PERSTEMPO in the Canadian Forces: The Role of Coping and Cohesion in the Relationship between Job Stress and Morale

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ABSTRACT

Following a decade of increased frequency and intensity of international and domestic operational deployments by the Canadian Forces (CF), a range of anecdotal data gathered in 2000 suggested that significant personal difficulties were being experienced by military members. The PERSTEMPO (Personnel Tempo) and Human Dimensions of Deployments Study (HDDS) was established in order to meet the growing awareness of the need to assess the human dimensions of performance among military personnel. In addition to deployments, day-to-day aspects of job functioning may have a significant effect on the morale of military members. It is important to recognize the factors that may influence the relationship between job-related stress and morale, so that efforts and resources to increase the operational effectiveness of the CF can be directed appropriately. To this end, the present paper explored the buffering effects of horizontal cohesion, vertical cohesion, and coping on the relation between job-related stressors and morale in the CF. It was found that vertical and horizontal cohesion moderated the effects of job stressors on unit morale, such that the negative effect of job-related stressors on morale in units was attenuated if members experienced high levels of cohesion in their unit and cohesion with their superiors. Moreover, job stressors and cohesion had direct effects on personal morale. Coping strategies did not act as moderators, but instead had strong additive effects on morale, such that high levels of active coping, and low levels of passive coping, predicted higher morale. The findings are discussed in terms of the implications for programs and resources aimed at increasing morale among military members and units.

1.0 INTRODUCTION

1.1 Background to the PERSTEMPO Study

Our ability to manage the effects of continuous operation on equipment is highly developed. Rates of parts and systems usage and failures over time are observed and recorded, and precise maintenance schedules minimize the likelihood of breakdown. Our ability to manage the effects of the demands of military service on our people is, however, relatively limited. The decade of the 1990s highlighted this: as the frequency and intensity of operational deployments increased, personnel strength and budgets were reduced. As a result, there has been growing awareness of the need to assess the human dimensions of performance in the military.

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To address this, the PERSTEMPO (Personnel Tempo) and Human Dimensions of Deployments Study (HDDS) was established in 2000 to examine the effects of PERSTEMPO among CF members, their families, and the organization. PERSTEMPO is defined as the sum of the demands made by military service upon individual members, in terms of deployment load or the tempo of CF operations (OPTEMPO), the time away members spend away from home for more than twenty-four hours/overnight, and general workload (garrison load).

Exploratory research was conducted in 2000 in Macedonia and Kosovo among deployed members. More than 100 interviews with service providers and senior military members were conducted across Canada and at all large international deployment locations in 2001, including Eritrea, Bosnia, the Middle East, and aboard Her Majesty's Canadian Ship (HMCS) Winnipeg en route to the Arabian Sea. The unusually extensive qualitative program was undertaken due to the complexities of the problem area, the scope of the analysis required (down to the military occupation classification [MOC] level), and the unanticipated response to the research, which saw several requests for inclusion from locations not originally included in the plan. The information assembled from the interviews and focus groups, as well as from a literature review of existing research on other militaries, was used in the development of a quantitative survey on the impacts of military service on personnel. The survey contained a comprehensive set of questions regarding PERSTEMPO and its impacts. It was administered to CF personnel serving in Canada, as well as those deployed internationally.

The present paper will focus on some of the key factors relating to PERSTEMPO that affect individuals serving in Canada. Specifically, the paper will discuss the impacts of members' experiences of job-related stressors on morale. Stressful experiences can strongly affect the morale and performance of military personnel [1]. Variables such as cohesion, effective leadership, and high morale are important components in retention of personnel, in that fewer members are likely to leave as a result of job stress-related reasons [2]. Importantly, human aspects of work affect the performance of both individual military members as well as units. Thus, it is important to be able to measure these human dimensions in order for researchers to determine their effect on the military members' performance.

1.2 Occupational Stress in the Military

Extensive research has been conducted on workplace stress in various civilian work environments. Occupational stress researchers have demonstrated that work-related stress leads to a number of adverse organizational outcomes, including job dissatisfaction, reduced morale, and diminished performance [3]. Aspects of work stress such as occupational role stress, defined in terms of role conflict (incongruence in role expectations), role ambiguity (lack of information about one's job), as well as other factors associated with perception of one's role in the workplace, are associated with outcomes such as lower job performance, job dissatisfaction, lack of self-confidence, and intentions to leave one's job, in civilian work environments [4, 5].

However, fewer studies have been conducted focusing specifically on occupational stress in the military environment, and in particular among Canadian Forces personnel. Due to its unique nature, the military may differ from other organizations in terms of how job-related stress can affect organizational outcomes. Previous research on stress in the military has focused on tensions during operations, in the context of war. However, stressors involved in day-to-day service may also play a significant role in well-being and unit effectiveness. In fact, it has previously been reported that CF personnel perceive their service in Canada as less satisfying than their operational role [6], indicating that day-to-day service may involve unique stressors that lead to dissatisfaction. As well, among CF personnel engaged in peacekeeping tasks in Bosnia in the late 1990s, issues in the day-to-day work environment (e.g., leadership concerns, boredom at work, lack of cohesion among work colleagues, role uncertainty) were the largest factors associated with individual well-being [7].

According to the researchers, these factors relating to the work environment during peacekeeping are not unlike everyday domestic military service. Among CF personnel deployed on peacekeeping missions in the former Yugoslavia, work environment and service/career-related issues were also of particular salience [8]. In addition to these findings on the prominent role of daily work stressors, some military personnel may not have experienced a great deal of traumatic combat-related events. It is critical, therefore, to assess work-related stressors in routine service in addition to traumatic events occurring during wartime conditions, since everyday occupational stressors may be of even greater relevance for individual and organizational well-being.

Studies of occupational stress in the military indicated that role stress was associated with both personal and organizational well-being, including individual strain, job satisfaction, and affective commitment to the military [9]. As well, a high level of job unpredictability was associated with lower well-being and higher intentions to leave the military [3]. Aspects of a job that lead to dissatisfaction, such as increases in workload or added job complexity, may affect attitudes toward the military, and may contribute to individuals' decisions to stay or leave [10]. However, working longer hours in itself does not necessarily produce negative outcomes. In fact, Tucker and colleagues [3] found that the number of hours worked by U.S. military personnel was positively associated with self-reported commitment to the military, possibly because the military workplace may involve more shared experiences and opportunities for bonding and cohesion with colleagues than the civilian workplace.

Importantly, the satisfaction and well-being of individuals in organizations may have an effect not only on individual personnel, but on effectiveness of the organization as a whole. As indicated by Dobreva-Martinova and colleagues [9, p. 112], "[I]t is generally assumed that behavioural outcomes valued by the employees (e.g., job satisfaction) will benefit the organization through increased effectiveness and cooperation, and that negative outcomes (e.g., strain) will result in increased withdrawal behaviours and in decreased organizational effectiveness."

1.3 Horizontal Cohesion

Horizontal cohesion, or relations among members of a peer group, involves affinity and supportive ties to group members, as well as commitment of members of the group to each other [11]. It is "a complex social-psychological construct involving both group and individual characteristics (e.g., pride, sense of purpose and meaning, commitment)" [12, p. 164]. Horizontal cohesion is conceptualized in terms of the degree of confidence members have in each other's competence and compassion for other members of the group [13]. Importantly, cohesion is considered to be a key factor for combat effectiveness and performance, as well as combat motivation and individual morale [14, 15]. Collective and motivational forces that exist between group members create bonds that may increase the productivity of the group.

There is significant overlap between the concepts of cohesion and social support [11]. Previous research has examined social support as a buffering, or moderating factor in the relationship between stress and performance [16]. Cohesion may be a form of informal social support that is more often used in stressful situations than formal sources (e.g., a chaplain or social worker). Focus groups conducted by Hosek and colleagues [10] with military members revealed that talking with friends and colleagues in their units was more useful in coping with stressors or dealing with trauma. Lack of shared experiences with formal support sources, as well as a perception of stigma associated with using services, were cited as reasons why members relied on other individuals in their unit. Thus, cohesiveness in the military unit appears to be a key factor associated with the well-being of personnel, as well as the organization as a whole.

1.4 Vertical Cohesion

Vertical cohesion refers to the relations between superiors and subordinates. It is conceptualized as members' perceptions of the fairness, competence, and compassion of their immediate supervisors [13]. Research on leadership practices in the civilian workplace indicates that leadership can significantly affect employees in a number of ways. For example, it has been found that positive leadership styles, in which employees are looked after and are permitted to make decisions, are associated with greater job satisfaction, organizational commitment, productivity, and lower work-related stress [17-19]. In parallel with civilian workplace research, leadership practices in the military can significantly affect members' well-being and performance in similar ways. It was found that among CF personnel deployed on a peacekeeping mission in Bosnia, positive leadership style predicted higher unit morale/cohesion both during and after the deployment [7, 20]. As well, perceptions of organizational support were related to strain, job satisfaction, and affective commitment to the CF. Perceptions of military leadership as supportive and respectful toward its members may thus have a significant impact on members [9]. During times of stress, if members perceive leadership as supportive and understanding, they may be better able to perform in their role and to deal with stress without negative consequences on morale or well-being. Positive leader characteristics, such as effective communication and motivational ability, have also been found to buffer the negative effects of stress on group performance, unit morale, and unit efficiency [21].

1.5 Coping

Coping refers to the thoughts and behaviours utilized in situations that are perceived as both personally significant and as challenging the individual's resources for dealing with the situation [22, 23]. Coping strategies are used to avoid being harmed by stressors, and may include such actions as eliminating the source of the stressor, altering one's appraisal of the stressor, or attempting to manage or reduce feelings of discomfort [24]. Coping may affect one's immediate emotional and behavioural reactions to a stressful experience, as well as longer-term adaptive outcomes (e.g., well-being, social functioning) [25]. Coping has commonly been categorized as either problem-focused (i.e., aimed at problem solving or addressing the source of the stressor) or emotion-focused (i.e., concerned with attenuating the negative emotions induced by the stressor) [22]. Similar to this, several researchers [26, 27] conceptualized coping along two dimensions: active and passive. While other approaches emphasize the function of coping (i.e., managing the problem versus managing the emotions associated with the problem), the active versus passive approach concerns the focus of coping (i.e., the type of action – approach or avoidance – used to deal with the stressor) [28]. Active strategies involve directly addressing the source of the stressor, and include such actions as changing what's causing the stress, trying to feel challenged by it, and looking for information about possible choices of how to deal with it. Passive strategies, in contrast, involve attempts to behaviourally and/or emotionally avoid the stressor, including becoming apathetic, physically withdrawing from the situation, alcohol/drug use, and trying to ignore the stressor.

Problem-focused, or active coping has generally been associated with more positive outcomes, such as increased physical and mental health, whereas emotion-focused or avoidant strategies (e.g., rumination, emotional containment, self- and other-blame) are generally considered more maladaptive, leading to psychological distress [29-31]. In line with this, military research on coping has indicated that individuals who denied or disengaged from stressful experiences, or who tended to vent emotions, were more likely to report negative psychological, behavioural, and physical symptoms. For example, use of avoidance coping was related to the degree of strain reported by CF members [9]. Furthermore, such maladaptive coping strategies exacerbated the effects of work-related stressors (acute work stressors, lack of job stimulation, role ambiguity) on reported negative health outcomes [32].

1.6 Morale

Morale can be conceptualized as both an individual and a collective phenomenon [33]. Thus, morale may be a state of mind of an individual (e.g., dedication, willingness to sacrifice), or of a group (e.g., collective enthusiasm toward achieving goals). Morale involves the motivation for being ready to perform duties [3]. Group morale involves aspects of group readiness, teamwork, and effectiveness, whereas personal morale (also referred to in the literature as professional morale) involves appraisals of the self, such as confidence and pride [34], and may be considered an index of degree of psychological strain. Whereas research on combat stress has focused on outcomes such as posttraumatic stress disorder, assessing more common occupational stressors may be more relevant for increasing outcomes such as the morale and readiness of military personnel. Stressful experiences can influence morale and performance among military personnel [1]. Importantly, stress experienced by individuals in a group may affect not only individual well-being but also the well-being of other employees [3]. Thus, it is important to look not only at individual outcomes, but also the negative effects of stress on groups as a whole.

1.7 The Present Study

Occupational researchers have used stress-strain-outcome models in which to examine the negative effects of job-related stress on negative outcomes. According to these models, work stress may be appraised as exceeding personal resources, resulting in adverse psychological, social, behavioural, and physiological outcomes [35]. A model of the effects of stress on military personnel was developed by Murphy and colleagues [36]. Named the Human Dimensions of Operations (HDO) model, it indicates that stressors may have an effect on outcomes (e.g., strain, morale/cohesion), and that this relationship between stressors and negative outcomes may be moderated by intra- and inter-individual factors such as appraisals, coping strategies, and available resources and interventions. That is, moderators may alleviate or exacerbate the effects of stress on outcomes by influencing the process by which a stressor is appraised as threatening or not.

In line with this model, a study of U.S. Army soldiers deployed to Haiti revealed that the relationship between work stressors and strains (in this case, morale and depression) was lower among individuals who were members of groups that had highly similar positive perceptions of leadership within their unit [37], highlighting the importance of the social environment in dealing with stressors. As well, it was found that stressful work environments alone may not be sufficient to lead to negative individual outcomes. Perception of leadership style was identified as a key intervening factor in this relationship, in that perceived positive leadership was associated with more adaptive outcomes in the face of stress [3]. Furthermore, some research also indicates that coping styles may buffer the effects of stressors on well-being. For example, Parkes [38] found that individuals who utilized problem-focused coping strategies reported lower levels of distress, regardless of the amount of job-related stress they experienced. Those who did not use problem-focused coping, however, experienced more distress when job demands were high. In the same study, it was found that coping by withdrawing or avoiding the situation did not affect the relationship between job stress and health outcomes.

Based on the models of stress-strain-outcome used by occupational researchers [e.g., 35], and the HDO model offered by Murphy and colleagues [36] on the effects of stress on negative outcomes, we proposed that job-related stressors in the military (specifically, role ambiguity and conflict, and perceptions of lack of personal authority), would have adverse effects on personal and unit morale, but that these effects would be moderated by perceived cohesion and coping strategies. That is, it is hypothesized that when faced with stressors in the day-to-day work environment, military personnel will experience reduced personal morale, as well as reduced morale in their unit. However, if cohesion in one's unit is high, as well as cohesion between members and

their superiors, the negative effects of occupational stress on morale will be attenuated. Similarly, the effects of stress on morale will be reduced if members utilize effective (i.e., active) coping strategies, rather than more maladaptive (i.e., passive) strategies.

2.0 METHODOLOGY

2.1 Sample

The PERSTEMPO and Human Dimensions of Deployment survey was mailed to a sample of 11,355 CF Regular Force members serving in Canada who were randomly selected by MOC. 5,150 members returned the completed questionnaires, yielding a response rate of 45.4%. Out of these, data from 1,147 participants was unusable due to large amounts of missing data. These participants filled out an electronic version of the survey, which may have contained errors that resulted in the missing demographic responses, which were required for the analyses conducted. Thus, the total sample size used in the analyses was 4,003.

The average age of the participants was 38.2, with a range of 17 to 65 years. Length of full-time service with the CF ranged from less than one year to 40 years, with an average of 17.4 years of service. Table 1 presents the demographic breakdown of participants. In general, the sample was representative of the CF population, with the exception of rank (specifically, junior non-commissioned officers [NCMs] were underrepresented).

Table 1: Demographic Breakdown of Survey Respondents (N = 4003)

	Survey Respondents
Gender	
Male	85.2%
Female	14.4%
Missing	0.4%
Rank	
Junior NCMs	36.0%
Senior NCMs	29.3%
Junior Officers	19.4%
Senior Officers	14.4%
Missing	1.0%
Environment	
Sea	22.8%
Land	42.9%
Air	33.5%
Missing	0.8%
First Official Language	
English	74.7%
French	24.1%
Missing	1.2%
Education	
Less than high school/some high school	6.5%
High school diploma	33.5%
Some college or college diploma	19.4%
Some university or university degree	26.4%
Some graduate school or graduate degree	10.9%
Missing	3.2%

2.2 Procedure

The cover page of the survey provided the necessary details for informed consent, information regarding the purpose of the study (to measure the tempo of military service, the frequency of deployments, and the positive and negative implications of the demands of service for personnel, their families, and the profession), and assurance that the respondents' participation was entirely voluntary. Participants were also guaranteed that their responses would be kept anonymous and strictly confidential. In addition, they were informed that results would only be reported in aggregate, such that no individual could be identified. All surveys included both an English and a French version of the questionnaire.

2.3 Measures

2.3.1 Job stress

2.3.1.1 Job-related tensions

A reduced (9-item) version of the Index of Job-Related Tensions in Organizations [39] was used as a measure of job stress among CF members. Participants indicated how frequently they experienced each conflict (e.g., "Feeling that you have too heavy a workload, one that you can't possibly finish during an ordinary workday") on a 5-point Likert scale in which responses ranged from "never" to "always." Responses on each item were combined to produce a single overall measure of job-related tension. The scale measures occupational role stress, specifically, role ambiguity (the extent to which information on one's role is lacking) and role conflict (incongruence in expectations associated with a role).

2.3.1.2 Reduction in Authority

The Hierarchy of Authority Scale [40] was used to measure perceived personal authority and participation in organizational decision making. Participants indicated the degree to which they agreed with each item (e.g., "A person who wants to make his or her own decisions would be quickly discouraged here") along a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." Responses on the five items were averaged to yield a single score for each participant.

2.3.2 Morale

Morale was measured using the 9-item Morale scale from the United States Army Medical Research Unit/ Walter Reed Army Institute of Research. This scale assesses both personal morale and general unit morale. Participants were asked to endorse each item according to a 5-point Likert scale ranging from "very low" to "very high." The items for unit morale (e.g., "Operational readiness in your unit") and personal morale (e.g., "Your level of motivation") were separated, such that each participant received a score on their own morale, as well as their perception of the level of morale in their unit.

2.3.3 Horizontal Cohesion

Horizontal cohesion was measured using a revised 3-item cohesion scale [41] that has been used in studies involving the U.S. Army [42]. Items assess the degree to which unit members are cooperative, can depend on one another and stand up for one another. The wording was revised to match the military description of work group (i.e. unit). Participants rated the extent they agreed with each item (e.g., "The members of my unit are cooperative with each other") according to a 5-point Likert scale, with responses ranging from "strongly disagree" to "strongly agree."

2.3.4 Vertical Cohesion

Vertical cohesion was assessed using a scale based on Marlowe and colleagues [43] and Vaitkus [44] and used in U.S. Army studies [45, 46]. The scale consists of 12 items, six pertaining to officers and six to non-commissioned members. Participants rated their agreement with each item (e.g., "The officers in my unit avoid micromanaging members' work) on a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." Consistent with previous research [47], the 12 items were combined into a single score for each participant.

2.3.5 Coping

Coping strategies were measured using an 18-item scale [1] that has been used in various Walter Reed Army Institute of Research and United States Medical Research Unit - Europe studies [e.g., 48]. Participants were asked to indicate the degree to which they used each of the items/behaviours on a 5-point Likert scale ranging from "never" to "always." The scale contains 3 subscales, active coping (i.e., active attempts to remove or attenuate the stressor), passive coping (e.g., ignoring the problem, withdrawing from the situation) and religious coping (e.g., seeking religious guidance or turning to prayer). For the purpose of clarity of the present analyses, only analyses involving active and passive coping are presented.

3.0 RESULTS

3.1 Reliability Analysis

The reliability of the scales used in the survey was estimated using the Cronbach's alpha reliability coefficient, which is a measure of the internal consistency of a scale. Consistent with previous recommendations [49], a reliability coefficient of at least .70 was established for retaining the scales for further analysis. Only the active coping subscale did not meet this criterion. However, since the reliability coefficient of this subscale was so close to the criterion (.69), it was decided to keep the subscale. Reliability coefficients are presented in Table 2.

Table 2: Reliability Alpha Coefficients and Number of Items for the Scales Used in the Analyses

Scale	No. of Items	Alpha Coefficient
Job Tension	9	.82
Reduction in Authority	5	.92
Personal Morale	4	.78
Unit Morale	5	.79
Horizontal Cohesion	3	.85
Vertical Cohesion	12	.91
Active Coping	6	.69
Passive Coping	9	.75

3.2 Correlational Analyses

In analyses based on very large samples, even small differences can be statistically significant because of increased power [50]. To avoid the problems associated with finding significant relationships that were trivial in nature, a more stringent significance level was used in this research. Namely, $p < .001$ was used as the criterion for significance for all analyses.

Before conducting the main analyses, the Pearson product-moment correlations for the variables examined in the study were calculated. Based on the theoretical foundation outlined in the introduction, the variables were categorized as predictors, moderators, and outcomes of job tension. The correlations among the variables are presented in Table 3. Both indices of job-related stress were inversely related to vertical and horizontal cohesion as well as active coping, whereas they were positively correlated with passive coping. The two job

stress indices were positively related to each other. Vertical and horizontal cohesion were strongly positively associated with each other, while active and passive coping were negatively correlated. The correlations of the predictors (job tension and reduction in authority) and moderators (coping strategies and cohesion) with the outcomes (personal and unit morale) are presented with the results of the main analyses.

Table 3: Intercorrelations Among Predictor, Moderator and Outcome Variables

Variables	1	2	3	4	5	6	7	8
1. Job Tension	1.000							
2. Reduction in Authority	.44***	1.00						
3. Vertical Cohesion	-.48***	-.53***	1.00					
4. Horizontal Cohesion	-.35***	-.41***	.59***	1.00				
5. Active Coping	-.08***	-.13***	.18***	.15***	1.00			
6. Passive Coping	.29***	.24***	-.23***	-.23***	-.16***	1.00		
7. Personal Morale	-.47***	-.33***	.41***	.36***	.24***	-.36***	1.00	
8. Unit Morale	-.40***	-.35***	.53***	.53***	.14***	-.22***	.44***	1.00

*** $p<.001$

3.3 Controlling for Demographic Variables

Regression analysis was performed to determine whether demographic variables were associated with morale. Importantly, rank differences have been found in certain factors, such as well-being (junior members reported more signs of stress than senior members) and coping (junior members reported more frequent use of ineffective coping strategies than senior members) [51]. In fact, low military rank was found to function as an intervening variable in the stress-functioning relationship, in that it increased the negative effects of stress on individual functioning [52]. To account for possible effects in the present sample, rank, age and education level were controlled. The correlations between the demographic variables and morale are presented in Table 4. Unit morale was correlated with both age and rank at the $p < .001$ level. Although the correlations with the demographic variables were relatively low, it was decided to keep them in all of the hierarchical regressions as the first step in the analyses to control for their possible effects.

Table 4: Correlations of Demographic Variables with Outcome Variables

	Personal Morale	Unit Morale
Age	-.03*	.10***
Rank	.03*	.12***
Education Level	.01	.04**

* $p<.05$; *** $p<.001$

3.4 Main Analyses[1]

3.4.1 Moderating Effect of Cohesion on Morale

The first set of analyses was conducted to examine the moderating effect of cohesion on morale. Specifically, it was hypothesized that at high levels of job-related stress, individuals who perceive low cohesion within their unit, and between unit members and supervisors, will tend to report lower morale. Moreover, at high levels of stress, individuals who report high cohesion will be more likely to report higher morale than those who perceive low cohesion within their unit.

A series of hierarchical regression analyses were conducted to test the moderating effect of horizontal and vertical cohesion on the relationship between each of the job-related stressors and each of the components of morale. Following the demographic variables, job stress was entered on the first step, followed by vertical and horizontal cohesion, followed by the interaction terms[2]. A moderating effect would be indicated by a p value of less than .001 for the R^2_{change} at Step 4 of each moderator model (i.e., the interaction between cohesion and job stress). The proposed moderator model for cohesion is presented in Figure 1.

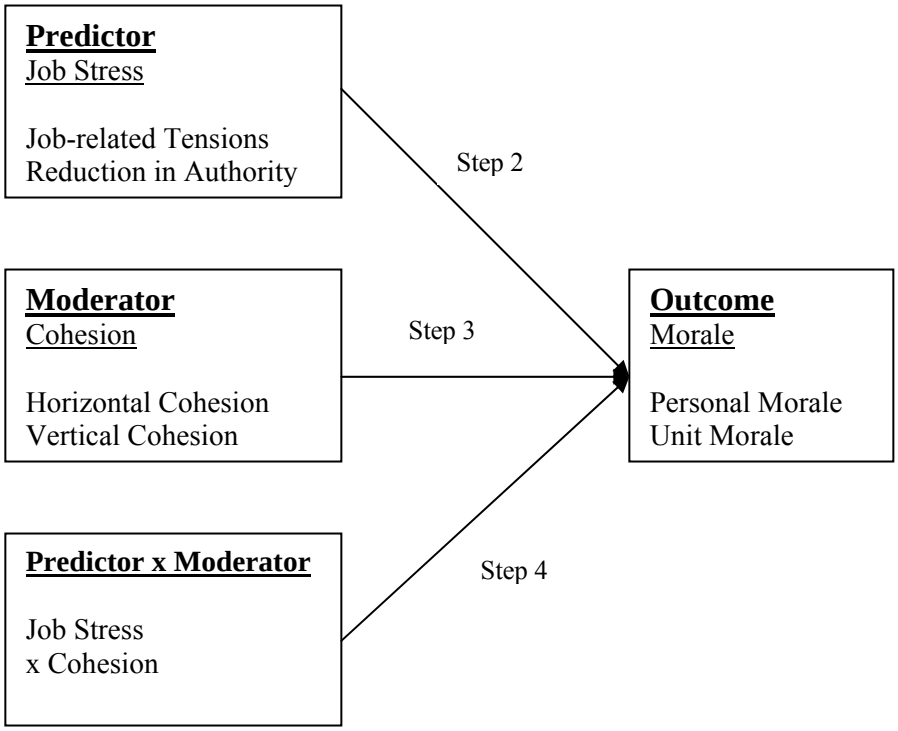

Figure 1: Proposed Moderator Model for Cohesion[3].

[1] The presence of multicollinearity, or intercorrelation among independent variables, was tested for in all hierarchical regression analyses by examining the variance inflation factor (VIF). The VIF was less than the standard cutoff of 4 in all analyses, indicating that multicollinearity was not an issue.

[2] To compute the interaction terms in all of the hierarchical regression analyses presented in this paper, centred scores on the predictor and moderator variables were created by subtracting each variable's mean from the individual cases. The cross-products were then computed using the centred variables in order to assess the interactive effects.

[3] In this depiction of the hierarchical regression steps, Step 1 (demographic variables) was omitted for clarity.

3.4.1.1 Moderating Effect of Cohesion on the Relation between Job Stress and Personal Morale

As indicated in Table 5, both job-related tensions and reduction in authority were significantly correlated with personal morale above and beyond age, rank and education level, in that greater levels of job tension and perceptions of lack of authority were associated with lower morale. However, as indicated by the values of the standardized regression coefficients [βs] and squared semi-partial correlations for the predictor variables in Step 2 of the hierarchical regressions, job-related tension was a greater unique predictor of personal morale than reduction in authority. Specifically, while job tensions explained an additional 22% of variance in personal morale above the demographic variables, reduction in authority explained an additional 11%.

None of the interaction terms assessing the moderating effects of cohesion (R^2_{change} for Step 4 in each hierarchical regression in the table) were significant beyond the adopted $p < .001$ criterion for meaningfulness of significance. While these moderators did not appear to alter the relationship between job tensions and personal morale, or between reduction in authority and personal morale, they did have additive effects. As seen in Table 5 (R^2_{change} for Step 3, size and significance of the standardized regression coefficients [βs] and squared semi-partial correlations for the predictor variables at Step 3 of each hierarchical regression), both forms of cohesion were highly positively correlated with personal morale.

Table 5: Hierarchical Regression Analysis of Cohesion on Job Stress (Personal Morale as Outcome)

Predictor		r	β	Semi-part correlation^2	R^2_{change}
Hierarchical Regression 1					
Step 1	Age	-.03*	-.05**	.002**	.003**
	Rank	.03*	.08**	.003**	
	Education	.01	-.04	.001	
Step 2	Job Tensions	-.47***	-.47***	.22***	.22***
Step 3	Horizontal Cohesion	.36***	.15***	.01***	.06***
	Vertical Cohesion	.41***	.18***	.02***	
Step 4	Job Tensions x Horizontal Cohesion	.07***	-.04*	.001*	.002**
	Job Tensions x Vertical Cohesion	.08***	-.01	.00	
Hierarchical Regression 2					
Step 1	Age	-.03*	-.05**	.002**	.004**
	Rank	.03*	.08**	.003**	
	Education	.01	-.04	.00	
Step 2	Reduction in Authority	-.33***	-.36***	.11***	.11***
Step 3	Horizontal Cohesion	.36***	.17***	.02***	.10***
	Vertical Cohesion	.41***	.26***	.04***	
Step 4	Red. Authority x Horizontal Cohesion	.13***	-.01	.00	.00
	Red. Authority x Vertical Cohesion	.13***	-.01	.00	

*p<.05, **p<.01, ***p<.001

3.4.1.2 Moderating Effect of Cohesion on the Relation between Job Stress and Unit Morale

As indicated in Table 6, both job tensions and reduction in authority were strongly associated with perceived unit morale above and beyond the effects of the demographic variables (Step 2 for each hierarchical regression), in that higher levels of job tension and perceived lack of authority were associated with lower unit morale. As well, horizontal and vertical cohesion were significantly correlated with unit morale when entered together, above the effects of the demographic and job variables (R^2_{change} for Step 3 in the hierarchical regression table).

The interaction terms assessing the moderating effects of cohesion on the relation between job tensions and unit morale, and on the relation between reduction in authority and unit morale, were significant (R^2_{change} for Step 4 in the hierarchical regression table). Thus, the effects of job stressors on unit morale varied as a function of level of cohesion. Specifically, the negative effects of job stress on unit morale are attenuated when members perceive high levels of cohesion both within their unit and between unit members and supervisors. Likewise, the negative effects on unit morale of this aspect of job stress were less salient when members perceived high levels of cohesion both within their unit and between unit members and supervisors.

Table 6: Hierarchical Regression Analysis of Cohesion on Job Stress (Unit Morale as Outcome)

Predictor		r	β	Semi-part correlation^2	R^2_{change}
Hierarchical Regression 1					
Step 1	Age	.11***	.07***	.004***	.02***
	Rank	.12***	.12***	.01***	
	Education	.04***	-.04	.00	
Step 2	Job Tensions	-.40***	-.40***	.16***	.16***
Step 3	Horizontal Cohesion	.53***	.32***	.07***	.20***
	Vertical Cohesion	.53***	.27***	.04***	
Step 4	Job Tensions x Horizontal Cohesion	.08***	-.04*	.001*	.01***
	Job Tensions x Vertical Cohesion	.06***	-.05**	.002**	
Hierarchical Regression 2					
Step 1	Age	.11***	.07***	.004***	.02***
	Rank	.12***	.12***	.01***	
	Education	.04***	-.04	.00	
Step 2	Reduction in Authority	-.35***	-.34***	.11***	.11***
Step 3	Horizontal Cohesion	.53***	.33***	.07***	.23***
	Vertical Cohesion	.53***	.32***	.05***	
Step 4	Red. Authority x Horizontal Cohesion	.10***	-.07***	.003***	.01***
	Red. Authority x Vertical Cohesion	.10***	-.04*	.001*	

*p<.05, **p<.01, ***p<.001

3.4.2 Moderating Effect of Coping on Morale

The second set of analyses was conducted to examine the moderating effect of coping on morale. Specifically, it was hypothesized that at high levels of job-related stress, individuals who tend to use avoidant coping strategies will tend to report lower morale. Moreover, at high levels of stress, individuals who report the use of active strategies will be more likely to report higher morale than those who do not use active strategies.

A series of hierarchical regression analyses were conducted to test the moderating effect of active and passive coping on the relationship between job-related tensions and morale. Following the demographic variables, job stress was entered on the first step, followed by active and passive coping, followed by the interaction terms. A moderating effect would be indicated by a p value of less than .001 for the R^2_{change} at Step 4 of each moderator model (i.e., the interaction between cohesion and job stress). The proposed moderator model is presented in Figure 2.

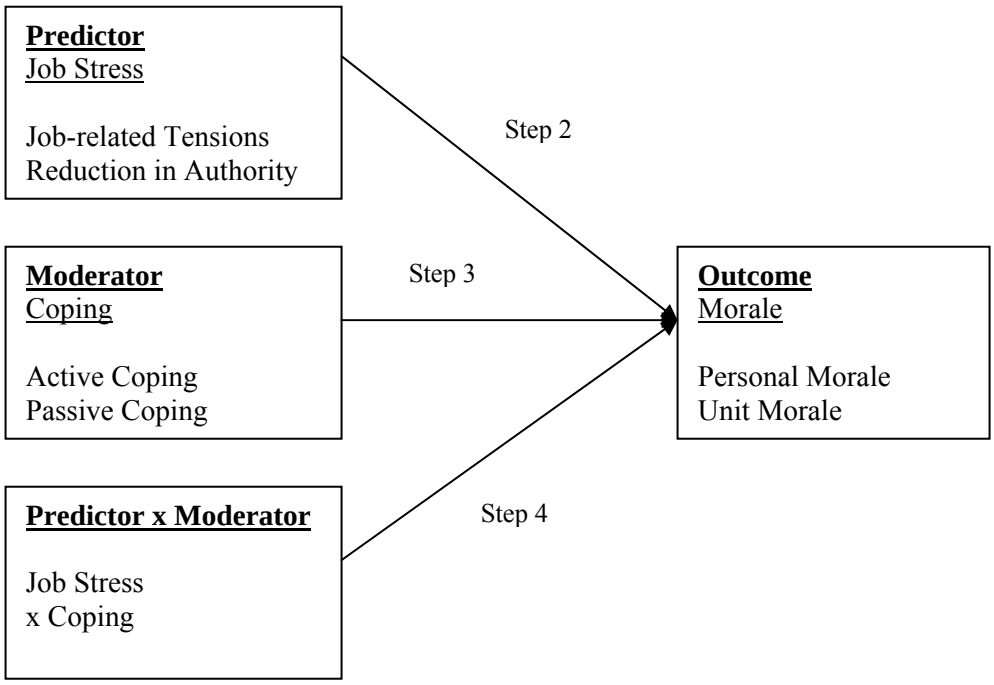

Figure 2: Proposed Moderator Model for Coping[4]

3.4.2.1 Moderating Effect of Coping on the Relation between Job Stress and Personal Morale

As indicated in Table 7, neither of the interaction terms assessing the moderating effects of coping strategies (R^2_{change} for Step 4 in each hierarchical regression in the table) were significant. Although these variables did not appear to alter the relationship between job tensions and morale, they did have an additive effect. As indicated in Table 7 (R^2_{change}, size and/or significance of the standardized regression coefficients [βs] and squared semi-partial correlations for the predictor variables at Step 3), coping strategies were strongly associated with level of personal morale. In particular, active coping strategies were positively associated with morale, whereas passive strategies were inversely related.

[4] In this depiction of the hierarchical regression steps, Step 1 (demographic variables) was omitted for clarity.

Table 7: Hierarchical Regression Analysis of Coping on Job Stress (Personal Morale as Outcome)

Predictor		r	β	Semi-part correlation^2	R^2_{change}
Hierarchical Regression 1					
Step 1	Age	-.03*	-.05**	.002**	.003**
	Rank	.03*	.08**	.003**	
	Education	.01	-.04	.00	
Step 2	Job Tensions	-.47***	-.47***	.22***	.22***
Step 3	Active Coping	.23***	.17***	.03***	.09***
	Passive Coping	-.36***	-.23***	.04***	
Step 4	Job Tensions x Active Coping	.02	-.00	.00	.00
	Job Tensions x Passive Coping	-.03	.00	.00	
Hierarchical Regression 2					
Step 1	Age	-.03*	-.05**	.002**	.003**
	Rank	.03*	.08**	.003**	
	Education	.01	-.04	.00	
Step 2	Reduction in Authority	-.32***	-.35***	.11***	.11***
Step 3	Active Coping	.23***	.17***	.03***	.12***
	Passive Coping	-.36***	-.28***	.07***	
Step 4	Red. Authority x Active Coping	.05*	.01	.00	.00
	Red. Authority x Passive Coping	-.08***	-.00	.00	

*p<.05, **p<.01, ***p<.001

3.4.2.2 Moderating Effect of Coping on the Relation between Job Stress and Unit Morale

As indicated in Table 8, none of the interactions assessing the moderating effects of coping on the relation between job stress and unit morale, either in terms of job tensions or reduction in authority, were significant (R^2_{change} for Step 4 in the hierarchical regression table). Thus, it appears that the effects of coping on unit morale are additive. As indicated in Table 8 (R^2_{change}, size and/or significance of the standardized regression coefficients [βs] and squared semi-partial correlations for the predictor variables, at Step 3), coping strategies were strongly associated with level of unit morale. In particular, active coping strategies were positively associated with morale, whereas passive strategies were inversely related.

Table 8: Hierarchical Regression Analysis of Coping on Job Stress (Unit Morale as Outcome)

Predictor		r	β	Semi-part correlation[2]	R^2 change
Hierarchical Regression 1					
Step 1	Age	.11***	.07***	.004***	.02***
	Rank	.12***	.12***	.01***	
	Education	.04***	-.04	.00	
Step 2	Job Tensions	-.40***	-.40***	.16***	.16***
Step 3	Active Coping	.14***	.08***	.01***	.02***
	Passive Coping	-.23***	-.10***	.01***	
Step 4	Job Tensions x Active Coping	.01	-.01	.00	.00
	Job Tensions x Passive Coping	-.03	-.01	.00	
Hierarchical Regression 2					
Step 1	Age	.11***	.07***	.004***	.02***
	Rank	.12***	.12***	.01***	
	Education	.04***	-.04	.00	
Step 2	Reduction in Authority	-.35***	-.34***	.11***	.11***
Step 3	Active Coping	.14***	.08***	.01***	.03***
	Passive Coping	-.23***	-.14***	.02***	
Step 4	Red. Authority x Active Coping	.00	-.01	.00	.00
	Red. Authority x Passive Coping	-.04**	.02	.00	

*p<.05, **p<.01, ***p<.001

4.0 DISCUSSION

The PERSTEMPO data set is a valuable resource that permits the illumination of the impacts of crucial aspects of military service on CF members. The analyses undertaken in the present paper sought to examine the potential moderating (i.e., buffering) effects of cohesion and coping styles in predicting the morale of Canadian Forces personnel. It was found the negative effects of work-related stressors on unit morale were reduced when members perceived high levels of cohesion within their unit, as well as positive relationships with their leaders. Moreover, work stressors and cohesion had direct effects on personal morale, in that greater work stress, and low levels of horizontal and vertical cohesion, were directly related to reduced personal morale. The effects of coping on morale, however, were additive rather than moderating. Both types of coping were strongly correlated with personal and unit morale. The use of more active, adaptive coping strategies was associated with increased morale, whereas the reverse held for passive coping strategies. As well, job-related tensions, an index that contains components of role stress and ambiguity, were better predictors of morale than perceived lack of authority among military personnel. These findings are in line with some of the previous findings on military personnel, which have utilized models of stress-strain-outcome to examine the negative effects of stressors on well-being, and the factors that may intervene in this relationship [36].

The identification of factors that influence the relationship between stressors and morale is important in the development of programs and interventions dealing with increasing performance in the military environment. Fostering good working relationships with supervisors, and cohesion within units, may be effective strategies in increasing morale among CF members. In turn, increased morale may lead to better performance in operations as well as in day-to-day tasks. Personnel support can be a cost-effective means of increasing workplace satisfaction, organizational commitment, and personal well-being.

The findings have implications for increasing the morale of individuals, as well as the morale of units as a whole. Efforts to improve morale may increase retention and effectiveness of military units as well as the organization. In particular, developing means to enhance cohesion in units, to improve relations between leaders and subordinates, and to teach effective means of coping not only with traumatic experiences in combat but also daily work-related stressors, may increase the morale of CF personnel. Efforts to improve the work environment, leadership behaviour, and coping mechanisms employed may improve the quality of work performed by CF members. Enhancing such factors is particularly important at a time when many aspects of modern military life may be acting to reduce cohesion in military communities. Several trends were identified in the U.S. military that may function in this regard [13]. In particular, greater numbers of married members entering the military has increased the dispersion of members off bases and into the civilian community. This has also been reported in the CF. The CF Household Survey conducted by the Directorate of Quality of Life in 1999 revealed that only 25% of military families (approximately 10,250 families) were living in married quarters or other Crown-controlled residential housing units, while the remaining families were either rented or owned property in the private sector. Since this time, the number of families in married quarters has decreased even further to approximately 8,000, according to the 2006 Canadian Forces Housing Agency Annual Report. As well, the military is becoming increasingly diverse in its demographics, values, and lifestyles [13]. Furthermore, the importance of mess life, previously an important source of cohesion in units, has declined [53]. All of these factors may contribute to decreased cohesion in military communities, and may ultimately impact morale.

The necessity of maintaining effective performance of military personnel has been recognized as a priority for defence research [54]. If the CF is to remain competitive as an employer of choice, it is apparent that resources and effort must continue to be aimed at the human dimensions of military service.

5.0 REFERENCES

[1] Halverson, R. R., Bliese, P. D., Moore, R. E. & Castro, C. A. (1995). *Psychological well being and physical health symptoms of soldiers deployed for Operation Uphold Democracy: A summary of the human dimensions research in Haiti* (DTIC No. ADA 298125). Alexandria, VA: Defense Technical Information Center.

[2] Helmus, T., & Glenn, R. (2005). *Steeling the mind: Combat stress reactions and their implications for urban warfare*. Santa Monica, CA: RAND Corporation.

[3] Tucker, J. S., Sinclair, R. R., & Thomas, J. L. (2005). The multilevel effects of occupational stressors on soldiers' well-being, organizational attachment, and readiness. *Journal of Occupational Health Psychology, 10*, 276-299.

[4] Babin, B. J., & Boles, J. S. (1996). The effects of perceived co-worker involvement and supervisor support on service provider role stress, performance and job satisfaction. *Journal of Retailing, 72*, 57-75.

[5] Hughes, J. (2001). Occupational therapy in community mental health teams: A continuing dilemma? Role theory offers an explanation. *British Journal of Occupational Therapy, 64*, 34-40.

[6] Murphy, P. J., Gingras, C., Farley, K. M. J., & Thivierge, J. A. A. (1997). *The management of meaning on peace support operations*. Research Note. Canadian Forces Personnel Research Team. National Defence Headquarters. Ottawa, Ontario.

[7] Dobreva-Martinova, T., & Little, G. (1999). Stress in military service: Recent reports from Canadian peacekeeping Forces. *Paper presented to the 60th Annual Convention of the Canadian Psychological Association*, Halifax, Nova Scotia, Canada.

[8] Dobreva-Martinova, T. (1998). *Psychometric analysis of the stress in military service questionnaire based on surveys of deployed Canadian Forces personnel*. Sponsor Research Report 98-16. Ottawa, Canada: Directorate for Human Resource Research and Evaluation.

[9] Dobreva-Martinova, T., Villeneuve, M., Strickland, L., & Matheson, K. (2002). Occupational role stress in the Canadian Forces: Its association with individual and organizational well-being. *Canadian Journal of Behavioural Science, 34*, 111-121.

[10] Hosek, J., Kavanagh, J., & Miller, L. (2006). *How deployments affect service members*. Santa Monica, CA: RAND Corporation.

[11] Griffith, J., & Vaitkus, M. (2000). Relating cohesion to stress, strain, disintegration, and performance: An organizational framework. *Military Psychology, 11*, 27-55.

[12] Griffith, J. (1988). Measurement of group cohesion in U.S. Army units. *Basic and Applied Social Psychology, 9*, 149-171.

[13] McClure, P., & Broughton, W. (2000). Measuring the cohesion of military communities. *Armed Forces and Society, 26*, 473-487.

[14] Henderson, W. D. (1985). *Cohesion: The human element in combat*. Washington, DC: National Defense University Press.

[15] MacCoun, R. (1993). What is known about unit cohesion and military performance. In B. Rostker, S. A. Harris, J. P. Kahan, et al., *Sexual Orientation and U.S. Military Personnel Policy, Option, and Assessment*. Santa Monica, CA: RAND Corporation.

[16] Cohen, S., & Wills, T. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*, 310-357.

[17] Argyle, M. (1972). *The social psychology of work*. London, UK: The Penguin Press.

[18] Jones, B., Flynn, D., & Kelloway, K. (1995). Perception of support from the organization in relation to work stress, satisfaction, and commitment. In S. Sauter and L. Murphy (Eds.) *Organizational risk factors for job stress*, 41-52. Washington, DC: APA.

[19] Vancouver, J., & Schmitt, N. (1991). An exploratory examination of person-organizational fit: Organizational goal congruence. *Personnel Psychology, 44*, 333-374.

[20] Dobreva-Martinova, T. (1999). Leadership and morale in peacekeeping environment: the Canadian experience. *Paper presented at the 22nd Annual Scientific Meeting of the International Society of Political Psychology*, Amsterdam, The Netherlands.

[21] Kirmeyer, S., & Dougherty, T. (1988). Work load, tension, and coping: Moderating effects of supervisor support. *Personnel Psychology, 41*, 125-139.

[22] Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior, 21*, 219-239.

[23] Folkman, S., & Moskowitz, J. T. (2004). Coping: pitfalls and promise. *Annual Review of Psychology, 55*, 745-774.

[24] Murphy, L. R. (1985). Individual coping strategies. In C. Cooper and M. Smith (Eds.) *Job stress and blue collar work*, 225-239. Chichester, England: John Wiley & Sons.

[25] Lazarus, R. (1995). Psychological stress in the workplace. In R. Crandall and P. Perrewe (Eds.) *Occupational stress: A handbook*, 3-14. Washington, DC: Taylor & Francis.

[26] Billings, A.G. & Moos, R.H (1981). The role of coping responses and social resources in attenuating the stress of life events. *Journal of Behavioral Medicine, 4*, 139-157.

[27] Suls, J., & Fletcher, B. (1985). The relative efficacy of avoidant and nonavoidant coping strategies: A meta-analysis. *Health Psychology, 4,* 249-288.

[28] Blalock, J. A., & Joiner, T. E., Jr. (2000). Interaction of cognitive avoidance coping and stress in predicting depression/anxiety. *Cognitive Therapy and Research, 24*, 47-65.

[29] Matheson, K., & Anisman, H. (2003). Systems of coping associated with dysphoria, anxiety and depressive illness: a multivariate profile perspective. *Stress, 6,* 223-234.

[30] Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology, 109,* 504-511.

[31] Ravindran A.V., Matheson, K., Griffiths J, Merali Z., & Anisman H. (2002). Stress, coping, uplifts, and quality of life in subtypes of depression. *Journal of Affective Disorders, 71*, 121-131.

[32] Day, A. L., & Livingstone, H. A. (2001). Chronic and acute stressors among military personnel: Do coping styles buffer their negative impact on health? *Journal of Occupational Health Psychology, 6*, 348-360.

[33] Gal, R. (1986). Unit morale: from a theoreticall puzzle to an empirical illustration – an Israeli example. *Journal of Applied Social Psychology, 17*, 369-391.

[34] Murphy, P. J., Farley, K. M. J., Dobreva-Martinova, T., & Gingras, C. (1997). Stress in peace support operations: Recent Canadian experiences. *Paper presented to the NATO Research & Technology*

Organization Aerospace Medical Panel Symposium on Aeromedical Support Issues in Contingency Operations, Rotterdam, The Netherlands.

[35] Koeske, G. F., & Koeske, R. D. (1993). A preliminary test of a stress-strain-outcome model for reconceptualizing the burnout phenomenon. *Journal of Social Service Research, 17*, 107-133.

[36] Murphy, P. J., Farley, K. M. J., & Dobreva-Martinova, T. (1997). A conceptual approach to the study of stress in peacekeeping personnel. *Paper presented to the NATO Research & Technology Organization Aerospace Medical Panel Symposium on Aeromedical Support Issues in Contingency Operations*, Rotterdam, The Netherlands.

[37] Bliese, P. D., & Britt, T. W. (2001). Social support, group consensus and stressor-strain relationships: Social context matters. *Journal of Organizational Behavior, 22*, 425-436.

[38] Parkes, K. R. (1990). Coping, negative affectivity, and the work environment: Additive and interactive predictors of mental health. *Journal of Applied Psychology, 75*, 399-409.

[39] Kahn, R.L. (1964). *Organizational Stress*. New York: Wiley.

[40] Aiken, M., & Hage, J. (1968). Organizational interdependence and intraorganizational structure. *American Sociological Review, 33*, 912-930.

[41] Podsakoff, P.M., & MacKenzie, S.B. (1994). An examination of the psychometric properties and nomological validity of some revised and reduced substitutes for leadership scales. *Journal of Applied Psychology, 79*, 702-713.

[42] Bienvenu, R.V., Huffman, A.H., Adler, A.B., & Castro, C.A. (2000). *USAREUR Soldier Study II: Kosovo Mid-deployment*. USAMRU-E Technical Brief #99-04. Heidelberg, Germany: U.S. Army Medical Research Unit-Europe.

[43] Marlowe, D.H., Furukawa, T.P., Griffith, J.E., Ingraham, L.H., Kirkland, F.R., Martin, J.A., Schneider, R.J., & Teitelbaum, J.M. (1985). *New Manning System Field Evaluation*. Technical Report No.1. Washington, DC: Walter Reed Army Institute of Research.

[44] Vaitkus, M. (1994). *Unit Manning System: Human dimensions field evaluation of the COHORT company replacement model*. Technical Report ADA 285942, Washington, DC.

[45] Huffman, A.H., Bienvenu, R.V., Adler, A.B. (1999). *USAREUR/7A OPTEMPO and PERSTEMPO Study - In-Progress Report 1*. USAMRU-E Technical Brief #99-03. Heidelberg, Germany: U.S. Army Medical Research Unit-Europe.

[46] Thomas, J., Huffman, A.H., Dolan, C.A.,Adler, A.B. & Castro, C.A. (2001). *USAREUR/7A OPTEMPO and PERSTEMPO Study - In-Progress Report 7*. USAMRU-E Technical Brief #01-04. Heidelberg, Germany: U.S. Army Medical Research Unit-Europe.

[47] Castro, C. A., & Adler, A. B. (2001). *The impact of operations tempo: Issues in measurement*. U.S. Army Medical Research Unit – Europe.

[48] Dolan, A.B., Huffman, A.H., Adler, A.B. & Castro, C.A. (2000). *USAREUR/7A OPTEMPO and PERSTEMPO Study - In-Progress Report 5*. USAMRU-E Technical Brief #01-01. Heidelberg, Germany: U.S. Army Medical Research Unit-Europe.

[49] Nunally, J. (1978). *Psychometric theory*. 2nd Edition. New York: McGraw Hill.

[50] Howell, D.C. (2002). *Statistical methods for psychology*. Pacific Grove, CA: Duxbury - Thomson Learning.

[51] Brown, Capt K. J. (2005). Human dimensions of operations. Norm development 2004. *Sponsor Research Report 2005-02*. Director Human Resources Research and Evaluation. National Defence Headquarters. Ottawa, Ontario.

[52] Green, B. L., Grace, M. C., Lindy, J. D., Gleser, G. C., & Leonard, A. (1990). Risk factors for PTSD and other diagnoses in a general sample of Vietnam veterans. *American Journal of Psychiatry, 147*, 729-733.

[53] Sudom, K.A., & Dursun, S. *Family issues in the Canadian Forces: Qualitative report*. Unpublished report.

[54] Farley, K. M. J. (1995). *Stress in military operations*. Working Paper 95-2. Willowdale, Canada: Canadian Forces Personnel Applied Research Unit.