 3. Although these fit indices suggested a better fit to the data, model re-specification was again indicated.

Figure 3

Overall Model 1 – Simplified (N = 1,897).

Note: Disrupted line indicates path from Positive Coping to the indicator COPE 9 (Restraint coping) of Negative Coping only. * $p < .05$

Theoretically relevant improvements suggested from the analysis of Model 2 included adding paths from positive coping to COPE 3 (turning to religion), confidence in platoon commander, confidence in company commander and morale/cohesion. According to Carver et al. (1989), turning to religion could be seen as either positive or negative depending on whether or not individuals use the strategy as an active tactic to deal with the stressor. For example, if individuals use religion for positive reinterpretation and growth that, in turn, addresses a stressor, then the strategy can be seen as positive. Therefore, adding a path from positive coping to turning to religion makes sense.

Adding paths from positive coping to confidence in platoon commander and confidence in company commander also make sense especially because the seeking social support variable (COPE 4) consists of items that lend themselves to seeking advice from superiors (e.g., "I talk to someone who could do something concrete about my situation", "I try to get advice from someone about what to do"). This is further supported by the significant correlations between seeking social support and confidence in platoon commander ($r = .12, p < .001$) and confidence in company commander ($r = .11, p < .01$).

Interestingly, a path from negative coping to COPE 4 (seeking social support) was indicated. As seeking social support items for emotional reasons (e.g., "I seek understanding from someone") and instrumental reasons (e.g., "I talk to someone who could do something concrete about the situation") factored together in this study, it might be that negative coping is predicting the "emotional" side of the social support seeking

variable. Finally, paths from confidence in platoon commander and morale/cohesion to Stress 4 (work environment) were also indicated. It makes sense that work stress decreases as confidence in platoon commander and morale/cohesion increases. The final model (Model 3, Figure 4; Figure C-1 in Appendix C) includes these improvements and provides a much better fit to the data.

In summary, the overall model (Figure C-1) suggests important relations among components. First, there are direct, positive relations between stress and strain, and negative coping and strain. Negative coping increases as stress increases although there is no direct relation between stress and positive coping. Stress also has direct and negative effects on confidence in platoon commander, confidence in company commander and morale/cohesion. Stress directly influenced the levels of strain, negative coping, confidence in leadership, and morale/cohesion, but did not directly affect positive coping; therefore, *Hypothesis 1 received only partial support.*

Positive coping has positive effects on confidence in platoon commander, confidence in company commander and morale/cohesion but does not affect strain directly. Similarly, confidence in platoon commander and confidence in company commander have direct positive effects on morale/cohesion. Morale/cohesion appears to play an important mediating role between positive coping, confidence in platoon commander, confidence in company commander and strain. Mediating coefficients can be calculated by multiplying the direct path coefficients of interest. For example, the effect of confidence in platoon commander on strain can be calculated by multiplying its coefficient to Morale/cohesion with the Morale/cohesion coefficient to strain ($.46 \times -.17$

= -.08). Therefore, strain *decreases* .08 of a standard deviation for every full standard deviation *increase* in confidence in platoon commander through its relation to Morale/cohesion. Figure 4 is a simplified version of the overall model (3).

Figure 4

Overall Model 3 – Simplified ($N = 1,897$).

Note: Complete model can be seen at Figure C-1. * $p < .05$.

Examination of Moderators – Hypotheses 2-6

The testing of moderating effects relied primarily on the regression approach. However, for comparison purposes, two SEM techniques were used to examine the hypothesized moderating effects on the relation between stress and strain.

Specifically, the separate model approach was used to test the moderating effect of rank on the relations between stress and strain (Hypothesis 2). This question asks whether morale/cohesion has similar relations to stress and strain for officers and soldiers. Similarly, the separate model approach was used to test the change in moderating effect of time within the same tour of duty on the relations between stress, strain, morale/cohesion and confidence in leadership (Hypothesis 3). The Multiple Group Analysis (MGA) approach was used to test the moderating effect of positive coping style and negative coping style (Hypothesis 4).

Finally, hierarchical regression analyses were used to test the direct and moderating effects of coping style, morale/cohesion, and confidence in leadership on the relation between stress and strain (Hypotheses 4-6). As SEM and regression approaches have been used to study moderation, both the MGA and hierarchical regression techniques were used to examine Hypothesis 4 for comparison purposes. The results of both approaches are compared and their respective merits and limitations are considered in the Discussion. Definitions and procedures for testing moderators using regression and SEM are provided in Appendix B.

Separate SEM Approach – Hypothesis 2

Rank will moderate the relation between stress and strain. Specifically, morale/cohesion will not play an effective role in the relation between stress on strain for officers.

For the first separate model approach, the entire data set was split into two subsets, officers and soldiers. Officers (lieutenants, captains and majors) serving in headquarters and field positions in the Bosnia theatre formed the officer group. As there are only 40 officers in each Battle Group of approximately 700 soldiers, officer sample sizes are usually low compared to soldiers. Officers were in supervisory or subordinate roles with respect to their ratings of confidence in platoon commanders and company commanders and, therefore, did not rate themselves. For the soldier group, privates only were used in this analysis due to their rank differential with officers and sample size.

The overall model identified above (Figure 4) served as the comparison model; that is, this model was applied to both groups. The two data sets were screened in accordance with the procedures outlined above. For officers ($N = 140$), skewness and kurtosis values were in the normal range with the exception of COPE 8 (Using alcohol; 3.78, 16.88) and COPE 10 (Using drugs; 8.76, 26.62). Together with low mean scores for both scales, these values indicated uniformly low occurrence for this group. For reasons discussed earlier, these variables were retained for the analysis. One multivariate and three univariate outliers were identified and removed leaving 136 cases for analysis.

For soldiers ($N = 328$) skewness and kurtosis levels were in the acceptable range with the exception of Strain 4 (Generalized anxiety, 3.05, 15.42) and COPE 10 (Using drugs, 4.20, 17.86). Similar to the officer data, both mean scores were low and these

variables were retained for analysis. Four multivariate and 22 univariate outliers were identified and removed leaving 302 cases for analysis.

The results of the separate analyses can be seen in Table 19 below.

Table 19

Separate Model Approach Results: Officers (N = 135) and Soldiers (N = 302).

	X^2	X^2/df	GFI	AGFI	NFI	NNFI	RMSR
Optimal fit		<3	>.90	>.90	>.90	>.90	<.10
O Model 1	585.43	1.74	.77	.72	.80	.89	.09
O Model 2	481.50	1.46	.81	.76	.83	.93	.08
S Model 1	949.69	2.82	.82	.79	.81	.85	.09
S Model 2	910.99	2.69	.83	.80	.82	.86	.09

Note: X^2 = Chi-square. df = degrees of freedom. GFI = Goodness of fit. Adjusted Goodness of fit. NFI = Normed fit index. NNFI = Non-normed fit index. RMSR = Root mean square residual. O = officer. S = soldier.

As can be seen in Table 19, the overall model does not provide a good fit to either group, even after improvements were made. This might be expected due to the distinctive nature of these sub-groups especially with respect to role differences in the organization. However, an inspection and comparison of unstandardized estimates for each initial solution is revealing. For officers (Figure 5), and in contrast to the overall model, non-significant relations are evident from positive coping to morale/cohesion and confidence in company commander. Moreover, non-significant relations are evident from stress to morale/cohesion and from morale/cohesion to strain. A complete view of the model with standardized estimates can be seen in Figure C-2.

Figure 5

Separate Model Approach – Unstandardized Officer Model 1 (N = 135).

Note: * $p < .05$

Similar to officers, the soldier model (Figure 6) indicates non significant relations from positive coping to morale/cohesion and confidence in company commander. Unlike the officer model however, and similar to the overall model, the soldier model indicates significant negative relations between stress and morale/cohesion and morale/cohesion and strain. The standardized version of the model can be seen in Figure C-3.

Figure 6

Separate Model Approach – Unstandardized NCM Model 1 (N = 302).

Note: * $p < .05$

The inference from this analysis is that morale/cohesion has different relations between stress and strain for officers and soldiers; that is, rank moderates the relation between stress and strain. *Therefore, Hypothesis 2 is supported.* Specifically, morale/cohesion does not appear to play a role in the relation between stress and strain for officers.

Separate Model Approach – Hypothesis 3

Time will moderate the relation between stress, strain, morale/cohesion and confidence in leadership. Specifically, the relations between these variables will become weaker over time within the same tour of duty.

For the test of Hypothesis 3, data were split across one rotation in-theatre ($N = 718$) into two sub-groups; early and late administration groups. A third sub-group (mid-tour, $N = 449$) was not used in the analysis. Each data sub-set was screened in accordance with the procedures outlined above and submitted for SEM analysis. For the early administration group (data collected after 6 weeks in-theatre, $N = 219$), skewness and kurtosis values were in the normal range. Three multivariate and 11 univariate outliers were identified and removed leaving 205 cases for analysis.

For the late administration group (data collected after 5 months in-theatre, $N = 230$) skewness and kurtosis levels were in the acceptable range with the exception of COPE 10 (Using drugs, 5.41, 31.71). Although the mean scores for COPE 10 were low for each group (early group = 2.01; late group = 2.07) the late administration group value was slightly higher. One multivariate and seven univariate outliers were identified and removed leaving 302 cases for analysis.

The results of the separate analyses can be seen in Table 20 below.

Table 20

Separate Model Approach Results: Early Administration (N = 205) and Late Administration (N = 222) Groups.

	X^2	X^2/df	GFI	AGFI	NFI	NNFI	RMSR
Optimal fit		<3	>.90	>.90	>.90	>.90	<.10
E Model 1	662.51	1.97	.83	.79	.77	.85	.09
E Model 2	408.62	1.82	.86	.83	.82	.91	.07
L Model 1	686.56	2.02	.83	.79	.80	.88	.09
L Model 2	663.76	1.97	.83	.80	.81	.88	.08

Note: X^2 = Chi-square. df = degrees of freedom. GFI = Goodness of fit. Adjusted Goodness of fit. NFI = Normed fit index. NNFI = Non-normed fit index. RMSR = Root mean square residual. E = Early administration group. L = Late administration group.

As can be seen in Table 20, and similar to the previous analysis, the overall model does not provide a good fit either group, even after improvements were made. In fact, a unique solution for the late administration group could not be achieved using this model. That is, the model would not converge after the program conducted the maximum allowed number of iterations.

A review of improvement statistics indicated that a path from confidence in platoon commander to stress 4 (work environment) and the deletion of the path from positive coping to confidence in company commander might improve the situation. With these initial changes, a solution (L Model 1) was achieved. Again, lack of fit might be due to the application of a general model to fairly distinct groups. That is, the overall model is a blend of responses over all time periods and, although similar in terms of personnel, these groups differ in terms of experiences (time in-theatre).

Again, however, an inspection and comparison of unstandardized estimates for each initial solution reveals important differences between groups. Recall that skewness and kurtosis values for COPE 10 (using drugs) were high for the late administration group but normal for the early group. Interestingly, the SEM analysis (see Figure C-4, Appendix C) indicated COPE 10 was not a significant indicator of negative coping ($\beta = .12$ ns) for the early group but became important for the late group (Figure C-5, Appendix C; $\beta = .50$, $p < .05$).

For the early administration group (Figure 7), and in contrast to the overall model, non-significant relations are evident from stress to confidence in company commander and from positive coping to morale/cohesion, confidence in platoon commander and confidence in company commander. That is, early in the tour positive coping strategies appear to have little influence on confidence in leadership or morale/cohesion.

Figure 7

Separate Model Approach – Unstandardized Early Administration 1 (N = 205).

Note: * $p < .05$

Similar to the early group, the late administration model (Figure 8) indicates non-significant relations from stress to confidence in leadership. Unlike the early group however, and similar to the overall model, the late administration model indicates significant positive relations from positive coping to confidence in platoon commander and morale/cohesion.

Figure 8

Separate Model Approach – Unstandardized Late Administration Model 1 (N = 222).

Note: * $p < .05$

Inferences that can be drawn from this analysis are that, although the relations between stress, strain, confidence in platoon commander and morale/cohesion remain significant across time (i.e., *Hypothesis 3 is not supported*), over time, the relations between positive coping, confidence in leadership and morale/cohesion appear to change. Early in the tour, positive coping strategies do not appear to be important in perceptions of confidence in leadership and morale/cohesion. This appears to change later in the tour when positive coping strategies become important in predicting confidence in platoon

commander and morale/cohesion and, through these variables, work environment stress and strain. In fact, at this point in the tour, confidence in platoon commander can be seen to have a direct relation to work environment stress ($\beta = -.26, p < .05$; Figure C-5) such that work stress decreases as confidence in platoon commander increases. This makes sense in that, as time goes on, respondents have a greater number of opportunities to develop confidence in their platoon commander.

Although stress as measured in the present model does not predict positive coping (i.e., positive coping is an exogenous variable), other chronic stressors or personality characteristics outside the model might be stimulating positive coping as these issues become more salient over time. Therefore, although Hypothesis 3 was not supported in this analysis, other important relations between positive coping, confidence in platoon commander and morale/cohesion were revealed and merit further research attention.

Multiple Group Analysis Approach – Hypothesis 4

Individual coping style will moderate the relationship between stressors experienced by soldiers in operations and strain such that positive coping styles will reduce strain.

For the MGA, the entire data set was split into two sub-sets, high positive coping and high negative coping. First, based on the breakdown of coping strategies into positive and negative components (Table 13), a positive coping score and negative coping score were computed for each respondent by summing the appropriate variable scores. Then, respondents were selected into the positive coping group who scored at least one standard deviation ($SD = 15.46$) above the mean ($M = 80.57$) for positive coping ($N = 282$). Similarly, respondents were selected into the negative coping group who scored at least one standard deviation ($SD = 7.64$) above the mean ($M = 36.24$) for

negative coping ($N = 308$). Each data set was then screened in accordance with the procedures outlined above. For the positive coping group, skewness and kurtosis values were in the normal range with the exception of Strain4 (generalized anxiety; 3.36, 15.91) and Cope 10 (using drugs; 5.89, 37.09). Low mean scores for these variables, as is the case for the overall sample, indicated a low occurrence for these items. Six univariate outliers were identified and removed leaving 276 cases for analysis in the positive coping group.

For the negative coping group, all skewness and kurtosis levels were in the normal range. Four univariate outliers were identified and removed leaving 304 cases for analysis in the negative coping group. No cases appeared in both positive and negative coping groups after outliers were removed. These data sets were then submitted for MGA analysis (see Appendix B for a discussion of the MGA procedure). The results from the MGA analysis can be seen in Table 21.

Table 21

Multiple Group Analysis Results: Positive Coping (N = 276) and Negative Coping (N = 304) Groups.

	X^2	X^2/df	GFI	AGFI	NFI	NNFI	RMSR
Optimal fit		<3	>.90	>.90	>.90	>.90	<.10
Ind Model	9085.54	12.02	-	-	-	-	-
Model 1	2658.52	3.61	.76	.74	.71	.76	.18
Model 2	2394.68	3.29	.78	.75	.74	.80	.13
Model 3	2074.88	2.87	.80	.75	.77	.83	.09

Note: X^2 = Chi-square. df = degrees of freedom. GFI = Goodness of fit. Adjusted Goodness of fit. NFI = Normed fit index. NNFI = Non-normed fit index. RMSR = Root mean square residual. Ind Model = Independence model. Degrees of freedom in MGA are calculated by summing across groups.

The MGA for positive coping and negative coping groups did not provide a good fit to the data although the removal of constraints did improve the situation. Most importantly, the identification of constraints to be removed indicated moderating effects of coping. Specifically, the LM tests for Model 1 (all constraints imposed) indicated that the model could be improved by releasing the constraints between the several indicators and latent variables including strain and generalized anxiety ($X^2 = 20.15, p < .001$), strain and depression ($X^2 = 5.27, p < .05$), strain and hyper-alertness ($X^2 = 9.92, p < .01$), positive coping and problem focused coping1 ($X^2 = 4.44, p < .05$), and negative coping and using drugs ($X^2 = 37.84, p < .001$).

In addition, the results indicated several constraints between latent variables should also be released. These were stress and strain ($X^2 = 15.05, p < .001$), stress and negative coping ($X^2 = 25.47, p < .001$), positive coping and confidence in platoon commander ($X^2 = 27.20, p < .001$), confidence in company commander ($X^2 = 23.65, p < .001$) and morale/cohesion ($X^2 = 24.65, p < .001$). Finally, releasing the constraints between confidence in platoon commander and confidence in company commander ($X^2 = 22.51, p < .001$) and confidence in platoon commander and morale/cohesion ($X^2 = 23.74, p < .001$) was also suggested.

According to this analysis then, the two models measured several indicators and, in turn, latent variables differently. That is, group membership moderated the relation between these variables. A review of the mean scores for each variable showed that coping moderated the relation among these variables such that, compared to negative copers, those with high positive coping scores had lower strain ($M = 1.43$ vs. $M = 1.65$) and negative coping ($M = 1.91$ vs. $M = 2.71$), and higher confidence in platoon commander ($M = 3.75$ vs. $M = 3.40$), company commander ($M = 3.79$ vs. $M = 3.31$), task cohesion ($M = 3.88$ vs. $M = 3.65$) and social cohesion ($M = 3.84$, vs. $M = 3.52$).

The run of the second model indicated further improvement could be achieved by releasing the constraints between negative coping and the indicators using alcohol ($X^2 = 7.96, p < .001$) and mental disengagement ($X^2 = 26.85, p < .001$). The interpretation of this improvement is that coping moderates the relation between these variables such that those with high negative coping scores tend to use alcohol ($M = 1.75$) and mental disengagement ($M = 1.03$) more often than do those who use positive coping strategies

($M = 1.25$ and $M = .87$ respectively). Figure 9 is an overall view of Model 3 (Table 22).

Disrupted lines in the Figure 9 indicate the variables measured differently for positive and negative coping groups.

Figure 9

Multiple Group Analysis: Positive coping ($N = 276$) and Negative coping ($N = 304$) Groups.

Note: Disrupted lines indicate released constraints (i.e., measurement invariance between groups).

In summary then, according to the MGA coping style appears to moderate the relationship between stressors experienced by soldiers in operations and strain such that positive coping styles tend to reduce strain. *Therefore, Hypothesis 4 is supported.* Moreover, coping also appears to moderate the relations between several other variables including confidence in leadership and morale/cohesion. As will be seen in the regression analyses, the moderating effects of coping on the relation between stress and strain were confirmed.

Hierarchical Regression Approach – Hypotheses 4-6

4. *Individual coping style will moderate the relationship between stressors experienced by soldiers in operations and strain such that positive coping styles will reduce strain;*
5. *Morale/cohesion will moderate the relationship between stressors experienced by soldiers in operations and strain such that high levels of morale/cohesion will reduce strain; and,*
6. *Confidence in leadership will moderate the relationship between stressors experienced by soldiers in operations and strain such that high levels of confidence will reduce strain.*

Hierarchical regression analyses were used to test the direct and moderating effects of coping style, morale/cohesion, and confidence in leadership on the relation between stress and strain (Hypotheses 4-6). Gender, age, rank, operational experience and marital status were entered on the first step. That is, strain was regressed on these biographical variables first.

Working with the same data set that was used in the test of the overall model ($N = 1,897$), and following Day and Livingstone (2001) and Dobрева-Martinova et al. (2002),

first order variables were standardized, and the interaction terms were calculated using these standardized cross-products to avoid problems with scale invariance and multicollinearity (Neter, Wasserman, & Kutner, 1989). Thus, strain was regressed on stress, task cohesion, social cohesion, confidence in platoon commander, confidence in company commander, positive coping and negative coping on the second step.

Strain was then regressed on each of the possible two-way interactions on the third step (stressors X morale/cohesion, stressors X confidence in leadership, stressors X coping style, morale/cohesion X confidence in leadership, morale/cohesion X coping style and confidence in leadership X coping style). Three-way and higher interactions were not necessary to test the relevant hypotheses and were not examined.

As can be seen in Table 22 below, in step one the biographical variables jointly accounted for a low but significant proportion of the variance ($R^2 = .01, p < .01$) in strain. Of these variables, only operational experience ($\beta = .08, p < .01$) and age ($\beta = .07, p < .05$) uniquely predicted strain. In step two, the main variables jointly accounted for a large proportion of the variance ($R^2 = .32, p < .001$).

Stress, of course, was the strongest predictor of strain ($\beta = .45, p < .001$). All other variables, with the exception of Positive Coping ($\beta = .02, ns$), uniquely predicted strain. Finally, on the last step, the interaction terms jointly accounted for a low but significant proportion of the variance ($R^2 = .02, p < .01$) in strain. Of these interaction terms, Stress X Confidence in Company Commander ($\beta = .01, ns$) and Stress X Confidence in Platoon Commander were not significant ($\beta = .02, ns$). The total proportion of variance in strain accounted for by this solution was 34%.

From this analysis it can be seen that both Task Cohesion ($\beta = -.08, p < .001$) and Social Cohesion ($\beta = -.10, p < .001$) moderate the effects of stress on strain. *Therefore, Hypothesis 5 is supported.* Although confidence in platoon commander and company commander showed mediating effects in previous analyses, they did not appear to moderate the relation between stress and strain. *Therefore, Hypothesis 6 is not supported.* Finally, the finding from the MGA that coping moderates the relation between stress and strain was confirmed in the regression analysis (*Hypothesis 4 supported*). Specifically, Negative Coping interacts with stress in such a way that strain increases more ($\beta = .12, p < .001$) than when Positive Coping interacts with stress ($\beta = .04, p < .05$).

Table 22

Results from Hierarchical Regression Analyses (N = 1,897).

Variable	β	R ² change	Total R ²
<u>Step 1</u>			
		.010**	.010**
Rank	.03		
Sex	.04		
Mstat	-.01		
Op Exp	.08**		
Age	.07*		
<u>Step 2</u>			
		.306***	.316***
Stress F	.45***		
Task Coh	-.10***		
Social Coh	-.19***		
Conf Pl	.08**		
Conf Coy	.07**		
Pos Coping	.02		
Neg Coping	.29***		
<u>Step 3</u>			
		.023**	.339***
Stress X Task Coh	-.08**		
Stress X Social Coh	-.10***		
Stress X Conf Pl	.02		
Stress X Conf Coy	.01		
Stress X Pos Coping	.04*		
Stress X Neg Coping	.12***		

Note: Mstat = Marital status. Op Exp = Operational experience. Stress F = Stress Full Scale. Task Coh = Task Cohesion. Social Coh = Social Cohesion. Conf Pl = Confidence in Platoon Commander. Conf Coy = Confidence in Company Commander. Pos Coping = Positive Coping. Neg Coping = Negative Coping.

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

Summary of Moderators

The inferences that can be drawn from the SEM and regression approaches to moderators are that:

a. Morale/cohesion has different relations between stress and strain for officers and soldiers; that is, *rank moderates the relation between stress and strain*. Specifically, and as predicted in Hypothesis 2, morale/cohesion does not appear to play a role in the relation between stress and strain for officers;

b. Hypothesis 3 was not supported. That is, *the relations between stress, strain, confidence in platoon commander and morale/cohesion remain significant across time*. However, over time, the relations between positive coping, confidence in leadership and morale/cohesion appear to change. Early in the tour, positive coping strategies do not appear to be important in perceptions of confidence in leadership and morale/cohesion. This appears to change later in the tour when positive coping strategies become important in predicting confidence in platoon commander and morale/cohesion and, through these variables, work environment stress and strain;

c. Consistent with Hypothesis 4, *coping style appears to moderate the relationship between stressors experienced by soldiers in operations and strain such that positive coping styles tend to reduce strain*. Moreover, coping also appears to moderate the relations between several other variables including confidence in leadership and morale/cohesion. The moderating effects of coping were confirmed in the regression analysis;

d. As predicted in Hypothesis 5, *morale/ cohesion (task cohesion and social cohesion) also appear to moderate the relation between stress and strain* such that high levels of task and social cohesion reduce strain; and,

e. *Confidence in company commander and confidence in platoon commander do not appear to moderate the relation between stress and strain.* Therefore, Hypothesis 6 was not supported.

Discussion

The purpose of this study was twofold. First, and most importantly, this study was designed to contribute further to the occupational stress literature by testing a model of unit climate and stress experienced by Canadian soldiers on operations. Second, the psychometric properties of the UCP and associated scales were confirmed. As P-E fit and transactional approaches to occupational stress were seen as complementary, both contributed to the conceptual framework of the study by taking into account the characteristics of a soldier's job and his or her interpretation of work-related stress. Using this framework, connections between soldiers' perceptions of stress, strain, social support (confidence in leadership and cohesion), and coping strategies were explored. Of particular importance to the stress literature, this study points out the utility of conducting military stress research in an active theatre of operations and, in addition, identifies the major role social cohesion plays in the amelioration of strain in this unique environment.

More specifically, it was found that social support in the form of task cohesion and social cohesion had buffering effects on the relation between stress and strain. Similar to previous research, negative coping strategies were found to exacerbate the relation between stress and strain and positive coping strategies were shown to have little direct effect on strain. However, unlike previous research, positive coping strategies were shown to interact with stress, providing a buffering effect on strain. Moreover, positive coping strategies were found to have indirect effects on strain through their relations to morale/cohesion and confidence in leadership. Although social support in the form of confidence in leadership was not found to moderate or buffer the relation

between stress and strain, confidence in platoon commander and confidence in company commander were shown to have indirect (mediating) effects on strain through their relations to morale/cohesion.

In addition to the major findings of the study, the psychometric properties of the UCP and associated scales were examined. Briefly, the SMSQ, Signs Scale and UCP were found to have similar factor structures to previous studies. However, a factor analysis of the items in the morale/cohesion revealed two clear factors that were labelled task and social cohesion. Like previous research with Bosnia data, the COPE Inventory produced an 11 versus 13-factor structure which emphasized the importance of problem focused strategies in this unique environment.

In the next section, each of the study findings will be discussed in detail and integrated into the literature, and suggestions for future research will be presented. A comparison of the regression and SEM approaches to moderators will then be presented. Finally, the discussion will close with a consideration of study limitations and concluding remarks.

Hypothesis 1 was Partially Supported

"Further, bear in mind that 'all models are wrong, but some are useful'" (G. E. P. Box; cf.

Pedhazur, 1997, p. 769).

Consistent with both the transactional and P-E fit approaches to stress, the model proposed in the present study predicted positive relations between stress and strain. In addition, previous UCP research found strong linear relations between stress and strain (Dobrevva-Martinova, 1998a) and significant negative correlations between unit climate

dimensions (morale/cohesion and confidence in leadership) and both stress and strain (Izzo et al., 2000). Given the presumed highly stressful nature of operations, it was also predicted that stress would predict positive and negative coping. All elements of this hypothesis were supported except one: Stress did not directly influence positive coping.

With respect to the direct effects of stress on strain, morale/cohesion, confidence in leadership, and negative coping, the model showed significant path coefficients among these variables in theoretically predicted directions. While supporting stress theory, these findings also confirm the utility and validity of the measures used in the study. Although more research will be required to confirm these results with other groups in different locations, these findings go some way in demonstrating the validity of the measures used. Importantly, the general support for the model lends evidence to the argument that military stress research might best be conducted in an active theatre of operations.

Interestingly, although stress did not directly influence positive coping, this was the first sign in the analysis that positive coping might play a moderating rather than mediating role in the relation between stress and strain. More specifically, rather than stress alerting the individual to engage in positive coping strategies, positive coping might be independent of stress and the relationship between stress and strain might differ depending on the level of positive coping the individual utilized. In fact, a review of the correlation matrix (Table 12) indicated that there were zero correlations between all positive coping components to *both* stress and strain.

This particular finding does not appear to be consistent with coping research conducted in other settings and underscores again the importance of conducting military

stress research in operational environments. For example, although Day and Livingstone (2001) found zero correlations between positive coping strategies (e.g., problem-focused and seeking support) and health outcomes (strain), positive coping was correlated with most stressor variables. Recall that these researchers did not find a moderating effect of positive coping on the relation between stress and strain in their sample of soldiers in non-operational settings. In another study designed to examine the relations between affective personality and emotional social support for office workers, Zellars and Perrewé (2001) found significant negative correlations between positive social support and both stress and strain measures indicating mediating rather than moderating effects.

The relation of a moderating variable to both the predictor and criterion (dependent) variable has been a topic of debate for many years. For example, according to Zedeck (1971), a moderator variable “is uncorrelated with both the predictor and the criterion” (p. 305). However, other researchers have suggested that it is only “desirable that the moderator variable be uncorrelated with both the predictor and the criterion ... to provide a clearly interpretable interaction term” (Baron & Kenny, 1986, p. 1174). Still others have suggested that the determinant of whether a moderator has zero correlations with the predictor and criterion depends on the nature (disordinal or ordinal) of the interaction (Stone, 1988). Although there is some lack of consensus with respect to the meaning of correlations in the moderator model, subsequent analyses in the present study did indicate that positive coping indeed appeared to play a uniquely moderating role in the relation between stress and strain. In contrast, task and social cohesion correlated strongly with both stressors and strain (see Table 17) but were found to mediate *and*

moderate the relation between these variables. This dual role for cohesion variables will be discussed in later section.

Although the test of Hypothesis 1 indicated that the instruments were useful for examining stress and strain while on operations in Bosnia, future research should focus on the generalizability of the instruments to other operational settings. In particular, as stressors are different in each setting, the stress measure may have to be modified to reflect conditions in each setting. For example, information collected by Winslow (1997) suggested that stressors experienced by soldiers in Somalia were much more physically oriented than those experienced in Bosnia. High temperatures, no fresh food, limited water and opportunities for proper hygiene conspired to create an environment where other issues (e.g., career, family) were completely outweighed by basic living condition concerns (Winslow, 1997). Thus, modification of stressor items by use of focus groups in-theatre might be necessary in extreme or novel environments. This process is consistent with both P-E fit and transactional approaches in that the sources of stress outside the individual as well as the interpretation of stressors would continue to be examined (Speilberger & Reheiser, 1995).

Hypothesis 2 was Supported

Although morale/cohesion was expected to be important in the relation between stress and strain for soldiers, the same was not expected for officers. This hypothesis was tested using the separate SEM approach. One limitation of the separate SEM approach was quickly apparent; the application of a general model to specialized groups may not

always be appropriate. However, for this analysis, the review of individual pathways is what is of primary concern (Kline, 1997).

As paths from stress to morale/cohesion and from morale/cohesion to strain were significant for soldiers but not significant for officers, the grouping variable - rank, was seen to moderate these relations. Again, this appears consistent with previous UCP research that found that officers reported significantly higher mean scores than all other ranks on morale/cohesion and confidence in leadership scales but also reported experiencing significantly higher levels of physiological, psychological and behavioural strain than all other groups (Izzo et al., 2000).

A review of the standardized models for both officers and soldiers indicates that task cohesion may be a more important aspect of cohesion than social cohesion for officers. In contrast, social cohesion appears to be the dominant aspect of cohesion for soldiers. As cohesion predicted strain in the soldier model but not for officers, it might be that the social aspect of cohesion is what makes the difference with respect to strain reduction. In fact, social cohesion was seen to have a greater effect on strain than task cohesion in the hierarchical regression analysis of the overall sample.

It should not be surprising that task cohesion plays a bigger role in life of officers than social cohesion. First, task completion is their job. By and large, officers are the people responsible to ensure all unit tasks and missions are completed correctly. Task cohesion, therefore, is likely to be seen by officers as an important motivational instrument for work completion. Moreover, as there are fewer officers than soldiers in any unit, and officers are segregated from soldiers for social purposes, the importance of

social cohesion might be seen by officers as less important. The effect, however, might be that the strain reduction benefits of social cohesion are not available to officers.

This finding and related follow-on research might have implications for non-military research as well. That is, while much occupational stress research has focused on worker perceptions of social support and its relation to stress and strain, much less research has specifically examined these relations in supervisory, management and executive groups. This is particularly important in light of recent research (O'Driscoll & Cooper, 1996) that indicates levels of work-related stressors for middle managers have increased over the past two decades and this category of employees often experiences as much, or even more, strain than other occupational categories.

Therefore, future research could focus specifically on officer cohesion. In particular, and in contrast to the application of a general model as was the case here, specialized models for officers could be proposed and tested. In addition, a qualitative approach might enhance model testing and the interpretation of results. For example, participant observation and in-depth interviews with officers and soldiers in operations might reveal important types of social cohesion that are preferred or effective over others.

The differences in officer and soldier perceptions of cohesion might also underline a fundamental difference in how these groups see each other and the accuracy of these assessments. Although officer over-confidence was not formally tested in the present study, these data are consistent with previous research showing a tendency for officers to report more satisfaction with the level of leadership they provided as compared to levels of soldier satisfaction with leadership (e.g., Eyres, 1998; Gabriel,

1985, Korpi, 1965; Stouffer et al., 1949a). Using the soldier and officer data set from the test of hypothesis 2 ($N = 438$), an independent sample t -test was conducted on mean scores of confidence in leadership for soldiers and officers. This test indicated that officers had significantly higher confidence in platoon commander ($t = 4.32, p < .001$) and company commander ($t = 3.27, p < .01$) than did soldiers.

Given these consistent differences in the perceptions between soldiers and officers and the potential for negative consequences due to these differences (e.g., Winslow, 1997) a more formal approach to examining these differences is warranted. This approach could include experimentation with officers that focuses on the accuracy of their cognitive and sensory judgements (e.g. Baranski & Petrusic, 1999; Gigerenzer, Hoffrage, & Kleinbolting, 1991). Recent research suggested that confidence judgements in the sensory domain are similar to those identified in the cognitive domain. For example, Baranski and Petrusic (1999) found that individuals tended to be underconfident on easy sensory judgements and overconfident on hard sensory judgements.

From the laboratory this research could be extended to the applied (operational) setting in the context of the UCP. That is, subjective judgements about unit climate issues together with probability statements about the accuracy of these judgements could be incorporated into the UCP questionnaire. In addition, the effects of feedback on the degree to which an individual's probability assessments are similar to the accuracy of the responses (calibration) could be examined in the context of the UCP output feedback to commanders. Results of this research might indicate pre-deployment training initiatives

that focus on assessing unit climate issues or changes in existing feedback of information systems.

Hypothesis 3 was Not Supported

It was predicted that the passage of time would moderate the relation between stress and strain. In particular, morale/cohesion and confidence in leadership would become weaker or erode over time within the same tour of duty. Similar to the test for the previous hypothesis, the test for hypothesis 3 was a separate model SEM approach – early and late administration groups. Again, the application of the general model to these groups did not provide a good fit to the data, however a comparison of the different estimates revealed important differences between groups.

Although the relations between stress, strain, confidence in platoon commander and morale/cohesion remained significant across time, the relations between positive coping, confidence in leadership and morale/cohesion appeared to change across time. That is, early in the tour, positive coping strategies did not appear to be important in predicting confidence in leadership and morale/cohesion. This changed later in the tour when positive coping strategies become more important in predicting confidence in platoon commander and morale/cohesion and, through these variables, work environment stress and strain. In fact, at this point in the tour, confidence in platoon commander could be seen to have a direct relation to work environment stress.

In contrast to previous research that found an erosion of social support over a two-month period in response to a chronic stressor (Lepore, Evans & Schneider, 1991), the present study found that social support in the form of cohesion and confidence in platoon

commander leadership remained significant over a six-month period in operations.

Arguably, the form of social support and stressors in these two studies are very different (the previous study measured social support from roommates during household crowding) and this may account for the observed differences.

Alternatively, the point in time when measurements take place may also be important. According to Schmidtchen (1997) for example, six-month deployments follow four predictable work intensity stages. During preparation and deployment (stage one) and arrival in location (stage two), the level and intensity of work increases from a low in preparation and reaches a high peak for the deployment near the end of the arrival stage – about two-months in-theatre. Stage three (about 2 to 4.5 months in-theatre) is known as the maintenance period and is characterized by a lower level and intensity of work compared to the rest of the tour. Finally, in stage four the level and intensity of work increases again in preparation for re-deployment to Canada.

In the present study, measurement early in the tour took place near the end of stage two (between six and seven weeks after deployment) when the level and intensity of work is expected to be the highest. It should not be surprising then, that the relations between stress, confidence in leadership, and morale/cohesion were significant during this period. In a similar way however, measurement taken after five-months in theatre coincided with another high intensity work period (preparation for re-deployment) and the relations between these variables was seen to be significant as well. As this last phase occurred after a period of low intensity (maintenance stage), it could be that, instead of detecting a set of chronic stressors over a six-month period, the occurrence of the

maintenance stage had the effect of reproducing relations among these variables similar to those seen in the arrival stage (after preparation for deployment – another low intensity stage).

That said, the finding that positive coping became important in predicting morale/cohesion and confidence in platoon commander only later in the tour deserves further research attention. In particular, the relations between positive coping, confidence in platoon commander and work environment stress should be examined. A review of the work environment items indicates many are concerned with role ambiguity (e.g., “uncertainty about what your work role is or will be [e.g., mission, ROEs]”, “the feedback you receive about your work”). As the end of the tour prepares individuals for return to Canada, and with that a change to non-operational status, ambiguity about what the future holds is likely to be high. So, again, rather than dealing with chronic stressors building up over the six-month deployment, the introduction of ambiguity about future events might call upon coping resources and social support in the form of confidence in platoon commander that were not previously required. Therefore, an examination of role ambiguity and its relation to other forms of social support throughout all phases of deployment should be undertaken.

Interestingly, although role ambiguity has been found to be positively correlated with a number of strain variables (e.g., Babin & Boles, 1996; Hughs, 2001; King & King, 1990), there is some evidence that a certain degree of ambiguity might be valued by individuals, especially for those whose tolerance for uncertainty is high (O’Driscoll & Beehr, 2000). For example, O’Driscoll and Beehr (2000) found that the extent to which

subordinates had a need for clarity moderated the relationship between role ambiguity and strain. This suggests that, rather than assuming that variables such as role ambiguity have uniformly negative effects on people, researchers might further investigate the situational (e.g., family situation, degree of work autonomy) and personal moderators (e.g., personality characteristics) of the ambiguity-strain relationship. Moreover, the process by which ambiguity and other stressors influence individual well-being, not just strain, requires research attention. Such issues could be examined quite easily in the context of the UCP.

Hypothesis 4 was Supported

The results of previous military research on the effects of coping strategies on strain have been mixed (e.g., Day & Livingstone, 2001; Dobрева-Martinova et al., 2002). Recall that Day and Livingstone (2001) found that negative coping styles such as denial or disengagement exacerbated the negative effect of stressors on strain outcomes, although positive styles such as problem-focused coping had very little influence on reported health outcomes. Dobрева-Martinova et al. (2002) did not identify any moderating effects of coping on the relation between stress and strain. In contrast, the present study found that both positive and negative coping strategies moderated the relation between stress and strain. Indeed, it was suggested that the operational setting might produce a clearer picture of the moderating effects of coping because of the uniqueness and saliency of the stressors experienced there.

However, there are a number of other possible reasons why there is a lack of agreement in these findings. First, the stress measures in each study are different. Day

and Livingstone (2001) used a combination of acute work-related stressors (e.g. harming a person, seeing a colleague killed) and role stressors taken from four subscales of the Occupational Environment Scales (OES; Osipow & Spokane, 1983). Dobрева-Martinova et al. (2002) used five scales drawn from the OES, and the present study used the SMSQ developed specifically for military personnel on operations. Although many of the items between these scales appear similar, there has not been a study to determine their relatedness.

Second, although all three studies used the same strain measure⁵, the methods for identifying and examining coping strategies were different. The previous studies broke down the 56-item COPE Inventory on an *a priori* basis into strategies identified by Carver, Scheier, and Weintraub (1989). In the present study, coping strategies were defined empirically by factor analysis and then correlations with strain determined the direction and magnitude of the relationship. Recall that the factor analysis in the present study is very similar to that found by Dobрева-Martinova (1999b) using another sample of soldiers serving in Bosnia. Taken together, these findings indicate that soldiers in operations define coping strategies somewhat differently compared to other groups.

Thus, the result is that the coping strategies reported by Livingstone and Day (2001) and Dobрева-Martinova (2002) are not defined exactly the same way as the present study. For example, using *a priori* scale assignment of items, seeking social support for instrumental reasons and seeking social support for emotional reasons are

⁵ Dobрева-Martinova, et al. (2002), and Day and Livingstone (2001) used the 20-item version of the Signs Scale. The present study used the 21- item version.

considered unique strategies by Carver et al. (1989). These researchers considered seeking social support for instrumental reasons to be always positive and seeking social support for emotional reasons to be either positive or negative. In contrast, the present study found that these two sets of items factored together resulting in a single factor (seeking social support) with a zero correlation with strain and therefore was defined as a positive coping strategy. That said, correlations between selected strategies and the strain measure reported by Livingstone and Day (2001) are very similar to those found in the present study. In particular, only negative strategies reported by Livingstone and Day (2001) correlated significantly with strain while positive strategies and strain showed zero correlations.

Third, both previous studies examined the effects of single coping strategies on the relation between stress and strain. The present study, on the other hand, combined coping strategies into positive and negative groupings. The aim of grouping strategies was to simplify the overall model while maintaining the pattern of relations observed in the correlational analysis. In fact, the grouping of strategies did not change the overall pattern (negative coping correlated significantly with strain while positive strategies and strain showed a zero correlation) and may more accurately reflect coping processes used by individuals. That is, it is likely that individuals use a variety of coping strategies simultaneously. Teasing out single coping strategies for analysis might restrict the effects of a particular strategy on strain outcomes. An empirical basis for the grouping of strategies might also allow a research context in which the effects of personality constructs could more easily be explored.

According to Zellars and Perrewe (2001) for example, the common distinction in the literature between problem-focused and emotion-focused coping is erroneous because emotion-focused strategies are “multidimensional and have suffered from a negative reputation primarily due to their measurement” (p. 459). In particular, these authors argued that affective personality dimensions (neuroticism, extraversion, and agreeableness) are central to understanding how people cope.

In their study of the effects of various types of emotional support on job burnout, Zellars and Perrewe (2001) found that engaging in conversations with a positive content was associated with reduced burnout and engaging in conversations reflecting empathy for a co-worker's thoughts and feelings was associated with increased perceptions of personal accomplishment. Conversations with negative content, on the other hand, increased levels of burnout. Overall, extraversion had a positive association with all dimensions of emotional support and agreeableness was found to be associated with greater non-job, positive and empathic emotional social support. Neuroticism was associated with engaging in conversations with a negative focus, and, in turn, job burnout.

In the present study recall that positive coping was an exogenous variable. That is, the causes of these strategies were seen to come from outside the model – stress did not predict positive coping. Given the results of the Zellars and Perrew (2001) research, it seems likely that personality characteristics of the individual such as extraversion and agreeableness have a role to play in the stimulation of positive coping strategies found here (i.e., problem focused, seeking social support, acceptance). In fact, other positive

affectivity elements such as optimism have also been found to be associated with seeking social support (Scheier, Weintraub, & Carver, 1986). Although negative coping was not an exogenous variable (stress predicted negative coping), a residual proportion of variance (disturbance) indicated that some variability in negative coping was coming from outside the model. In a similar way then, personality characteristics such as neuroticism are likely playing a role in the stimulation of negative coping strategies.

Future coping research with military populations should also incorporate affective personality measures. If coping is largely a function of personality characteristics, this might have important implications for the screening and training of personnel for special employment such as operational deployments. Moreover, as special populations in unique environments might actually define coping strategies differently, the examination of coping strategies based on *a priori* scale assignment should be avoided in favour of a psychometric review of the items in the context of the sample of interest.

In summary then, although the operational setting appeared to produce a clearer picture of the moderating effects of coping, several other issues might have contributed to these results. Therefore, more research in other operational settings will be necessary to confirm the findings reported here. In addition, future research should incorporate affective personality measures and focus on coping strategies in the context of the sample of interest.

Hypothesis 5 was Supported

It was predicted that, overall, morale/cohesion would moderate the relationship between stressors and strain such that high levels of morale/cohesion would reduce strain. Research indicates cohesion might best be considered a multi-dimensional rather than unitary construct (Griffith, 1988; Mudrack, 1989; Mullen & Copper, 1994; Seibold & Kelly, 1988; Zaccaro & McCoy, 1988). The most common distinction is between social cohesion and task cohesion. According to Griffith (1988), social cohesion refers to the nature and quality of the emotional bonds of friendship, liking, caring, and closeness among group members. In contrast, task cohesion refers to the shared commitment among members to achieving a goal that required collective efforts. In studies of the relations between group cohesion and performance, task cohesion, rather than social cohesion appears to be most important (Mullen & Copper, 1994). Moreover, Griffith (1997) found task cohesion to be a better predictor of well-being (lack of strain) than social cohesion.

Previous research on the UCP had failed to identify the multi-dimensional nature of the cohesion construct. Although the results of the present study identified the existence of both task and social cohesion components, the effects of these variables on strain appears different than those identified in previous research. Specifically, social cohesion in the present study showed stronger negative relations to strain than task cohesion in the hierarchical regression analyses. Moreover, both social cohesion and task cohesion showed significant moderation of the effect of stress on strain even though the overall magnitude of the effect was small.

The similarity of social cohesion to several dimensions of social support such as work-based support and non-work-based support (e.g., Lim, 1996) suggests that support from colleagues and friends in a military group might be important in buffering individuals from strain. Indeed, social cohesion was found to be an important moderator of the relation between stress and strain in the present study. That is, the relationship between stress and strain differed depending on the level of support the individual experienced. In addition, when social cohesion was combined with task cohesion in the test of overall model, cohesion was seen to mediate the relation between stress and strain. In this view, stressors were seen to alert the individual to engage cohesion/support resources, which in turn reduced the amount of strain.

But how can cohesion variables play both moderating and mediating roles? According to Evans and Lepore (1997), the finding of a significant interaction, or moderating effect, can “allude to the operation of an underlying mediation process” (p. 271). In the present study for example, regression coefficients derived in the hierarchical regression showed that people who experienced high levels of cohesion (task and social) reported less strain than did people who experienced low levels of cohesion. This suggests that cohesion-*related* processes might be important aspects of the stressor-strain link. Indeed, the SEM showed that several variables such as confidence in leadership and positive coping were related to cohesion. Thus, the SEM analysis gives us insight as to why the interactions between cohesion and stress occurred. That is, leadership and coping are *generative* processes for cohesion that, in turn, produced an interaction

between cohesion and stress resulting in the moderating effect. Evans and Lepore (1997) refer to this process as “mediated moderation” (p. 267).

Indeed, the existence of both mediating and moderating roles for cohesion points to complex relations between these variables and stress and strain. However, this complexity might be expected given the dynamic nature of group processes. For example, going beyond the traditional formulations of group cohesion in the military literature, Hogg (1992) used social identity theory to explain group cohesion processes. He suggested that cohesion represents a cognitive process whereby members of a group define themselves and other group members in terms of a group *prototype*. As individuals define themselves in relation to other group members (i.e., in-group vs. out-group) they become *depersonalized*, and a group social identity emerges. This group prototype is a cognitive representation of the group’s features that provide group member identity and can be seen as a checklist of attributes of the idealized group member. Group members also assign these perceived attributes to themselves which leads to the development of more normative behaviour and a more salient group prototype for their social identity. In this view then, cohesion is useful in understanding the cognitive processes involved in group development with respect to regulation of the individual and group behaviour, social influence, conformity, social attraction, performance and social loafing (Hogg, 1992). Given the dynamic nature of the cognitive processes outlined here, it should not be surprising that the roles of both social and task cohesion are complex and even overlapping with respect to both antecedent and outcome variables.

Future research in this area could focus on these elements of cohesion in the context of group dynamics. For example, although the UCP is set in the context of the platoon, other organizational levels might be important in the development of group identity and cohesion⁶. It might be that social cohesion is important at the level of the primary work group (e.g., the section) and task cohesion is more important at higher levels of organization (e.g., the company) when inter-group cooperation is necessary. Similarly, shared experiences such as basic training or critical incidents could be investigated to determine if group identity and cohesion generalizes to other similar groups as individuals move between them.

In summary, the findings of this study suggest that social cohesion might play a larger role in the relation between stress and strain in military groups than previously thought. In addition, both mediating and moderating effects of cohesion on the relation between stress and strain were identified indicating complex relations to other important variables.

Two related issues have yet to be discussed – the role of individual morale to cohesion as seen in the present study and how cohesion can be fostered to maximize stress buffering. Most modern-day definitions of morale are set in the context of a goal-oriented group. For example, according to Manning (1991) “Morale is the enthusiasm and persistence with which a member of a group engages in the prescribed activities of that group” (p. 455). Consistent with these definitions, the results of this study indicate

⁶ For example, there are 3, 10 person sections in each platoon and these form the basic, day-to-day work group for most soldiers.

that the personal morale of a soldier is closely tied to social cohesion. These items factored together and appear to indicate that responses about one's personal morale are at least in part dependent on the level of social cohesion in one's unit⁷. In fact, Manning (1991) suggested that group factors such as shared experiences are as important to one's morale as individual factors such as good health, food, rest, and appropriate clothing and equipment. In practical terms then, an individual soldier's morale should always be viewed in the context of the group. Similarly for research purposes, morale should be examined as an element of cohesion.

The items in the social cohesion factor point to a level of comfort, understanding, and trust among group members that is built upon shared experiences over time. It follows that the disruption of these activities by high rates of personnel turnover or the decomposition of group tasks into individual tasks would diminish group cohesion and, in turn, the positive effects of cohesion on strain reduction. Although personnel turnover is limited during operations, rates of turnover in non-deployed settings are high and this may account for observed declines in cohesion among units after re-deployment (Murphy & Farley, 2000). Given the importance of cohesion in the relation between stress and strain identified in this study, future research should examine the degree to which unit stability fosters cohesion at all organizational levels. Moreover, as officer leadership turnover tends to be very high⁸, the effects of officer turnover on cohesion should also be examined.

⁷ Although this dependency was not found statistically, the level of that analysis may be incorrect and will be discussed in a later section.

⁸ The normal length of time an officer commands a battalion is 2 years or less. Company and platoon commanders change more frequently.

Hypothesis 6 was Not Supported

Previous UCP research had found negative correlations between confidence in leadership and physiological, psychological and behavioural signs of strain (Izzo, 2000). Moreover, social support in the form of support from supervisors was found to buffer individuals from strain resulting from job insecurity (Lim, 1996). Based on this research, and similar to Hypothesis 5, it was predicted that confidence in leadership would moderate the relationship between stress and strain for this group of deployed personnel. However, a test of this hypothesis using the regression approach indicated no moderating effects. Interestingly, the regression coefficients on step two of the test indicated significantly positive relations to strain for both variables (see Table 22). In contrast, recall that in the SEM overall model, regression coefficients for both variables with strain were zero and these pathways were removed (see Figure 3). Moreover, and similar to Izzo et al. (2000), the correlation analysis indicated significant negative relations between confidence in leadership variables and most stress and strain subscales (see Table 17). Although the disagreement between analyses is troubling, the magnitude of the positive regression coefficients is small and therefore the findings, although statistically significant, might not have many practical implications. In any case, care must be taken in the interpretation of these findings.

Rather than a moderating role, confidence in platoon commander and confidence in company commander appear to play a mediating role between stress and morale/cohesion. In this role, stressors alert the individual to engage in social support in the form of support from superiors (platoon and company commander) that, in turn,

directly influence morale/cohesion. The nature of this direct relationship is such that morale/cohesion increases as confidence in leadership increases. The nature of the mediating or indirect relationship is such that morale/cohesion decreases *less* as a result of stress when confidence in leadership is involved ($-.20 \times .46 = -.09$; see Figure 3) compared to when confidence in leadership is absent ($-.17$; see Figure 3).

Moreover, confidence in platoon commander and confidence in company commander have indirect effects on strain through their relation to morale/cohesion. In this view, morale/cohesion mediates the relation between confidence in platoon commander, confidence in company commander and strain. Put another way, morale/cohesion is part of the causal chain between confidence in leadership and strain. For example, strain decreases $-.08$ ($.46 \times -.17$; see Figure 3) of a standard deviation for every full standard deviation increase in confidence in platoon commander through its relation to morale/cohesion. Thus, the relation between confidence in leadership and strain is important but of a different role than predicted.

Although officers might be more concerned with task cohesion than social cohesion (see the discussion of Hypothesis 2), a review of the correlation matrix (see Table 17) indicates that confidence in leadership plays an important role in social cohesion as well. In fact, while both correlations are strong, the correlation between confidence in platoon commander and social cohesion is higher ($.54$) than the correlation between confidence in platoon commander and task cohesion ($.40$). Thus, the feelings of comfort, understanding and trust that underline the items in the social cohesion factor are closely related to the confidence soldiers place in their leaders. The inter-relatedness of

these variables was also apparent in their relations to work environment stressors (see Figure C-1). Recall that both confidence in platoon commander and morale/cohesion showed direct and negative relations to this group of stressors. That is, work environment stressors decreased as confidence in platoon commander and morale/cohesion increased.

Clearly then, confidence in leadership plays an important role in the relations between stress, strain and morale/cohesion for soldiers in operations. In addition to future research already suggested on the subject of officer over-confidence, other studies might examine how confidence in non-officer leadership is related to stress and strain. For example, section commanders (rank of sergeant) often play an intermediary role between soldiers and officers; they might have a larger effect on outcome variables than do officers. In fact, it could be argued that a soldier's confidence in his or her platoon commander is a result, at least in part, of how the section commander relays his or her own confidence in the platoon commander. In a similar way, the calibration of officer opinions could be affected by the section commander "filter" that often exists between the officer and the soldiers. These are important questions that merit further research attention.

SEM vs. Regression Approaches to Moderators

Although researchers have been applying different SEM approaches to the study of moderators (e.g., Kline, 1997; Kline & Dunn, 2000), the state of the art appears to be less flexible than more traditional regression approaches.

For example, the use of the separate model approach appears necessarily limited by the choice of models to use. That is, as the moderator variable defines a particular group difference (e.g., rank – soldiers and officers), the application of a general model to these groups might not be appropriate. Although the focus of the analysis is on parameter coefficients and not model fit *per se*, grossly non-fitting models could result in spurious relations among variables. Thus, this approach should be avoided when model fit indices are completely unsatisfactory.

Although more sophisticated than the separate model approach, the MGA analysis has limitations as well. In particular, other than including biographical variables in the actual model, this method does not permit a way to control for other variables thought to be important in the analysis. Including these variables in the model would increase model complexity and reduce overall fit. Taking another approach and using separate data across variables of interest (e.g., females vs. males) would reduce sample size to unusable levels in even the most simple of models.

In contrast, the regression approach appears to be more flexible in terms of the inclusion of variables to be controlled. Moreover, issues of model complexity and fit are not involved. For comparison purposes, both the MGA and regression approaches were used to examine Hypothesis 4 – the moderating effects of coping on the relation between stress and strain. While the overall results appeared to be similar and supported the hypothesis, the MGA approach required a fair amount of data manipulation (e.g., determining high positive and negative coping groups) and complex interpretation of group equality constraints. The regression approach, on the other hand, required less

manipulation (conversion to standard scores and derivation of cross products) and the interpretation of results was less complex.

Thus, until SEM approaches can be adapted to overcome these limitations, the use of hierarchical multiple regression analysis will likely remain the method of choice for the examination of moderating effects. Once moderators are detected, however, SEM can be used to identify possible underlying mediating processes that give rise to the interaction.

Study Limitations

As is the case with any study, the present research has limitations that need to be taken into account in the interpretation of results as well as for improvements to future research. The limitations include problems arising from the sampling technique, the likely existence of group effects at other organizational levels and, given the uniqueness of operational environments, the generalization of results to other operational settings.

The sampling technique used in this research is based on the availability of personnel. After data are collected, biographic data are compared to determine if the sample is similar to other samples in the same setting and is representative of the characteristics of people in-theatre for that time. A problem arises because measures are taken at several times in the same rotation. Thus, in a few cases, the same individual will complete the questionnaire at all three times. Most individuals, however, complete the questionnaire only once. As there is no tracking of individuals in the questionnaire administration, this limits the data in two ways. First, proper longitudinal research is not possible. This has serious implications if PTSD research is considered in-theatre.

Moreover, the completion of questionnaires at more than one time without identification might create some dependency across time. A lack of independence of observations could have the effect of creating spurious significant results (Stevens, 2002).

Although more sophisticated sampling techniques are difficult to incorporate in these settings, a system of anonymous coding could alert researchers to questionnaires filled in by the same person at different times while at the same time protecting the identity of the respondent. For example, respondents could be asked to invent their own 5-digit code that they write on the questionnaire at every session. Researchers could then match these codes when they appeared. While privacy is an important consideration in all research, military populations are particularly sensitive to these issues because of the perceived potential for retribution on the individual if criticisms are made or personal/medical problems are acknowledged.

The issue of independence of observations arises again when individual responses to group context items such as cohesion are influenced by the relations in the group (group effects). As was seen in the present study, group effects at the company level were not found. However, as most items were set in the context of the platoon, the level of analysis was probably incorrect. Unfortunately, platoon level identifiers are not available in the data. This should be corrected in future versions of the UCP so that individuals can report their platoon identifier as well as their company.

Finally, care must be taken in generalizing these results to other operational settings. Although UCP data has been collected in other settings (e.g., Eritrea, Kosovo, Haiti), a comparison of UCP variables across environments has not been conducted. A

psychometric review of the scales from data collected in these other settings could indicate the requirement for modifications to the UCP.

In summary, care must be taken in the interpretation of the results from the present study. Independence of observations and the ability to generalize findings from one operational setting to another are issues that will require future research attention.

Conclusions

Like all other forms of psychology, the overarching role of military psychology is to explain behaviour. The theories and methods of many other areas have been brought to bear on questions related to these special populations in unique environments. In this tradition, the present study has extended military stress research by examining several dimensions of unit climate in an active theatre of operations.

The general findings of the study have been illustrated in Figure 10. To summarize briefly, positive coping, task cohesion, and social cohesion were found to moderate the relation between stress and strain such that those individuals who reported using or seeking higher levels of these resources experienced lower strain. Conversely, negative coping moderated the relation between stress and strain such that those individuals who reported using negative coping strategies tended to report experiencing more strain compared to people who did not use such strategies. Rank also moderated the relationship such that officers experienced more strain than did soldiers. Finally, positive coping, confidence in one's platoon commander and company commander played underlying or mediating roles in the generation of the interaction between cohesion variables and stress and strain.

Figure 10

Illustration of General Findings from the Study.

Based on the findings of the study, the following research is recommended:

1. UCP data already collected from other operational settings (e.g., Eritrea, Haiti, Kosovo) should be examined to determine the generalizability of the instruments. In particular, the SMSQ should be reviewed for each deployment to ensure items reflect the stressors experienced by soldiers in that particular environment;
2. Research focusing on officer cohesion should be undertaken. Participant observation and in-depth interviews with soldiers and officers in

operations will be useful methods for examining both social and task cohesion processes;

3. A more formal approach to studying officer/soldier perception differences is warranted. This approach should include experimentation with officers on the accuracy of cognitive and sensory judgements followed by applications to unit climate issues in the context of the UCP;
4. Role ambiguity and its relation to other forms of social support throughout all phases of deployment should be examined;
5. Affective personality measures should be incorporated in future coping research with military populations. This research might have important implications for the screening personnel for special duties and the pre-deployment training;
6. Research on group identity and, in particular, which organizational levels and common military experiences (such as basic training) foster group identity should be undertaken. Results of this research could reveal social and task cohesion differences based on organizational level;
7. The effects of officer turnover and other aspects of unit stability should be examined to determine how they relate to both task and social cohesion;
8. In addition to confidence in officers, non-officer leadership and its relation to stress and strain needs to be examined; and,

9. Future versions of the UCP need to incorporate platoon level identifiers and develop a system for tracking individuals while preserving individual privacy.

In addition to research questions arising from the present study, the following policy and training issues should be considered:

1. Presently, army policy is that UCP feedback is directed to unit commanding officers only. At their discretion, they may share this information with others including subordinates. As this data continues to point to discrepancies between the perceptions of officers and soldiers, it is recommended that UCP feedback be disseminated throughout the chain of command;
2. As task cohesion, social cohesion and positive coping strategies appear to play important roles in the buffering of stress-strain relations in operations, pre-deployment training should focus attention on specific initiatives designed to foster improvement in these areas. For example, sections, platoons, and companies should be formed and fixed as early as possible after the warning order for deployment is issued. Moreover, if the use of replacements (augmentees) cannot be avoided, every effort should be made to include them in the social as well as work activities of the group; and,
3. Current pre-deployment training that focuses on identifying signs of PTSD, critical incident stress and other mental health problems should be

expanded to include formal instruction on group dynamics and the importance of cohesion in buffering the effects of stress on strain.

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Appendix A

Development and Psychometric Properties of the Unit Climate Profile Questionnaire, the
Stress in Military Service Questionnaire, the COPE Inventory, and the Signs Scale

Development of the Unit Climate Profile and Associated Scales

Development and Psychometric Properties of the Unit Climate Profile

Unit Climate Profile development. The Unit Climate Profile (UCP) was developed within a conceptual framework proposed by Wild (1988) which postulated that the human dimension of operational readiness was founded on several antecedent variables including aptitude level, combat proficiency, understanding of the task, motivational environment, and motivation. The motivational environment comprises of both individual factors such as personal morale, professional morale, ideology and group factors such as small group morale, cohesion, stability of unit, and cooperation. According to Wild (1988), the presence of antecedent variables alone was not sufficient to ensure a high level of performance. In addition, he saw leadership as “the filter through which the antecedent variables are integrated into a unified whole” (p. 11).

Wild’s (1988) conceptual model was adopted by Reeves and Hansen (1989) to develop a psychometric instrument called the Human Dimension Combat Readiness Index – Experimental (HDCRI-X). Reeves and Hansen (1989) focused on the motivational component of the model and constructed a questionnaire that included eight dimensions of combat readiness:

1. Leadership – characteristics of leaders believed to directly affect soldiers’ trust and confidence in their leaders;
2. Personal morale – the psychological state of mind characterized by a sense of well being, eagerness, and willingness to sacrifice;

3. Professional morale – soldiers' confidence in their skills and abilities as soldiers;
4. Ideology – ideas characterizing internalized normative beliefs, legitimacy and commitment;
5. Small group morale – the sense of wellbeing that stems from the group;
6. Cohesion – the result of all forces acting on the members to remain in a group;
7. Stability – the time in unit, the number of supervisors, and time away from unit; and,
8. Intentions – a stated intention to enter and do well in combat, to remain in the combat arms, and stay within the organization.

Reeves and Hansen (1989) derived 152 items from several allied sources including the Israeli Defence Forces Combat Readiness Morale Questionnaire, (Gal, 1986) and the Company and Squad/Platoon Perceptions Questionnaire (Manning & Ingram, 1987) to cover the eight conceptual domains. The initial item pool of 152 was reduced to 92 items, which were subsequently administered to 215 infantry NCMs. Principal Components Analysis (PCA) was used to further reduce the questionnaire size and confirm the existence of independent dimensions or components. The final solution yielded 56 items loading on eight factors accounting for 53.9% of the total variance:

1. morale/cohesion;
2. professional morale;
3. ideology;

4. leadership-skills;
5. leadership-confidence in section commander;
6. leadership-confidence in platoon warrant;
7. leadership-confidence in platoon commander;
8. leadership-confidence in company commander.

The 56-item HDCRI-X was subsequently refined by Farley (1996)

and became the basis for the initial version of the UCP. The UCP was designed such that the mean scores for each dimension could be plotted to form a line on a graph⁹. Each line represented a different point in time for the same unit. Respondents were asked to indicate how much they agree with each item on a five-point scale from 1 = “strongly disagree” to 5 = “strongly agree”. The pilot version of the UCP was administered to the same infantry company at two points ($N = 172$) in time: 48 hours prior to departure on operational deployment to Bosnia, and after five months in the theatre of operations.

As can be seen in Figure 2, the results showed that respondents felt less positive about all climate dimensions after several months in-theatre and significantly ($p < .05$) less positive about morale/cohesion, leadership skills; confidence in section commander, and confidence in platoon warrant officer. Based on the results of the pilot study and feedback from respondents, six items were added to the questionnaire to assess confidence in Commanding officer (three items) and confidence in Company Sergeant Major (three items). The 62-item version of the UCP was introduced for continuous data

⁹ Although pairs of bars are more appropriate for non-continuous data presentation, the line graph was chosen based on feedback from COs indicating greater ease of interpretation with this format.

collection for all deployed units in 1997 (see Appendix B for a complete copy of the questionnaire).

Figure A-1

Mean scores in profile format for pilot administration of the UCP (N = 172).

Note: For ease of interpretation by COs, response options (0 = “strongly disagree” to 4 = “strongly agree”) are converted to positive and negative scores and plotted on Y axis of the UCP output. Adapted from Murphy and Farley (2000).

Factor structure of the UCP. Dobрева-Martinova (1999a) conducted the first examination of the psychometric properties of the 62-item UCP using data collected from personnel serving in Bosnia in 1997 ($N = 614$). A PCA resulted in a 12-factor solution

accounting for 66.38% of the total variance. The reliability coefficients (Cronbach's alpha) for the 12 factors ranged from .66 (ideology) to .95 (morale/cohesion).

This solution was similar to the 56-item UCP solution (Reeves & Hansen 1989), however, with the addition of new items confidence in commanding officer and confidence in company sergeant major appeared as new factors. Interestingly, the leadership (skills) factor that appeared in the 56-item solution broke down in the 62-item solution into positive leadership (positive leadership skills items e.g., "My immediate supervisor offers new ideas for solving job-related problems") and negative leadership (negative leadership skills items, e.g., "My immediate supervisor lets other supervisors interfere with my work group"). Similarly, the ideology factor in the 56-item solution broke down into ideology (three-items) and a new factor called military ethos (four-items representing professional morale and three-items representing the ideology constructs from the 56-item solution). Based on these results, Dobрева-Martinova (1999a) recommended all 62 items in the UCP be retained for future use.

Development and Psychometric Properties of the Stress in Military Service

Questionnaire

Stress in Military Service Questionnaire development. To determine the type, frequency, and intensity of stressors experienced by soldiers in operations, the Stress in Military Service (SMSQ) is included with each administration of the UCP. The development of SMSQ consisted of a literature review, a series of focus groups with CF members on operations, and several test administrations and refinements (Farley, 1995; Dobрева-Martinova, 1998a). The literature review identified many common stressors in

combat environments (e.g. Black, 1987; Martin, 1992) and United Nations (UN) peacekeeping missions (Bartone, Vaitkus, & Adler, 1994) such as threats of serious injury, seeing widespread suffering, experience with death and seeing instances of inhumanity. Similarly, the detrimental effects of role conflict, ambiguity, and overload for individuals and organizations is well documented (e.g., Jackson & Schuler, 1985). This review and information gathered from seven focus groups resulted in the initial development of 75 items which fell into four general areas; leadership/management, safety of self and others, external relations, privacy and adjustment, and family concerns. After several test administrations, the initial item list was reduced to 35 items. The SMSQ asks respondents to indicate to what extent these stressors have caused them trouble or concern during the last month using a six point Likert-type scale from 0 “not applicable” to 5 “very much trouble/concern.”

Factor structure of the Stress in Military Service Questionnaire. A PCA was conducted on the 35-item SMSQ using a sample of 694 soldiers serving in Bosnia (Dobrevva-Martinova, 1999a). This analysis resulted in a five-factor solution accounting for 54.7% of the total variance. The reliability coefficients (Cronbach’s alpha) for the five factors ranged from .80 (family concerns) to .87 (combat stressors). The first factor (work environment, 13.2%) was related to work issues such as policies, leadership, and work roles. The second factor (external conditions, 12.6%) contained items such as lack of privacy, threat of serious injury, and dealing with people external to the CF). The third factor (combat stressors, 10.7%) combined combat and peacekeeping stressors such as seeing widespread suffering and seeing instances of inhumanity. Career issues such as

conditions of service were apparent in the fourth factor (service/career issues, 9.9%).

Finally, the fifth factor dealt with issues concerning the family (family concerns, 8.3%) such as time spent away from home and lack of communication with family.

Development and Psychometric Properties of the Signs Scale

Signs Scale development. In addition to the UCP and the SMSQ, a scale designed to measure several aspects of psychological and physiological strain was included in each administration. According to Griffith and Vaitkus (1999), measures of psychiatric symptomatology (e.g., depression and anxiety disorders) and stress-related diseases (e.g., somatic complaints) are both suited for use in studies of the socially supportive role of cohesion in reducing strain.

The Signs Scale incorporates the 20-item Symptoms Checklist (Bartone et al., 1989) and 15 additional items developed specifically for the CF (Dobрева-Martinova, 1998b). Eleven items in the Symptoms Checklist (Bartone et al., 1989) were drawn from the psychosomatic complaints scale developed by Stouffer, Guttman, and Suchman (1950). Evidence for the validity and reliability of the Stouffer et al. (1950) scale come from large-scale studies of American soldiers during World War II. The test was 89% effective in identifying hospitalized psychoneurotic patients ($N = 563$) and showed 1-week test-retest reliability of .90 in that sample and .93 in a control sample ($N = 3,501$). The remaining nine items were drawn from the Hopkins Symptoms Checklist (Dergatis, Lipman, & Rickels, 1974) and represent complaints frequently seen in studies of traumatic stress, such as trouble sleeping and depressed mood.

Bartone et al.'s (1989) composite scale measures the frequency with which symptoms are experienced. The response options range from 0 (none) to 3 (very often). PCA conducted by the authors in their study of military disaster assistance workers ($N = 103$) helping families of soldiers killed in an airplane crash in Gander, Newfoundland showed four factors, accounting for 48% of the variance: depression/withdrawal, hyper-alertness, generalized anxiety, and somatic complaints. Reliability (Cronbach's alpha) for the full scale for two administrations was reported to be .90 and .93.

Fifteen new items were added by the CF to Bartone et al.'s (1989) to represent themes of anxiety, fatigue, and psychological trauma. In addition, the item "lack of appetite/loss of weight" from the Bartone et al. (1989) scale was split into two items to determine weight loss due to climate issues rather than loss of appetite. Thus, the resulting Signs Scale comprised 36 items representing three sub-domains within the strain construct: physiological strains (14 items), psychological strains (12 items), and behavioural strains (10 items). Respondents are asked to report how often they experience each of the items according to four response categories: 0 "never", 1 "sometimes", 2 "often", and 3 "very often".

Factor structure of the Signs Scale. Dobрева-Martinova (1998b) examined the reliability and validity of the Signs Scale using a sample of 959 Canadian soldiers deployed on operations. Corrected item-total correlations for the sample were all over .3 with none exceeding .66 indicating item consistency but not redundancy. Reliability coefficients for the physical, psychological, and behavioural strain subscales were satisfactory; .76, .80 and .86 respectively. Full-scale reliability was .93. A PCA

conducted on the data resulted in a four-factor solution accounting for 42.8% of the variance. The factor structure was appeared to be more similar to Bartone et al.'s (1989) findings than the structure conceptualized for the Signs Scale: depression/withdrawal (15.8%); hyper-alertness (12.1%); generalized anxiety (10.1%); and, somatic complaints (9.2%). Based on these results, Dobрева-Martinova (1998b) concluded that the new 15 items did not explain any more of the variance than the Bartone et al. (1989) scale alone. Moreover, the extra items did not contribute to the disclosure of new domains of strains or symptoms experienced by the survey participants. Thus, she recommended only the 21-item Symptom Checklist to be used for future administrations of the questionnaire. This version (21-item) of the questionnaire was used in the present study.

Development and Psychometric Properties of the COPE Inventory

COPE Inventory development. As individual coping strategies are thought to buffer the effects of stressors (Folkman & Lazarus, 1980; Parker & Endler, 1996), a measure of such strategies has accompanied the administration of the UCP. The COPE Inventory (Carver, Scheier, & Weintraub, 1989) is a multidimensional coping scale that incorporates 13 conceptually distinct subscales. These subscales, broadly categorized as problem-focused or emotion-focused, are based on both theoretical arguments and empirical evidence about the functional properties of coping strategies. Problem-focused strategies are all considered to be functional and include:

1. active coping – taking steps to try to remove or circumvent the stressor or to ameliorate its effects;
2. planning – thinking about how to cope with a stressor;

3. suppression of competing activities – putting other projects aside, trying to avoid becoming distracted by other events, even letting other things aside in order to deal with the stressor;
4. restraint coping – waiting for an appropriate opportunity to act and not acting prematurely; and,
5. seeking social support for instrumental reasons – seeking advice, assistance or information.

In contrast, emotion-focused strategies may be either functional or dysfunctional and included:

6. seeking social support for emotional reasons – getting moral support, sympathy or understanding which may be functional when it fosters a return to problem-focused coping and not very adaptive when used as an outlet for ventilation of one's feelings;
7. positive reinterpretation and growth – aimed at managing distress emotions rather than dealing with the stressor per se. This is seen as a functional coping strategy in that it should lead the person to continue (or to resume) active, problem solving coping actions;
8. focus on and venting of emotions – a dysfunctional strategy that might result in undesirable outcomes;
9. acceptance – seen as a functional strategy based on the argument that an individual who accepts the reality of a stressful situation would seem to engage in attempts to deal with it;

10. denial – refusal to believe that the stressor exists or trying to act as though the stressor is not real. This is the opposite of acceptance and considered to be a dysfunctional strategy;
11. behavioural disengagement – reducing one's effort to deal with the stressor, even giving up the attempt to attain goals with which the stressor is interfering. This is seen as a dysfunctional strategy in many circumstances;
12. mental disengagement – a variation of behavioural disengagement also seen as dysfunctional, occurring when conditions prevent behavioural disengagement like escape through sleep or immersion in TV; and,
13. turning to religion – this might be considered emotion-focused when it serves as a source of emotional support or a way for positive reinterpretation and growth or problem-focused when it is used as an active tactic of dealing with the stressor.

Cronbach's alpha reliability coefficients for the COPE subscales reported by Carver et al. (1989) were acceptable falling between .70 and .90. In addition to the 13 subscales developed by Carver et al. (1989), four new items that focused on alcohol and drug use were included in the CF version of the scale. Each subscale consists of four items (56 items total) measured on a four-point scale from 1 "I usually don't do this at all" to 4 "I usually do this a lot".

Factor structure of the COPE Inventory. Dobrev-Martinova (1999b) examined the reliability and validity of the COPE Inventory using a sample of CF personnel

deployed on peacekeeping duty in Bosnia ($N = 723$). Reliability coefficients (Cronbach's alpha) were calculated and found to be satisfactory for the full scale (.91), problem-focused coping (.91), emotion-focused coping (.82) and each of the 14 subscales (.59 for alcohol/drug disengagement to .93 for turning to religion). A PCA conducted on the data resulted in a 13-factor solution accounting for 59.8% of the total variance. Unlike Carver et al.'s (1989) analysis however, the first factor (problem solving, 13%) in Dobrev-Martino's (1999b) analysis combined different problem solving strategies (restraint coping, suppression of competing activities, active coping and planning). Similarly, seeking social support items (for instrumental and emotional reasons) loaded on a single factor (seeking emotional support, 2.9%). The additional alcohol and drug use items appeared as one factor (alcohol/drug disengagement, 3.1%). The other factors were very similar to Carver et al.'s (1989) solution: planning (7.2%); suppression of competing activities (6.1%); positive reinterpretation and growth (5.2%); acceptance (5.1%); restraint coping (4%); turning to religion (3.3%); focus on and venting of emotions (2.2%); denial (2%); behavioural disengagement (2%); and, mental disengagement (2%).

Appendix B

Procedures for Structural Equation Modelling and Testing of Moderators

Structural Equation Modelling Procedure

Prior to analysis, the complete data set was screened in accordance with the procedures outlined above. A total of 99 univariate and 16 multivariate outliers were identified and removed leaving 1,897 cases for analysis. According to Kline (1997), there are five basic steps in any SEM procedure. This section will describe these steps using the overall study model as an example. Subsequent models were tested using the same procedure.

Step one - Specify the model. A model can be specified by drawing a diagram using standard symbols or by using a series of equations. Most current model fitting programs such as EQS use English rather than traditional Greek letters to indicate variables, factors, errors and so on. These equations define the model's parameters which correspond to presumed relations among observed or latent variables. The computer program estimates these parameters with the sample data. For example, in the initial model for the present study, the Strain subscales and Strain factor equations in EQS are as follows:

$$\begin{aligned} V193 &= F6 + E193 \\ V194 &= F6 + E194 \\ V195 &= F6 + E195 \\ V196 &= F6 + E196 \\ F6 &= F1 + F2 + F3 + F4 + F5 + D6 \end{aligned}$$

Where V = observed variable, F = factor, E = error, D = disturbance.

As can be seen in the equations, each observed variable consists of a contribution from the factor and an error term. When arrows from one or more factors point to another, the equation for the target factor (F) consists of all these factors (e.g., F1 = Stress, F2 =

Positive coping, F3 = Negative coping, F4 = Morale/cohesion, F5 = Confidence in leadership) plus a disturbance. In this case, Strain is an endogenous variable; a linear combination of other variables in the model and a residual (disturbance). The disturbance represents the variance in the endogenous variable unaccounted for by the other variables. Disturbances are analogous to residuals in regression. Theoretically, a disturbance can be seen as a proxy or composite variable that represents all unmeasured causes and the line that points from a disturbance to an endogenous variable represents the combined effects of all the omitted causes of that variable (Kline, 1997).

The main advantage of using drawings rather than writing equations in programs such as EQS is that the likelihood of making errors or omitting equations is reduced. Therefore, with the exception of the multiple group procedure which does not permit the use of a drawing, the model drawing facility in EQS was used to specify each model for analysis.

Step 2 - Determine whether the model is identified. A model is identified if it is theoretically possible for the computer to derive a unique estimate of every model parameter. The most important issue is that there must be at least as many observations as model parameters to be estimated. If not, the model is said to be *not identified* or *underidentified*. The following equation is used to derive the number of observations in the model (Kline, 1997):

$$\text{Number of observations} = \frac{v(v+1)}{2}$$

where v is the number of observed variables (subscales).

Using the equation above, the overall model for the present study has 300 observations:

$$\text{Number of observations} = \frac{24(24+1)}{2} = \frac{600}{2} = 300$$

The original number of parameters to be estimated was 57. The degrees of freedom for the model are calculated by subtracting the number of parameters from the number of observations. Therefore there are 243 degrees of freedom ($300 - 57 = 243$) in this original model. A basic *just identified* model (sometimes called a *saturated* model) has an equal number of observations and parameters to be estimated. An *overidentified* path model has fewer parameters than observations. Thus, the present model is overidentified. It is possible to find a unique solution for overidentified models by imposing a statistical criterion on the solution, however, it may not perfectly fit the data.

In addition, a model is said to be *recursive* if the flow of information (direction of the arrows) is in one direction. That is, there are no feedback loops. Feedback loops indicate that a model is *nonrecursive*. The direction of the arrows in the present model is, generally, from left to right and there are no feedback loops. Thus, the present model is recursive.

Step 3 - Analyze the model. This step involves using a model-fitting program such as EQS to derive estimates of the model's parameters with the data. Path analysis using multiple regression is only useful with the most basic type of model. Other more sophisticated methods such as maximum likelihood are typically used to estimate the model. The interpretation of path coefficients in SEM is the same as in multiple

regression. That is, they are standardized regression coefficients (unidirectional arrows) and covariances (two directional arrows).

According to Tabachnick and Fidell (1996), the two methods differ in how they go about the task of estimation. Whereas in multiple regression parameter estimation is aimed at minimizing the sum of squared residuals (principle of least squares) maximum likelihood estimates parameters that have most likely given rise to the sample data. In maximum likelihood estimation, $\mathbf{W}$ (the weight matrix) is interpreted as $\mathbf{W} = \Sigma^{-1}$, the inverse of the estimated population covariance matrix.

In contrast to multiple regression, which requires a separate analysis for each endogenous (dependent) variable, maximum likelihood estimation is simultaneous. That is, estimates of all model parameters are calculated all at once. Assuming multivariate normality, maximum likelihood estimation sets arbitrary values for population parameters (means, variances and covariances for the variables) and treats them as if they were the population parameters. Then, the procedure determines the likelihood of observing certain values for the variables on a single observation drawn from such a population. If there is more than one observation, then the procedure determines the joint likelihood of obtaining such a sample of observation vectors. When the procedure is complete, such values are taken to be the maximum likelihood estimators of the population parameters.

Maximum likelihood estimation is usually iterative, which means that the computer derives an initial solution and then attempts to improve these estimates through subsequent cycles of calculations. "Improvement" means that the model-implied

covariances based on the estimates from each step become more similar to the observed ones.

Step 4 - Evaluate model fit. In this step the aim is to determine how adequately the model accounts for the data. Generally, researchers recommend a multiple set of fit indices should be examined (e.g., Byrne, 1994; Kline, 1997; Pedhazur, 1997; Tabachnick & Fidell, 1996). In fact, although there appears to be some disagreement with respect to a general rule of thumb for different fit indices (e.g., Loehlin, 1998), according to Pedhazur (1997) there is “unanimity” (p. 832) that no single fit index should be relied upon in the assessment of model fit.

Model fit was assessed using multiple statistical and fit indices including Chi-square (χ^2), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Bentler-Bonett Normed Fit Index (NFI), Bentler-Bonett Non-normed Fit Index (NNFI) and the Standardized Root Mean Square Residual (RMSR.) Detailed descriptions of these and other indices can be found in several sources (e.g., Byrne, 1994; Kline, 1997; Tabachnick & Fidell, 1996).

Briefly, a low and non-significant value of the chi-square statistic indicates a good fit to the data. However, chi-square can not be interpreted in a standardized way (it has no theoretical upper bound) and is very sensitive to sample size. To deal with the sensitivity to sample size problem, the chi-square statistic can be divided by the degrees of freedom to get a better estimate. Kline (1997) recommended that a chi-square/df ratio of less than 3 is acceptable. The GFI and AGFI values range from 0 (poor fit) to 1 (perfect fit). The GFI is analogous to a squared multiple correlation indicating the

proportion of covariances explained by the model-implied covariances whereas the AGFI is like a shrinkage-corrected squared multiple correlation in that it includes an adjustment for model complexity (Kline, 1997). The NFI indicates the proportion in the improvement of the overall fit of the model to a null model (one in which the observed variables are assumed to be uncorrelated). The NNFI includes a correction for model complexity similar to the AGFI. NFI and NNFI values range from 0-1. Kline (1997), Stevens (2002) and Tabachnick and Fidell (1996) suggest GFI, AGFI, NFI, and NNFI values of .9 or greater indicate the model is a good fit to the data. In contrast, the RMSR is a standardized summary of the covariance residuals that indicates better fit with lower (closer to zero) values. Goodness of fit indices for the overall model and improvements as well as optimal values can be seen in Table B-1.

Table B-1

Goodness of fit indices for overall model (N = 1,897).

	X^2	X^2/df	GFI	AGFI	NFI	NNFI	RMSR
Optimal fit		<3	>.90	>.90	>.90	>.90	<.10
Model 1	3264.77	13.44	.86	.81	.77	.75	.09
Model 2	2677.98	7.92	.88	.86	.88	.88	.08
Model 3	2053.74	6.22	.91	.90	.91	.91	.05

Note: X^2 = Chi-square. df = degrees of freedom. GFI = Goodness of fit. Adjusted Goodness of fit. NFI = Normed fit index. NNFI = Non-normed fit index. RMSR = Root mean square residual.

As can be seen in Table B-1, Model 1 did not provide an adequate fit to the data.

Of particular concern was the observed relation between confidence in leadership and

strain. Although the correlational analyses indicated negative relations between confidence in leader components and strain, when combined into one factor the SEM analysis indicated a positive relation. That is, the standardized regression coefficient of .19 between confidence in leadership and strain indicated that strain would increase .19 of a standard deviation for a full standard deviation increase in confidence in leadership. A careful examination of the data indicated that scale scores were entered in the analysis correctly.

As confidence in platoon commander and confidence in company commander are ratings at different organizational levels, it might be that treating them similarly (i.e., in the same factor) is not appropriate. Therefore, it was decided to decompose the confidence in leadership factor into its components and re-analyze the model. When re-analyzed, these separate paths from confidence in platoon commander and confidence in company commander to strain were not significant and were removed. The results of this analysis can be seen in Table B-1 Model 2. Although these fit indices suggested a better fit to the data, model respecification was indicated.

Step 5 - Respecify the model. Model respecification should be guided by the researcher's hypotheses. To determine possible misfits, the Legrange Multiplier (LM) test and the Wald W statistic were examined. The LM test provides an estimate of how much the overall chi-square statistic would decrease if a particular parameter was added. Conversely, the Wald W test estimates the amount the overall chi-square would increase if a particular free parameter were fixed, that is, dropped from the model.

For model 1, in addition to the decomposition of confidence in leadership to individual components, the Wald W Test indicated that paths from stress to positive coping and from positive coping to strain be dropped, that is, they were not significant. The LM test indicated that further reductions in X^2 values could be achieved by adding a path from positive coping to Cope 9 (restraint coping). As restraint coping can be seen to be beneficial in some instances, the path was added (Model 2). Theoretically relevant improvements suggested from the analysis of Model 2 included adding paths from positive coping to Cope 3 (turning to religion), confidence in platoon commander, confidence in company commander and morale/cohesion. In addition, paths from negative coping to COPE 4 (seeking social support) and morale/cohesion were indicated. Finally, paths from confidence in platoon commander and morale/cohesion to Stress 4 (work environment) were also indicated. The final model (Model 3) includes these improvements and provides a much better fit to the data.

In summary, the overall model (Figure B-1 below and Figure C-1 in Appendix C) suggests important relations among components. First, there are direct, positive relations between stress and strain, and negative coping and strain. Negative coping increases as stress increases although there is no direct relation between stress and positive coping. Stress also has direct and negative effects on confidence in platoon commander, confidence in company commander and morale/cohesion. Therefore, as stress directly influenced the levels of stress, negative coping, confidence in leadership, and morale/cohesion, but did not directly affect positive coping, *Hypothesis 1 received only partial support*

Positive coping has positive effects on confidence in platoon commander, confidence in company commander and morale/cohesion but does not affect strain directly. Similarly, confidence in platoon commander and confidence in company commander have direct positive effects on morale/cohesion. Morale/cohesion appears to

Figure B-1

Overall Model 3 (N = 1,897)

play an important mediating role between positive coping, confidence in platoon commander, confidence in company commander and strain. Mediating coefficients can be calculated by multiplying the direct path coefficients of interest.

For example, the effect of confidence in platoon commander on strain can be calculated by multiplying its coefficient to Morale/cohesion with the Morale/cohesion coefficient to strain ($.46 \times -.17 = -.08$). Therefore, strain *decreases* .08 of a standard deviation for every full standard deviation *increase* in confidence in platoon commander through its relation to Morale/cohesion.

Defining and Examining Mediators and Moderators

A mediating variable “transmits” the effects of one variable to another (e.g., James & Brett, 1984). That is, a mediating effect refers to an intervening variable that is “... part of a causal chain that is affected by a prior variable and in turn affects a subsequent one” (Kline, 1997; p. 55). As was seen for the overall model for example, confidence in leadership contributes indirectly to perceived strain through the individual’s experience and interpretation of morale/cohesion. Path analysis (a core technique in SEM) is used to test for mediating effects. A mediator variable should not be confused with a moderator variable which is defined as “any variable which when systematically varied ‘causes’ the relationship between two other variables to change” (Stone, 1978; p. 26). Specifically, the moderating effect of a variable refers to differences in the relation between two variables, such as stress and strain, when considering a third variable, such as social support (Stone, 1988). For example, the effects of stress on strain might be expected to be more debilitating when social support

is lacking that when social support is present. Moderators are implied whenever a theory, model, or perspective argues that a relationship between two variables is contingent on the value of a third variable. In some cases, variables can act as both moderators and mediators.

Traditionally, moderators have been examined using a regression approach (e.g., Cohen & Cohen, 1983; Pedhazur, 1997; Saunders, 1956). For the case of one predictor and one hypothesized moderator variable, the regression strategy is a two-stage hierarchical analysis. In the first stage, dependent variable scores (e.g., a measure of strain) are regressed on scores for both the independent variable (e.g., a measure of job stressors) and the hypothesized moderator variable (e.g., coping strategy). The regression yields an estimate of the proportion of variance explained in the dependent variable by the main effects of the independent and moderator variables, $R^2(1)$. In the second stage, a cross-product term (independent variable $\times$ moderator variable) is added to the model. This regression provides an estimate of the proportion of variance in the dependent variable explained not only by the main effects of the independent and moderator variables, but also their interaction, $R^2(2)$. If $R^2(2)$ is significantly different from $R^2(1)$, it is concluded that the independent variable and moderator interactively influence dependent variable scores. That is, there is evidence of a moderating effect.

Recall that Day and Livingstone (2001) used this approach in their study of the moderating effects of coping strategies on strain for a sample of Canadian soldiers. Specifically, a series of hierarchical regression analyses were used to test the direct and indirect (moderating) effects of coping style and support on the relationship between

acute stressors and psychological, behavioural, and physical complaints. To account for any variance due to unrelated variables, reported health symptoms were regressed on age, gender, acute nonwork events, lack of job stimulation, responsibility for others and role overload. These variables accounted for 16% ($p < .001$) of the variance in health symptoms. In the next step, health symptoms were then regressed on the number of acute work events experienced by respondents. These events accounted for a low but significant amount of the variance in health indices ($R^2 = .01, p < .01$). The coping variables (problem-focused, positive emotion focused, seeking information and emotional support, venting of emotions, and denial/disengagement) were then entered on the third step. Jointly, they accounted for an additional 12% ($p < .001$) of the variance in the health indices. Of these variables, only coping through denial/disengagement ($\beta = .30, p < .001$) and venting of emotions ($\beta = .13, p < .001$) uniquely predicted health indices. Finally, on the last step, the health complaints were regressed on the four interaction terms: acute work events with either problem focused coping, support seeking, venting of emotions and denial/disengagement. These terms did not explain a significant proportion of the variance in health complaints. However, two of the interaction terms (Acute Work Events X Denial/Disengagement and Acute Work Events X Venting of Emotions) were significant ($\beta = .10, p < .05$; $\beta = -.10, p < .05$) and, therefore further examined. Thus the total proportion of variance accounted for by this solution was approximately 29%.

Moderators in structural equation modelling. Recently, moderators have also been examined by the use of SEM (e.g., Kline, 1997). There are two basic approaches

for dealing with moderators in SEM. The simplest approach is to conduct a separate path analysis for each group along the moderator variable. For example, if rank was hypothesized to moderate the effects stress on strain, a separate path analysis could be conducted for those cases of one rank group (e.g., officers) and another for a different rank group (e.g., soldiers). Then, unstandardized estimates for each solution would be visually inspected and compared.

A more sophisticated comparison can be conducted using a Multiple Group Analysis (MGA) approach in SEM (e.g., Kline, 1997; Vandenberg & Lance, 2000; Schmitt & Mills, 2001). The main question of a MGA concerns measurement invariance or whether a set of indicators assesses the same latent variables in different groups. Again, group membership (in our example, positive coping strategies vs. negative coping strategies) is conceptualized as the moderator variable; that is, the variable hypothesized to moderate the relations between the indicators and latent variables specified in the measurement model. The evaluation of measurement invariance typically involves the comparison of the relative fits with the chi-square difference test of the two models, one with cross-group equality constraints imposed (group membership identified) and the other without constraints. If the fit of the equality-constrained model is not significantly worse than that of the unconstrained model, then the indicators may measure the latent variables in the same way. If the fit of the constrained model is significantly worse, however, this might indicate measurement invariance, or a moderating effect.

The major problem with the SEM approach in dealing with moderators is its lack of flexibility in controlling for the effects of other variables. For example, unlike the

hierarchical regression approach that can systematically control for variables (e.g., sex or rank) while examining the existence of main effects and interactions between independent variables and hypothesized moderators on the dependent variable, MGA “controls” for variables only by examining different variations of the data set. Thus, to examine the moderating effects of confidence in leadership with other variables on strain while controlling for sex, one would need four variations of the data set (i.e., four groups each in a different file): males with high confidence, males with low confidence, females with high confidence, and females with low confidence. As each group is run individually within the MGA first to determine the independence model, this would have the effect of reducing the sample size to an insufficient level given the number of cross-group equality constraints present in even the simplest of models. Thus, the MGA is not an efficient procedure for dealing with moderators while controlling for other important variables.

In the present study, this limitation of MGA presented problems for the examination of several moderating effects. For example, previous research (Izzo et. al., 2000) indicates age and operational experience are related to strain and, therefore, should be controlled for when examining the moderating effects of other variables such as morale/ cohesion. Thus, the regression approach was used for most analyses of moderators.

MGA special issues. Unlike single group analyses, MGA cannot rely on model drawings for equation input. All equations have to be entered in a command file by filling an equation matrix. The equations for this analysis and the initial cross group

constraints can be seen in Table B-2. In terms of output, the MGA procedure in EQS is very similar to the single group analysis. However, there are some important differences in the statistics needed for the fit indices. For the NFI and NNFI indices, a null or baseline model is defined and the current model is evaluated against this baseline. The baseline model is the multi-group model of within-group independence or uncorrelated variables, with no cross-group constraints. The chi-square statistic for this multi-group independence model is reported as well as the chi-square for the model of interest based on the entire parametric specification across all groups, taking into account all within-group and cross-group constraints. These statistics, along with their degrees of freedom, provide the components needed for the calculation of NFI, and NNFI. The GFI and AGFI are computed in the usual way using information from all groups. The LM test in the MGA context is designed to evaluate cross-group equality constraints. A univariate LM test is provided for each of the cross-group equality constraints in the model. Each test provides evidence on the null hypothesis that the constraint is true in the populations involved. If the probability value of the LM statistic for such a constraint is low ($p < .05$), this is a good indication that the constraint is unreasonable, and perhaps should be released in a subsequent analysis. If the LM statistic yields a probability value for a cross-group constraint that is high, the null hypothesis of the equality of some parameters across populations cannot be rejected and the constraint should be maintained in further analyses; that is, there is no interaction between population membership and the structural model.

Table B-2

Variable Labels, Equations and Constraints Imposed for Multiple Group Analysis – Model 1: Positive Coping (N = 276) and Negative Coping (N = 304).

/LABELS

V1=H36A; V2=H37A; V3=H38A; V4=H39A; V5=H40A;
 V6=H41A; V7=Stress1; V8=Stress2; V9=Stress3; V10=Stress4;
 V11=Stress5; V12=Strain1; V13=Strain2; V14=Strain3; V15=Strain4;
 V16=COPE1; V17=COPE2; V18=COPE3; V19=COPE4; V20=COPE5;
 V21=COPE6; V22=COPE7; V23=COPE8; V24=COPE9; V25=COPE10;
 V26=COPE11; V27=TaskCo; V28=SocialCo.

/EQUATIONS

V1 = + *F4 + E1;
 V2 = + *F4 + E2;
 V3 = + *F4 + E3;
 V4 = + *F5 + E4;
 V5 = + *F5 + E5;
 V6 = + *F5 + E6;
 V7 = + *F1 + E7;
 V8 = + *F1 + E8;
 V9 = + *F1 + E9;
 V10 = + *F1 + E10;
 V11 = + *F1 + E11;
 V12 = + *F7 + E12;
 V13 = + *F7 + E13;
 V14 = + *F7 + E14;
 V15 = + *F7 + E15;
 V16 = + *F2 + E16;
 V17 = + *F3 + E17;
 V19 = + *F2 + E19;
 V20 = + *F2 + E20;
 V21 = + *F3 + E21;
 V22 = + *F2 + E22;
 V23 = + *F3 + E23;
 V24 = + *F3 + E24;
 V25 = + *F3 + E25;
 V26 = + *F3 + E26;
 V27 = + *F6 + E27;
 V28 = + *F6 + E28;
 F3 = + *F1 + D3;
 F4 = + *F1 + *F2 + D4;
 F5 = + *F1 + *F2 + *F4 + D5;
 F6 = + *F1 + *F2 + *F4 + *F5 + D6;
 F7 = + *F1 + *F3 + *F6 + D7;

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/CONSTRAINTS
(1,V18,V18)=(2,V18,V18);
(1,F1,F1)=(2,F1,F1);
(1,F2,F2)=(2,F2,F2);
(1,E1,E1)=(2,E1,E1);
(1,E2,E2)=(2,E2,E2);
(1,E3,E3)=(2,E3,E3);
(1,E4,E4)=(2,E4,E4);
(1,E5,E5)=(2,E5,E5);
(1,E6,E6)=(2,E6,E6);
(1,E7,E7)=(2,E7,E7);
(1,E8,E8)=(2,E8,E8);
(1,E9,E9)=(2,E9,E9);
(1,E10,E10)=(2,E10,E10);
(1,E11,E11)=(2,E11,E11);
(1,E12,E12)=(2,E12,E12);
(1,E13,E13)=(2,E13,E13);
(1,E14,E14)=(2,E14,E14);
(1,E15,E15)=(2,E15,E15);
(1,E16,E16)=(2,E16,E16);
(1,E17,E17)=(2,E17,E17);
(1,E19,E19)=(2,E19,E19);
(1,E20,E20)=(2,E20,E20);
(1,E21,E21)=(2,E21,E21);
(1,E22,E22)=(2,E22,E22);
(1,E23,E23)=(2,E23,E23);
(1,E24,E24)=(2,E24,E24);
(1,E25,E25)=(2,E25,E25);
(1,E26,E26)=(2,E26,E26);
(1,E27,E27)=(2,E27,E27);
(1,E28,E28)=(2,E28,E28);
(1,D3,D3)=(2,D3,D3);
(1,D4,D4)=(2,D4,D4);
(1,D5,D5)=(2,D5,D5);
(1,D6,D6)=(2,D6,D6);
(1,D7,D7)=(2,D7,D7);
(1,V7,F1)=(2,V7,F1);
(1,V8,F1)=(2,V8,F1);
(1,V9,F1)=(2,V9,F1);
(1,V10,F1)=(2,V10,F1);
(1,V11,F1)=(2,V11,F1);
(1,V16,F2)=(2,V16,F2);
(1,V19,F2)=(2,V19,F2);
(1,V20,F2)=(2,V20,F2);
(1,V22,F2)=(2,V22,F2);
(1,F3,F1)=(2,F3,F1);
(1,F4,F1)=(2,F4,F1);
(1,F4,F2)=(2,F4,F2);
(1,F5,F1)=(2,F5,F1);
(1,F5,F2)=(2,F5,F2);
(1,F6,F1)=(2,F6,F1);

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(1,F6,F2)=(2,F6,F2);
 (1,F7,F1)=(2,F7,F1);
 (1,V1,F4)=(2,V1,F4);
 (1,V2,F4)=(2,V2,F4);
 (1,V3,F4)=(2,V3,F4);
 (1,V4,F5)=(2,V4,F5);
 (1,V5,F5)=(2,V5,F5);
 (1,V6,F5)=(2,V6,F5);
 (1,V12,F7)=(2,V12,F7);
 (1,V13,F7)=(2,V13,F7);
 (1,V14,F7)=(2,V14,F7);
 (1,V15,F7)=(2,V15,F7);
 (1,V17,F3)=(2,V17,F3);
 (1,V20,F3)=(2,V20,F3);
 (1,V21,F3)=(2,V21,F3);
 (1,V23,F3)=(2,V23,F3);
 (1,V24,F3)=(2,V24,F3);
 (1,V25,F3)=(2,V25,F3);
 (1,V26,F3)=(2,V26,F3);
 (1,V27,F6)=(2,V27,F6);
 (1,V28,F6)=(2,V28,F6);
 (1,F5,F4)=(2,F5,F4);
 (1,F6,F4)=(2,F6,F4);
 (1,F6,F5)=(2,F6,F5);
 (1,F7,F3)=(2,F7,F3);
 (1,F7,F6)=(2,F7,F6);

Note: V = variable (indicator). F = factor. E = error term. D = disturbance. H36A, H37A, H38A = Confidence in platoon commander items. H39A, H40A, H41A, = Confidence in company commander items. Stress 1 = career issues, Stress 2 = combat stress, Stress 3 = family concerns, Stress 4 = work environment, Stress 5 = living conditions, Strain 1 = depression, Strain 2 = hyper alertness, Strain 3 = somatic complaints, Strain 4 = generalized anxiety, COPE 1 = problem focused1, COPE2 = denial, COPE3 = turning to religion, COPE 4 = seeking social support, COPE 5 = acceptance, COPE 6 = venting emotions, COPE7 = problem focused2, COPE8 = using alcohol, COPE9 = restraint coping, COPE 10 = using drugs, COPE11 = mental disengagement, Taskco = task cohesion, Socialco = social cohesion.

Appendix C

Structural Equation Modelling Figures

Figure C-1

Overall model 3 ($N = 1,897$).

E188 E189 E190 E191 E192

Figure C-2

Separate model approach – standardized officer model 1 (N = 135).

Figure C-3

Separate model approach – standardized NCM model 1 ($N = 302$).

Figure C-4

Separate model approach – standardized early administration model 1 (N = 205).

Figure C- 5

Separate model approach – standardized late administration model 1 (N = 222).

Appendix D

The Unit Climate Profile Questionnaire

Unit Climate Profile

Questionnaire

Your participation is voluntary. This survey is one of a series that examines the human aspects of operations. Your responses will be added to group data and used to enhance the effectiveness of future operations and to respond to the needs of members and families. Your honest and thoughtful responses are requested.

Your responses are treated confidentially. No individual responses are examined or used for any purpose beyond being added to group data.

Instructions: There are several sections to the survey. Please fill in the appropriate circle which is either under or beside the question.

Use a pencil. If you wish to change your response cross out the incorrect answer and fill in the correct answer.

Please return the completed survey to the administrator.

Thank you for your participation.

Directions: *Please fill in the circle under the response you wish to make. For example:*

Sex: Male Female
 ☐¹ ☐²

Background Information:

1. Rank:

Pte JNCM SNCM Officer
☐¹ ☐² ☐³ ☐⁴

2. Sex:

Male Female
☐¹ ☐²

3. Marital Status:

Married/
Partner Single Separated/
Divorced Other (eg.
widowed)
☐¹ ☐² ☐³ ☐⁴

4. The number of dependents that live with you (not counting your partner/spouse):

0 1 2 3 4 5+
☐ ☐ ☐ ☐ ☐ ☐

5. How many UN or NATO tours of duty have you had (including this one)?

0 1 2 3 4 5+
☐ ☐ ☐ ☐ ☐ ☐

6. How many years of completed service do you have?

0-4 5-9 10-14 15+
☐¹ ☐² ☐³ ☐⁴

7. Your age:

17-21 22-26 27-31 32-36 37+
☐¹ ☐² ☐³ ☐⁴ ☐⁵

8. Your first official language:

Eng French
☐¹ ☐²

9. What level of education do you have?

Some Completed Some University/
high high university college
school school /college degree
☐¹ ☐² ☐³ ☐⁴

10. Have you been convicted of an offence under the National Defence Act during the last six months?

No Yes
☐⁰ ☐¹

11. Other than regular check-ups and inoculations, how many times have you visited the MIR in the last six months?

0 1-2 3-4 5+
times times times times
☐⁰ ☐¹ ☐² ☐³

12. Which of the following categories best describes your status?

Regular Regular Reservist
Forces Augmentee
☐¹ ☐² ☐³

13. How many UN or NATO tours have you had in the last five years?

0 1 2 3 4 5+
☐ ☐ ☐ ☐ ☐ ☐

14. Have you been deployed in the last 12 months on a UN or NATO tour?

No Yes
☐⁰ ☐¹

This ends this section. Please continue on the next page.

Climate:

The purpose of this section is to measure morale, cohesion and other aspects important to military performance. Using the scale beside each question please fill in the circle that corresponds with your level of agreement/disagreement with the given statement.

	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
1 My platoon/troop is ready for combat.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
2 Soldiers in my platoon/troop know what is expected of them.	☐	☐	☐	☐	☐
3 I am confident in the combat abilities of soldiers in my platoon/troop.	☐	☐	☐	☐	☐
4 It feels good to be part of my platoon/troop.	☐	☐	☐	☐	☐
5 The level of morale of my platoon/troop is very high.	☐	☐	☐	☐	☐
6 Overall, my platoon/troop is effective in field training exercises.	☐	☐	☐	☐	☐
7 I am satisfied with the social events in my platoon/troop.	☐	☐	☐	☐	☐
8 In my platoon/troop my friends are ready to go to combat, if and when it is necessary.	☐	☐	☐	☐	☐
9 If we were going to war, I would rather go with my platoon/troop than with any other platoon/troop I know.	☐	☐	☐	☐	☐
10 The soldiers in my platoon/troop encourage each other to work together as a team.	☐	☐	☐	☐	☐
11 The soldiers in my platoon/troop know what the unit is trying to accomplish.	☐	☐	☐	☐	☐
12 My personal level of morale is very high.	☐	☐	☐	☐	☐
13 The soldiers in my platoon/troop are proud to be in this unit.	☐	☐	☐	☐	☐
14 My job is important to the mission of the unit.	☐	☐	☐	☐	☐
15 Soldiers in my platoon/troop would stick together in a combat situation.	☐	☐	☐	☐	☐
16 Overall, my platoon/troop is effective in garrison (for example, inspections, individual task training, physical fitness).	☐	☐	☐	☐	☐
17 There is a lot of togetherness in my platoon/troop.	☐	☐	☐	☐	☐
18 When I talk to my immediate supervisor, s/he doesn't pay attention to what I'm saying.	☐	☐	☐	☐	☐

		strongly disagree	disagree	neither agree nor disagree	agree	Strongly Agree
19	My immediate supervisor gives us big jobs late in the day and wants them done before we leave work.	☐	☐	☐	☐	☐
20	My immediate supervisor encourages soldiers to give their best efforts.	☐	☐	☐	☐	☐
21	My immediate supervisor maintains high standards of performance.	☐	☐	☐	☐	☐
22	My immediate supervisor offers new ideas for solving job-related problems.	☐	☐	☐	☐	☐
23	My immediate supervisor is willing to listen to any problems.	☐	☐	☐	☐	☐
24	My immediate supervisor refuses to explain his/her actions.	☐	☐	☐	☐	☐
25	My immediate supervisor puts suggestions by soldiers of the platoon/troop into operation.	☐	☐	☐	☐	☐
26	My immediate supervisor makes sure his/her role in the unit is understood by the soldiers.	☐	☐	☐	☐	☐
27	My immediate supervisor acts without consulting the soldiers in the platoon/troop.	☐	☐	☐	☐	☐
28	My immediate supervisor makes us work a lot of extra hours.	☐	☐	☐	☐	☐
29	My immediate supervisor lets other supervisors interfere with my work group.	☐	☐	☐	☐	☐
30	My platoon/troop warrant stands up for the troops.	☐	☐	☐	☐	☐
31	My platoon/troop warrant is respected by platoon/troop Members.	☐	☐	☐	☐	☐
32	In the event of combat I have confidence in my platoon/troop warrant.	☐	☐	☐	☐	☐
33	The Sr NCOs in my platoon/troop stay with us in the field when conditions are terrible.	☐	☐	☐	☐	☐
34	The Sr NCOs in my platoon/troop go to bat for their troops to get things they deserve.	☐	☐	☐	☐	☐
35	The Sr NCOs trust the soldiers in this platoon/troop.	☐	☐	☐	☐	☐
36	My platoon/troop commander is respected by platoon/troop members.	☐	☐	☐	☐	☐
37	My platoon/troop commander stands up for the troops.	☐	☐	☐	☐	☐
38	In the event of combat I have confidence in my platoon/troop commander.	☐	☐	☐	☐	☐
39	My company commander stands up for the troops.	☐	☐	☐	☐	☐
40	My company commander is respected by those in the company.	☐	☐	☐	☐	☐
41	In the event of combat I have confidence in the company commander.	☐	☐	☐	☐	☐
42	My section commander is respected by section members.	☐	☐	☐	☐	☐
43	My section commander stands up for the troops.	☐	☐	☐	☐	☐

		strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
44	In the event of combat I have confidence in my section commander.	☐	☐	☐	☐	☐
45	My Commanding Officer stands up for the troops.	☐	☐	☐	☐	☐
46	My Commanding Officer is respected by those in the Battalion/Regiment.	☐	☐	☐	☐	☐
47	In the event of combat I have confidence in the Commanding Officer.	☐	☐	☐	☐	☐
48	My CSM/SSM stands up for the troops.	☐	☐	☐	☐	☐
49	My CSM/SSM is respected by those in the company.	☐	☐	☐	☐	☐
50	In the event of combat I have confidence in the CSM/SSM.	☐	☐	☐	☐	☐
51	I think I would perform better in battle than other members of my platoon/troop.	☐	☐	☐	☐	☐
52	I feel I am making a contribution to Canada by serving in the Army.	☐	☐	☐	☐	☐
53	I am confident in my abilities as a soldier.	☐	☐	☐	☐	☐
54	I feel proud to be a soldier in the Canadian Army.	☐	☐	☐	☐	☐
55	I am better trained than soldiers from other nations.	☐	☐	☐	☐	☐
56	I feel the Army has an important job to do in defending Canada.	☐	☐	☐	☐	☐
57	Differences in rank should not be important after hours.	☐	☐	☐	☐	☐
58	What a member does in private life should be of no concern of his supervisor/commander.	☐	☐	☐	☐	☐
59	What a member does in off duty hours is none of the military's business.	☐	☐	☐	☐	☐
60	I plan on making the combat arms my career.	☐	☐	☐	☐	☐
61	I would encourage my civilian friends to enlist in the Army.	☐	☐	☐	☐	☐
62	A career in the Canadian Forces is worthwhile.	☐	☐	☐	☐	☐

This ends this section. Please continue on the next page.

Stress in Military Service:

Below is a list of issues, situations and threats that have caused stress for personnel serving in the military. Please indicate to what extent these stressors have caused you trouble or concern during the last month.

	no trouble or concern	a little trouble or concern	some trouble or concern	much trouble or concern	very much trouble or concern
1 Conditions of service matters (e.g., pay, allowances).	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
2 Administrative support.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
3 Career issues (eg., promotions, postings).	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
4 Training issues (eg., repetition).	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
5 Your workload.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
6 Boredom while at work.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
7 Degree of control over your work tasks.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
8 Uncertainty about what your work role is or will be (eg, mission, ROEs).	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
9 Boredom while off-duty.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
10 Uncertainty about the competence of others you rely on to do their job.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
11 The quality of your personal clothing and equipment.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
12 The feedback you receive about your work.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
13 Leadership concerns.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
14 CF policies that impact on your work.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
15 Policies and regulations in your unit (leave, alcohol etc).	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
16 Lack of cohesion among your work colleagues.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
17 Time spent away from your family due to service.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
18 Problems with or in your family.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
19 Communication with your family.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵

		no trouble or concern	a little trouble or concern	some trouble or concern	much trouble or concern	very much trouble or concern
20	Concern about the impact of deployment on your relationship with your family.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
21	Level of support shown by those outside the CF (eg., government, media).	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
22	Lack of privacy.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
23	Dealing with people external to the CF (eg., UN officials, NGOs, local police).	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
24	Mental or physical fatigue.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
25	Harsh environmental conditions (eg., heat, dust).	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
26	Threat of serious injury.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
27	Double standards (eg., in supply, applying rules, receiving privileges).	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
28	Standard of living conditions in the field/on deployment (eg., food, sleeping quarters).	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
29	Lack of recreation opportunities.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
30	Uncertainty about end-of-mission date.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
31	Seeing widespread suffering (eg., starvation, forced migration).	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
32	Seeing instances of inhumanity (eg., mass graves, neglected children, signs of torture).	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
33	The impact of a different culture (eg., attitudes towards women, death, time).	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
34	Experience with death (eg., seeing someone die, handling corpses).	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵
35	Risk of contracting a serious disease.	☐ ¹	☐ ²	☐ ³	☐ ⁴	☐ ⁵

This ends this section. Please continue over the page.

Signs:

*Here is a list of troubles or complaints people sometimes have. Using the given scale, please indicate how often you have experiences each of these **over the last month.***

		Never	Sometimes	Often	Very often
1	Common cold or flu.	☐ ¹	☐ ²	☐ ³	☐ ⁴
2	Dizziness or faintness.	☐ ¹	☐ ²	☐ ³	☐ ⁴
3	General aches or pains.	☐ ¹	☐ ²	☐ ³	☐ ⁴
4	Sweating hands, feeling wet and clammy.	☐ ¹	☐ ²	☐ ³	☐ ⁴
5	Headaches.	☐ ¹	☐ ²	☐ ³	☐ ⁴
6	Muscle twitching or trembling.	☐ ¹	☐ ²	☐ ³	☐ ⁴
7	Nervousness or tenseness.	☐ ¹	☐ ²	☐ ³	☐ ⁴
8	Rapid heartbeat (while not exercising or working hard).	☐ ¹	☐ ²	☐ ³	☐ ⁴
9	Shortness of breath (while not exercising or working hard).	☐ ¹	☐ ²	☐ ³	☐ ⁴
10	Skin rashes or itches.	☐ ¹	☐ ²	☐ ³	☐ ⁴
11	Upset stomach.	☐ ¹	☐ ²	☐ ³	☐ ⁴
12	Trouble sleeping.	☐ ¹	☐ ²	☐ ³	☐ ⁴
13	Feeling down, blue or depressed.	☐ ¹	☐ ²	☐ ³	☐ ⁴
14	Difficulty concentrating.	☐ ¹	☐ ²	☐ ³	☐ ⁴
15	Crying.	☐ ¹	☐ ²	☐ ³	☐ ⁴
16	Lack of appetite.	☐ ¹	☐ ²	☐ ³	☐ ⁴
17	Loss of weight.	☐ ¹	☐ ²	☐ ³	☐ ⁴
18	Taking medication to sleep or calm down.	☐ ¹	☐ ²	☐ ³	☐ ⁴
19	Overly tired/lack of energy.	☐ ¹	☐ ²	☐ ³	☐ ⁴
20	Loss of interest in things (eg., TV, news, friends).	☐ ¹	☐ ²	☐ ³	☐ ⁴
21	Feeling life is pointless.	☐ ¹	☐ ²	☐ ³	☐ ⁴

This is the end of this section. Please continue over the page.

Coping:

Please indicate what you generally have done and how you have generally responded when faced with difficult or trying events during the last month. Use the given scale to indicate how often, if at all, you have used these responses.

	I usually don't do this at all	I usually do this a little bit	I usually do this a medium amount	I usually do this a lot
1 I take additional action to try and get rid of the problem.	☐ ¹	☐ ²	☐ ³	☐ ⁴
2 I try to come up with a strategy about what to do.	☐ ¹	☐ ²	☐ ³	☐ ⁴
3 I put aside other activities in order to concentrate on the main problem.	☐ ¹	☐ ²	☐ ³	☐ ⁴
4 I force myself to wait for the right time to do something.	☐ ¹	☐ ²	☐ ³	☐ ⁴
5 I ask people who had similar experiences what they did.	☐ ¹	☐ ²	☐ ³	☐ ⁴
6 I talk to someone about how I feel.	☐ ¹	☐ ²	☐ ³	☐ ⁴
7 I look for something good in what is happening.	☐ ¹	☐ ²	☐ ³	☐ ⁴
8 I learn to live with it.	☐ ¹	☐ ²	☐ ³	☐ ⁴
9 I seek God's help.	☐ ¹	☐ ²	☐ ³	☐ ⁴
10 I get upset and let my emotions out.	☐ ¹	☐ ²	☐ ³	☐ ⁴
11 I refuse to believe that it has happened.	☐ ¹	☐ ²	☐ ³	☐ ⁴
12 I give up trying to get what I want.	☐ ¹	☐ ²	☐ ³	☐ ⁴
13 I turn to work or other substitute activities to take my mind off things.	☐ ¹	☐ ²	☐ ³	☐ ⁴
14 I drink alcohol in order to think less about my concerns.	☐ ¹	☐ ²	☐ ³	☐ ⁴
15 I concentrate my efforts on doing something about my concerns.	☐ ¹	☐ ²	☐ ³	☐ ⁴
16 I make a plan of action.	☐ ¹	☐ ²	☐ ³	☐ ⁴
17 I focus on dealing with the main problem, and if necessary let other things slide by a little.	☐ ¹	☐ ²	☐ ³	☐ ⁴
18 I hold off doing anything until the situation permits.	☐ ¹	☐ ²	☐ ³	☐ ⁴
19 I try to get advice from someone about what to do.	☐ ¹	☐ ²	☐ ³	☐ ⁴
20 I try to get personal support from friends or relatives.	☐ ¹	☐ ²	☐ ³	☐ ⁴
21 I try to see things in a different light, to make things seem more positive	☐ ¹	☐ ²	☐ ³	☐ ⁴
22 I accept what has happened and that things can't be changed	☐ ¹	☐ ²	☐ ³	☐ ⁴
23 I put my trust in God.	☐ ¹	☐ ²	☐ ³	☐ ⁴
24 I let my feelings out.	☐ ¹	☐ ²	☐ ³	☐ ⁴
25 I pretend that things haven't really happened.	☐ ¹	☐ ²	☐ ³	☐ ⁴
26 I just give up trying to reach my goal or have my concerns satisfied.	☐ ¹	☐ ²	☐ ³	☐ ⁴
27 I try to watch a video, listen to music or read, to think less about things.	☐ ¹	☐ ²	☐ ³	☐ ⁴
28 I take prescribed drugs in order to think less about my concerns.	☐ ¹	☐ ²	☐ ³	☐ ⁴
29 I do what has to be done, one step at a time.	☐ ¹	☐ ²	☐ ³	☐ ⁴
30 I think hard about what steps to take.	☐ ¹	☐ ²	☐ ³	☐ ⁴

		I usually don't do this at all	I usually do this a little bit	I usually do this a medium amount	I usually do this a lot
31	I stop myself from getting distracted by other thoughts or activities.	☐ ¹	☐ ²	☐ ³	☐ ⁴
32	I make sure not to make matters worse by acting too soon.	☐ ¹	☐ ²	☐ ³	☐ ⁴
33	I talk to someone to find out more about the situation.	☐ ¹	☐ ²	☐ ³	☐ ⁴
34	I discuss how I feel with someone.	☐ ¹	☐ ²	☐ ³	☐ ⁴
35	I try to learn something from negative experiences.	☐ ¹	☐ ²	☐ ³	☐ ⁴
36	I get used to the idea that negative events do happen.	☐ ¹	☐ ²	☐ ³	☐ ⁴
37	I try to find comfort in my religion.	☐ ¹	☐ ²	☐ ³	☐ ⁴
38	I find myself venting my stress a lot.	☐ ¹	☐ ²	☐ ³	☐ ⁴
39	I act as though negative events haven't really happened.	☐ ¹	☐ ²	☐ ³	☐ ⁴
40	I admit to myself that I can't deal with my concerns, and quit trying.	☐ ¹	☐ ²	☐ ³	☐ ⁴
41	I daydream about things other than my difficulties.	☐ ¹	☐ ²	☐ ³	☐ ⁴
42	I go on a drinking binge when I can.	☐ ¹	☐ ²	☐ ³	☐ ⁴
43	I take direct action to resolve problems.	☐ ¹	☐ ²	☐ ³	☐ ⁴
44	I think about how I might best handle my problems.	☐ ¹	☐ ²	☐ ³	☐ ⁴
45	I try hard to prevent other things from interfering with my efforts to deal with my main problems.	☐ ¹	☐ ²	☐ ³	☐ ⁴
46	I restrain myself from doing anything too quickly.	☐ ¹	☐ ²	☐ ³	☐ ⁴
47	I talk to someone who could do something concrete about my situation..	☐ ¹	☐ ²	☐ ³	☐ ⁴
48	I seek understanding from someone.	☐ ¹	☐ ²	☐ ³	☐ ⁴
49	I try to develop as a person as a result of my experience.	☐ ¹	☐ ²	☐ ³	☐ ⁴
50	I accept the reality of the fact that these things have happened.	☐ ¹	☐ ²	☐ ³	☐ ⁴
51	I pray more than usual.	☐ ¹	☐ ²	☐ ³	☐ ⁴
52	I get upset, and am really aware of how upset I am.	☐ ¹	☐ ²	☐ ³	☐ ⁴
53	I say to myself: "this isn't real."	☐ ¹	☐ ²	☐ ³	☐ ⁴
54	I reduce the amount of effort I put into solving my problems	☐ ¹	☐ ²	☐ ³	☐ ⁴
55	I sleep more than usual.	☐ ¹	☐ ²	☐ ³	☐ ⁴
56	I take non-prescribed drugs in order to think about my concerns less.	☐ ¹	☐ ²	☐ ³	☐ ⁴

General Comments:

We welcome your comments about any aspect of this survey, especially your thoughts on your platoon, troop or unit cohesion and morale; or, things that you have found stressful in this early stage of your deployment experience and how you have coped with these issues. Suggestions for improving support during the deployment phase, your personal well-being and support to families are particularly sought. *Remember, we do not identify individuals. We are concerned only with how we might be able to improve operational effectiveness.*

PLEASE MAKE YOUR COMMENTS HERE

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.