

RESILIENT OUTCOMES FOLLOWING MILITARY OPERATIONS:

A SURVEY OF CANADIAN SOLDIERS AFTER AFGHANISTAN

by

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Abstract

Resilient Outcomes following Military Operations:

A Survey of Canadian Soldiers after Afghanistan

Canadian soldiers ($N = 2,830$) deployed on operations to Afghanistan are exposed to operational stressors that result in various psychological distress trajectories including resilience. The goal of this study was to examine whether the protective factors of cohesion, commitment and leadership moderate the relationship between operational stress and the distress reaction. The Human Dimensions of Operations survey was administered prior to, during and following deployment. Results of the longitudinal analysis ($N = 128$) confirmed that exposure to operational stressors was correlated to distress reaction. No evidence of cohesion, commitment and leadership operating as moderators was found. Analysis of distress trajectories mirrored those found in adult bereavement studies with 67 percent of the soldiers following a resilience trajectory. Results are discussed in terms of their implications regarding protective factors and distress trajectories following deployment on operations.

RESILIENT OUTCOMES

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Disclaimer

This thesis is conducted under the conditions of a Memorandum of Understanding between G1 Concepts 4, Canadian Army, the author, and the author's supervisors effective 21 September, 2010 and revised on 4 March, 2011. Use of the Human Dimensions of Operations data for this thesis is granted by the Commander, Canadian Army and Director General Military Personnel Research and Analysis. The results and discussion expressed in this thesis reflect the opinion of the author and do not necessarily represent the opinion of the Canadian Forces or the Department of National Defence.

Resilient Outcomes following Military Operations:

A Survey of Canadian Forces Soldiers after Afghanistan

Military operations are inherently stressful. Participation on operations exposes soldiers to a variety of intense, life threatening or disturbing situations that can have a significant impact on the mental health and well-being of the soldiers (Castro, 2009). Murphy and Gingras (1997) found that 55 percent of a sample of Canadian Forces who participated in peacekeeping operations in Yugoslavia reported that their lives had been threatened and 78 percent reported seeing or experiencing things that disturbed them during their deployment. Castro, Hoge and Cox (2006) reported that 90 percent of American soldiers deployed to Iraq indicated that they had been attacked or ambushed, with over 60 percent reporting that they were in a threatening situation in which they were unable to respond due to rules of engagement restrictions. Given the high rates of exposure, it is perhaps not surprising that some soldiers experience significant psychological distress following their tour of duty. However, not all soldiers report significant mental health problems following military operations. Many (if not most) soldiers appear to remain psychologically healthy despite exposure to combat stress. The purpose of this thesis is to assess factors that buffer soldiers from high levels of distress following a combat mission. As such, the focus of the thesis is on resilience and the factors that promote resilience in soldiers.

It is well established that the more severe the operational exposure the more distress one will experience (Farley, 1995). Castro (2009) noted that soldiers who experienced higher levels of combat exposure were more likely to screen positive for anxiety, depression or PTSD. United States soldiers and Marines involved in combat operations in Afghanistan and Iraq who were exposed to higher levels of combat stressors reported higher levels of psychological distress than those soldiers and marines who had less combat exposure (Office of the Surgeon Multinational Force – Iraq & Office of the Surgeon General US Army Medical Command, 2006).

Recent studies on Canadian and American soldiers who have served in Iraq and Afghanistan indicate that between 15 and 30 percent of soldiers screen positive for significant mental health problems following operations. Castro, Hoge and Cox (2006) found that 15 percent of American soldiers and Marines returning from combat duty in Iraq met screening criterion for PTSD and a further 12 percent reported clinically significant levels of anxiety or depression. A 2008 post-deployment questionnaire of 6,380 Canadian personnel revealed that since their return from Afghanistan 4.4 percent of the soldiers had experienced PTSD symptoms while 4.6 percent had experienced symptoms of major depression (OSSIS, 2008). In addition to PTSD and depression, some soldiers returning from combat operations suffer from anxiety, abuse or misuse of drugs and alcohol, and have relationship problems that may stem from or be exacerbated by their experiences in combat (Bartone & Adler, 2000; Castro, 2009; Farley, 1995; Farley, 2002; Murphy, 2003; Murphy & Gingras, 1997).

Soldiers whose functioning is not negatively impacted are considered to have had a resilient outcome following operations. For the purposes of this thesis resilience refers to the ability of soldiers on operations who are exposed to violent and/or life threatening situations to maintain a relatively stable, healthy level of psychological functioning (Bonanno, 2004). The purpose of this research is to further the understanding of factors that have a role in moderating or buffering stress which subsequently leads to resilient outcomes for soldiers.

Childhood Resilience Research

While this thesis does not use child developmental measures it is considered important to examine the findings of child developmental researchers as they form the foundation of much of the adult resilience literature. Initial research on the topic of resilience was situated within developmental psychology and concerned the factors that assisted children raised in difficult

circumstances to adapt in order to have good outcomes despite the adversity they had experienced. Initially, child development researchers focussed on the identification of risk factors and the subsequent protective factors that lead to successful outcomes (e.g., Garmezy, Masten & Tellegen, 1984; Masten, Hubbard, Gest, Tellegen & Garmezy, 1999; Rutter, 1985, 1987, 2000; Werner, 1994, 2000; Werner & Smith, 1977). Over time the focus of empirical work evolved from identifying protective factors to understanding underlying protective processes (Luthar, Cicchetti & Becker, 2000). Researchers have increasingly sought to understand how the protective factors contribute to the positive outcomes in order to design appropriate intervention strategies for individuals facing adversity (Luthar et al., 2000).

Based on a large, thirty year study of child development among at-risk children on the Island of Kauai, Werner and Smith (1977) developed a model of resilience that incorporated individual differences, family differences and community factors. According to this model, neonatal vulnerability factors like low birth weight, poverty and parents' low level of education increase the risk that children, by their 20s, will engage in criminal behaviour, have difficulty keeping a job and experience stress-related health issues. However, despite these risk factors, Werner and Smith (1977) identified a variety of factors that appear to operate in reducing this risk. They found that extraverted children were less likely to engage in deviant behaviours later in life in part because these children were better able to establish and maintain relationships and to marshal social support when needed (Werner, 1994; Werner & Smith, 1977). They also found that children with warm relationships with same sex parents were less likely to engage in socially deviant behaviour such as truancy (Werner & Smith, 1977). Likewise, the research indicated that when extraverted children lacked close family support they used their personal resources to seek out positive relationships with role models from the community (such as teachers) and

involvement in sports and community clubs (like 4H and Scouts) which provided role models for them that they did not have in their home.

Werner and Smith (1977) divided the protective factors into three general spheres: those that are individual-based (such as extraversion and intelligence), those that are family-based, and those that are community based. These three sets of protective factors reduced the likelihood that vulnerable children will engage in counterproductive behaviours, such as poor performance at school, truancy and breaking the law. Despite the developmental challenges that these children had been exposed to many of them developed into productive members of society by securing jobs, raising their own families and being law abiding citizens. These positive outcomes despite adversity represented a resilient outcome. Resilient children were found to be able to engage other people, had good problem solving skills and faith that their own actions can make a positive difference in their lives (Werner, 1994). The longitudinal study demonstrated that these resilient outcomes were stable over time. Those children who had demonstrated successful adaptation into adulthood continued to demonstrate resilient outcomes over the thirty year period (Werner, 2000).

Garmezy has also contributed greatly to our understanding of resilience. Garmezy's early work examined manifestations of competence and incompetence in children considered to be at risk for psychopathology on the basis of having schizophrenic parents (Garmezy, Masten & Tellegen, 1984). Garmezy hypothesized that the competence level of a child, even one at risk, might serve as a protective factor against the development of schizophrenia (Garmezy et al., 1984). Garmezy's criteria for competence included such factors as effectiveness (at work, play and love), positive outlook, self-esteem, self-discipline, and critical thinking skills. Finding that most of these at risk children were deemed competent by these criteria, Garmezy and colleagues

refocused their attention on factors that contributed to such stress resistance. The resulting “Project Competence” followed approximately 200 school children between grades 3 to 6 for a period of ten years (Garmezy et al., 1984). Garmezy et al (1984) proposed three generic models to describe the moderating role of personal attributes on the relation of stress with quality of adaptation: A compensatory model, a challenge model, and a protective factor model. Of these models, the protective factor model yielded the most empirical support. The protective factor model argues that a protective factor interacts with a risk factor which thereby reduces a negative outcome. Consistent with this model, Garmezy et al., (1984) found that children with high measures of intelligence who were under significant adversity were better able to adapt than those children under significant adversity who were rated as having low or moderate intelligence. An additional significant finding was the interaction of stress and IQ in relation to achievement. High-IQ children maintained good achievement scores at both low and high levels of stress whereas for low-IQ children, their performance drops off as a function of higher stress. This finding indicated that IQ was functioning to some degree as a protective factor (Garmezy et al., 1984).

Building on the initial work of Garmezy et al. (1984), Masten, Hubbard, Gest, Tellegen, Garmezy and Ramirez (1999) continued the longitudinal research by interviewing the same children between the ages of 17 to 23. They hypothesized that, in addition to intelligence, parenting quality would be associated with greater academic, social, and behavioural competence in adolescents experiencing significant levels of adversity. Initially examining the IQ, they found that under conditions of low environmental stress, IQ did not predict conduct problems. However, under conditions of high environmental stress, those with higher IQ were significantly less likely to have conduct problems. Defining parenting quality as a combination of high

structure and rules, warmth and closeness, and high expectations for the child's achievement and prosocial behaviour, and competence as success with salient developmental tasks, Masten et al. (1999) found that parenting quality moderated the relationship between stress and competence/conduct. Those children who possessed high quality parenting adapted well despite high adversity whereas those with poor quality parenting were more likely to have significant conduct issues when faced with high adversity. Those children with high quality parenting in a low adversity environment still performed better than those children with low quality parenting in a low adversity environment. Further, Masten et al. (1999) found evidence for that IQ and parenting combine together moderate the relationship between adversity and conduct in a low and high adversity environment. Using multiple regression they found that children with high IQ and high parenting quality had significantly higher positive conduct scores in a low adversity environment when compared to children with low IQ and low parental quality. In a higher adversity environment, children with high IQ and high parental quality conduct scores improved while those children with low IQ and low parenting quality had their conduct scores decrease. A major conclusion from this study is that the combination of high adversity and low resources tends to result in competence problems, rather than simply being under high adversity or possessing low resources alone. In a benign environment, low resource children developed competence much like high resource children. However, in a threatening environment, high resource children also developed competence much like low adversity children (Masten et al., 1999). Overall, findings of this longitudinal work indicate that (a) the development of competence is related to psychosocial resources (b) good resources are less common among children growing up in the context of adversity (c) if reasonably good resources are present, competence outcomes are generally good, even in the context of chronic, severe stressors, and

(d) maladaptive adolescents tend to be stress reactive and have a history of adversity, low resources, and broad-based competence problems (Masten et al., 1999).

Unlike Werner, Garmezy and Masten, Rutter (1985) examined resilience as a set of processes or pathways that unfold over time. Rutter (1972) re-examined Bowlby's (1951) seminal work on the importance of maternal attachment and the importance of child-mother bonding for subsequent positive and negative outcomes such as antisocial behaviour. Rutter (1972) demonstrated that anti-social behaviour was not linked to maternal deprivation but to overall family discord and dysfunction. Rutter acknowledged that maternal attachment does play a role, but suggested that it was that of a vulnerability factor rather than as a causative agent as Bowlby had proposed.

For Rutter, resilience represents several somewhat different types of dynamic processes rather than simply a set of protective factors (Rutter, 1979). Rutter (1985) defined resilience as the overcoming of stress or adversity and achieving a relatively good outcome despite having been exposed to the stress and adversity. Rutter (2000) argues that there is a universal finding of large individual differences in people's responses to all kinds of environmental or developmental hazards and there is evidence of a "steeling" effect in which successful coping with stress or adversity can lead to improved functioning and increased resistance to stress and adversity. Rutter (2000) argues that resilience is an interactive concept which requires demonstration of an effect that operates in the presence of stress/adversity but not in its absence. Unlike Garmezy and Masten, he does not view this as the same as competence or well being. Rutter (1987) argues that children need to be exposed to stressors in order to properly adapt to the challenges inherent in adulthood, similar to developing immunity to infection by immunization. In particular, he notes that stressful experiences during childhood can enhance resistance to minor stresses and provide

the individual with the ability to successfully manage stressors later in life. In his work with Romanian orphans adopted to the UK, Rutter and O'Connor (2004) demonstrated that a change in environment had profound positive improvements on a number of social indicators. Rutter (1985, 1987) suggested that the effects of stress are catalytic insofar as they trigger responses by the children that reduce the risk of the adversity. Thus protection derives from what people do to deal with the stress and adversity. The result is that the exposure to adversity and stress acts as a trigger or catalyst which may open up opportunities to increase self-efficacy, self-esteem and efficiency leading to new opportunities for the child.

Similar to Werner, Garmezy and Masten, Rutter identifies three factors that can operate to increase an individual's resilience: personality coherence, family cohesion, and social support. These factors increase one's resilience because they enhance one's ability to alter the appraisal of events, change the amount of exposure to the events, and help promote self-esteem and self-efficacy to deal with the issues. In Rutter's model, the protective factors operate through opportunities to obtain experience that may mitigate the harmful effects of exposure to adversity. Opportunities presented to children and young adults for positive changes in their lives, such as educational and occupational opportunities, are critical foci for his research. As an illustration, Rutter, Tizzard, Yule, Graham and Whitmore (1976) examined the role of education and schools. Those students who attended schools with high academic expectations, where children were treated positively and given opportunities for responsibility, had much lower levels of anti-social behaviour. Teachers in high performing schools served as role models of conscientious behaviour coupled with a genuine interest in their pupils, their work and their activities. Rutter (2009) noted that resilience included a number of critical change points for at risk children and young adults, which included entrance to military service, marriage and employment. Rutter

(2009) notes that these positive change points demonstrate the value of meaningful work which provides for autonomy, complexity and a connection between effort and reward. Key pathways in resilience include the provision of social support at the individual level, provision of community resources and a source of friends and love relationships.

In reviewing the landscape of childhood resilience research, Masten (2001) notes that what began as “a quest to understand the extraordinary has revealed the power of the ordinary. Resilience does not come from rare and special qualities but from the everyday magic of ordinary, normative human resources in minds, brains and bodies of children, in their families and relationships and in their communities” (p. 235). Resilience emerges from ordinary processes of human adaptation which can be enhanced with support to an individual, to the family and with the building of strong communities. The pathways to resilience are now often considered within the more general construct of “positive adjustment” and as a function of normative adjustment rather than as a unique process (Luthar et al., 2000). This process of adaptation, or “ordinary magic”, is not likely limited solely to child adaptation and we now turn to whether these same protective factors operate in a similar fashion for adults who are exposed to high adversity or traumatic events.

Childhood resiliency research has led to the broader recognition that in face of adversity that successful individual adaptation appears to be enhanced by three inter-related factors: individual differences (and in particular general mental ability), close family support and community support. These three factors tend to act as protective factors for children and are cited by many adult resilience researchers as continuing to operate across the adult development spectrum. However, these factors are not the sole ones that appear to operate as protective factors

within the adult resilience literature and it is now appropriate to examine the additional protective factors that appear to assist adults in having resilient outcomes.

Adult Resilience Research

Commitment is a factor that a number of leading researchers (Allen & Meyer, 1990; Begley & Czajka, 1993; Folkmann and Lazarus, 1984; Glazer & Kruse, 2008; Kobasa, 1979; Schmidt, 2007; Siu, 2002) have identified as appearing to act as a protective factor; however, the manner in which it appears to operate is not universally agreed to. As commitment is one of the main variables used in the analysis for this thesis it is appropriate to review the literature related to this factor.

The starting point for much of the adult resilience literature is Kobasa's (1979) research on the individual difference concept of hardiness. Kobasa (1979) compared highly stressed individuals who did not develop stress-related illnesses to those who did. She found that the healthy group reported a higher sense of commitment, a higher sense of meaningfulness, and an internal locus of control than the group with poor health (Kobasa, 1979). This combination of characteristics became the defining features of the personality construct of hardiness. That is, according to Kobasa, hardy individuals are those who (1) believe that they can control or influence events, (2) possess an ability to feel deeply involved or committed to the activities of their lives, and (3) perceive change as an exciting challenge to further development (Kobasa, 1979). These three general characteristics were later relabelled commitment, control and challenge (Kobasa, Maddi & Kahn, 1982). Individuals viewed as hardy tend to be less affected by, or deal more effectively with, stressful events than those individuals who are not hardy (Kobasa & Puccetti, 1983). These results have found support in a number of studies within the military (Adler, 2006; Bartone, 2005; Bartone & Adler, 2000; Castro, 2009).

Lazarus and Folkman (1984) suggested that one's commitment to important goals has implications for the appraisal process in their model of coping. Lazarus and Folkman (1984) argue that high commitment to a goal, ideal or principal can operate as a protective factor. Specifically, commitments serve "as a motivating quality, they sustain coping effort, they guide people to and away from situations that can harm, threaten or challenge them and they define areas of meaningfulness and determine which encounters are relevant to well being" (p. 63). They note that some individuals who face life threatening illness are willing to undergo aversive treatment regimens in order to prolong life and that this creates a will to live without which a patient can die (Lazarus and Folkman, 1984). Similarly, they cite examples of holocaust survivors who, faced with horrific and catastrophic events, forged a "will to live" which was critical to their survival as has been reported by Frankl (1963) and Benner, Roskies and Lazarus (1980). Lazarus and Folkman (1984) note that the reasons for the particular commitment to survive varied from individual to individual.

While Kobasa and Lazarus and Folkmann identified individual differences in relation to commitment, Allen and Meyer (1990) expanded the individual differences view to the broader organization within which an employee works and examined how organizational commitment functions in employee coping. In their three-component model of organizational commitment they distinguish different facets of commitment. Under their organizational commitment model, *affective commitment* refers to employee's emotional attachment to, identification with and involvement in, the organization. *Normative commitment* refers to the employees' feelings of loyalty or obligation to remain with the organization. *Continuance commitment* refers to the costs that employees associate with leaving the organization. Meyer and Allen view affective, normative and continuance commitment as distinguishable components, rather than types, of

attitudinal commitment, in that employees can experience each of these three psychological states to varying degrees (Allen & Meyer, 1990). Research based on Allen and Meyer's three component model of commitment suggests that of the three, affective commitment is most consistently correlated with employee satisfaction, even in times of adversity. For instance, Meyer and Herscovitch (2001) found that high levels of affective (but not normative or continuance) commitment appeared to moderate the relationship between stress and job satisfaction. In their meta-analysis of 99 published articles and 22 dissertations, Meyer, Stanley, Herscovitch and Topolnytsky (2002) found a statistically significant correlation of $-.15$ between affective commitment and various negative workplace outcomes as turnover and absenteeism. As well, the analysis indicated a negative correlation between affective commitment and self-reported stress ($-.21$) and affective commitment and work-family conflict ($-.20$). They further found statistically significant positive correlations between affective commitment and job satisfaction ($.65$), organizational citizenship behaviour ($.32$) and job performance ($.16$). There were not enough studies to conduct moderator analyses on these findings (Meyer et al., 2002). The authors do note that research was only just beginning to examine the implications of organizational commitment for employee-relevant outcomes such as stress, health and well-being (Meyer et al., 2002).

Other researchers have also found the general construct of organizational commitment to be a significant moderator between stress and job satisfaction, intent to quit and health outcomes. Begley and Czajka (1993), for instance, found a significant interaction between stress and organizational commitment in a sample of hospital workers when predicting job displeasure (job dissatisfaction, intent to quit and irritation). Begley and Czajka defined stress as the effects of a single acute organizational event, which was seen as a trigger that evoked stress and its potential

consequences in some employees (Begley & Czajka, 1993). They measured employee commitment before and after a major organizational change in work and possible staff reductions using the nine-item Organizational Commitment Questionnaire developed by Mowday, Steers and Porter (1979). This 9-item scale is generally regarded as measuring affective commitment. Using moderation analysis, the results indicated that as stress increased, those low in organizational commitment experienced a significant increase in job dissatisfaction. On the other hand, for those individuals high in organizational commitment, as stress increased there was no effect on their job dissatisfaction. Overall, increasing stress levels increased job dissatisfaction only for those low in commitment. As the only stressful event that occurred between Time 1 and Time 2 was the work consolidation Begley and Czajka argue that high organizational commitment buffered the relationship of stress with job dissatisfaction.

Similarly, Siu (2002) found in a survey of Hong Kong white collar workers that organizational commitment moderated the relationship between stress and well being outcomes (defined as job satisfaction, mental well being and physical well being) in the work place. Siu defined stress as the process that occurs when the magnitude of the stressor exceeds the individual's capacity to resist (Siu, 2002). Stress was measured using the Occupational Stress Indicator -2 (Williams & Cooper, 1996) while the 9-item Organizational Commitment Questionnaire (Mowdy et al., 1979) measured organizational commitment. Using hierarchical regression, Siu found that affective commitment moderated the relationship between stress and worker well being. White collar workers who reported higher levels of stress at work and who scored low on affective commitment had lower overall well being scores. In contrast, white collar workers who reported high levels of stress, and who scored high organizational commitment reported significantly higher well being scores. Siu (2002) argued that these results

support Kobasa, Maddi, and Kahn's (1982) findings that commitment protects individuals from the negative effects of stress because it enables them to attach direction and meaning to their work.

Schmidt (2007) also found that organizational commitment moderated the relationship between work-related stress and job satisfaction/job burnout reported by members in a German municipal government agency. Schmidt did not define stress; however, he used a measure of quantitative and qualitative measure by Hahn and Byosiere (1992) which he asserts is well established in the organizational stress literature (Schmidt, 2007). Using the Meyer and Allen (1990, 1997) Organizational Commitment scale, Schmidt combined the affective commitment questions (4) and the normative commitment questions (4) to form an index of organizational commitment. Schmidt posited that employees who reported high levels of organizational commitment would be buffered from the effects of stress on burnout (measured by the Maslach Burnout Inventory) and a job satisfaction measure developed by Neuberger and Allerbeck (1978). For employees with very low and low levels of commitment the adverse impact of work stress was much more pronounced than for employees with high and very high levels of commitment. In other words, the effects of high stress, on emotional exhaustion and depersonalization were significantly buffered with increasing affective commitment to the organization (Schmidt, 2007). The strength of relations between high work stress and emotional exhaustion and depersonalization decreased with increasing levels of organizational commitment.

Similarly, Glazer and Kruse (2008) found affective commitment moderated the relationship between job-related anxiety and the intention to leave. In a study of Israeli nurses, they found that those nurses who had low commitment reported higher levels of work-related

anxiety and intention to leave. Nurses who had high commitment reported much lower results for job related anxiety and lower turnover intentions. As job related anxiety increased, the intentions to leave also increased, however the intention to leave was significantly higher for those nurses with low affective commitment, compared to those nurses with high affective commitment. The findings indicate that higher levels of affective commitment moderates the relationship between job-related anxiety and turnover intention (Glazer & Kruse, 2008).

In sum, since Kobasa's early work on hardiness, commitment to something larger than the self (e.g., to the organization, to a purpose or a mission) has become recognized as a protective factor for adults during challenging times. Research indicates that people who report an affective commitment to an organization, to an important goal that is threatened, or to a personally meaningful activity are better able to cope with uncertainty in the workplace, avoid burnout, and maintain health and wellbeing. One of the shortcomings of the foregoing research is that other than Begley and Czajka (1993) the research has been co-relational and often measured at a single time. This raises the question of whether commitment was a buffer or was it an outcome? New research should examine these effects over time and this thesis addresses organizational commitment over time. George Bonanno, a well known adult resilience researcher, has conducted longitudinal studies on bereavement that has contributed greatly to our understanding of resilience and his work will now be examined.

Bonanno (2004) defined adult resilience as "the ability of adults in otherwise normal circumstance who are exposed to an isolated and potentially highly disruptive event such as the death of a close relation or a violent or life threatening situation to maintain relatively stable, healthy levels of psychological and physical functioning" (p. 20-21). According to Bonanno, resilience can only be defined in terms of the level of an individual's adjustment after the

stressful event in order to determine whether the individual did have a resilient outcome. In Bonanno's view, resilience is a distinctly different process from recovery. Bonanno (2004) defines recovery as "a trajectory in which normal functioning gives way to threshold or sub-threshold posttraumatic stress disorder, usually for a period of at least several months, and then gradually returns to pre-event levels". In contrast, Bonanno argues that resilience "reflects the ability to maintain a stable equilibrium" (p. 20). In a prospective and longitudinal conjugal bereavement study, Bonanno et al. (2002) found that 46 percent of their sample had low levels of depression both prior to the loss and through 18 months of bereavement with relatively few grief symptoms during bereavement. Relative to those reporting significant depression following the loss, the low distress (resilient) group tended to possess greater pre-loss acceptance of death and a greater belief in a just world. Resilient individuals may experience transient perturbation in normal functioning (e.g., several weeks of sporadic preoccupation or restless sleep) but generally exhibit a stable trajectory of health functioning across time, as well as the capacity for generative experiences and positive emotions (Bonanno, Papa & O'Neill, 2001).

Similar to Masten (2001), Bonanno (2004) argues that resilience, rather than being uncommon, is quite common; many (if not most) individuals exposed to violent or life-threatening events do not report high levels of distress. For instance, Hanson, Kilpatrick, Freedy and Saunders (1995) reported that 78 percent of people exposed to the 1992 Los Angeles riots cited fewer than 3 PTSD symptoms. Sutker, Davis, Uddo, and Ditta (1995) found that 62.5 percent of American soldiers returning from tours of duty in Gulf War I (1991) reported no psychological distress when examined within one year of their return to the United States. Following the September 11, 2001 attack in New York City Resnick, Galea, Kilpatrick and Vlahovl (2004) found that over 40 percent of the population in Manhattan did not report a single

PTSD symptom. Bonanno, Galea, Bucciarelli and Vlahov (2007) sought to identify predictors of psychological resilience following the September 11, 2001 attack in New York City. Multiple regression analysis indicated that education, resources and life stressors were significant predictors of resilience. People with lower levels of perceived social support were less likely to be resilient. A significant relationship was found between resilience and each of the life stress variables examined. Specifically, resilience was more prevalent among people who reported no prior traumatic events, no recent life stressors and no experience of additional traumatic events following September 11. Participants with the most extreme life stress (several recent life stressors) were only about one third as likely to be resilient. What is interesting is that these findings tend to contradict some of the findings of Rutter who argues that the challenges provide a “steeling” effect and it would appear to indicate that adult resilience does not operate the same as childhood resilience. Concurrently, the findings that low levels of social support meant less resilient outcomes does reflect the general findings of Garmezy, Masten and Werner and Smith.

Reviewing the global themes across the childhood development and adult literature on resilience there appear to be three broadly accepted protective factors which assist individuals in having resilient outcomes in the face of stressful life events or adversity: individual differences; family support; and broad social or external support. Having identified these three protective factor themes across the resilience literature it is now germane to examine how these apply within a military context.

Military Risk Factors for Psychological Distress

Recognizing that combat can result in significant mental health problems ranging from posttraumatic stress disorder and major depression to relationship problems, and that many soldiers manage to adapt quite well following exposure, a number of researchers have begun to

examine factors that predict adjustment difficulties on the one hand, and resilience on the other (McCreary, 2006). Although it is tempting to draw from the childhood resilience and adult resilience literatures, it is important to note aspects that make the military context somewhat unique.

Bartone (2005) identified a number of risk factors for psychological distress unique to military operations. These include (a) isolation, (b) ambiguity in the mission, (c) a sense of powerlessness, (d) boredom and (e) danger. Boredom refers to the fact that often there are long periods of “staying in place” often without significant work to do. As months and weeks pass by, daily tasks result in daily drudgery. Bartone (2005) notes that “soldiers have a tremendous need to see their work and activities as meaningful and important” (p. 319).

The level of combat exposure a soldier experiences is a strong predictor for subsequent psychological distress where level of combat exposure is positively correlated to distress (Castro, 2009; McQuaig and Ivey, 2010). In a study of American soldiers serving in Iraq, Castro (2009) found that those soldiers who have been exposed to higher levels of combat were more likely to screen for psychological distress (anxiety, depression or PTSD) compared to those soldiers who are exposed to lower levels of combat.

Protective Factors within a Military Context

A large body of research within various militaries has identified a number of protective factors that appear to moderate or buffer the psychological impact of military operations. Morale, cohesion, confidence in leadership and commitment are considered among the most significant protective factors (Canadian Army Lessons Learned Center, 2004). On the assumption that these factors promote resilience in soldiers serving in war zones, militaries are committing resources to

develop unit morale/cohesion, soldiers' confidence in their leaders, and a sense of organizational commitment.

Cohesion. Cohesion is often defined as task cohesion and social cohesion (Griffith, 1988; Farley, 2002). Task cohesion refers to shared commitment to achieving a goal whereas social cohesion refers to the nature and quality of emotional bonds. Cohesion is often measured in regards to performance. Military leaders have long considered unit cohesion as an important ingredient for operations combat effectiveness and successful military performance on the battlefield (Bartone & Adler, 2000; Farley, 1997; Farley, 2002; Griffith, 1988, 1997; Griffith and Vaitkus, 1999; Ingraham & Manning, 1980; Mangelsdorff, 1985). More recently, unit cohesion is being researched as having a moderating role between the relation of combat exposure and subsequent stress reaction (Castro, 2009; Campise, Geller & Campise, 2006; Farley, 1997; Farley & Murphy, 1999). Shils and Jonowitz (1948, as cited in Griffith, 1997; Farley, 2002) in studying the German Army's successful resistance in World War II in the face of overwhelming odds was attributed primarily to the solidarity among members of small groups of soldiers (group cohesion). Griffith (1988) found that cohesion moderated the relationship between stress and individual combat performance in a survey of 9,013 US Army soldiers. Stress was defined as job work load and number of hours worked in a week. The results indicated that team task support (cohesion) was a significant moderator between stress and perceived individual combat performance. The relationship between stress and perceived individual combat performance was less negative when soldiers reported higher levels of team task support, higher levels of well being, and lower levels of disintegration (Griffith, 1988). Izzo, Lapointe, Vileneuve and Columbe (2000) found that Canadian soldiers deployed on peacekeeping operations who reported high levels of unit cohesion also reported low levels of stress on operations. Based on

this and other evidence, there is a consensus amongst military researchers that military units whose soldiers form a psychological and emotional bond to each other (i.e., a “Band of Brothers”) tend to report lower rates of combat stress injury, acute stress reactions and post traumatic stress disorder.

Cohesion and morale are very closely related within a military context. Morale has been defined in many ways and is generally considered a multi-dimensional higher order construct that encompasses the following factors: cohesion, confidence in commander, confidence in equipment, confidence in one’s ability to use the equipment and perceived legitimacy of the mission (Campise, Geller & Campise, 2006). Ingraham and Manning (1980) defined morale as “the enthusiasm and persistence with which a member of a group engages in the prescribed activities of that group” (p. 7). Britt and Dickson (2004) define morale as “the service member’s level of motivation and enthusiasm for accomplishing mission objectives” (p.162). While considered multi-dimensional, measurement of morale has tended to be based on a single item indicators, whereby an individual is asked to rate their own morale and also the morale of their group (Britt & Dickinson, 2004). Morale is the “glue” that binds a unit together towards its operational mission.

Confidence in Leadership. Leadership plays a critical role in the prevention and management of stress on operations by inspiring confidence in leadership competence, fostering morale and cohesion, ensuring effective communication through meaning making, applying sleep and fatigue management principles, and promoting mutual support (Murphy, 2003). Kanki (1982) found that effective leaders help their teams deal with the stress of a chaotic work environment by setting expectations for performance and acting in a consistent manner. Sausen, Bourne, Kaufman and Caruso (1998) found lower Beck Depression Inventory scores in Marines

who had deployed to Bosnia who had confidence in their leaders compared to those soldiers who lacked confidence in their leaders. Similarly, Castro (2009) found that soldiers' perception of their leaders was a significant predictor of psychological distress in American soldiers returning from Iraq. Of those soldiers who perceived their leaders positively, only 11 percent screened positive for mental health issues; those who did not perceive their leaders positively, 28 percent screened positive for mental health issues. Among those soldiers experiencing high combat situations, perception of leaders remained an important predictor of distress: of those in the high combat group who viewed their leaders positively, 17 percent screened positive for mental health problems; of those in the high combat group who viewed their leaders negatively, 36 percent screened positive for mental health problems (Castro, 2009). In other words, those soldiers who have confidence in their leadership report less stress than those soldiers who do not have confidence in their leadership.

Organizational Commitment. The focus of most military research has been on cohesion, morale and confidence in leadership (Farley, 2002) and the Canadian Forces only recently commenced collecting data on this construct. Organizational commitment within the Canadian Forces reflects the Allen and Meyer (1990) definitions for affective, normative and continuance commitment and this is further reflected in using their 12 item measure. US Military researchers have recently used an abbreviated version of the Meyer and Allen (1997) survey to measure the relationship between affective commitment and continuance commitment to attrition, morale and job performance however no normative commitment questions were asked nor were any stress measures included (Gade, 2003; Gade, Tiggler & Schumm, 2003; and Heffner & Gade (2003). Allen (2003) in commenting on these three research articles stated that little is known about the relationship between organizational commitment and behaviour under stressful

conditions which she viewed as an area of valuable research particularly within a military setting. Further, she noted that the removal of the normative commitment questions due to brevity requirements meant a lack of research of this measure within a military context. Most recently, Tucker, Sinclair and Thomas (2005) found those soldiers who possessed higher levels of commitment to completing their mission reported higher levels of well being, higher levels of operational readiness and reported less stress, however this was not done as a moderated analysis. The present study is the first for the Canadian Forces to examine the role of organizational commitment as a potential protective factor.

The Present Study

Research in the childhood and adult resiliency literatures indicate a range of individual difference variables (like general mental ability, extraversion, self-efficacy, commitment, and sense of purpose or meaning), family support, and community support that appear to protect individuals from the debilitating effects of chronic or acute stressors. Within a military context, researchers have found that cohesion/morale and confidence in leadership are considered protective factors while Schmidt's (2007) research on organizational commitment and in particular affective and normative commitment (Schmidt, 2007) acts as a protective factor within a government agency context. The connection between the childhood protective factors to military protective factors is that affective commitment is considered to represent an individual difference. Family support within a military context is reflected in the traditions of a unit or regimental family. When one joins the Army your fellow soldiers essentially become your new family and the perceived closeness of this family is measured through cohesion. The family role models are reflected in the confidence in leadership of immediate supervisors (traditionally senior non-commissioned officers and officers) and as well as the overall confidence in the chain

of command. Community support is reflected in the entire Canadian Forces whose programs and services provide broad support to soldiers.

My goal in this thesis is to examine whether perceptions of cohesion/morale, affective and normative commitment, and confidence in leadership predict a resilient outcome in Canadian soldiers who have returned from combat operations in Afghanistan. There have been a total of ten Battle Group deployments since 2006. The Battle Group spends 6 months on pre-deployment training in Canada, followed by a six to eight month deployment into Afghanistan, located in the region of Kandahar. A Battle Group consists of approximately 1,800 combat soldiers. Military occupations within the Battle Group consist of: infantry, armoured, artillery, combat engineers, logistical, medical, communications, and administrative personnel. The Battle Group is further supported by senior Joint Task Force Headquarters, with senior officers from the same occupations as resident within the Battle Group. In addition, special operations forces, third line support logistical, medical and air assets and personnel increase the number of Canadian Forces personnel in theatre by an additional 1,200, resulting in approximately 3,000 Canadian Forces personnel. As of the writing of this thesis, 154 Canadian soldiers have died due to combat related injuries since April, 2002. 13 officers have been killed, 26 Senior Non Commissioned Officers (Sergeant to Chief Warrant Officer) have been killed and 115 Junior Non commissioned officers (Private to Master Corporal) have been killed. 16 of these deaths occurred in 2010. Of those injured while on operations, a total of 1,442 is reported for 2009, with 529 injuries reported as wounded in action, while 913 are listed as resulting from accidents. The CF does not report the nature of the injuries as it considers this information as classified. Injuries that are stress related are included under this classification and all medical information on soldiers is protected by both national security and medical confidentiality. As previously noted, a 2008 post-deployment

questionnaire of 6,380 Canadian personnel revealed that since their return from Afghanistan 4.4 percent of the soldiers had experienced PTSD symptoms while 4.6 percent had experienced symptoms of major depression which is similar to the US Armed Forces findings of prevalence of PTSD (OSSIS, 2008).

Research has shown that the level of combat exposure on operations a soldier experiences is one of the single best predictors of the subsequent outcome of psychological distress. Accordingly, the protective factors should moderate the relationship between combat exposure on operations and psychological distress. Specifically I will test the following hypotheses:

- H₁ Soldiers' level of exposure on operations will be positively correlated with increases in psychological distress from pre-deployment to post-deployment while controlling for residual distress from pre-deployment.
- H_{2A} Soldier's perceptions of cohesion will moderate the relationship between exposure on operations and changes in psychological distress.
- H_{2B} Soldier's perceptions of affective commitment will moderate the relationship between exposure on operations and changes in psychological distress.
- H_{2C} Soldier's perceptions of immediate supervisor's leadership behaviours will moderate the relationship between exposure on operations and changes in psychological distress.
- H_{2D} Soldier's perceptions of confidence in the leadership of the chain of command will moderate the relationship between exposure on operations and changes in psychological distress.
- H₃ Exploratory Analysis. To assess resilient outcomes following the tour of duty in Afghanistan, Bonanno et al. (2002) model of resilience trajectories will be used

which can only be determined post hoc following the traumatic or stressful experience which in this case is considered the six months tour of duty.

Method

Participants

The Army attempts to provide all deployed Battle Group personnel ($N=2,830$) the opportunity to complete the Human Dimensions of Operations (HDO) survey (Farley, 1995) at Time 1, Time 2 and Time 3. Participation is voluntary and anonymous. Participants include both genders; married and single personnel; Regular Force and Reserve soldiers; soldiers on their first tour of duty and also those who have had multiple tours; soldiers' time in service is from a low of two years to in excess of 30 years of service. The HDO survey instructions explained the purpose of the survey, emphasized the voluntary nature of participation, and assured respondents of the confidentiality and anonymity of their responses. The HDO survey results were gathered by Personnel Selection Officers serving in the military. The HDO data for this thesis are from a Canadian Forces Battle Group that deployed on operations to Afghanistan in 2009.

Procedure

The HDO survey measures human factors associated with operational readiness and effectiveness and is administered three times across the deployment cycle (i.e., pre-deployment, in-theatre, post-deployment) and this timeline consists of a total of 18 months. Specifically, the Battle Group is constituted and conducts pre-deployment training for a period of six months in Canada. Prior to be deployed to Afghanistan (pre-deployment) Canadian Forces personnel were invited to participate in the HDO survey by means of an email which included a link to the online survey. The pre-deployment survey represents Time 1 for this thesis. After providing informed consent they were given the option of providing a PIN code of their choosing for the

sole purpose of collating responses across the three data collection phases. Following this, they were asked a series of questions assessing a range of topics relevant to human dimensions of operations, including measures of demographic data, commitment to the mission, confidence in leadership, and current level of perceived stress. No incentives were offered for completing the survey. The number of respondents who voluntarily participated at this data collection time were $N = 1,867$ which was a response rate of 67%.

The second survey was administered in Afghanistan approximately half way (3 months) following their arrival in theatre. This represents Time 2. This version was administered in a paper and pencil format, and also included an informed consent form. Participation was again anonymous, voluntary and with no incentives. Due to operations tempo, this administration tends to have the lowest response rate. The survey included many of the same measures used at pre-deployment cohesion, commitment, confidence in leadership, stress level as well as a measure of exposure to specific battle field experiences. The number of respondents who voluntarily participated at this data collection time were $N = 1,629$ which was a response rate of 58%.

The third survey was administered about 6 months after personnel had returned to Canada following completion of their 6 month tour. This represents Time 3. This survey was administered via computer in the same way as the pre-deployment survey. Again participation was voluntary and anonymous. No incentives were offered for completing the survey. All surveys provided respondents the opportunity to provide general comments and feedback on the survey, whether it is administered electronically or manually. The number of respondents who voluntarily participated at this data collection time were $N = 913$ which was a response rate of 32%.

Measures

The HDO collects demographic data which includes age, rank, regular force or reservist, number of operational tours, number of years of military service, and marital status. The pre-deployment survey consists of 6 scales with a total of 88 items. The scales include a measure of Unit Climate, Operational Preparedness, Confidence in Skills and Abilities, Organizational Commitment, Signs of Stress, and Moral Climate. The in-theatre survey consists of 5 scales and 111 items, including Signs of Stress, Moral Climate, Military Values, and Stress on Operations. The post-deployment survey consists of 13 scales and 245 items. The scales include Commitment, Signs of Stress, Military Values, Stress on Operations, Future career intentions, physical fitness during deployment, Third Location Decompression, Individual and Collective Training, Cultural Awareness Training, Training Realism, and Conduct after Capture Training and Personnel Recovery. Scales specifically used in this research paper are outlined below.

Independent Variable. Combat exposure was measured with the Stress on Operations Scale, a measure adapted from the US Mental Health Advisory Team (MHAT) IV Soldier/Marine Well-Being Survey (Office of the Surgeon Multinational Force-Iraq & Office of the Surgeon General US Army Medical Command, 2006). The Stress on Operations Scale is comprised of 44 items that describe combat experiences common on the modern battlefield, to which respondents were asked how often they had experienced each item, or combat stressor (e.g., “Witnessing an accident which resulted in serious injury or death”), on a five-point scale with 0 = Never, 1 = One time, 2 = Two to four times, 3 = Five to nine times, and 4 = Ten or more times. The main purpose of this scale is to quantify the level of exposure of a particular stressor that the soldier experienced. Within the HDO, the underlying structure of the Stress on Operations scale has not been evaluated as it is considered a causal indicator model (MacCallum

& Brown, 1993). This means that the items that make up the scale cause the underlying stress experienced on operations therefore a factor analysis was not conducted on the scale. The scale does have face validity as the items are clearly related to the exposure items they purport to measure. For example, the soldier was asked whether they experienced the stressor or not, and if they did, they are asked to report how often they experienced that stressor. There have been no questions concerning ambiguity of the phrasing of items nor has the relevance of any of the items been challenged by the Commander, Canadian Army nor his staff. This scale has been used since 2007 and data has been collected on 10 Canadian Battle Group rotations using the measure. Descriptive statistics indicating the percentage of soldiers who reported experiencing the particular exposure item at least one time during the deployment is provided at Table 2. The Canadian Forces has not formally categorized whether the stressor is an acute or chronic in nature. The categorization of the stressor in the table was done by the author solely based on experience as a military officer.

Moderator Variables. For this thesis, three moderating variables were used in four separate moderation regression analyses.

Cohesion. Cohesion is measured through two items with responses measured on a 5-point Likert scale ranging from 1 “*strongly disagree*” to 5 “*strongly agree*”. The two items measuring unit cohesion/morale are: “In my unit there is a collective enthusiasm and persistence in pursuing our assigned goals” and “We ‘stick together’ which enhances our ability to achieve our assigned tasks”. Director General Military Personnel Research and Analysis Section of the Canadian Forces indicated that previous Cronbach’s alpha ranges from .78 to .80 for cohesion. To establish validity of perceptions of unit cohesion, indicators of social cohesion and task cohesion are traditionally measured in relation to performance (Farley, 2002). The two questions

used by Farley (2002) to measure cohesion have been psychometrically validated (Dobrevá-Martinová, 1999) with reliability coefficients of .92. Dobrevá-Martinová (1999) found that cohesion accounted for 13.7% of the variance. For the present study the two items measuring cohesion have a Cronbach's $\alpha = .78$.

Organizational Commitment. The Organizational Commitment scale is based on Meyer and Allen's (1997) 12 item scale assessing affective, normative and continuance commitment (four questions for each construct). Items are measured on a 5 point Likert scale ranging from 1 "*strongly disagree*" to 5 "*strongly agree*". Affective commitment refers to emotional attachment the soldier feels towards the CF (e.g., I have a strong sense of belonging to the CF). The higher the score on affective commitment items, the more emotionally attached the respondent feels to the Canadian Forces. High scores on normative commitment reflect an obligation to serve out of feelings of loyalty to the organization. High scores on continuance commitment reflect the willingness to serve because the costs of leaving are too high. Cronbach's alphas have shown good internal reliability for each subscale (affective: .88; normative = .71; and continuance = .88). This scale is widely used and has been validated in a number of studies. Allen and Meyer, (1990) reported Cronbach's alpha for affective commitment = .87 and normative commitment = .79. Meyer, Stanley, Hesovitch & Topolyntsky (2002) found in their meta-analysis that affective commitment reliability $r = .82$ while normative commitment reliability is $r = .73$. Schmidt (2007) using a combined Meyer and Allen affective and normative commitment scale which was created following a factor analysis found the Cronbach's $\alpha = .86$. Glazer and Kruse (2008) reported reliability for affective commitment was $r = .81$. Prior to formal moderation analysis and in keeping with the approach adopted by Schmidt (2007) a factor analysis was conducted of the 12 item organizational commitment scale (Meyer & Allen, 1990, 1997) to see if it is a two

factor (affective/normative and continuance) model or a three factor (affective, normative and continuance) model. Discussions with the Research Officers at the Director General Operational Research and Analysis Section for the Canadian Forces had indicated that in military populations, that the organizational commitment scale tends to be a two factor scale with both affective and normative commitment loading on a single factor. The two factor model was selected and 7 items from the affective and normative commitment were combined which had a Cronbach's $\alpha = .86$. This is similar to Gade and Tiggie (2003) that found Cronbach's $\alpha = .89$ with a US military population that also used a combined affective and normative commitment scale.

Confidence in Leadership. Confidence in leadership is measured in two categories: the immediate supervisor and on the overall confidence in the chain of command. Immediate supervisor leadership is measured by one item while the overall confidence in the chain of command is through seven items with responses measured on a 5-point Likert scale ranging from 1 "*strongly disagree*" to 5 "*strongly agree*". Items measuring confidence in leadership include: "In the event of combat I have confidence in my Commanding Officer" and "In the event of combat I have confidence in my section commander". Previous Canadian military samples indicate the Cronbach's alpha for this scale ranges from .83 to .88. In establishing validity for this scale, confidence in chain of command's leadership is a single question that asks how confident the respondent is, in the various individuals who are superior to them in the chain of command: their section commander, their platoon sergeant, their platoon warrant officer, their company sergeant major, their platoon officer, their company commander and their commanding officer. Due to confidentiality issues the scores are aggregated into an overall confidence in leadership of the chain of command score. The question has face validity as appears to measure

what is being sought to be measured. The respondent knows who each of the individuals who holds these appointments and is asked how confident they are in that leader. The response is related to the confidence in the person occupying the position, rather than the position itself and is a measure of a personal opinion. As the items for the confidence in the leadership of the chain of command are provided as an overall composite mean, it is not possible to calculate the Cronbach's alpha.

Dependent Variable. Psychological distress is the dependent variable that was measured using the Kessler Psychological Distress Scale (K10; Kessler et al., 2002). This scale contains 10 items that measure symptoms of generalized anxiety (e.g., "Did you feel nervous?") and depression (e.g., "Did you feel hopeless?") experienced within the last month. Responses were provided on a five-point Likert-type scale, ranging from 1 = "*None of the time*" to 5 = "*All of the time*". The scores were summed and divided by ten to obtain a psychological distress score out of 5. Previous use of the K10 in the HDO has yielded high internal reliability ($\alpha = .90$; McCuaig Edge & Blanc, 2009). For the present study the Cronbach's $\alpha = .90$. Andrews and Slade (2001) sought to create norms for the K10 using the results of the Australian National Survey of Mental Health and Wellbeing ($N = 1,401$) and reported the population K10 $M = 1.42$ (no *SE* nor *SD* was reported). In examining construct validity Andrews and Slade (2001) found a moderate correlation between the K10 ($r = .5$) and the General Health Questionnaire (GHQ) which also measures psychological distress. Kessler et al., (2003) found that the K10 has good convergent validity with it being a valid measure of mental distress in the general population, when compared with other diagnoses of mental health including the WHO Disability Assessment Schedule (WHO-DAS); and the Composite International Diagnostic Interview Short Form (CIDI-SF; Who, 1997). Baillie (2005) found that the K10 has shown consistency and convergent

validity with the computerized version of the Composite International Diagnostic Interview (CIDI) across genders and education levels in adults over the age of 18 using data from the 2000 Australian National Survey of Mental Health and Well Being ($N = 13,624$). The only Canadian research in the general population is from a national community mental health survey ($N = 36,656$) persons aged 15 or older living in private households. Cairney, Veldhuizen, Wade, Kurdyak and Streiner, (2007) found that the K10 was a good predictor of 1-month depressive episodes but declined slightly when looking at 12-month depression. Cairney et al., (2007) used ROC analysis (AUC) statistics and did not report any K10 mean score results for the Canadian population. Recently, Slade, Grove and Burgess (2011) analyzed the 2007 Australian National Survey of Mental Health and Wellbeing ($N = 8,841$) and reported the population norm for the K10 ($M = 1.45, SE = 0.1$).

Results

Preliminary Analysis

A factor analysis was conducted prior to the main analysis to assess the structure of the organizational commitment scale. Affective commitment was assessed with Meyer and Allen's (1990, 1997) organizational commitment scale. This instrument was originally designed to assess three distinct aspects of organizational commitment: affective commitment, normative commitment, and continuance commitment. However, some research has suggested that the affective and normative commitment subscales correlate so highly in military samples that the two subscales represent a single factor (Gade et al., 2003). Canadian military researchers using the Meyer and Allen (1990, 1997) organizational commitment scale have found mixed results in that some military samples load onto two factors while other military samples load on three factors (McQuaig Quick & Blanc 2008). Given these varied findings, I conducted a series of factor analyses to determine whether the data better fit a two- or three-factor model. The 12

items which compose the commitment scale were examined for errors in data entry, missing values, power, normality, influence of univariate and multivariate outliers, tolerance, and multicollinearity. The N was initially 1,876 cases with 73 cases with missing values. Missing values analysis indicated these were missing completely at random and were deleted. 30 univariate outliers that exceeded the z scores ± 3.29 SD were initially identified and removed. 17 multivariate outliers were detected and deleted. Item 9 was reversed coded so this was transformed prior to the analysis. The final N was 1,763.

The 12 x 12 correlation matrix was factored using the unweighted least squares method. Although the eigenvalues > 1 rule suggested the retention of three factors, the more rigorous parallel analysis (O'Connor, 2000) suggested that a two factor solution was more parsimonious. For the third factor, parallel analysis indicated a root 3 value = 1.094367 whereas the eigenvalue for factor 3 = 1.018. The two factors extracted (accounting for 50.6% of the variance) were rotated using varimax rotation. Examination of the factor loadings indicated that all four items assessing affective commitment loaded on one factor, along with three items from the normative commitment subscale. All four of the continuance commitment items loaded onto the second factor. One item identified as normative commitment did not load onto either factor (see Table 1).

Table 1

Rotated Factor Matrix Two Factor Loadings

Items	<u>Factor 1</u> Affective	<u>Factor 2</u> Continuance
I feel a strong sense of belonging to the CF.	.89	
The CF has a great deal of personal meaning to me.	.83	
I feel “emotionally” attached to the CF.	.76	
I feel like “Part of the Family” in the CF.	.71	
The CF Deserves my loyalty.	.64	
I owe a great deal to the CF.	.53	.22
I would not leave the CF right now because of a sense of obligation to the people in it.	.45	
I am afraid of what might happen if I quit the CF without having another job lined up.		.84
Too much of my life would be interrupted if I decided to leave the CF now.	.21	.72
One of the problems of leaving the CF would be the lack of available alternatives.		.72
It would be too costly for me to leave the CF in the near future.	.23	.68
I do not feel any obligation to remain with the CF (R coded)		

Note. Only crossloadings of .2 or greater are reported.

Based on these results, I calculated an Affective Commitment score for each participant by averaging the seven items loading most strongly on the first factor and a Continuance Commitment score for each participant by averaging the four items loading most strongly on the second factor. Cronbach's alpha for the Affective Commitment scale was .86 ($M = 3.76$, $SD = .61$) and for the Continuance Commitment scale was .86 ($M = 3.10$, $SD = 1.08$). The correlation between these two subscales was $r(1,763) = .29$, $p = .001$). The combined Affective Commitment scale was used for the main analysis. The results of the entire factor analysis conducted are found at Appendix A.

Main Analysis

The HDO survey was administered anonymously. Participants are invited, however, to provide a unique code that would allow their survey responses to be linked from one administration to the next without personally identifying themselves. Of the 1,875 participants who completed the pre-tour survey and 905 who completed the post-tour survey, 128 provided a unique code at both pre-tour and post-tour that allowed for linkage between the two surveys. To assess the extent to which the 128 who provided a code were representative of the larger sample, I conducted a series of independent samples t -tests on the pre-tour variables of interest. There was no significant difference between those providing a code and those not providing a code on pre-tour distress ($t = .36$, $p = .72$), cohesion ($t = -.43$, $p = .67$), confidence in immediate leadership behaviours ($t = -1.33$, $p = .19$) and confidence in the leadership of the chain of command ($t = -.09$, $p = .93$). The groups did, however, differ significantly on affective commitment such that those providing a code scored somewhat lower on affective commitment ($M_{\text{code}} = 3.62$, $SD = 0.67$ vs $M_{\text{no code}} = 3.76$, $SD = 0.72$; $t(1,747) = -2.01$, $p < .05$). Comparisons between the 128 and those who did not provide a unique code at post-tour on exposure and post-

tour distress indicated no significant differences (exposure: $M_{code} = 1.82, SD = .56$ vs $M_{no\ code} = 1.96, SD = 1.20$; $t(778) = -1.21, p = .23$ and post tour distress: $M_{code} = 1.71, SD = .68$ vs $M_{no\ code} = 1.81, SD = 1.16$; $t(778) = -.89, p = .37$).

Of the 128 who provided a code, 119 respondents were members of the regular force and 9 were reservists. Eighty-six respondents were junior non-commissioned members (private to master corporal); 20 were senior non-commissioned members (sergeant to chief warrant officer); 16 were junior officers (lieutenants or captains) and 6 were senior officers (major or higher). Seventy respondents were on their first tour; 23 were on their second tour; 35 indicated that they had been on more than two tours. A one way ANOVA was conducted to examine whether there was a significant difference based on number of tours a soldier had served on and the variables of cohesion, commitment, immediate leadership behaviours, confidence in the leadership of the chain of command and pre-tour and post-tour distress levels. The findings indicated no significant differences between the number of tours and the indicated variables.

Exposure Scale. The exposure scale as the main predictor variable was examined to assess the percentage of soldiers who had experienced that particular stressor at least one time during the deployment in Afghanistan. Each battlefield stressor item was categorized as either an acute stressor or a chronic stressor (See Table 2). The overall exposure statistic represents the summation of all the exposure items divided by 44 (the total number of items) which generated an overall exposure mean for the respondent group on a 5 point scale with 1 being low exposure and 5 being high exposure. The level of exposure reported at Time 3 is the critical predictor for all the subsequent regression analyses: $M = 1.80, SD = .05$.

Table 2

Proportion of Soldiers Exposed to Each Battlefield Stressor

Exposure to Battlefield Stressor	% Exposed	Type of Stressor
Being attacked or ambushed	64.1	Acute
Seeing destroyed homes or villages	74.2	Chronic
Receiving small arms fire	54.7	Acute
Seeing dead bodies or human remains	58.6	Acute
Handling or uncovering human remains	26.6	Acute
Witnessing an accident which resulted in serious injury or death	53.1	Acute
Witnessing violence with the local population or between ethnic groups	39.8	Acute
Seeing dead or seriously injured Canadians	44.5	Acute
Knowing someone seriously injured or killed	82	Acute
Participating in demining operations	31.2	Chronic
Improvised explosive device/booby traps exploded near you	68.7	Acute
Working in areas that were mined or had improvised explosive devices	60.2	Chronic
Having hostile reactions from local civilians	64.1	Chronic
Disarming civilians	14.8	Chronic
Being in a threatening situation where you were unable to respond because of the rules of engagement	25.0	Chronic
Shooting or directing fire at the enemy	48.4	Acute
Calling in fire on the enemy (e.g., artillery or mortar fire)	15.6	Acute

Engaging in hand to hand combat	0.00	Acute
Clearing/searching homes or buildings	35.2	Chronic
Clearing/searching caves or bunkers	13.3	Chronic
Witnessing brutality/mistreatment towards non-combatants	Classified	Acute
Being wounded/injured	10.9	Acute
Seeing ill/injured people you were unable to help	47.7	Acute
Receiving incoming artillery, rocket or mortar fire	79.7	Chronic
Being directly responsible for the death of an enemy combatant	18.7	Acute
Observing violations of the Law of Armed Conflict/Geneva Conventions	Classified	Acute
Being responsible for the death of Canadian or Allied Personnel	0.8	Acute
Having a member of your own unit become a casualty	53.9	Acute
Had a close call – dud landed near you	27.3	Acute
Had a close call – a bullet or shrapnel hit a piece of your personal equipment	13.3	Acute
Had a close call – equipment shot off your body	2.3	Acute
Had a close call – was shot or hit but your protective equipment saved you	2.3	Acute
Had a buddy shot or hit who was near you	12.5	Acute
Informed unit member/friend of a soldier's death	18	Acute
Witnessed the verbal abuse of non-combatants	Classified	Acute
Witnessed the damage and/or destruction of private property when it was not necessary	Classified	Acute
Witnessing a non-combatant being physically hit/kicked when it was not necessary	Classified	Acute

Witnessing the unauthorized modification of ROE in order to accomplish the mission	Classified	Acute
Witnessing ROE being ignored in order to accomplish the mission	Classified	Acute
Witnessing corruption by local nationals, including government officials and security personnel	39.8	Chronic
Witnessing incompetence by local nationals, including government officials and security personnel	63.3	Chronic
Having to work under tight deadlines	80.5	Chronic
Being expected to do more work than is reasonable	64.8	Chronic

The correlations among combat exposure, cohesion, affective commitment, confidence in immediate leadership behaviour, overall confidence in the chain of command and the distress reaction were examined (see Table 3). Exposure was not significantly associated with any of the pre-tour variables. The proposed moderators of cohesion, affective commitment, confidence in immediate leadership behaviours and overall confidence in the chain of command were positively and significantly correlated with one another. Affective commitment was significantly (and positively) correlated with confidence in the chain of command leadership, but not with the other moderators. Cohesion was significantly negatively correlated with pre-tour distress. Pre-tour distress scores were moderately (and positively) correlated with post-tour distress scores.

Table 3

Correlations among predictor, moderator and outcome variables (N=128)

Variable	1	2	3	4	5	6	7
1. Exposure (T3)							
2. Cohesion	.03						
3. Commitment	-.06	.36**					
4. Supervisor	.09	.49**	.08				
5. C of C	.14	.57**	.24**	.67**			
6. Distress (T1)	-.06	-.23**	-.17	-.12	-.15		
7. Distress (T3)	.16	-.14	-.15	.04	-.05	.38**	
Mean	1.82	3.93	3.63	3.92	4.14	1.71	1.71
SD	.54	.76	.66	1.06	.74	.53	.68

*Note: ** $p < .01$*

Exposure on operations correlated to post tour distress.

It was hypothesized that exposure on operations at post deployment would be positively correlated to post-tour distress after controlling for pre-deployment distress. To test this, a partial correlation was conducted. The results (see Table 4) of this analysis was that exposure is significantly positively correlated ($r = .19$) while controlling for distress (T1).

Table 4

Correlation of Exposure (T3) to Distress (T3) while controlling for Distress (T1)

Variable	<i>M</i>	<i>SD</i>	1	2	3
1. Distress T1	1.71	.53			
2. Exposure T3	1.82	.54			
3. Distress T3	1.71	.68		.19*	

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

The more rigorous multiple regression was conducted to provide the effect size of the R^2 change (see Table 5). The analysis indicated that controlling for pre-tour distress, greater exposure was associated with greater post-tour distress ($B = 0.23$, $se = .10$; $t(125) = 2.21$, $p = .03$).

Table 5

Regression analysis

Variable	<i>B</i>	<i>SE B</i>	<i>t</i> (125)	ΔR^2
Step 1				
K10 T1	.49	.11	4.67***	.15***
Step 2				
K10 T 1	.51	.10	4.86***	.03*
Exposure T3	.23	.10	2.21*	

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

Examining Hypothesized Moderators

A series of moderation analyses was conducted to examine if the hypothesized moderators significantly moderated the relationship between exposure on operations (T3) and the reported distress (T3) while controlling for distress at T(1). In conducting this series of analyses, the sample ($N= 128$, representing a 4.5% response rate) is based on soldiers who provided anonymous PIN tracking numbers.

Cohesion as a moderator between exposure on operations and post tour distress.

It was hypothesized that cohesion would moderate the relationship between exposure on operations and subsequent stress reaction. To test this, a multiple regression analysis was conducted on post tour distress (see Table 6). Exposure was used as a continuous variable.¹ The pre-tour distress was entered in first block followed by the centered exposure variable and the centered cohesion variable. The interaction of exposure by cohesion was entered into block 2.

¹ The same pattern of results is obtained when exposure was divided by median split into a high exposure/low exposure group and acute/chronic stressors.

Table 6

Cohesion as a moderator between exposure and distress level at T3

Variable	<i>B</i>	<i>SE B</i>	<i>t</i>	ΔR^2
Step 1				
Distress T1	.49	.19	4.60***	.18***
Exposure	.26	.11	2.47*	
Cohesion	-.04	.07	-.58	
Step 2				
Distress T1	.50	.11	4.46***	.00
Exposure	.27	.11	2.37*	
Cohesion	-.04	.08	-.53	
Interaction	-.02	.15	-.13	

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

The analysis indicated no significant main effect of cohesion ($B = -.04$, $se = .07$, $t(124) = -.58$, $p = .56$, 95% $CI_{LL} = -.19$, $CI_{UL} = .10$, nor did it yield a significant exposure by cohesion interaction ($B = -.01$, $se = .15$, $t(123) = -.13$, $p = .90$, 95% $CI_{LL} = -.32$, $CI_{UL} = .28$).

Commitment as a moderator between exposure on operations and post tour distress.

It was hypothesized that commitment would moderate the relationship between exposure on operations and subsequent distress reaction. To test this, a multiple regression analysis was

conducted (see Table 7). Exposure was used as a continuous variable.² The pre-tour distress was entered in first block followed by the centered exposure variable and the centered commitment variable. The interaction of exposure by commitment was entered into the second block.

Table 7

Commitment as a Moderator between Exposure and Distress at T3

Variable	<i>B</i>	<i>SE B</i>	<i>t</i>	ΔR^2
Step 1				
Distress T1	.49	.11	4.66***	.19***
Exposure	.26	.11	2.39*	
Commitment	-.07	.08	-.79	
Step 2				
Distress T1	.49	.11	4.60***	.00
Exposure	.26	.11	2.38*	
Commitment	-.07	.08	-.79	
Interaction	-.03	.18	-.14	

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

The analysis indicated no significant main effect of commitment ($B = -.07$, $se = .08$, $t(124) = -.79$, $p = .43$, 95% $CI_{LL} = -.23$, $CI_{UL} = .10$) nor did it yield a significant exposure by

² The same pattern of results is obtained when exposure was divided by median split into a high exposure/low exposure group and acute/chronic stressors.

commitment interaction ($B = -.01$, $se = .18$, $t(123) = -.14$, $p = .88$, 95% $CI_{LL} = -.38$, $CI_{UL} = .33$).

Immediate leadership behaviour as a moderator between exposure on operations and post tour distress.

It was hypothesized that immediate leadership behavior would moderate the relationship between exposure on operations and subsequent stress reaction. To test this, a multiple regression analysis was conducted (see Table 8). Exposure was used as a continuous variable.³

Table 8

Supervisor's leadership as a moderate exposure and distress at T3

Variable	<i>B</i>	<i>SE B</i>	<i>t</i>	ΔR^2
Step 1				
Distress T1	.52	.10	4.95*	.19***
Exposure	.26	.11	2.40*	
Supervisor	.05	.05	.95	
Step 2				
Distress T1	.52	.11	4.88***	.00
Exposure	.26	.11	2.39*	
Supervisor	.05	.05	0.97	
Interaction	-.02	.10	-.20	

³ The same pattern of results is obtained when exposure was divided by median split into a high exposure/low exposure group and acute/chronic stressors.

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

The pre-tour distress was entered in first block followed by the centered exposure variable and the centered immediate leadership variable. The interaction of exposure by immediate leadership behavior was entered into the second block. The analysis indicated no significant main effect of immediate leadership behavior ($B = .05, se = .05, t(124) = .95, p = .34, 95\% CI LL = -.05, CI UL = .15$) nor did it yield a significant exposure by immediate leadership behavior interaction ($B = -.02, se = .10, t(1, 123) = -.20, p = .84, 95\% CI LL = -.22, CI UL = .19$).

Confidence in the leadership of the chain of command as a moderator between exposure on operations and post tour distress.

It was hypothesized that confidence in the leadership of the chain of command would moderate the relationship between exposure on operations and subsequent stress reaction. To test this, a multiple regression analysis was conducted (see Table 9). Exposure was used as a continuous variable.⁴ The pre-tour distress was entered in first block followed by the centered exposure variable and the centered confidence in the leadership of the chain of command variable. The interaction of exposure by confidence in the leadership of the chain of command was entered into the second block.

⁴ The same pattern of results is obtained when exposure was divided by median split into a high exposure/low exposure group and acute/chronic stressors.

Table 9

Chain of Command moderates the relationship between exposure and distress level at T3

Variable	<i>B</i>	<i>SE B</i>	<i>t</i>	ΔR^2
Step 1				
Distress T1	.50	.11	4.78*	.19***
Exposure	.26	.11	2.46*	
C of C	-.01	.08	-.16	
Step 2				
Distress T1	.50	.11	4.67***	.00
Exposure	.26	.11	2.31*	
C of C	-.01	.08	-.19	
Interaction	.06	.16	.35	

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

The analysis indicated no significant main effect of confidence in the leadership of the chain of command ($B = -.01$, $se = .08$, $t(124) = -.16$, $p = .87$, 95% $CI_{LL} = -.16$, $CI_{UL} = .14$) nor did it yield a significant exposure by confidence in the leadership of the chain of command interaction ($B = .03$, $se = .16$, $t(123) = .35$, $p = .73$, 95 % $CI_{LL} = -.25$, $CI_{UL} = .36$).

Comparison of exposure and distress reactions to previous deployments.

Concerned that the moderating effects were not significant because exposure on operations was not sufficient to require a stress buffering effect, the exposure and distress reactions from two previous Battle Groups (BG) were compared to the present cohort (see Table

10). BG 3-08 was replaced by the current cohort, while BG 1-08 had been deployed exactly one year previous to the current cohort.

Table 10

Comparison of Battle Groups Combat Exposure and Distress Levels at Time 3

Battle Group	Exposure	Distress
(Current Cohort)	$M = 1.80, SD = .51$	$M = 1.71, SD = .66$
BG 3-08	$M = 1.78, SD = .55$	$M = 1.76, SD = .78$
BG 1-08	$M = 2.05^*, SD = .60$	$M = 1.87^*, SD = .76$

Note: * indicates that there is a significant difference at $\alpha = .05$ between Current Cohort and BG 1-08 exposure and distress reaction.

The results of independent t tests indicated that BG 1-08 had been exposed to significantly higher combat exposure ($t(126) = -4.14, p = .01, 95\% CI LL = -.37, CI UL = -.13$) and subsequent distress reaction ($t(126) = -2.09, p = .04, 95\% CI LL = -.31, CI UL = -.01$) compared to the present cohort. There was no significant difference between combat exposure and distress between BG 1-09 and BG 3-08 on either combat exposure nor distress reaction. It is germane to note that during BG 3-08's deployment, the Canadian Aviation Wing with 8 Chinook helicopters deployed in theatre which provided air mobility and reduced the amount of travel by vehicle that the soldiers were required to conduct. This subsequently reduced the number of road side bomb deaths and casualties that all subsequent BG's have experienced. This operational change likely explains the significant difference between combat exposure and subsequent distress between the current cohort and BG 1-08.

Resilience on operations over time.

For exploratory purposes the participants who had provided a unique code that would allow their survey responses to be linked from one administration to the next without personally identifying themselves at all three administration points ($N = 42$, which represents a 1.5 % response rate) provided an opportunity to analyze resilience over the deployment period which was assessed by the stability of the distress reaction over time. Of the 42 code ID group, 37 respondents were members of the regular force while five were reservists. Rank wise, 26 respondents were junior non-commissioned members (private to master corporal); five were senior non-commissioned members (sergeant to chief warrant officer); 8 were junior officers (lieutenants or captains) and three were senior officers (major or higher). In examining number of previous tours of duty overseas, 23 respondents were on their first tour; 10 were on their second tour; 5 were on their third tour; 2 were on their fourth tour and 2 were on their fifth tour. Following the method outlined in Bonanno (2004), the sample of 42 was subdivided into a high distress group (i.e., at least 1 SD above the mean on distress pre-tour; $N = 10$) and a low distress group ($N = 32$).

Upon completing the initial groupings into a high stress and low stress group, the percentage in the high stress group and the low stress group was similar to Bonanno's initial start state group of 20% membership in the high stress group and 80 % in the low stress group. The present sample group began with 30% in the high stress group ($N = 10$) with 70% in the low stress group ($N = 32$). See Table 11 for Groupings over time.

Table 11

Membership in Stress Group at Time 1, 2 and 3

	Time 1	Time 2	Time 3
Low Stress Group - Total	32		34
Resilient Group		27	27
Changed 1 SD		5	
Recovery			4
Stress Reaction			1*
High Stress Group - Total	10		8
Chronic Stress		4	4
Changed 1 SD		6	
Improved - Regressed			3
Improved			3*

Note: * These individuals changed group membership based on trajectory at Time 3.

At time 2 (mid-tour) each individual's distress score was plotted and assessed as to whether it had increased or decreased 1 SD from their initial pre-deployment distress score. The majority of the pre-deployment low stress group ($N = 27$) score did not change more than 1 SD which indicated initial resilience or stability. Five of the individuals who had started in the low stress group had their distress scores increase by 1 SD which indicated that they were experiencing distress or adjustment challenges. Four of the high stress group remained high, which represents stability however this indicated initial chronic stress. Six members of the high

stress group had their distress scores reduce by 1 SD which is an improvement from their initial distress level.

At time 3 (post tour), each individual's distress score was plotted. The individual's overall trajectory at all three time points was examined and each individual's trajectory categorization and final membership standing was determined.

Using Bonanno's labelling method a total of six trajectories were identified. The low stress group trajectories were resilience, recovery and stress reaction while the high stress group trajectories were chronic stress, improved/regressed and improved. The soldiers were regrouped into trajectory groupings. The mean distress score for each trajectory group was calculated at time 1, time 2 and time 3. The three mean scores for each trajectory group were plotted to visually provide the trajectory path (see Figures 1, 2 and 3).

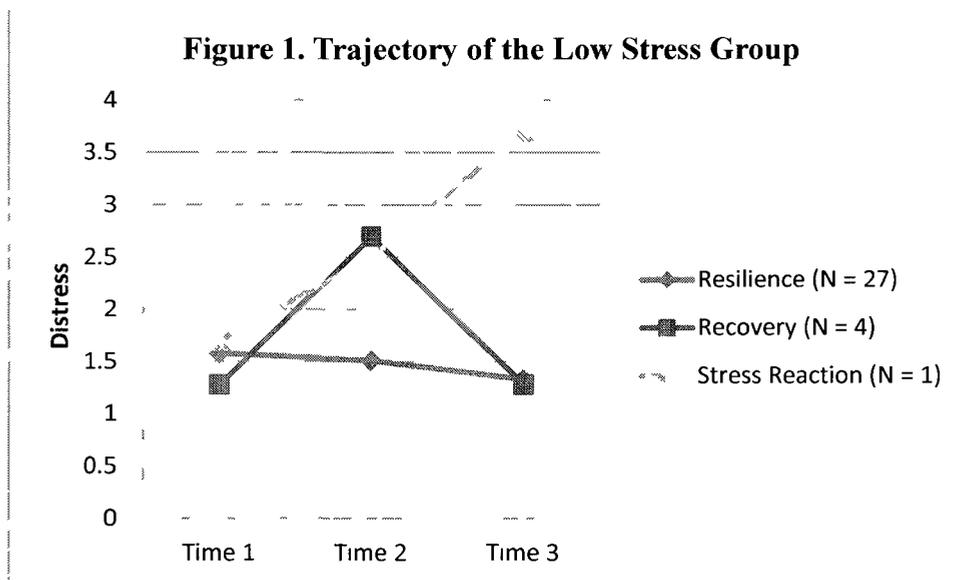
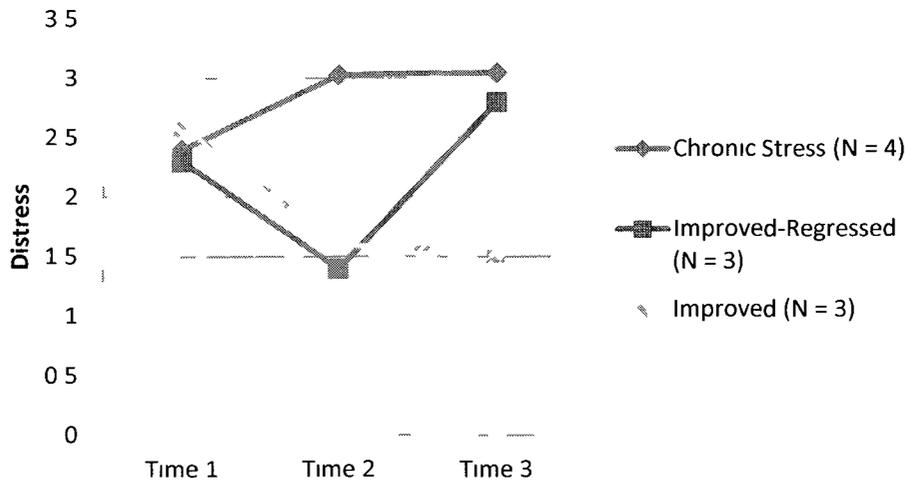
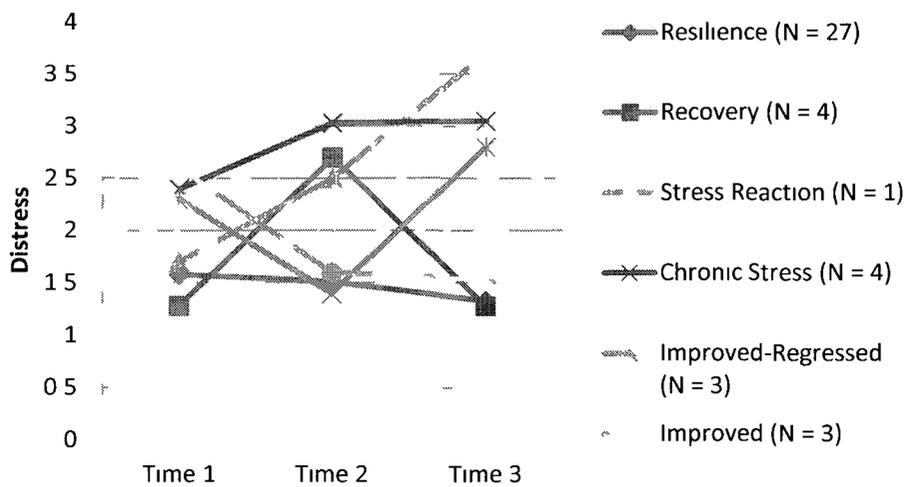


Figure 2. Trajectory of the High Stress Group**Figure 3. Trajectory of Overall Group (N = 42)**

Examining overall group trajectories. At Time 3 there were 27 soldiers who had begun in the low stress group and remained stable throughout thus were categorized as the resilience trajectory. Four members of the low stress group started and ended there but at time 2 their distress was 1 SD higher and this is the recovery trajectory. One soldier who started with the low stress group had a distress reaction 1SD higher at time 2 and remained high at time 3 which is a stress reaction trajectory (this soldier's group membership was changed at time 3 to the high

stress group). Within the high stress group, four soldiers remained high throughout the timeframe and this is categorized as the chronic stress trajectory. Three soldiers reported a lower distress score of 1 SD at time 2, however at time 3 they reported a higher stress reaction which is the improved/regressed trajectory. Three soldiers had a reduced distress level of more than 1 SD at time 2 and remained below 1 SD at time 3 which is the improved trajectory (these soldiers changed group membership at time 3 to the low stress group).

Examining proposed moderators between resilient and chronic stress trajectories.

Having identified individuals by trajectories, it was sought to determine whether or not those soldiers with a resilience trajectory differed from those soldiers who had a chronic stress trajectory on the hypothesized moderator variables of cohesion, commitment, immediate supervisor leadership and confidence in the chain of command leadership. Due to the small sized N of chronic stress trajectory ($N = 4$) all members who were assigned to the high stress group at time 3 were included. Independent t tests were conducted using the grouping variable of resilience trajectory group ($N = 27$) versus high stress trajectory group ($N = 8$). It was recognized that power is an issue and the groups were uneven, however for exploratory purposes it was considered that there may be some markers or indicators of potential differences (see Table 12).

Table 12

t Test of resilience and high stress trajectory groups on hypothesized moderators

Variable	<u>Resilience</u>		<u>High Stress</u>		<i>t</i> (33)	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Cohesion	3.94	.78	3.69	.84	-.81	.43
Commitment	3.56	.72	3.27	.60	-1.03	.31
Supervisor	3.96	1.02	3.63	1.51	-.74	.47
Chain of Command	3.94	.93	3.67	.97	-.73	.47

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

The results indicated that there were no significant differences between the resilient trajectory and high stress trajectory groups (cohesion, $t(33) = -.81$, $p = .43$, 95% *CI LL* = $-.90$, *CI UL* = $.39$; affective commitment, $t(33) = -1.03$, $p = .31$, 95% *CI LL* = $-.86$, *CI UL* = $.28$; immediate supervisors leadership behaviour, $t(33) = -.74$, $p = .47$, 95% *CI LL* = -1.27 , *CI UL* = $.60$; and overall confidence in the chain of command, $t(33) = -.73$, $p = .47$, 95% *CI LL* = -1.05 , *CI UL* = $.50$). Cohen's *d* was calculated as $.32$. This result indicates a small effect size (Cohen, 1992).

Using Table 2 (Cohen, 1992) the size of *N* required in each group to detect a small sized effect at $\alpha = .05$ is 393. Using the online calculator for *R* results (Soper, 2011) with $d = .32$, $N_1 = 27$ and $N_2 = 8$, $R = 0.14$ and $R^2 = .02$. The conclusion is that the resilience group and the high stress group do not significantly differ on the four hypothesized moderators.

Discussion

Consistent with prior research (e.g., Bartone & Adler, 2000; Castro, 2009; Farley, 1995, 2002), greater exposure to battlefield stressors predicted higher levels of post-deployment distress. Extending the prior literature, however, I found that greater exposure to battlefield stressors predicted an *increase* in distress from pre-deployment to post-deployment. By controlling for pre-deployment distress, the link between exposure and post-deployment distress cannot be attributed individual differences in distress that predate deployment.

I hypothesized that the link between exposure and distress would be moderated by cohesion, affective commitment, immediate leadership behaviours and confidence in the overall chain of command leadership. I found no evidence that these hypothesized moderators served as protective factors. Moreover, I found no evidence that these factors had any effect on levels of distress in this cohort of soldiers. These findings were unexpected as they do not accord with prior research (Castro, 2009; Farley, 2002; Sharon & Glazer, 2008 and Schmidt, 2007).

The failure to find any effect for cohesion, affective commitment, immediate leadership behaviours and confidence in the overall chain of command leadership may be attributable to a number of factors. First, the lack of effect for unit cohesion, confidence in the chain of command and confidence in one's immediate leadership may be owing to ceiling effects for these variables. In each case, the mean score for the sample on these hypothesized moderators was at least 3.9 on a 5-point scale, indicating that most soldiers felt a great deal of unit cohesion and felt very confident in their leadership going into theatre. Given that few scored low on these hypothesized protective factors, I may have lacked sufficient variance to detect any significant effect.

A second possible explanation for the lack of effects for the hypothesized moderating variables may be the relatively small number of soldiers who experienced significant exposure. When one compares the mean level of exposure reported by this cohort of soldiers to cohorts from earlier tours, this cohort did experience significantly less combat exposure than BG 1-08. Although the exposure reported by this cohort may appear significant to civilians, it is within the expected range for Canadian Forces personnel. The training that Canadian Forces personnel receive before deployment is designed to buffer them from the negative effects of stressors such as these. It is only at high levels of exposure that soldiers should be at risk. Although no criterion has been established for defining 'high exposure', it is clear that most soldiers in this sample did not experience as much exposure as other tours, and therefore were less in need of the protections that might have been accorded by cohesion, affective commitment, immediate leadership behaviours and confidence in the overall chain of command leadership.

Third, it must be acknowledged that cohesion, affective commitment, immediate leadership behaviours and confidence in the overall chain of command leadership may not play a protective role in soldiers. Although these factors may play a protective role in other organizations, their role may simply be overshadowed by other factors not considered. For instance, cognitive appraisal of the stressor may play a role and there is no measure for this present study. It is possible that while exposed, these soldiers did not find the stressors threatening. As well, coping styles were not measured and the manner in which a soldier copes with the combat exposure may play a role in moderating the distress reactions.

One striking feature of previous research that stands in sharp contrast to the present findings is that the research conducted on US military samples in Iraq and Afghanistan used only the top 10 most reported stressors in their analysis (Castro, 2009) of the 40 items that the US

Armed Forces use on the MHAT IV. This restriction in range provides the foundation for their subsequent analyses for main effects and moderation of the hypothesized factors of cohesion, commitment and confidence in leadership. One of the contributions of this present research is that it raises a question of these findings as my research includes the full spectrum of the exposure items ($N = 44$. Note the Canadian Forces ask four additional questions than the US military). It is possible that the restriction in range and by only using the most frequently reported stressors results in a much higher mean for US military samples for exposure versus the approach used in my study. While it is beyond the scope of my research, the question that is raised is would the US Forces result reflect the significant moderation results if all the exposure items were included in their analysis? Recognizing their sample sizes are larger and do not have power issues there remains a lingering question that perhaps the present results are not necessarily non-reflective of previous research if the analytical approach of previous research itself may have certain questionable analysis decisions were made that restrict the range. It is unknown if the range was not restricted would the US results continue to show the moderation effects as previously reported.

Another way of assessing the protective effects of cohesion, affective commitment, immediate leadership behaviours and confidence in the overall chain of command leadership is to compare soldiers who evince a resilient outcome from those who do not. Following the approach to resilience adopted by Bonanno and his colleagues (Bonanno et al., 2002) I mapped the distress trajectories of all 42 soldiers who provided a personal code allowing researchers to link their responses over the three assessments (pre-deployment, mid-tour, and post-deployment). Bonanno classifies individuals as resilient if they (a) are not highly distressed prior to the stressor (i.e., in the bottom 80% on some indicator of distress), and (b) do not increase by

more than one standard deviation on distress during or after the stressor has passed. Using the same criteria, 27 of the 42 soldiers providing a linking code (64%) were identified as having a resilience trajectory. These 27 soldiers were compared to 8 soldiers whose pattern of distress over the three time points indicated a chronic stress trajectory on the proposed moderators. These comparisons indicated that the two groups did not differ significantly on any of the four proposed moderators. Although these tests lacked sufficient statistical power (owing to the small number of soldiers willing to provide a code permitting us to link their data across waves), the consistent failure to find any evidence for the protective factors of cohesion, affective commitment, immediate leadership behaviours and confidence in the overall chain of command leadership raises significant doubts about the protective role played by these factors.

In considering the landscape of resilience literature I am led to believe that perhaps it is time to begin developing a unitary model of resilience which incorporates the findings of both the childhood and adult resilience researchers. A unified theory would seek to synthesize how childhood resilience literature has traditionally classified protective factors as individual differences, family support, and community support as this way of classifying is artificial and can create confusion (e.g., whether self-efficacy, attitudes and beliefs constitute individual differences). Ultimately, what appears to matter are the attitudes and expectancies that individuals possess as they face challenges. Presumably, role models in the community are effective because they lead individuals to believe in themselves and to set high expectations. Categorizing effects as due to individual differences, family, or community may be helpful from a policy perspective, but it blurs rather than clarifies the process by which individuals respond to significant threat. In seeking to understand the pathways to the resilience the present study does not provide support for the hypothesized protective moderators and questions some of the

accepted previous findings in US military samples. Both Masten (2001) and Bonanno (2004) advocate that the focus of future research should be to examine the pathways of resilience to better understand the underlying mechanisms. The present research provides support for their position of continued research given that while the soldiers had a resilience outcome it remains unclear the pathways that assisted in achieving this. However, prior to further research being conducted it is perhaps time for resilience researchers to develop a more holistic, unitary model that addresses some these identified challenges if the research outcomes are to be meaningful.

Limitations and Future Directions

This study had a number of limitations. First, it is concerning that levels of distress reported post-deployment were almost identical to those reported pre-deployment. The low levels of distress reported post-deployment may be attributable to a number of factors. For instance, post-deployment distress may have dissipated in most soldiers by the time the post-deployment survey was administered (six months after soldiers had returned to Canada); stronger distress might have been reported had the post-deployment assessment occurred sooner after deployment. Moreover, the distress reported at the six-month post-deployment may not entirely be due to deployment-related events. Some distress may have been attributable in part to events and situations that have arisen after soldiers had returned to Canada.

The low level of combat exposure the soldiers experienced may have contributed to the low levels of distress reported by soldiers post-deployment. Subsequently, the results of moderation did not indicate any significant moderation effects. In future, studies that examine moderation should ensure that the soldier group that is examined were exposed to medium to high level combat operations versus placed in a situation where it *could* be experienced. The introduction of the Air Aviation Wing very likely resulted in a lower level of combat exposure. A second fact that may have impacted the present results are that this rotation was in 2009. The

main combat exposure for Canadian soldiers in 2009 was from IED strikes (bombs planted on roads) which are random and in some cases only occur 6 times per deployment (approximately 1 per month) again indicating lower levels of exposure.

A second limitation concerns the issue of self-report. One way to examine whether soldiers were accurately reporting their levels of distress is to consider how their distress level compares to the general population. There is no Canadian population data, however there is Australian general population data. This is relevant since the Canadian Army, due to its small size ($N = 25,000$) traditionally does not benchmark itself against the US Army, but rather compares itself on a routine basis with the Australian Army which is a fellow Commonwealth Army of approximately the same size. Reflecting on the K10 population norms (Andrew & Slade, 2001; Slade, Grove & Burgess, 2011) from the Australian National Survey of 2001 and contrasting them with my sample K10 results at T1 and T3 suggests that the soldiers level of distress may be significantly higher than that of the Australian civilian population norm, albeit no formal t test was conducted nor was this a hypothesis I was seeking to test. However, this provides an indication that perhaps faking is not occurring. It makes intuitive sense that soldiers would report higher levels of distress than civilians and could lead one to conclude that faking was not a potential problem. However, the concern of faking good in a soldier population is greater than whether they are similar to civilian population results. Despite efforts over the past few years to de-stigmatize the negative perception towards soldiers who feel distress and to legitimize posttraumatic stress disorder within the Canadian Forces, many soldiers may still be unwilling to acknowledge - much less report - feelings of distress. The fact that only 128 of more than 900 soldiers completing the pre- and post-deployment surveys were willing to provide a code (made up of letters from their mother's maiden name and numbers from their social

insurance number and their father's last names) that linked their responses from one survey to the next suggests that there may be a significant lack of trust among soldiers that personal information. The feeling may be that this code could somehow link the soldier to their survey response. This potential lack of trust, if correct, may manifest not only in a soldier's unwillingness to report distress, but it may also manifest in an unwillingness to indicate any attitudes that might suggest that the soldier is not confident in his or her superiors, or that he or she is not fully committed to the mission. It is well known that there is a stigma attached to soldiers who suffer distress. While there are many programs of assistance in place, it remains a fact that soldiers are being released from service due to operational stress injuries related to distress. Given this, how many soldiers faked "good" on the distress scale in order to ensure that they were not identified as perhaps requiring assistance? With no faking or deception items in the Human Dimensions of Operations survey there is no way to know. Thus, while compared to a civilian population it would appear that faking is not occurring this does not provide evidence that soldiers are not under-reporting their distress levels. This is a systematic issue as soldiers across all deployed battle groups could be guarding against detection and may engage in underreporting their distress. The potential outcome of the underreporting is that soldiers who need assistance do not get it, which leads to a bad individual outcome as well as a negative organizational outcome.

A third limitation concerns statistical power. Initial power analyses indicated that there were enough subjects to detect a medium level effect at .05 for multiple regression. The lack of significance for moderating variables is therefore is not attributable to a lack of subjects, but rather a lack of subjects who had higher exposure levels and higher distress reaction. For the resilience exploratory study, power was confirmed as a definite issue as the effect size was small

and the number required to detect significance was 392 per group. If there were greater trust and more willingness to provide a Code ID it is considered that power issues would be resolved.

Summary

Canadian soldiers who deploy to Afghanistan are exposed to a wide range of combat experiences that range from seeing bombed out villages to extreme violence, injuries and death. According to CF Medical Services reporting (Canadian Forces, 2008) approximately 5 to 10 percent of the soldiers who have returned from the combat mission in Afghanistan have reported stress reactions to combat exposure that range from anxiety, depression and posttraumatic stress disorder symptoms. Of the 128 soldiers in this cohort, seven of them had a score of 3 on distress or higher (range is 3 to 4.3) which represents 5.5% of the respondents. Conversely, approximately 90 percent of the soldiers appear to have maintained a healthy psychological adjustment despite this combat exposure which indicates that they have had a resilience outcome. Developmental psychologists (e.g., Garmezy, 1984; Rutter, 1987; Masten, 2001) and bereavement researchers (Bonanno et al., 2004) have found that a number of protective factors appear to operate to assist individuals maintain psychological balance despite exposure to childhood adversity and/or sudden loss of a loved one. These scholars have found that a resilience outcome following trauma does not consist of a “special” quality inherent in the individual but rather tends to be a function of normal human adaptation which the majority of people successfully manage (Bonanno, 2004; Masten, 2001). The present study indicates that most Canadian soldiers do appear to have a resilient outcome following operations. This is perhaps best demonstrated by the fact that the overall level of distress following deployment is not different from the pre-deployment distress level. However it is considered that this tour may have experienced an overall level of combat exposure that was relatively low. Logically

speaking, if exposure was low it stands to reason that the distress reaction would be low. Given most military researchers have found that these hypothesized moderators do significantly operate on soldier samples who have been exposed to medium and high levels of combat (Castro, 2009; Hoge et al, 2006) it is considered premature to argue that these factors do not operate at all. Prudence suggest that perhaps less exposure results in less distress thus leaving little for the hypothesized moderators to operate on. Unlike Bonanno, the present study did not find any differences between the resilient and high stress trajectory group due to power issues. Future studies should consider examining cohorts of soldiers who engage in medium and high combat as low exposure may have been a factor in this study. It is considered that if cohesion, commitment, and confidence in immediate leadership and overall confidence in the chain of command are truly protective factors then it is within a medium to high combat environment where they would most likely moderate the relationship between combat exposure and subsequent distress reaction.

This study adds a number of significant findings to military research. This is the first study for the Canadian Forces that augments and solidifies previous research that found that exposure is related to distress, by further controlling for distress prior to deployment. Previous research has not controlled for distress prior to deployment. More importantly, the resilience trajectory analysis using Bonanno's methodology is ground breaking within the domain of military research on resilience and more broadly in the realm of adult resilience literature. Regarding the distress reaction, combat soldiers who served in a war zone do follow the same distress trajectories as civilians who have been exposed to acute or traumatic events as initially reported (Bonanno et al., 2002). Similarly, soldiers appear to have the same ratio of resilient and recovery outcomes as found in civilian populations who have had to cope with sudden or acute

events. Bonnano et al., (2007) noted that his trajectory analysis had not been examined with police or military forces. This research fills this gap; it is the first to empirically demonstrate that soldiers follow the same distress trajectories as civilians. Further, the present findings indicate that the majority of soldiers do have a resilience outcome following military operations. This is considered a positive outcome and is exactly the type of outcome that the Canadian Forces and by extension the Canadian public would like to see. Yet, not all soldiers have resilience outcomes. These soldiers require assistance. One way of providing that assistance is to further our understanding of the pathways and mechanism of resilience. It is considered that resilience and its mechanisms will remain an important research issue within the Canadian Forces as the department's aim is ultimately to assist every soldier in having a resilience outcome following operations. The better that civilian and military researchers understand the mechanisms of resilience the closer the Canadian Forces will be to achieving this goal.

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Appendices

Appendix A

Factor Analysis – Organizational Commitment Scale

This thesis uses Meyer and Allen's (1990, 1997) organizational commitment scale as a hypothesized moderator which they have identified as a three factor construct (affective, continuance and normative commitment). Gade et al. (2003) eliminated the normative commitment scale because they found a high correlation between the affective and normative commitment scales within military populations and due to space limitations eliminated the normative commitment scale. Allen (2003) noted that while she recognized the survey space issue that Gade et al. (2003) identified she felt that normative commitment was a distinct factor which should definitely be found within a military organization. More recently Schmidt (2007) used an 8 item affective commitment questionnaire (whereas there are 4 items for affective, 4 for continuance and 4 for normative) it is suspected that Schmidt combined the affective and normative items to derive his 8 item scale. Canadian military researchers using the Meyer and Allen (1990, 1997) organizational commitment scale have found that mixed results in that some military samples load onto two factors while other military samples load on three factors (McQuaig Quick & Blanc 2008). Given these varied findings, it was decided to conduct a factor analysis of the organizational commitment scale prior to continuing with the main analysis of the thesis. The factor analysis results will then provide direction as to whether affective and normative commitment are both retained as individual hypothesised protective factors, are they combined into a single protective factor, or is one or both removed as protective factors.

Factor Analysis

The 12 items which compose the commitment scale were examined using SPSS programs for errors in data entry, missing values, power, normalcy, influence of outliers, tolerance, and multicollinearity. Sample size is critical to assessing the logic of factor analysis with a sample size of 1,000 or more considered excellent (Tabachnick & Fidell, 2007). The N was initially 1,876 cases with 24 cases with missing values. Missing values analysis indicated these were missing completely at random and were deleted. 20 univariate outliers that exceeded the z scores ± 3.29 SD were initially identified and removed. No multivariate outliers were detected. Item 9 was reversed coded so this was transformed prior to the analysis. The final N was 1,823. The PCA Factor Analysis was the chosen method of factor analysis therefore there are no concerns regarding normalcy and no transformations were conducted during data cleaning.

In screening the data for factor analysis, the determinant value for the data set = .006 > .00001. The correlations of the 12 items was obtained to assess factorability. Correlations ranged from a low of .05 to .76 with the majority being higher than $\pm .30$ indicating it was within guidelines to continue with factor analysis. The *KMO* measure of sampling size = .861 is considered great for factor analysis purposes. Bartlett's test of sphericity was obtained with values: chi square = 79,054.26, $df = 66$, $p > .001$ supporting factorability.

Initial factor loadings were examined for eigenvalues > 1 which indicated a three factor solution. Scree plot examination further indicated a three factor solution. The more rigorous parallel analysis (O'Connor, 2000) indicates that it is more parsimonious to use a two factor solution. For the third factor, parallel analysis indicated a root 3 value = 1.071945 whereas the eigenvalue for factor 3 = 1.036. The general rule of thumb when using parallel analysis is that

when the root value exceeds the eigenvalue, then that is where the factors to be retained stop. A three factor solution using eigenvalues accounts for 64.14% of the variance whereas the parallel analysis with a two factor solution would account for 55.5%. It was decided that both a three factor solution and a two factor solution would be examined considering that the parallel analysis finding has a difference of 0.0359 between the two values.

Three Factor Solution. Based on findings that the three factors are correlated it was decided that Principal Component Analysis would be conducted using oblique rotation with direct oblim extracting for three factors. The pattern and structure matrixes were both examined. In examining loadings and in the interest of parsimony, it was decided that items with loadings in excess of .4 only would be used for the three factors. Pattern and structure matrix output was obtained.

Pattern Matrix. All four of the affective commitment items from Meyer and Allen (1990, 1997) identified as affective commitment loaded onto the first factor. All four of the continuance commitment items from Meyer and Allen (1990, 1997) identified as continuance commitment loaded onto the second factor. Three of four items from Meyer and Allen (1990, 1997) identified as normative commitment loaded onto the third factor. One item identified as normative commitment from Meyer and Allen (1990, 1997) identified as normative commitment loaded onto the first factor.

Table 1

Pattern Matrix 3 Factor Loadings

Item	Factor 1	Factor 2	Factor 3
3	.918		
2	.868		
4	.803		
1	.783		
10	.579		
6		.881	
7		.828	
8		.814	
1		.767	
11			.773
12			.690
9			.767

Structure matrix. The structure matrix represents the relationship between a variable and a given factor without concern whether the variable loads on another factor indicated cross loadings. Essentially the structure matrix identifies shared variance.

Table 2

Structure Matrix Factor Loadings

Item	Factor 1	Factor 2	Factor 3
3	.907		
2	.863		
4	.810		
1	.781		
10	.663		.477
6		.866	
7		.852	
8		.801	
1		.786	
11			.773
12	.474		.690
9			.767

Combining Items into Factors. Pattern matrix is traditionally used for interpretation purposes as the results represent the unique relationship between a variable and a given factor while holding all other factors constant. Using the results from the Pattern matrix, it was decided that the items that loaded onto factor 1 (items 1, 2, 3, 4) would be combined into an overall variable labelled affective commitment. Cronbach's alpha for this variable $\alpha = .87$. Items that loaded onto factor 2 (6, 7, 8, 9) would be combined into an overall variable labelled continuance

commitment. Cronbach's alpha obtained for this variable $\alpha = .85$. In creating the normative commitment scale, item 10 which did not load on this factor was not initially included. Items that loaded onto factor 3 (9, 11, 12) were combined into an overall variable labelled normative commitment. Cronbach's alpha obtained for this variable $\alpha = .45$. This was considered problematic. A second Cronbach's alpha obtained for this variable by combining items (9, 11, 12) with item 10 (which had loaded onto factor 1) which provided a Cronbach's $\alpha = .55$.

Two Factor Solution. Based on the parallel analysis findings that a more parsimonious solution was two factors, Principal Component Analysis was conducted using oblique rotation with direct oblim extracting for two factors. The pattern and structure matrixes were both examined. In examining loadings and in the interest of parsimony, it was decided that items with loadings in excess of .4 only would be used for the two factors. Total variance explained from the two factor solution was 55.51%. Pattern and structure matrix output was obtained.

Pattern Matrix. All four of the affective commitment items from Meyer and Allen (1990, 1997) identified as affective commitment loaded onto the first factor. Three of four items from Meyer and Allen (1990, 1997) identified as normative commitment loaded onto the first factor. All four of the continuance commitment items from Meyer and Allen (1990, 1997) identified as continuance commitment loaded onto the second factor. One item identified as normative commitment from Meyer and Allen (1990, 1997) did not load onto either factor, Item 9.

Table 3

Pattern Matrix Two Factor Loadings

Item	Factor 1	Factor 2
3	.898	
2	.836	
4	.792	
1	.778	
10	.732	
12	.587	
11	.501	
9		
6		.887
7		.833
8		.821
5		.744

Structure matrix. The structure matrix represents the relationship between a variable and a given factor without concern whether the variable loads on another factor indicated cross loadings. Essentially the structure matrix identifies shared variance.

Table 4

Structure Matrix Two Factor Loadings

Item	Factor 1	Factor 2
3	.869	
2	.828	
4	.798	
1	.742	
10	.707	
12	.628	
11	.537	
9		
6		.863
7		.854
8		.799
5		.777

Combining Items into Two Factors. Pattern matrix is traditionally used for interpretation purposes as the results represent the unique relationship between a variable and a given factor while holding all other factors constant. Using the results from the Pattern matrix, it was decided that the items that loaded onto factor 1 (items 1, 2, 3, 4, 10, 11, 12) would be combined into an overall variable labelled affective commitment. Cronbach's alpha for this

variable $\alpha = .85$. Items that loaded onto factor 2 (6, 7, 8, 9) would be combined into an overall variable labelled continuance commitment. Cronbach's alpha obtained for this variable $\alpha = .85$.

Table 5

Comparing Cronbach's Alpha in Three and Two Factor Model

	Aff	Con	Norm
Three Factor	.87	.85	.55
Two Factor	.85	.85	

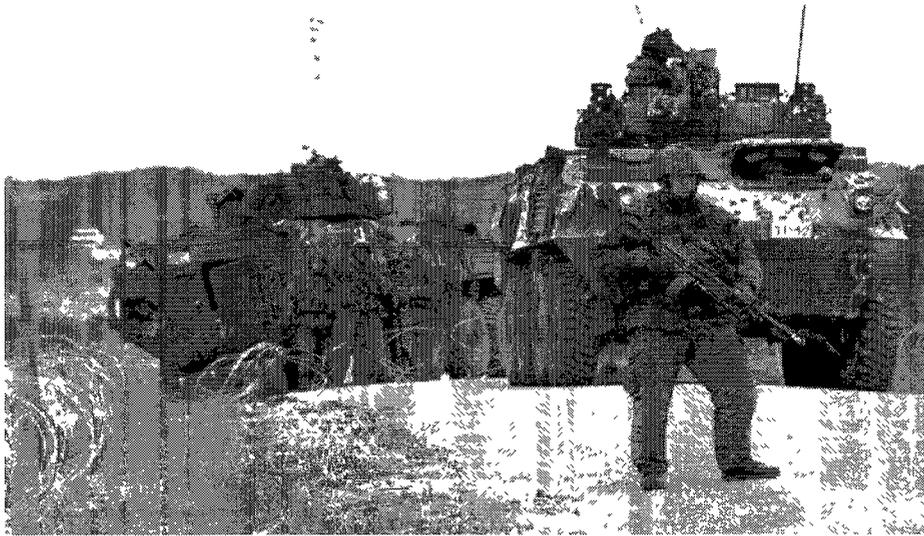
Note. Aff = Affective; Con = Continuance; Norm = Normative

Decision regarding Factor Structure.

Adopting a three factor model is supported by using eigenvalues >1 , the scree plot and the Pattern Matrix which clearly provides a three factor model. The shortcomings in adopting this approach is that the Cronbach's $\alpha = .55$ for normative commitment which is considered poor. Furthermore, parallel analysis which is a more rigorous analysis indicated that there are two versus three factors based on a comparison of eigenvalues to root values. In examining the two factor results the pattern matrix results indicate that three of the four items considered normative commitment are captured under the same first factor as the four affective commitment items with the Cronbach's $\alpha = .85$ while the fourth normative item (Item 9) does not load on either of the two factors. Given these results it is considered prudent to adopt a two factor solution for this thesis. The impact of this decision is that the hypothesis that normative

commitment moderates the relationship between combat exposure and stress reaction will not be examined.

Appendix B

Human Dimensions of Operations (HDO) Survey***Task Force 1-09 (Roto 7)***

The purpose of this survey is to provide senior leaders in the Army chain of command with supplemental information on the human factors that can influence the operational readiness/effectiveness of their unit(s). Participation is voluntary; therefore, you do not have to complete this survey. However, in order to provide senior leaders with accurate information, maximum participation is encouraged. Should you decide to participate, please complete all sections of this survey fully and honestly. You may choose to skip any questions that you are not comfortable with, or that may reveal your identity.

Thank you for your participation.

This survey has been produced by DMPORA (reviewed by LPCP) and is authorized for administration within DND/CF in accordance with CANFORGEN 145/02 ADMHRMIL 079 UNCLASS 131028Z DEC 02. Authorization number: 712/08.

Protecting the Confidentiality of Your Responses

Director Military Personnel Operational Research and Analysis (DMPORA) will protect the confidentiality of your responses to the extent permissible under Canadian Law

You should be aware that under the Access to Information Act, Canadian citizens are entitled to obtain copies of research reports and research data (including the database pertaining to this project) held in federal government files. Similarly, under the Privacy Act, Canadian citizens are entitled to copies of all information concerning them that is held in Federal government files including research databases. Prior to releasing requested information, the Directorate of Access to Information and Privacy (DAIP) screens the data to ensure that individual identities are not disclosed.

To further safeguard your anonymity and privacy, you should not write your name, service number or personal record identifier anywhere on this questionnaire. Second, you should ensure that any written comments you may offer are sufficiently general that you cannot be identified as the author.

Please read the following instructions before filling out the survey

Each section of this survey has its own instructions. Please read each set of instructions carefully prior to completing each section.

Please respond to the questions by marking the number corresponding to your response.

1 2 3 4 5
 ① ● ③ ④ ⑤

The bubble can be filled in or circled.



1 2 3 4 5
 ① ② ③ ④ ⑤

If you change your mind about your responses, please put an X through the incorrect bubble and fill in the correct answer.

1 ~~2~~ 3 4 5
 ① ● ③ ● ⑤

Please return **all the pages** of the survey.

UNIT 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. If a question does not apply, please answer accordingly (NA).

Strongly Disagree	<i>Disagree</i>	Neither Agree nor Disagree	<i>Agree</i>	Strongly Agree

1.	In my unit, we have a shared system of beliefs, values, and attitudes (e.g., integrity, courage, loyalty, etc.) that are valued by and define members of the military.	①	②	③	④	⑤	
2.	In my unit, there is a collective enthusiasm and persistence in pursuing our assigned goals.	①	②	③	④	⑤	
3.	We 'stick together', which enhances our ability to achieve our assigned tasks.	①	②	③	④	⑤	
4.	I have confidence in my abilities as a soldier.	①	②	③	④	⑤	
5.	My immediate supervisor has effective leadership behaviours.	①	②	③	④	⑤	
6.	In the event of combat, I have confidence in my Commanding Officer.	①	②	③	④	⑤	O NA
7.	In the event of combat, I have confidence in the CSM/SSM.	①	②	③	④	⑤	O NA
8.	In the event of combat, I have confidence in my company commander.	①	②	③	④	⑤	O NA
9.	In the event of combat, I have confidence in my platoon/troop commander.	①	②	③	④	⑤	O NA
10.	In the event of combat, I have confidence in my section commander.	①	②	③	④	⑤	O NA
11.	In the event of combat, I have confidence in my platoon/troop warrant.	①	②	③	④	⑤	O NA

PERSONAL COMMITMENT

Please indicate your level of agreement with the following statements using the scale provided below.

Strongly Disagree	<i>Disagree</i>	Neither Agree nor Disagree	<i>Agree</i>	Strongly Agree
--------------------------	-----------------	-----------------------------------	--------------	-----------------------

1.	I feel like "Part of the Family" in the CF.	① ② ③ ④ ⑤
2.	The CF have a great deal of personal meaning to me.	① ② ③ ④ ⑤
3.	I feel a strong sense of belonging to the CF.	① ② ③ ④ ⑤
4.	I feel "emotionally attached" to the CF.	① ② ③ ④ ⑤
5.	It would be too costly for me to leave the CF in the near future.	① ② ③ ④ ⑤
6.	I am afraid of what might happen if I quit the CF without having another job lined up.	① ② ③ ④ ⑤
7.	Too much of my life would be interrupted if I decided to leave the CF now.	① ② ③ ④ ⑤
8.	One of the problems of leaving the CF would be the lack of available alternatives.	① ② ③ ④ ⑤
9.	I do not feel any obligation to remain with the CF.	① ② ③ ④ ⑤
10.	The CF deserve my loyalty.	① ② ③ ④ ⑤
11.	I would not leave the CF right now because I have a sense of obligation to the people in it.	① ② ③ ④ ⑤
12.	I owe a great deal to the CF.	① ② ③ ④ ⑤

SIGNS OF STRESS

In the **last four** weeks, about how often...

None of the time	A little of the time	Some of the time	Most of the time	All of the time
------------------	----------------------	------------------	------------------	-----------------

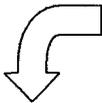
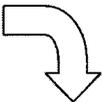
1.	Did you feel tired-out for no good reason?	①	②	③	④	⑤
2.	Did you feel nervous?	①	②	③	④	⑤
3.	Did you feel so nervous that nothing could calm you down?	①	②	③	④	⑤
4.	Did you feel hopeless?	①	②	③	④	⑤
5.	Did you feel restless or fidgety?	①	②	③	④	⑤
6.	Did you feel so restless that you could not sit still?	①	②	③	④	⑤
7.	Did you feel depressed?	①	②	③	④	⑤
8.	Did you feel that everything was an effort?	①	②	③	④	⑤
9.	Did you feel so sad that nothing could cheer you up?	①	②	③	④	⑤
10.	Did you feel worthless?	①	②	③	④	⑤

STRESS ON OPERATIONS

*Below is a list of situations that may cause soldiers to experience stress. For each of the situations listed below, **TWO** answers are required. First using the 5-point rating scale on the left, please indicate the frequency of which you have experienced any of the following situations **while on your most recent deployment**. Then, using the 5-point rating scale on the right, indicate how much trouble or concern each of these situations have caused you.*

<p>How often have you experienced any of these stressful situations?</p> <div style="text-align: center; margin-top: 20px;"> </div> <p>1 – Never 2 – One time 3 – Two to four times 4 – Five to nine times 5 – Ten or more times</p>	<p>How much trouble or concern has this caused you?</p> <div style="text-align: center; margin-top: 20px;"> </div> <p>1 – No trouble or concern 2 – Little trouble or concern 3 – Some trouble or concern 4 – Much trouble or concern 5 – Very much trouble or concern</p>	
① ② ③ ④ ⑤	1. Being attacked or ambushed.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	2. Seeing destroyed homes or villages.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	3. Receiving small arms fire.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	4. Seeing dead bodies or human remains.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	5. Handling or uncovering human remains.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	6. Witnessing an accident which resulted in serious injury or death.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	7. Witnessing violence with the local population or between ethnic groups.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	8. Seeing dead or seriously injured Canadians.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	9. Knowing someone seriously injured or killed.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	10. Participating in demining operations.	① ② ③ ④ ⑤

① ② ③ ④ ⑤	11 Improvised explosive device/booby traps exploding near you	① ② ③ ④ ⑤
① ② ③ ④ ⑤	12 Working in areas that were mined or had improvised explosive devices	① ② ③ ④ ⑤
① ② ③ ④ ⑤	13 Having hostile reactions from local civilians	① ② ③ ④ ⑤
① ② ③ ④ ⑤	14 Disarming civilians	① ② ③ ④ ⑤
① ② ③ ④ ⑤	15 Being in threatening situations where you were unable to respond because of the rules of engagement (ROE)	① ② ③ ④ ⑤
① ② ③ ④ ⑤	16 Shooting or directing fire at the enemy	① ② ③ ④ ⑤
① ② ③ ④ ⑤	17 Calling in fire on the enemy (e.g., artillery or mortar fire)	① ② ③ ④ ⑤
① ② ③ ④ ⑤	18 Engaging in hand-to-hand combat	① ② ③ ④ ⑤
① ② ③ ④ ⑤	19 Clearing/searching homes or buildings	① ② ③ ④ ⑤
① ② ③ ④ ⑤	20 Clearing/searching caves or bunkers	① ② ③ ④ ⑤
① ② ③ ④ ⑤	21 Witnessing brutality/mistreatment toward non-combatants	① ② ③ ④ ⑤
① ② ③ ④ ⑤	22 Being wounded/injured	① ② ③ ④ ⑤
① ② ③ ④ ⑤	23 Seeing ill/injured people you were unable to help	① ② ③ ④ ⑤
① ② ③ ④ ⑤	24 Receiving incoming artillery, rocket, or mortar fire	① ② ③ ④ ⑤
① ② ③ ④ ⑤	25 Being directly responsible for the death of an enemy combatant	① ② ③ ④ ⑤
① ② ③ ④ ⑤	26 Observing violations of the Law of Armed Conflict/Geneva Conventions	① ② ③ ④ ⑤
① ② ③ ④ ⑤	27 Being responsible for the death of Canadian or Allied personnel	① ② ③ ④ ⑤
① ② ③ ④ ⑤	28 Having a member of your own unit become a casualty	① ② ③ ④ ⑤
① ② ③ ④ ⑤	29 Had a close call, dud landed near you	① ② ③ ④ ⑤

<p>How often have you experienced any of these stressful situations?</p>  <p>1 – Never 2 – One time 3 – Two to four times 4 – Five to nine times 5 – Ten or more times</p>	<p>How much trouble or concern has this caused you?</p>  <p>1 – No trouble or concern 2 – Little trouble or concern 3 – Some trouble or concern 4 – Much trouble or concern 5 – Very much trouble or concern</p>	
<p>① ② ③ ④ ⑤</p>	<p>30. Had a close call; a bullet or shrapnel hit a piece of your personal equipment.</p>	<p>① ② ③ ④ ⑤</p>
<p>① ② ③ ④ ⑤</p>	<p>31. Had a close call; equipment shot off your body.</p>	<p>① ② ③ ④ ⑤</p>
<p>① ② ③ ④ ⑤</p>	<p>32. Had a close call; was shot or hit, but protective equipment saved you.</p>	<p>① ② ③ ④ ⑤</p>
<p>① ② ③ ④ ⑤</p>	<p>33. Had a buddy shot or hit who was near you.</p>	<p>① ② ③ ④ ⑤</p>
<p>① ② ③ ④ ⑤</p>	<p>34. Informed unit member/friend of a soldier's death.</p>	<p>① ② ③ ④ ⑤</p>
<p>① ② ③ ④ ⑤</p>	<p>35. Witnessing the verbal abuse of non-combatants.</p>	<p>① ② ③ ④ ⑤</p>
<p>① ② ③ ④ ⑤</p>	<p>36. Witnessing the damage and/or destruction of private property when it was not necessary.</p>	<p>① ② ③ ④ ⑤</p>
<p>① ② ③ ④ ⑤</p>	<p>37. Witnessing a non-combatant being physically hit/kicked when it was not necessary.</p>	<p>① ② ③ ④ ⑤</p>
<p>① ② ③ ④ ⑤</p>	<p>38. Witnessing a detainee being physically hit/kicked when it was not necessary.</p>	<p>① ② ③ ④ ⑤</p>
<p>① ② ③ ④ ⑤</p>	<p>39. Witnessing the unauthorized modification of ROE in order to accomplish the mission.</p>	<p>① ② ③ ④ ⑤</p>
<p>① ② ③ ④ ⑤</p>	<p>40. Witnessing ROE being ignored in order to accomplish the mission.</p>	<p>① ② ③ ④ ⑤</p>

① ② ③ ④ ⑤	41. Witnessing corruption by local nationals, including government officials and security personnel.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	42. Witnessing incompetence by local nationals, including government officials and security personnel.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	43. Having to work under tight deadlines.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	44. Being expected to do more work than is reasonable.	① ② ③ ④ ⑤

PERSONAL IDENTIFICATION NUMBER (PIN)

Your PIN will allow us to compare your responses from this survey with your responses on other Human Dimensions of Operations surveys, while still respecting your anonymity.

Spaces 1 & 2: First two letters of your mother's maiden name

Spaces 3 & 4: The numbers corresponding to the month your mother was born

Spaces 5 & 6: The first two letters of your father's first name

PIN: _ / _ / _ _ _ _