Readiness, Resilience, and Readjustment: A Psychological Investigation of Human Factors across the Deployment Cycle of Contemporary Peace Support Operations

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READINESS, RESILIENCE, AND READJUSTMENT: A PSYCHOLOGICAL INVESTIGATION OF HUMAN FACTORS ACROSS THE DEPLOYMENT CYCLE OF CONTEMPORARY PEACE SUPPORT OPERATIONS

by

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DECLARATION

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

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PREAMBLE

In warfare the force of armies is the product of the mass multiplied by something else, an unknown X.

Military science, seeing in history an immense number of examples in which the mass of an army does not correspond with its force, and in which small numbers conquer large ones, vaguely recognises the existence of this unknown factor, and tries to find it sometimes in some geometrical disposition of the troops, sometimes in the superiority of weapons and most often in the genius of the leaders. But none of those factors yields results that agree with the historical facts.

One has but to renounce the false view that glorifies the effect of the activity of the heroes of history in warfare in order to discover this unknown quantity, X.

X is the spirit of the army, the greater or less desire to fight and to face dangers on the part of all the men composing the army, which is quite apart from the question whether they are fighting under leaders of genius or not, with cudgels or with guns that fire thirty times a minute.

Leo Tolstoy, *War and Peace*, 1904

ABSTRACT

Contemporary peacekeeping missions are complex, demanding, and potentially hazardous. There is general agreement that psychological factors are crucial to effective individual and collective performance of the military personnel deployed in support of these missions. This research has examined the human dimensions associated with capability, functioning, and health across the deployment cycle. The aim of this research was to increase understanding of the psychological issues associated with peace support operations at the individual, group, and organisational levels. The study applied precepts of the transactional model of stress (Lazarus & Folkman, 1984) to the context of military deployment on peace support operations. The overarching Human Dimensions of Operations model for this research incorporated stressor, buffer, and outcome components within the multi-level structure of the military organisation and across the stages (pre, peri, post) of deployment.

Participants were Canadian and Australian military personnel deployed on Peace Support Operations. The dissertation comprised seven chapters. Chapter One provided an introduction to the psychological challenges posed by peace support operations and the research opportunities these missions afford. The second chapter detailed the methodology and psychometric evaluation of several measurement scales that were developed as part of this research in order to address the unique characteristics of peace support operations. Each of the six scales examined proved to have a meaningful component structure and adequate subscale reliabilities. The third chapter was devoted to an examination of the psychometric properties of a measure of psychological climate factors, the Unit Climate Profile (UCP), which was the cornerstone instrument of this research. The UCP demonstrated a robust, multi-dimensional structure that

was conceptually concordant with its theoretical development and design. In addition, the component structure of the UCP changed in meaningful ways according to its level of analysis - individual or group.

The next three chapters examined human dimension constructs at different stages of deployment, notably psychological readiness for operations, psychological resilience during deployment, and readjustment following return from deployment. In Chapter Four, the most compelling structural model that examined collective psychological readiness demonstrated that perceptions of readiness at the group level, along with effective senior leadership, could significantly impact morale. The results in Chapter Five revealed that leadership both buffered the immediate impact of stressors, and also fostered meaning and morale, thereby reducing strain. Positive aspects of deployment and the personal meaning assumed to be derived from these experiences were also found to bolster morale significantly during deployment. In Chapter Six, the stressors specific to the postdeployment transition phase, rather than stressors encountered during deployment, had the strongest impact on postdeployment adjustment. Social support and a positive psychological climate in the unit (particularly evidenced by cohesiveness and caring behaviour by proximal leaders) moderated the impact of homecoming stressors.

A concluding chapter summarised the dissertation and discussed its practical significance and avenues for the dissemination of its findings. Broadly, the outcomes demonstrated that an understanding of the human factors in military units within the context of the stressors-strain relationship can provide potentially useful information to commanders who want to enhance the well-being, performance, and commitment of Service members deployed on peace support operations.

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GLOSSARY OF ACRONYMS

ADF	Australian Defence Force
AGFI	Adjusted Goodness-of-Fit Index
AMOS	Analysis of Moment Structures
ANOVA	Analysis of Variance
ANZAC	Australia and New Zealand Army Corps
APA	American Psychological Association
ARI	Army Research Institute for the Behavioural and Social Sciences
BOCI	Business Organization Climate Index
CF	Canadian Forces
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CISD/CISM	Critical Incident Stress Debriefing/Management
CMS	Critical Incident Mental Health Support
CPL	Corporal
CRMQ	Combat Readiness Morale Questionnaire
DFPO	Defence Force Psychology Organisation
DHRRE	Directorate for Human Resource Research and Evaluation
DOD	Department of Defense
DSM-III/IV	Diagnostic and Statistical Manual of Mental Disorders (3rd and 4th editions)
GFI	Goodness-of-Fit Index
HDO	Human Dimensions of Operations
HDCRI-X	Human Dimension Combat Readiness Index - Experimental
JNCO	Junior Non-Commissioned Officer
LCPL	Lance-Corporal
MANOVA	Multivariate Analysis of Variance
MSA	Measures of Sampling Adequacy
NASA	National Aviation and Space Administration
NCO	Non-Commissioned Officer
OOTW	Operations Other Than War
PCA	Principal Component Analysis
PCQ	Psychological Climate Questionnaire
PD	Predeployment
PAF	Principal Axis Factoring
PTSD	Post-traumatic Stress Disorder
RMSEA	Root Mean-Square Error of Approximation
RPA	Rwandese Patriotic Army
SEM	Structural Equation Modelling
SGT	Sergeant
SNCO	Senior Non-Commissioned Officer
SPSS	Statistical Package for the Social Sciences

SRMR	Standardised Root Mean-square Residual
SSGT	Staff Sergeant
TLI	Tucker–Lewis Index
TSES	Traumatic Stress Exposure Scale
UCP-A	Unit Climate Profile - Australian
UN	Unit Nations
UNAMIR	United Nations Assistance Mission for Rwanda
U.S.	United States
WHHSS	West Haven Homecoming Stress Scale
WRAIR	Walter Reed Army Institute of Research
WO	Warrant Officer

Chapter 1

INTRODUCTION

The Challenge of Peace Support Operations

On his first day in office as the Chief of the Defence Force, General Peter Cosgrove released a statement that noted "not in over 50 years has the Australian Defence Force been under such diverse and sustained operational demands" (Order of the Day, 4 July 2002). Unlike the war footing of 50 to 60 years ago, the operational demands of the last two decades for the Australian Defence Force (ADF) have been largely peace support operations.[1] These missions in pursuit of peace, chiefly sponsored by the United Nations (UN), have spanned the globe in countries such as the former Yugoslavia, the Middle East, Pakistan, Somalia, Namibia, Cambodia, East Timor, and Haiti. At certain times in recent years, there have been in excess of 14 concurrent UN peace support operations (Thakur & Schnabel, 2002). Several missions have been longstanding; for example, Cyprus (since 1964) and the Golan Heights (since 1974). Along with Canada and several nations from north-western Europe, Australia has extensive experience of wearing the coveted blue beret (Londey, 2004). As intimated by General Cosgrove, this commitment has not been without significant costs, both materiel and human.

After the demise of the Cold War in the late 1980s, the nature of international conflict resolution changed significantly (Hunt, 1994; Munro, 1995), as reflected in the expansion in the number and scope of peacekeeping operations (Bellamy, Williams, & Griffin, 2004). This growth spurred

[1] There is a well-developed lexicon surrounding these missions. One widely accepted taxonomy extends from 'peace monitoring' through 'peacekeeping' to 'peace enforcement' (Boutros-Gali, 1992; Evans, 1993; Mockaitis, 2000; Segal, 1995). The inclusive term 'peace support operation' is preferred herein.

considerable research into peace support operations, although much of this research has been devoted to issues related to geopolitics, economics, internationalism, and military strategy (Wisher, 2003). In terms of behavioural science research, a good deal is known about psychological aspects of war-related service (e.g., Bourne, 1970; Grinker & Spiegel, 1945a; Hoge et al., 2004; Marlowe, 2001; Marshall, 1947; Rivers, 1918; Roussy & Lhermitte, 1918; Salmon, 1919; Shephard, 2000; Solomon, 1993; Stouffer, Suchman, DeVinney, Star, & Williams, 1949). However, much less is known about the impacts and performance implications of serving on a peace support operation (Kolto-Rivera, Hancock, Dalton, Ganey, & Murphy, 2004; Murphy, 2003b).

Several narrative accounts (e.g., Bowden, 1999; Breen, 1998; Davis, 1997; MacKenzie, 1993; Owen, 1995; Stewart, 1994) have confirmed that peace support duties may involve a range of stressors that can impact powerfully on both the performance of members and teams, and on individual and collective wellbeing. The occurrence of serious incidents entailing misbehaviour or poor decision-making on the part of peacekeeping personnel (e.g., Collins, 2000; Erlanger, 2000; Everts, 2000; Klep & Winslow, 2000) has been especially worrying. In the prominent case of atrocious behaviour towards local civilians by some members of a Canadian unit in Somalia in 1993, Winslow (1997) concluded: "in a highly stressed environment and with leaders giving mixed messages about aggressive behaviour, perspective can be lost and extreme attitudes adopted" (p. 248).

Such disturbing incidents have demonstrated the need to improve the selection, training, and performance management of personnel undertaking these duties. This is particularly important for leaders because they have a pivotal role to play in adopting appropriate command styles to match the characteristics of peace support missions (Johansson, 1997) and in forming and maintaining the expectations and attitudes of their subordinates (Halverson & Bliese, 1996; Siebold, 1996). There is clearly a requirement for

research-based psychological advice to assist in the refinement of the training and support provided to personnel serving on peace support operations.

The aim of this study, developed as part of research entitled the 'Human Dimensions of Operations' (HDO) project[2], was to increase understanding of the psychological issues associated with peace support operations, particularly issues of psychological readiness for deployment, psychological resilience during deployment, and psychological readjustment following return from deployment. The study applied precepts of the transactional model of stress (Lazarus & Folkman, 1984) in the context of military deployment on peace support operations. The model incorporated stressor, buffer, coping, and outcome components within the multi-level structure of the military organisation, that is, at individual, group, and organisational levels. Consistent with both a recommendation by Hart and Cooper (2001) for advancing occupational stress research, and the practice of 'human dimensions' research in other nations (e.g., Bliese & Castro, 2003), the HDO model allowed for exploration of both micro- and macro-level theories.

This dissertation presents five empirical studies, in five separate chapters, drawn from the HDO project. The first two studies entailed psychometric analyses of component instruments of the HDO. Several of these measures were specifically developed for the unique characteristics of the peace support setting. At the time that the HDO project was launched in Canada, there was a dearth of available, appropriate psychometric measures of the constructs of interest (e.g., the domains of potentially traumatic stressors on peace support missions, military psychological climate, and daily stressors of military service). The first study examined the reliability and factor structure of a number of these measures that were to be used in analyses in

[2] During a posting to the Canadian Forces, the author was the senior researcher responsible for the design, initiation and early conduct of the HDO project. Upon return to Australia, the author was responsible for commencing a similar project within the ADF as a secondary duty (and again as the senior researcher).

later chapters. The second study conducted a dual-level analysis of the HDO project's cornerstone instrument, the Unit Climate Profile, a measure of psychological climate factors such as morale, cohesion and leadership behaviour. The remaining three discrete studies examined human dimension themes of different stages of the deployment cycle, namely, psychological readiness, resilience and readjustment.

The broad aims of these studies were to identify stressors of the deployment cycle, to delineate the human factors that served as effective mediators/moderators of these stressors, and to elaborate practical and meaningful relationships among these variables. This knowledge was expected usefully to inform command decision-making and the design of interventions to enhance the health, well-being, and performance of personnel serving on peace support operations.

Scope of the Introductory Chapter

This introductory chapter examined current views and challenges relating to stress on peace support operations. Broader, conceptual approaches to stress, coping, and performance were reviewed. The contexts of this research – the military organisation and the operational environment – are crucial to understanding the aims and procedures adopted. Therefore, a review of military psychology was provided as a means of enhancing this contextual understanding. The political, pragmatic, and theoretical impulses behind the recent upsurge in military 'human dimensions' research were explored. The model underpinning the HDO project was then described, along with the potential outcomes from this type of research. Finally, the structure of the thesis was introduced, including an outline of the five component studies that empirically explored aspects and levels of the HDO model.

Understanding the Human Dimensions of Peace Support Operations

The preceding discussion causes a question to be raised: How different, from a psychological perspective, is peacekeeping from armed conflict? Conventional wisdom has suggested that the lower threat levels assumed to be associated with peace support operations make them less likely to lead to adverse psychological impacts than exposure to traditional warfare. Others have presumed that combat affords the ultimate challenge to the soldier, and therefore peace support duties have fewer performance demands. Such assumptions are beginning to be challenged by high-ranking 'operators' (e.g., Dallaire, 2000, 2003), human science researchers (e.g., Litz, 1996) and even some of the largest, and presumably most conservative, military organisations (DOD Inspector General, 1994).

By its very nature, any military service poses potentially high risk of exposure to psychological and physical threat. There is growing evidence that the stressors of peace support operations can be as psychologically harmful as conventional warfare (Bartone, Vaitkus, & Adler, 1994; Laffittan & Biville, 1997; Mylle, 1997; Schade, 1997). These findings are not surprising in view of the demands and conditions of some peace support operations, especially in Rwanda (Fry, 1996; Rosebush, 1998) and the former Yugoslavia in the early 1990s (Cian & Raphel, 1996; Johansson, 1997). There have even been suggestions (e.g., Phare, 1994; Weisæth, 2003) that stressors specific to some peace support operations may result in more frustration and stress than conventional combat. For instance, there has often been uncertainty about the primary role of military personnel on peace support missions, which is typically absent during war (Battistelli, Ammendola, & Galantino, 2000). Winslow (2001) argued that one of the greatest challenges for peacekeepers has been working with other stakeholders (such as local factions, relief agencies, non-government organisations, other nations' military forces, and the media) that have different ethical and performance standards in how they

operate on peacekeeping missions, especially in how they deal with the local populace.

Discussing his research (Richardson, Naifeh, & Elhai, 2007), Richardson noted in a media interview that Canadian soldiers sent on peacekeeping missions appeared to suffer similar rates of posttraumatic stress disorders as combat soldiers. He speculated that this unexpected finding was because peacekeepers were exposed to combat-type events such as mortars and small arms fire, but they were unable to take decisive action in response: "The difference is they were unable to shoot back" (Miner, 2007, 14 December). It is not difficult to appreciate that constraints on soldiers with respect to the use of force when confronted with threats is likely to generate adverse reactions such as frustration, anger, helplessness, confusion, and guilt.

Other stressors that may be unique to peace support operations have included constraints on active involvement (even when witnessing atrocities), complex discrimination between friend, foe and non-foe, and tasks that military personnel may not be trained or adequately prepared for, such as tactical negotiation in threatening situations and resisting taunts designed to elicit behaviours that will compromise mission status (Collyer, 1996; Galantino, 2003; O'Brien, 1994; Orsillo, Roemer, Litz, Ehlich, & Friedman, 1998; Ward, 1997; Weisæth, Mehlum, & Mortensen, 1996).

Thomas and Castro (2003) provided a dissenting opinion about the uniqueness of peace support operations, with an assertion that all peacekeeping stressors can also be found in combat environments. In their view, what distinguished peacekeeping from combat was not the presence of unique stressors, but the different "constellation of stressors" present in the two generic environments. Weisæth (2003), in the same publication as Thomas and Castro, arrived at a distinctly different conclusion. He suggested there was strong evidence to indicate that 'blue beret missions' (i.e., peacekeeping) create more stress and greater need for specialised training than

'green helmet missions' (i.e., conventional combat operations). He attributed this difference to the fact that peacekeepers operate at the intersection between political, humanitarian, and military objectives and hence "the demands and stressors of peace support missions are relatively unique" (p. 210).

Unique or otherwise, the stressors of peacekeeping, or the patterns of stressors encountered, are nevertheless not well understood. As Adler, Litz and Bartone (2003) lamented, "to date, research on peacekeeping stressors has been less than comprehensive"(p. 153). In particular, they noted inconsistencies in what is measured, with some researchers focussing on potentially traumatic events, and others emphasising routine sources of stress in the deployed environment. Adler and her colleagues recommended that in addition to the type and intensity of a range of stressors, the various possible *reactions* to these stressors must form part of any approach to develop a comprehensive understanding of the challenges faced by personnel on peace support operations.

The existence of serious adjustment disorders among veterans of peace support operations is beyond doubt (Baggaley, Piper, Cumming, & Murphy, 1999; Ehlich, Roemer, & Litz, 1997; Forbes et al., 2005; Hodson, Ward, & Rapee, 2003; Orsillo et al., 1998; Passey, 1993; Richardson et al., 2007; Ward, 1997). However, the complexity of these operations, and of the individuals and organisations involved, has made it very difficult to predict emotional adjustment and psychological outcomes in peace support personnel. While many peace support operations may be qualitatively different from warfare, the end result – in terms of psychological impact – may be similar.

Many stressors for military personnel are present in any operational deployment, for example, separation from family, harsh environmental conditions and organisational tensions. Bartone, Adler and Vaitkus (1998)

found five underlying dimensions of psychological stress salient to soldier adaptation in peacekeeping operations: isolation, ambiguity, powerlessness, boredom, and danger/threat. A study of stressors in French peacekeepers posited four major stress factors: living conditions, working conditions, level of risk, and level of external support (Cian & Raphel, 1996). Those who are familiar with military history would recognise that these dimensions are generally just as pertinent to the human experience of traditional warfare. What may have changed over time are the ways in which stress reactions in response to the stressors of military service have been expressed by the individuals affected, and how these reactions have been interpreted and responded to by both specialists and the wider society (Leese, 2002).

Historical overviews of the psychologically wounded soldier have revealed that outward symptoms often reflect the social, cultural, and political contexts of a particular place and time (Binneveld, 1997). Consistent with this theme, Weisæth and Sund (1982) posited the existence of a 'peacekeeping stress syndrome' linked to the specific nature of peacekeeping stressors. A shortcoming in this conceptual approach is the failure to acknowledge the interactionist nature of stress responses: a particular stressor will not necessarily lead to a particular stress outcome. Several research studies of military veterans have shown that characteristics of the postdeployment experience (especially quality of social support) can be more predictive of longer-term adjustment in veterans of both war and peacekeeping than the nature of deployment stressors encountered (Michel, Lundin, & Larsson, 2003; Taft, Stern, King, & King, 1999). Further complexity is added to the postulated stressor-strain relationship by the finding of Belenky, Noy, and Solomon (1987) that perceived self-efficacy as a combatant was predictive of debilitating stress reactions in battle but independent of subsequent, ongoing posttraumatic stress symptomatology.

It should also be noted here that most personnel do not show serious maladjustment following peace support duties, even those exposed to

potentially traumatic stressors (Litz, Gray, & Bolton, 2003). A few studies have shown that veterans of combat and wartime captivity report positive outcomes in the wake of their experience (Aldwin, Levenson, & Spiro, 1994; Sledge, Boydstun, & Rabe, 1980). More compelling was that many such veterans have had distinguished post-war careers in domains such as medicine (e.g., Edward 'Weary' Dunlop (Ebury, 1997)), politics (e.g., John F. Kennedy (Dallek, 2003), John Gorton (Hancock, 2002), and John McCain (McCain & Salter, 2000)) and the arts (e.g., Audie Murphy (Joiner, 2006) and Ernest Hemingway (Baker, 1972)). It would appear that there has been a complex interaction between stressors, coping, and adjustment/performance outcomes in deployed military personnel.

Stress, Coping, and Military Performance

Stress, coping, and performance have both practical and theoretical significance. Much of the conjecture about the relative demands and impacts of different forms of military service has been based on a dominant theme within the occupational stress literature: the notion of a dose-response relationship between stressors and strain. However, Hart and Cooper (2001) criticised the stressor-strain model as lacking sophistication because generally it did not take into account mediational mechanisms and individual differences. The authors identified four simplistic assumptions underlying the stressors and strain approach that they posited have led to a prevailing intellectual stagnation in research efforts. This academic torpor was responsible, in their view, for a lack of tangible progress in expanding knowledge of occupational stress during the preceding decade. For example, the notion that occupational stress was associated only with unpleasant emotions has prevented researchers from distinguishing between stress and psychological distress.

Certainly within the military domain, the likely demands of realistic training and operational service are generally regarded as incentives to enlist – at least for the type of person that military organisations typically seek to

recruit. For example, the ADF officer recruitment campaign that commenced in mid-2003 adopted the slogan: "Have you got what it takes?" These advertisements used case studies of young officers faced with daunting operational challenges. The theme was that facing and surmounting such stressful situations is ultimately a source of great satisfaction.

Unfortunately, it would appear that some human science researchers have yet to reach the level of understanding about stress in naturalistic environments that practical organisations such as the ADF implicitly accept. Hart and Cooper (2001) posited the need to acknowledge that occupational stress can be a positive performance stimulus, that stress must be measured by more than a single variable, that stress can be caused by factors other than adverse work experiences, and that positive and negative stressors were not necessarily inversely related in terms of psychological outcomes. It seems extraordinary that such appeals for consensus about the concept of stress are occurring more than 50 years after Selye's (1950) pioneering work. Despite an everyday acceptance of the term 'stress' (e.g., cover stories in the magazines *Time* (Wallis, 1983) and *Newsweek* (Miller, 1986) back in the 1980s), and numerous academic books and journals devoted to the topic (e.g., *Stress Medicine*, *Journal of Traumatic Stress, Stress and Health*), the meaning of 'stress' remains imprecise – even amongst health professionals and within human science disciplines (Cummings & Cooper, 1998; Levi, 1998). Much of this conceptual looseness appears to stem from three common ways that stress is conceived: as a stimulus, as a response, and as an interaction of the two.

In the **stimulus** conception, stress was a characteristic of the environment, such as noise, that is disturbing. Stress was an external force that produced a negative reaction within the individual. This view closely corresponded with the prevailing engineering definition of stress, where stress was a load or demand placed on a physical material, and strain was the result. If the material had sufficient strength and elasticity, the material would return to its original condition when the stress was removed. Correspondingly, if a

stressful demand placed on a person was within that individual's coping limits, when the stress was removed, he or she should 'return to normal', without any permanent effect. This stimulus definition of stress has been perhaps the most commonly held view of the concept in both public and professional domains (Bartone, 1998; Stokes & Kite, 1994). This view was flawed for two main reasons: it failed to take account of individual differences (why do two people react differently to the same stressor?), and it assumed that an undemanding environment would be stress free. Yet as research into peacekeeping has shown, boredom and monotony can be extremely stressful (Carlstrom, Lundin, & Otto, 1990; Harris, 1994; Harris & Segal, 1985; Soeters, Op den Buijs, & Vogelaar, 2001).

The **response** approach depicted stress as the body's or the person's pattern of reactions to externally imposed demands. Stress was regarded as an internal response to external stressors. Early human science research promoted such a view, as seen in an authoritative definition of stress as a "non-specific response by the body to any demand made on it" (Selye, 1950). This view proved to be inadequate because it failed to take account of individual differences and situational differences (reactions to stress are variable – not unchanging – both within and across individuals) (Selye, 1983). In short, the response view was too simplistic. Nevertheless, the concept of 'strain' – the collective adverse outcomes of persistent stress – remained a key component of the interactionist model of stress.

Arguably, the dominant approach to research incorporating stress and performance in applied settings has been the transactional model of stress (Cox & Ferguson, 1991; Lazarus, 1991). Earlier situationist theories of person-environment interaction, such as Field Theory (Lewin, 1936) and 'neurological development' (Hebb, 1949), laid the conceptual groundwork for interactionist models of stress (Endler, 1997). The resulting stimulus-appraisal-response model viewed stress as a consequence of the interaction between dynamic environmental stimuli, individual perceptions of those

stimuli, and individual response patterns. Thus, stress generally occurred only when an individual perceived a demand to be beyond his or her coping resources. Characteristics of the stressor that would influence the appraisal process included timing, source, perceived control, and perceived desirability of the stressor (Le Fevre, Matheny, & Kolt, 2003).

Lazarus and Folkman (1984) have been perhaps the most influential advocates of the transactional approach. They defined 'psychological stress' as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her wellbeing" (p. 19). This model superseded stimulus and response views of stress by combining them and including an intervening component of subjective appraisal (see Figure 1). Stokes and Kite (2001) posited that transactional models "are more 'psychological' than either stimulus- or response-based approaches to stress, in that they acknowledge the subjective nature of stress and emphasize the mental processes that mediate the individual's reactions" (p. 115).

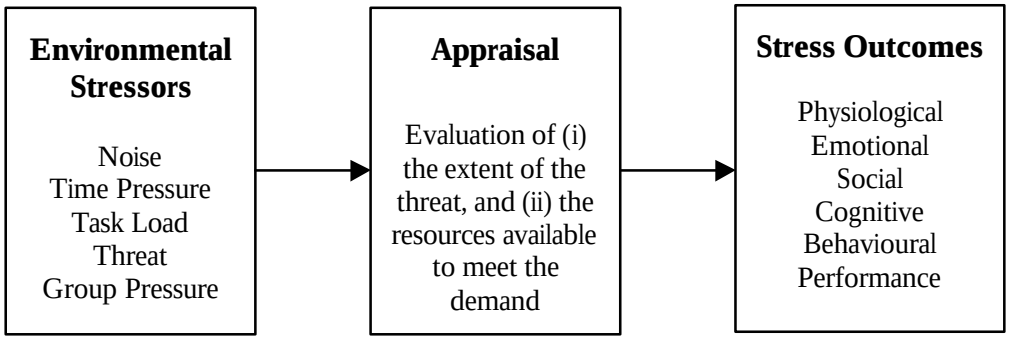

FIGURE 1 Stimulus-appraisal-response model of stress and performance.

The posited 'appraisal stage' had two elements. *Primary appraisal* involved an evaluation of the degree of harm, threat, or challenge posed by environmental stressors. During *secondary appraisal*, resources were evaluated to determine how effectively the individual could cope with the threat or

challenge posed by environmental stressors. An adverse appraisal of the situation was likely to result in various stress outcomes, including impaired performance.

The role of personal evaluation is the central component of this *transactional* process between the individual and the work environment, because it is regarded as instrumental to how the individual reacts to a stressor. Hence the transactional approach recognised various components of the stress process, and assumed that the relationships between the person and the environment were not constant over time or across different situations (Lazarus, 1995).

A frequent goal of research into occupational stress that has utilised the transactional model has been the identification of coping strategies and a determination of their effectiveness in moderating or buffering the relationship between stressors and strain. Coping – people's reactions and responses to stressful and upsetting situations – is a relatively mature construct within the psychological domain (Parker & Endler, 1996). For example, arguably one of the most important contributions of psychoanalytical theory was the concept of defence mechanisms (Breuer & Freud, 1955), which were postulated to underlie some forms of psychological adaptation or coping. The catalyst of modern conceptualisations about coping generally has been attributed to the work of Lazarus (1966). In the ensuing decades, research into coping has proliferated, as illustrated by the substantial *Handbook of Coping* by Zeidner and Endler (1996b). Research interest in coping in the military operational context has shown similar proliferation (e.g., Dirkzwager, Bramsen, & van der Ploeg, 2003; Dolan, Adler, Thomas, & Castro, 2005; Gal, 2006; Limbert, 2004; Moldjord, Fossum, & Holen, 2001, 2003; Solomon, Berger, & Ginzburg, 2007; Watson, 2006; Witvliet, Phipps, Feldman, & Beckham, 2004).

Coping has become a cornerstone of stress research and theory (Folkman & Moskowitz, 2004), yet it too has remained a disputed concept. A proportion of this debate has centred on how many coping dimensions or styles exist and how they occur. Situationists (a conceptual approach also known as 'intra-individual') have held the view that situational factors largely determined specific coping responses, and therefore particular types of situations would evoke similar behaviours or coping techniques in most individuals. Dispositional or inter-individual approaches to coping have contended that relatively stable personality factors were most likely to determine coping behaviours, and therefore habitual coping strategies would emerge in particular individuals across different types of stressful situations (Parker & Endler, 1996).

On the other hand, many psychoanalysts would suggest that coping or defence styles could be linked to specific psychological problems. Interestingly, although each of these theoretical approaches has generated numerous psychometric instruments to measure coping behaviours (see Schwarzer & Schwarzer, 1996, for a review), most of these scales have conceptualised coping in only two or three dimensions: notably problem-focussed coping and emotion-focussed coping, and, less often, avoidance strategies. While other theorists have spoken of 'adaptive' and 'maladaptive' coping, or 'mature' and 'immature' coping, the duality of problem-focussed and emotion-focussed coping has been dominant.

The initial focus of transactional models of stress was on *coping* with stress (Zeidner & Endler, 1996a). However, more recently the impact of stress on *occupational performance* has tended to dominate research in applied settings such as aviation and the military. The model below (Figure 2), initially developed from Salas, Driskell, and Hughes (1996), adds a 'performance expectation' stage to the traditional transactional model. This performance expectation stage was posited to involve evaluation of perceived capacity or personal resources to meet a performance requirement in the face

of particular threats or challenges, and then generate a level of expectation of success. If the evaluation of environmental *stressors* generated an adverse assessment of the situation during the initial appraisal stage (primary appraisal), and the individual felt unable to resolve the situation (secondary appraisal), this was likely to result in decreased performance expectations.

As Figure 2 demonstrates, in the case of the military operational environment, if a soldier's evaluation process generated perceptions of disorder and uncertainty, and the individual felt unable to achieve or perform appropriately, various adverse stress and performance outcomes were likely to occur. Such outcomes have been referred to collectively in the military literature as the 'fog of war'.

NOTE: This figure is included on page 15 of the print copy of the thesis held in the University of Adelaide Library.

FIGURE 2 Four-stage model of stress and performance.
(Wilson, Braithwaite, & Murphy, 2003)

Consistent with several reigning psychological theories such as 'self-efficacy' (Bandura, 1977) and 'learned helplessness' (Seligman, 1978), which have emphasised the importance of perceived control for confident action in the face of challenge, transactional models of stress have catered for individual differences and have emphasised the cognitive component of

coping. The transactional approach also has allowed for relatively complex modelling of the dynamic interactions that can occur in the stress and performance domain. The validity of the transactional model of stress has been demonstrated in several studies using combat veterans. For instance, Dekel, Solomon, Ginzburg, and Neria (2003) recently concluded that the mental health impact of combat stressors was related less to their objective severity than to individual assessments of the threat posed and the resources available to manage the stressors.

Although favoured by the majority of contemporary theorists, presumably for a strong theoretical basis and wide applicability, the transactional approach is not without limitations. Collectively, these shortcomings may explain why the transactional model has been utilised rarely in human factors or human performance research arenas. Noted shortcomings have included lack of reference to objective performance outcomes (Matthews, 2001a), vagueness about the actual mechanisms underpinning cognitive appraisal (Stokes & Kite, 2001), neglect regarding the role of emotion in appraisal (Lazarus, 1991), and a restrictive focus on the knowledge component of transaction (Matthews, Davies, Westerman, & Stammers, 2000). Matthews et al. (2000) distinguished three levels of explanation to conceptually define stress: the neural level, the level of cognitive architecture, and the knowledge level. Transactional models of stress normally have examined only the latter level, despite some stressor effects being best understood at the information processing level – for example, through impact on working memory (Matthews et al., 2000) – and some stressors acting at the biological or neurological level to impair performance without conscious awareness (Matthews, 2001b).

Despite these shortcomings, the transactional model of stress has been regarded generally as a significant advance over preceding stimulus- and response-based models because of its increased complexity. Furthermore, the model has a more 'psychological' basis, in that the subjective nature of stress

is acknowledged and linked to cognitive processes that mediate the human stress response (Stokes & Kite, 2001).

Transactional models of stress have obvious applications in the context of a peace support operation where there is often an unpredictable and fluid connection between the soldier and his or her environment. Uncertainty about what threats will be faced on a daily basis during deployment is common. Many usual coping resources – such as family support – may be unavailable. Other coping resources (e.g., group cohesion) may be untested because often new teams of deployed personnel are established to support a peacekeeping mission, and sometimes these teams are composed of personnel from different nations. Outcomes of the transactional process will be mediated or moderated by a unique set of individual, organisational, and contextual factors. Of particular importance to these outcomes are the military-specific coping resources and support strategies that are presumed to maintain and enhance performance during hardship. These coping resources and support strategies include morale, cohesion, perceptions of personal, team and unit competence, and confidence in leadership (Murphy & Farley, 2000).

There is evidence that these forms of military support resources may contribute also to long-term adjustment in combat veterans. For example, Dekel et al. (2003) found that only one of four battlefield stressor factors examined – 'experience of own Army fallibilities' – was associated with chronic Post-traumatic Stress Disorder (PTSD). This finding was surprising because the other factors – 'encounters with injuries and death', 'active fighting', and 'life-threatening situations' – normally were presumed to be traumatic events likely to lead to serious maladjustment. The commonality across items that made up the predictive factor of 'experience of own Army fallibilities' appeared to denote a failure in competence in one's peers and superiors, suggesting that a consequent lack of trust or cohesion may have led to lasting maladjustment. Dekel at al. (2003) concluded with a novel

hypothesis that battlefield *functioning* may be more important than battlefield *stressors* in contributing to subsequent adjustment.

This conclusion supported the conventional wisdom of effective military leaders throughout the ages that factors contributing to organisational and individual resilience were more important than the conditions encountered on the battlefield. Of course, the focus of these commanders was not on *stress* or individual *adjustment* but rather on individual and collective *performance.* Examples of this military wisdom were that the army "stronger in soul" would be victorious in battle (Xenophon, 1960), that "moral considerations" accounted for three-quarters of the outcome in war (Napoleon, cited in Wintle, 1989) and that "the morale of the soldier is the greatest single factor in war" (Montgomery, 1958).

The preceding discussion has highlighted the importance of researchers making their theoretical approach and level of measurement explicit. Since Grinker and Spiegel's (1945a) groundbreaking work *'Men under stress'*, which examined the impact of acute and chronic stress on military aircrew in the Second World War, human science researchers have tended to focus on behavioural issues of combat using a stressor-strain paradigm. Battlefield stressors and their impact on adjustment have generally aroused more research interest than the presumed antecedents of combat functioning such as morale, cohesion, and confidence in leadership (Britt & Dickinson, 2006). Indeed, Wild (1988) suggested that morale and cohesion could be treated as proxies for stress, rather than as issues for study in their own right.

Farley (1995), who identified the major stressors experienced by Canadian soldiers serving on peacekeeping duties in the Former Yugoslavia, adopted this stress-centric approach. 'Stressor themes' to emerge from factor analysis included 'Leadership / management', 'Safety of self and others', 'External relationships', 'Privacy and adjustment' and 'Family concerns'. Stressor items with the highest mean score ratings were "A 'double standard'

among ranks when it comes to applying the rules," "Superiors overreacting to situations," "A feeling that people in this unit are often treated like 'kids'," and "A feeling that the United Nations is powerless to change the situation here." Each of these items could be regarded as an organisation-level issue.

Rather than interpret these issues from a perspective of organisational behaviour, Farley (1995) focused on a link between the experience of stress and health, finding support for a dose-response relationship between both the amount and duration of stress, and strain. He did identify leadership as having an influence on strain, moderated by a number of role stressors. However, leadership was conceptualised as a stressor having an impact at the individual level. As an alternative and wider perspective, it was contended in this dissertation that leadership also can be viewed just as legitimately as a coping or support factor, as a moderating or mediating factor, and as a group- or organisation-level factor. As Bliese and Jex (1999) avowed, there is need to incorporate multiple levels of analysis into occupational stress research. Models that have purported to explain psychological adjustment in the workplace primarily in terms of environmental stressors may be missing potentially important organisational and individual factors (van Yperen & Snijders, 2000).

This prevailing emphasis on stress may be partly due to the long-recognised difficulties in gathering reliable and credible performance data in military units deployed on operations. Over 40 years ago, Cherns (1962) noted: "the most difficult aspect of these studies (of combat personnel in their units) is the search for *adequate criteria* of operational efficiency. The need for *objective* measures narrows the field of study to active combat conditions in which observations are hard to get and still harder to plan for" (p. 28, italics in original; bracketed text added).

Another reason for this popular focus on stress has been that the field of psychology, especially military psychology, has adopted stress as a

'catchall' for concepts that were difficult to operationalise. Watson (1980) – a journalist – argued somewhat cynically that psychologists use 'stress' in lieu of prevalent emotions on the battlefield such as 'fear' because "stress is a psychological jargon word: most important, it is 'value-free' – neither good nor bad but something which can be manipulated, experimented with and, given luck, smoothed out of the picture entirely" (Watson, 1980, p. 37). It would appear that stress has become a paradigm of choice among psychologists; a paradigm with a focus on individual adjustment.

It is of interest that Hart and Cooper (2001) have called for an expanded scope in stress research that should combine organisational performance alongside individual characteristics. Within military organisations, such an integrated approach to operational stress would seem particularly apt because of the almost perennial tension between a focus on individual wellbeing and operational / organisational effectiveness in times of active duty (Camp, 1993; Grinker & Spiegel, 1945b). Almost since psychology emerged as a distinct profession towards the end of the 19th century, it has been at the hub of such tensions within the military.

Military Psychology

> *The war of 1914-18 coincided broadly with the birth of a new era of philosophic thought on the nature, content and working of man's mind (psychology) and of its aberrations (psycho-pathology). The essential feature of this new era was, and is, the application to the problems of the mind of the methods of inductive science.*
>
> Colonel A. G. Butler, *The Australian Army Medical Services in the War of 1914-1918: Special problems and services*, 1943

In 1917, a group of American psychologists, led by Robert Yerkes, concluded that psychology could contribute "scientifically and effectively with the principal human factors in military organisation and activity" (Yerkes, 1918, p. 114). The group recommended that the field of psychology support matters of selection, training, motivation, and aviation as part of the U.S. war

effort. To a large extent, military psychology has come to be associated with selection and classification, due to a general consensus in the North American literature that military psychology was born in the mass selection program conducted by the U.S. military in the latter part of the First World War (APA Online, 2002). However, as Keene (1994) noted, this view was inaccurate because it did not recognise many other contributions by psychologists during the war.

Narain (1979) believed that military psychology was born in Europe during World War I in meeting the challenge of soldiers leaving the battlefield in large numbers. In the early stages of the war, psychological tests were used in the German forces in an attempt to resolve the military problem of screening soldiers vulnerable to psychological injury (Lerner, 1997). In the British Army, neurologists who were overwhelmed by the enormous number of head wounds passed the issue of combat stress casualties to a psychologist, Dr Charles Myers. By the middle of 1916, Myers had seen over 2000 cases and introduced the term 'shell shock' into the literature (Myers, 1915); although he came to regret the use of this label (Myers, 1940). Influenced by procedures in the French military at the time, Myers began several practical initiatives in managing combat stress casualties that remain in effect today.

Psychologists contributed to the military effort in the First World War – and subsequent major wars – in many other ways. In perhaps the earliest books devoted to military psychology, as opposed to military psychiatry, Bartlett (1927) and Simoneit (1933) discussed, from British and German perspectives respectively, the importance of leadership, morale and cohesion to operational effectiveness, among other issues. Meier's *'Military Psychology'* (1943) included chapters on combat motivation, psychological aspects of warfare, psychological preparation for combat, the adaptation of skills to military needs, the learning of military skills, garrison leadership, leadership in combat, and adjustment to combat conditions and stress. A review of the work of psychologists in the Services of the United Kingdom

during the two World Wars (Privy Council Office, 1947) noted 13 distinct areas where contributions were made by psychologists, including equipment design, training, visual problems, job analysis, 'field work', and the assessment and management of adjustment problems.

Even in its early years, the field of military psychology showed remarkable diversity in its contributions to the improvement of human performance in military settings. Mangelsdorff and Gal (1991) noted that psychologists have helped military organisations to "select, classify, place, manage, motivate, maintain, and retain military personnel both in combat and noncombat in a variety of situations and differing environments" (p. xxvi). The level of involvement of psychologists in the war efforts of the past can be surprising. For example, of the 4,500 qualified psychologists in the United States in 1943, over 1,000, which included about two thirds of all male psychologists under 39 years of age, were engaged in military psychology (Bray, 1948).

The primary objective of military psychology is to assist the Defence Force in achieving its mission by contributing to combat readiness and operational effectiveness. Unlike many of the fields within psychology, it is the *context* of its application that tends to differentiate military psychology. Perhaps the most commonly accepted definition of military psychology in the mainstream literature is simply "the application of psychological principles, theories and methods, within the military environment" (Mangelsdorff & Gal, 1991, p. xxvi). According to Walters (1968), the goal of applying these psychological principals and techniques was to "either optimise the behavioural capabilities of one's own military forces or minimise the enemy's behavioural capabilities to conduct war or protracted indirect conflict, and to prevent the possibility of war from occurring by employing psychological means to reduce war-producing tensions" (p. 2).

However, what these definitions failed to indicate was the impact that the field of military psychology has had on the broader science of psychology. In a review of research applications within military psychology, Driskell and Olmstead (1989) stated that "perhaps no other institution has been as inextricably linked with the growth and development of psychology as the military" (p.43). This was in part because military psychology is a microcosm of numerous psychology disciplines (Wiskoff, 1989), and in part because it has been at the forefront of many advances and innovations in psychology. For example, the military as an organisation has been viewed as the birthplace of both applied psychology (Johnson, 1991; Narain, 1979) and situational leadership research (Jacobs, 1991). The military has been the impetus for both the rapid expansion of human factors (Koonce, 1999), and the development of many training technology and lifestyle innovations (Mangelsdorff & Gal, 1991). Sadly, warfare has been a major source of cases for the management and research of psychoneuroses (Roussy & Lhermitte, 1918), brain injuries (Goldstein, 1942), and traumatic stress reactions (Shephard, 2000). Leahey (1997) suggested that the impetus for the expanded role for clinical psychologists from diagnostician to include therapist – that signalled the beginning of modern clinical psychology – began in the busy veterans' hospitals in the United States following the Second World War. It is evident that military psychology has had a long history of setting precedents in the behavioural science domain.

The relationship between the military and psychology has been classified as 'symbiotic' due to, on the one hand, psychology utilising the military as a "test-bed or applied laboratory" for psychological research and methods, and, on the other hand, the military providing the "impetus to initiate and direct research and innovation in psychology" (Driskell & Olmstead, 1989, p. 43). Many recent military innovations, including high fidelity simulation, effective automated systems, and computerised abilities testing were predicated on advances in psychological theories and research. At the same time, many fields within psychology have benefited significantly

from military challenges and requirements as diverse as sustained operations (psychophysiology), integration of women (gender issues), resistance to interrogation (individual differences), psychological resilience (personality), collective persuasion (group processes), recovery from injury (rehabilitation psychology), computer training technologies (educational psychology), international cooperation (cross-cultural psychology), the application of nonlethal weapons (social issues, group behaviour), suicide prevention (health psychology), the management of serious stress reactions (clinical psychology), support to military families (community psychology), and night flying (applied experimental and engineering psychology).

Two behavioural science fields that have long been prominent in the military are organisational psychology and social psychology. Due to the rapid and massive expansion of military forces during World War II, the selection, training, and evaluation of personnel, especially leaders, became initial areas of research. As the experience of combat increased, there was growing awareness of the importance of the determinants of human behaviour within groups in dangerous conditions. Issues such as morale, cohesion, confidence in leadership, and combat motivation were of vital interest to senior commanders – and military psychologists – as exemplified in the following conclusion drawn from a retrospective study of the Australian military experience in the Second World War.

> Far more detailed research is required on all units involved in the campaign before judgments about troop indiscipline and combat effectiveness can be made. What these findings do, however, is provide a warning to future military researchers. For what is unclear in the evidence we have to hand is just what sort of assumptions influenced senior commanders when they were judging aspects of soldiers' behaviour in combat situations in the 1939-45 war. And yet, despite this lack of information, we can still acknowledge that much of the in-the-field research of the Second World War has

> contributed greatly to present understanding of wartime stresses (Barter, 1994, p. 117).

One research project from this era, known as the 'Combat Soldier Series' by Samuel Stouffer and a veritable army of colleagues (Hovland, Lumsdaine, & Sheffield, 1949; Stouffer et al., 1950; Stouffer, Lumsdaine et al., 1949; Stouffer, Suchman et al., 1949), is perhaps the most widely known social psychology research project in the military. The work was promoted as a "mine of data, perhaps unparalleled in magnitude in the history of any single research enterprise in social psychology" (Stouffer, Suchman et al., 1949, p. 29). The Combat Soldier Series contributed significantly to advances in survey methodologies and statistical analysis techniques, and its subject matter provided the first systematic information about many human aspects of military service during war. It must be noted that the Combat Soldier Series was a multidisciplinary effort, with many sociologists, statisticians, and anthropologists on the team. Samuel Stouffer himself was a sociologist from Harvard.

Following the Second World War, psychological research in military settings continued, albeit more sporadically, through to the 1980s. During this period, in addition to customary studies of soldier attitudes (Janowitz, 1960), military families (Hill, 1949) and soldier adjustment (Figley, 1978), innovative research commenced in areas such as the psychophysiology of the stress response in naturalistic settings (Bourne, 1970) and the 'human dimensions' of military unit effectiveness (Motowildo & Borman, 1977; Turney & Cohen, 1976).

It would appear that, even today, the legacy of psychologists in the First World War has continued to reverberate as contemporary military psychologists grapple with many of the same questions their predecessors posed about the human experience of war. Current staples of research into the psychological aspects of military performance include morale (Maguen &

Litz, 2006; Riley, 2002; Simunovic, 1998), cohesion (Griffith, 1997; Oliver, Harman, Hoover, Hayes, & Pandhi, 2000; Sharpley, Fear, Greenberg, Jones, & Wessely, 2008), leadership effectiveness (Bliese & Castro, 2000; Dobreva-Martinova, 1999), soldier motivation (Siebold & Lindsay, 1999; Wong, Kolditz, Millen, & Potter, 2003), management of psychological casualties (Black, 1987; Jones & Wessely, 2003), operational decision-making (Cannon-Bowers & Salas, 1998; Chapman, Bonner, & Murphy, 2002), fatigue management (Caldwell & Caldwell, 2003; Murphy, 2002), issues relating to survival, evasion, resistance and escape (Laberg, Eid, Johnsen, Eriksen, & Zachariassen, 2000; Lieblich, 1994), stress and performance (Driskell & Salas, 1996) and aircrew functioning (Oser, Salas, Merket, & Bowers, 2001). It is unfortunate that these sources of information are at times neglected, occasionally with tragic consequences. The 'Vincennes Incident', when a missile frigate shot down a civilian airliner as a result of a causal chain of human error, is an example where the implementation of well-established behavioural science findings may have prevented such a tragedy (Bales, 1988). The Vincennes Incident was the impetus for the U.S. Navy's Tactical Decision Making Under Stress research project that spanned a decade and produced a plethora of findings and resources relating to performance under stress in field settings (see Cannon-Bowers & Salas, 1998, for a review).

The purpose behind this historical review of Military Psychology has been to provide an account of the broader context within which the research to be described here has been carried out. This thesis has adopted a model of peacekeeping stress and performance across the deployment cycle that reflects a macro-theoretical framework. The components of this model reflect many of the aspects of performance in military contexts examined in the preceding review of military psychology. The research conducted under this overarching model of stress and performance has been labelled the Human Dimensions of Operations project.

The Human Dimensions of Operations (HDO) Project

"It is very difficult to discover what actually goes on in the heads of a group of men."

First Lieutenant Paul Terry, Military Psychologist, 1918

Over the last two decades, research into the human dimensions of operations has become almost universal across Western military organisations. The genesis of the term 'Human Dimension' in relation to the military is difficult to determine. Use of the expression 'human factor' appears to have been commonplace among psychologists providing support during World War 1, and by the Second World War, the term had migrated into the lexicon of military commanders. The first use of the expression 'human dimension', as a subject in its own right and relating to military operations, may be the book chapter entitled 'The human dimensions of battle and combat breakdown' (Marlowe, 1986). Publications on many different aspects of the 'human dimension' in the military ensued: the human dimension of combat readiness (Wild, 1988), of peacekeeping (Harris, 1994), and of rapid force projection (Kirkland, Ender, Gifford, Wright, & Marlowe, 1996). Research into the 'human dimensions' of military service had become so popular by the mid-1990s that Bartone and Gifford (1995) presented a paper entitled "Doing human dimensions research: Lessons from recent military operations" at the 1995 Annual Convention of the American Psychological Association.

The expression 'human dimension of operations' appears to have emerged concurrently among behavioural science researchers in the military organisations of several nations in the mid-1990s. The term was a logical reaction to the emergence of peace support operations as a major activity for many Western military forces. The inclusivity of the term 'human dimension of operations' encompassed military tasks across the spectrum of force, from warlike operations to peacekeeping. The term – the 'Human Dimension of Operations' – is now a major constituent of the military psychology idiom.

The research effort into peacekeeping was fostered most fundamentally by recognition that the human components of military performance are crucial to mission effectiveness, and increasing acceptance of corporate responsibility for the psychological welfare of military personnel and their families (see Hobfoll et al., 1991). Arguably, the essential feature of the various research studies across the globe into the human dimensions of operations has been the intent to enhance operational effectiveness by identifying factors and their interrelationships that can explain or predict psychological readiness before, during, and after deployment. Typically, human dimensions projects are underpinned by pragmatic, political, and theoretical concerns.

Pragmatic rationale. There has been significant and enduring interest within Western military organisations in conducting behavioural science research to underpin policy development. The Canadian Forces is exemplary in this regard, with established research programs in areas such as quality of life (Dowden, 2001; Eyres, 1997; Thivierge, 1998), selection procedures (Davidson & Syed, 2004; Pelchat, 1997), occupational stress (Dobreva-Martinova, 2002; MacLennan, 1996), performance appraisal (Latham, Almost, Mann, & Moore, 2003; Mombourquette, Noonan, & Uchiyama, 1997), harassment (Adams-Roy, 2003; Davis, 1998), diversity (Ewins, 1997; Vanderpool, 2003), group functioning (MacIntyre, 2001), attrition (Bender & Tseng, 1996; Jenkins, 2003), downsizing (Murphy & Mombourquette, 1997), organisational climate (Johnston, Bernard, Brown, Cole, & Aggarwal, 2002; Little, 1999), ethics (Catano & Kelloway, 2001; Catano, Kelloway, & Adams-Roy, 2000), and gender integration (Bowser et al., 2004; Davis & Thomas, 1998; Tanner, 1996).

The Canadian Forces began formally their own HDO project in 1996, during the exchange posting tenure of this dissertation's author to the Personnel Research Team, National Defence Headquarters in Ottawa. A key impetus for the HDO project was an acknowledgment that empirical

measurement of aspects of organisational and psychological climate in military units could assist officers to command more effectively. Psychological / organisational climate within the military is believed to differ in several tangible ways to most non-military organisations because of the uniqueness of military culture, military organisational structures, and the fundamental military mission. In the military context, the term 'unit climate' often has been used to encompass both organisational and psychological climates (Farley, 2002; Murphy & Farley, 2000). Unit climate has been postulated to be made up of several dimensions presumed to be antecedent to individual, team, and unit readiness to undertake military duties. These dimensions have included morale, cohesion, esprit de corps, and confidence in command. In this research, unit climate was conceived as encapsulating organisational and psychological dimensions critical to operational efficiency.

Commander perceptions of subordinate attitudes and morale may be crucial ingredients to command decision-making in relation to readiness and the commitment of forces to active operations (Murphy & Farley, 2000). If command assessments of subordinate attitudes and mood and subunit cohesion and morale were substantially inaccurate, as Korpi (1965) had shown they can be, organisational effectiveness and performance might suffer. The Canadian Army expressed interest in developing a psychometric instrument that could be used by commanding officers to measure the human dimensions of operational readiness within units before and during deployment. The goal was to allow commanders to independently administer, score, and interpret the instrument, with optional recourse to specialist advice. Dimensions such as morale, cohesion, and confidence in leadership were to be included. The measurement of unit climate was the foundation of the Canadian Forces HDO project.[3]

[3] While the Canadian Forces had developed a measure of unit climate by that stage (see Chapter 3), the HDO project incorporated this measure into a broader research schema.

The potential for pragmatic outcomes from human dimensions research was readily apparent. A review of the literature (notably Britt & Adler, 2003) and the author's own experience with command consultation, demonstrated how many gaps remained in relation to the human aspects of military service in peace support missions. For example, how well are peacekeepers psychologically prepared for the stressors of peace support operations? What are the generic mission-essential tasks of peacekeeping missions? What challenges and demands do peacekeepers face? How can these challenges and demands affect accomplishment of the mission? How do peacekeepers respond and adapt to the various stressors they encounter? What can be done to facilitate adaptation in the face of these challenges? What determines whether peacekeepers will be effective in carrying out their various tasks? What distinguishes peacekeepers whose confidence and skills develop as a result of participation in peacekeeping from those who have adjustment difficulties? Is there a link between deployment duration and psychological symptomatology? Can the cognitive, affective, and behavioural markers of psychological resiliency be identified? Can specific coping skills to promote psychological resiliency be modelled and incorporated into standardised training programs? How do peacekeeping deployments impact on team and unit effectiveness? How do military organisations and commanders affect peacekeeper attitudes, wellbeing, and performance? Does previous peacekeeping experience predict subsequent peacekeeping adaptation and performance? How do peacekeepers from various countries work together to accomplish their mission? To what extent do findings from research with peacekeepers generalise across nations? How do peacekeepers view their participation in peacekeeping operations? This list of questions is far from exhaustive.

Political rationale. The ADF 'Human Dimensions of Operations' project began in 2000, shortly after the commencement of the mission to East Timor. Impetus to the project in Australia was lent political support by the Defence White Paper of that period (Department of Defence, 2000),

which highlighted the importance of "Operations Other Than War" (i.e., peace support operations). The document noted that:

> … the Government believes that this (the rise in commitment to Peacekeeping Operations) is an important and lasting trend, with significant implications for our Defence Force. Over the next 10 years the ADF will continue to undertake a range of operations other than conventional war, both in our own region and beyond. *Preparing the ADF for such operations will therefore take a more prominent place in our defence planning than it has in the past* (p. 10, italics added).

The White Paper also placed an emphasis on the 'Human dimensions' of operations (section 10.17):

> Wherever technology developments lead us, in the final analysis, people carry out military tasks so it is important that we continue to attach top priority to the human aspects… Nowhere is this more evident than in the land environment where the individual will continue to be… primary (p. 111).

Such statements appeared to endorse a need for research focussed on both the human aspects of operational service and the distinctiveness of peace support operations. Indeed, in several nations, there arose in the 1990s a general acceptance that peace support operations had become, and were destined to be, the standard mission for the military for decades to come. Conflict resolution appeared to have replaced warfighting as the main purpose for the international deployment of military forces (Dallaire, 2000).[4]

Theoretical rationale. Peace support operations are, from any perspective, inherently complicated phenomena. Numerous constructs and theories from a broad range of fields within the behavioural sciences could be applied to these 'natural laboratories.' For example, Britt and Adler (2003)

[4] The events of 11 September 2001, and the subsequent actions of Western governments in response to the terrorist attacks on that day, revealed how ephemeral such strategic planning documents can be.

organised their recent book on the psychology of peacekeeping around five areas of psychology that have been applied to these operations: social, industrial-organisational, health, clinical, and cross-cultural psychology. Potential variables for study appear almost unlimited. According to Bliese and Jex (1999; 2002), there is also practical and theoretical value in incorporating multiple levels of analysis in organisational settings. This is especially so in peacekeeping research due to the hierarchical structure of the military organisation and the importance of situational effects in active service deployments.

To address this conceptual complexity, many researchers have developed overarching theoretical frameworks or meta-theoretical models. Advantages of this approach have included the potential to readily integrate new constructs, to explore systematically relationships among abundant variables, and to study micro-oriented theories within a macro-theoretical setting or comparative context. The rich data that can result from these broad conceptual frameworks have allowed analyses to transcend the traditional focus on a relatively small number of variables. Bliese and Castro (2003) have referred to the complex analysis of embedded theories within a meta-theoretical framework as 'the examination of boundary conditions' (p. 186), in the sense that numerous measures allow increased scope for the testing of moderating and mediating effects among variables.

A meta-theoretical framework known as the Soldier Adaptation Model has guided U.S. Army behavioural science research into peace support operations since the mid-1980s (see Bliese & Castro, 2003). The model, shown in Figure 3, provided a broad conceptual schema based on a stress and performance perspective incorporating stressor, moderator, and strain components. Individual moderators such as job involvement and self-efficacy and unit/organisational moderators such as leadership climate, collective efficacy, and policy decisions were considered as separate components of the model.

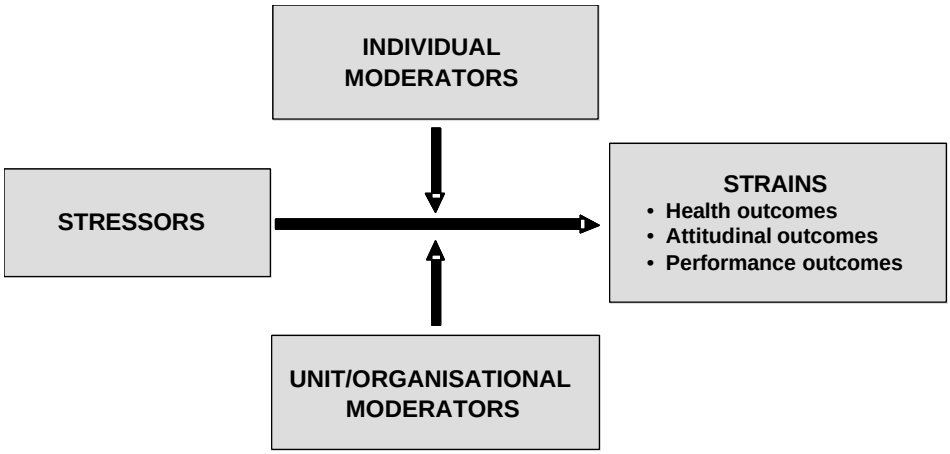

FIGURE 3 Soldier Adaptation Model.
(adapted from Bliese & Castro, 2003)

Research conducted under the auspices of the Soldier Adaptation Model typically collected data on a wide range of variables in order to examine a number of conceptualised relationships. While hypothesis generation and testing tended to be based on specific elements of the data set, Bliese and Castro (2003) have contended that attention to both micro and macro theories is important in advancing occupational stress research.

Another example of a conceptual model used in the context of peace support operations was adopted in order to structure the proceedings of the second Human in Command Symposium convened in the Netherlands in 2000 (Essens, Vogelaar, Tanercan, & Winslow, 2001). The model, displayed in Figure 4, distinguished five factors: mission effectiveness, the complexity of the mission and expected/actual conditions of the deployment, the structure of the unit and the level of predeparture training, the interpersonal processes of deployment such as motivation, discipline and cohesion, and leadership effectiveness. The symposium was focussed on the proposition that, irrespective of situational factors, leadership was pivotal in influencing, positively or negatively, the effectiveness of a mission.

NOTE: This figure is included on page 34 of the print copy of the thesis held in the University of Adelaide Library.

FIGURE 4 Facilitating model for research into peace support operations.
(modified from Essens et al., 2001, p. 21)

A Model of Stress and Performance in Operations

The preceding conceptual models demonstrated the potential for the application of theoretical constructs in the context of peace support operations. A meta-theoretical framework also underpinned the studies presented in this thesis. The variables incorporated into the model allowed the examination of relationships among the following constructs: situational stressors, coping with multiple stressors, group behaviour, organisational dynamics, social support, psychological climate, individual and collective efficacy, work motivation, traumatic and non-traumatic stressors, social reintegration, individual differences, and stress and performance outcomes.

The HDO project was based on a model of stress, psychological readiness and performance in military operations developed by the author and his colleagues at the Personnel Research Team in Ottawa (Murphy, Farley, & Dobreva-Martinova, 1998). As shown in Figure 5, the model incorporated four components: stressors, moderators/mediators, coping techniques and resources, and various health, psychological, and performance outcomes.

Each of these components could be considered at individual, group, and organisational levels. The theoretical framework was an extension to the four-stage model of stress and performance in Figure 2. It was designed to increase understanding of the human dynamics of the deployment cycle so as to inform the development of more appropriate training and support interventions that would enhance individual and organisational wellbeing and performance. The model has been continually refined through the interplay of theoretical considerations, applied research outcomes, and feedback from respondents and commanders. The components of the model and the rationale for their inclusion are explored in some depth below.

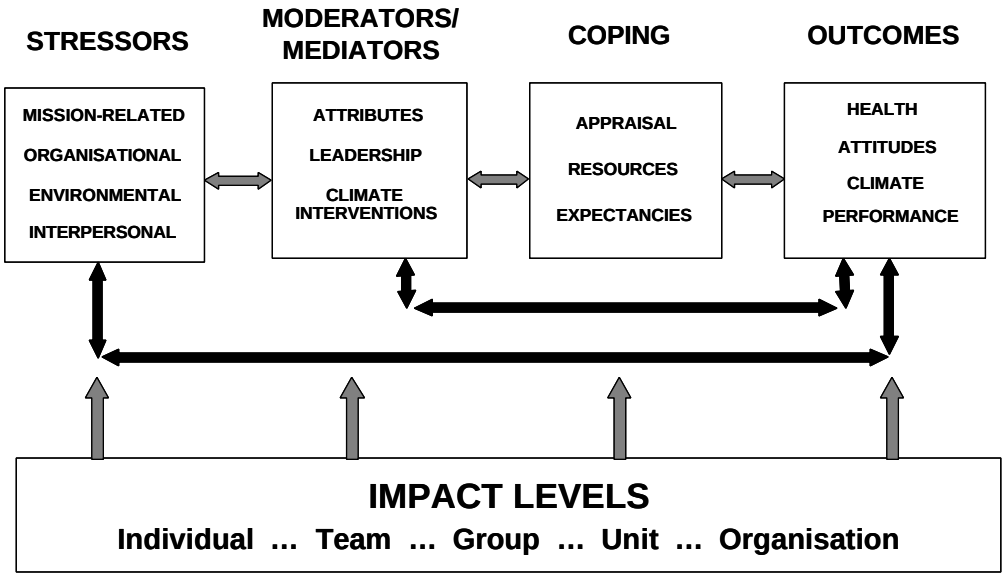

FIGURE 5 The Human Dimensions of Operations conceptual model.

Stressors. The model began with a stressor component. Stressors were defined as events or conditions that can cause stress in individuals. It was acknowledged that reactivity to stressors varied considerably between individuals, just as situations vary greatly both within and across peace support operations. Although this study built upon previous research that

sought to identify the stressors experienced by personnel on peacekeeping missions, the patterns of stressors for each deployment appeared to differ significantly (Thomas & Castro, 2003). Furthermore, stressors might be acute or chronic; they might be specific to the operational theatre or more occupational in nature; or they might be general life events or daily hassles that were not specific to the military, but nevertheless might assume disproportionate importance during deployment.

This research has emphasised, although not exclusively, the prevalent and chronic stressors of the deployment cycle, because it was presumed that their generic nature made them more amenable to study and intervention. In a sense, the deployment cycle – including the pre- and post-deployment phases – was considered to be one large composite stressor comprising numerous potential component stressors.

Moderators and mediators. Baron and Kenny (1986) warned against the use of the terms moderator and mediator interchangeably, arguing the conceptual differences of the two terms should be respected. Moderators were considered to be variables that affect the direction and/or the strength of the relation between an independent variable and a dependent variable. Mediators actively intervened and therefore accounted for the relation between the predictor and criterion variables. From an analytical perspective, "moderator variables specify when certain effects will hold, mediators speak to how or why such effects occur" (Baron & Kenny, 1986, p. 1176).

Like a number of researchers, Greller, Parsons and Mitchell (1992) preferred to use the term 'buffer' when discussing factors that moderated or mediated responses to stress. From a pragmatic perspective, they described buffers as operating in two distinct ways: first as "a salutary, independent effect on strain" (i.e., a moderator), and second, as a mechanism that could "also reduce the relation between a typically stressful event and strain" (i.e., a mediator) (p. 37). Often only statistical analytic techniques would shed light

on whether a variable was acting as a moderator or mediator, and sometimes in complex models, a variable could have both moderating and mediating roles. This potential dualism was acknowledged in the second component of the HDO model (refer to Figure 5).

Many conceptualisations of occupational stress (e.g., Frone, Russell, & Cooper, 1995) have posited that psychological resources and vulnerabilities might exert either stress-exacerbating or stress-buffering influences. It was anticipated that numerous factors could impinge upon the coping process during operational deployment, thereby influencing the impact of stressors. Examples of mediators, often characterised by internal transformational processes, were perceptions of organisational support, task satisfaction, and confidence in equipment. Moderators in the military context might include effective leadership, appropriate training, and positive psychological climate in the workplace. Many moderators were essentially resources, such as high levels of physical fitness, strong group cohesion, and ample recreational assets.

The HDO model supports tenets of *Conservation of Resources* theory (Hobfoll, Dunahoo, & Monnier, 1995). This theory postulated that individuals with the greatest resource pool were the most resilient when under stress, while individuals with the fewest resources were likely both to be more vulnerable to stress and to act defensively – and hence maladaptively – when faced with the loss of scarce resources. Groups that were both under stress and had minimal resources, might use existing resources inappropriately, unwisely, or even destructively. Consistent with Conservation of Resources theory, many typical support programs and psychological interventions aimed either to provide or replenish individual and group resources in the form of personal, social, informational, financial, materiel, or other assets. Certain interventions, such as psychological debriefing (Deahl, 2000; Deahl et al., 2000), were specifically intended to reduce stress. Consistent with its meta-theoretical framework, the HDO project collected information on several

factors hypothesised to buffer the impact of deployment stressors, including confidence in leadership, positive aspects of the experience of peacekeeping, and perceptions of support provided by family.

Coping. A simple definition of coping – the actions people take to avoid being harmed by stress – was adopted when the model was developed. Coping could include three broad strategies: altering one's appraisal of a stressor, managing or reducing feelings of discomfort caused by stressors within the individual, and cognitive, behavioural, and even somatic responses aimed at reducing or eliminating a source of threat or discomfort (Murphy, 1985). Coping processes were considered an important link in stress-health and stress-performance relationships, and as noted earlier, psychological coping has attracted a great deal of conceptual and research activity (Zeidner & Endler, 1996a).

In the HDO model, coping was underpinned by an appraisal process whereby an individual evaluated a stressor, might classify it as a threat or a challenge, and consequently would determine both how to adapt, and what coping resources to marshal (Murphy et al., 1998). Much of this appraisal process might occur subconsciously and could be governed by habitual response patterns, including expectancies about specific stressors and one's own ability to cope. The model viewed coping as a process with both trait (personality) and situational components and accepted that both the dispositional and contextual approaches to determining coping responses had value. It was assumed that individuals have a range of coping behaviours available and that they would selectively use those behaviours depending on stressor characteristics, situational factors (such as prevailing group norms and organisational culture), and individual preferences and tendencies. At early stages of the HDO project, greater emphasis was placed on the intra-individual approach to coping and appraisal; that is, attempting to identify basic behaviours and strategies used by military personnel on deployment. The study of *group* coping processes, largely neglected in the literature, is a

potentially valuable field for understanding and enhancing team behaviour and collective performance in military operations.

Outcomes. Ample research has documented the potentially deleterious effects of stress on individual wellbeing. Adverse outcomes in the physical, affective, cognitive, and social/behavioural arenas have been widely recognised. Behavioural science research into peacekeeping has tended to focus on the more serious adjustment problems and adverse health outcomes, including PTSD (e.g., Brundage, Kohlhase, & Gambel, 2002; Litz et al., 2003; Long, Vincent, & Chamberlain, 1995; MacDonald, Chamberlain, Long, & Mirfin, 1999; Michel et al., 2003; Orsillo et al., 1998; Stuart & Halverson, 1997). Although the HDO project does capture information about the constellation of serious post-deployment reactions that constitute post-traumatic stress disorder, the emphasis at the individual level has been on less clinical stress outcomes that are presumably more common. Indeed, Bliese and Castro (2003) 'de-emphasised' traumatic events in their peacekeeping research in the 1990s due to the limited number of peacekeepers who had developed serious stress syndromes.[5]

In a conscious attempt to transcend the usual emphasis on individual health outcomes in studies of occupational stress, the HDO model also examined group and organisation-level indicators of detrimental stress outcomes, including impacts on performance. As noted earlier, significant research has recently addressed the impact of stress on individual and collective performance (Driskell & Salas, 1996). The HDO model incorporated several additional outcome measures, including changes in commitment, morale and cohesion, and psychological readiness at multiple levels. It was envisioned that the project would eventually measure and predict key *performance* outcomes. However, because military operations present extremely complex and demanding task environments, the process of

[5] With the advent of warlike operations in Iraq and Afghanistan after 2001, this focus away from serious stress syndromes has changed appreciably.

identifying and operationalising pragmatic, universal, and meaningful performance measures remains inherently difficult (Cherns, 1962).[6] Nevertheless, many commanders were interested in morale and leadership outcomes, and this research endeavoured to demonstrate that considerable progress was being made in measuring such outcomes. Of course, it was plausible that many postulated outcomes might have multiple functions; that is, they might also link back into the deployment cycle as moderators and/or mediators, and even as sources of stress (e.g., low morale).

The deployment cycle. Experience has suggested a need to consider deployment from a broad perspective that integrated the three stages of deployment normally identified in the literature (Peebles-Kleiger & Kleiger, 1994) and used by military organisations to structure and deliver support services. These stages are predeployment, deployment, and postdeployment. Most behavioural and social science research has focused on the deployment stage itself, particularly issues of separation and operational stress (Gardner, 1995). However, interrelationships and interdependencies across the three phases of the deployment cycle have been identified and must be addressed if the complexities of deployment are to be understood and adequately addressed in support programs. For example, Vogelaar (1997) found that preparation for deployment (knowledge of probable role, tasks, Rules of Engagement, local politics, etc.) was highly correlated with both satisfaction as early as one week into deployment, and wellbeing at the end of the mission. A related finding was that expectations of the return home were often influenced by circumstances at home at the time of departure (Yerkes & Holloway, 1996).

Dobson and Marshall (1997) emphasised that military stress management programs must target both the occupational and/or traumatic stressors of the operational theatre, as well as any subsequent postdeployment

[6] Of course, the challenge of defining and measuring organisational effectiveness has not been confined to military organisations (see Katz & Kahn, 1978).

stress reactions. Several studies (e.g., Buttz, 1991) have acknowledged that the stress associated with operational deployment usually starts well before the serviceperson has left the family home. Paradoxically, research into the effects of peacekeeping deployments on New Zealand military personnel (MacDonald et al., 1999) revealed that, based on multiple indicators such as psychological distress and state anxiety, the predeployment and postdeployment phases were more stressful than deployment. Similarly, Maguen, Litz, Wang, and Cook (2004) found U.S. peacekeepers who had been deployed to Kosovo endorsed more severe mental health difficulties at predeployment compared with postdeployment. The authors suggested this outcome was a consequence of adverse anticipatory stress reactions prior to deployment.

Ideally, operational stress should be conceptualised using a model linking the three stages of the deployment cycle: pre-, peri- and post-deployment. Although not specifically illustrated in Figure 4, the HDO project has used a form of longitudinal design in an attempt to monitor the human dimensions of peace support operations across the stages of deployment. For issues of predeployment preparation and postdeployment support, the reader is referred to Schmidtchen (1999) and Murphy (2003a) respectively.

Potential Outcomes

Under the meta-theoretical umbrella afforded by the HDO model, a range of practical results is feasible. Potential outcomes from this type of applied research include:

- increased understanding across the stages of deployment of the psychological issues associated with peacekeeping at the individual, group and organisational levels, conferring an ability to answer specific questions regarding the human dimensions of operations in a timely, objective manner;

- contributions to individual and unit readiness evaluations;
- refinement of predeployment training and psychological screening;
- identification of the specific stressors and risks of peace support operations;
- useful information for the development of military doctrine and human resource management policy;
- refined guidance for the management of deployed personnel;
- awareness of changes in psychological climate (factors such as individual morale and group cohesion) following specific deployment-related events;
- provision of comparative information for key measures of effectiveness for different groups such as sub-units, rank levels, regular and reserve members, and gender; and
- clarification of the psychological impact of sustained high operational tempo, including estimates of the proportion of personnel who appear at risk of developing serious deployment or postdeployment adjustment difficulties, and evaluations of critical performance factors such as fatigue and predisposition towards inappropriate group behaviours.

Structure and Aims

In addition to this introductory chapter, the thesis is comprised of a chapter on methodology and the development of measurement instruments, followed by four chapters that each consists of a specific study, and then a brief concluding chapter. The method chapter is substantial, because many of the instruments utilised by the HDO project were developed specifically for this research, to address the uniqueness of peace support operations and the

lack of such instruments at the time the HDO project was initiated. Indeed, because one of the measures was of such fundamental importance to much of the ensuing analysis, the third chapter was devoted to its conceptual and psychometric development. The subsequent chapters examined selective micro-theoretical components of the HDO model, each with a focus on a specific stage of deployment and within the transactional stress framework. These studies conducted modelling of several psychological climate factors and stressor variables postulated to contribute to – or degrade – psychological readiness for deployment, psychological resilience during deployment, and postdeployment readjustment. Each discrete study is introduced briefly below.

Developing a measure of psychological climate. A cornerstone of the HDO project was a measure of facet-specific organisational climate at the level of the proximal work group. This chapter reported the conceptual development and psychometric validation of a multi-dimensional measure of psychological readiness in a military environment intended for use by unit and subunit commanders. Although military leaders have tended to regard climate factors such as morale, cohesion, motivation, and leadership as the foundation of military effectiveness, there were (in 1996) few tools available for commanders to determine quantitatively these human dimensions and their influence on the preparedness and capabilities of individual troops and working teams. The concepts of psychological and organisational climate were reviewed, as well as recent climate research within military organisations. The incremental stages of psychometric development were presented, along with data that attested to the underlying factor structure of the instrument, for both individuals and teams.

Psychological readiness for operations. Traditionally, the military has rarely attempted to measure the human dimensions of readiness. This chapter provided evidence for two dimensions of psychological readiness, namely individual readiness and collective readiness

at the level of the military unit. Theoretically derived psychological readiness models for both dimensions were tested. Regression and Structural Equation Modelling (SEM) examined human dimensions constructs, as well as biographical and health-related variables, as predictors of readiness.

Psychological resilience during deployment. This chapter examined factors that might account for resilience during deployment, in particular, the psychological climate variables postulated to buffer the effects of deployment stressors on strain. Relationships between the stressors of military service and strain during deployment were examined, including the potential buffering effects of human dimensions latent variables such as leadership effectiveness, personal meaning, and morale. A measure of the positive aspects of deployment was used as an indicator of the personal meaning of deployment. This study was intended to reveal the important psychological components of resilience during peacekeeping deployment.

Psychological readjustment following deployment. This chapter compared stressors encountered during deployment with the stressors specific to the postdeployment transition phase, in order to elucidate which had the strongest impact on postdeployment adjustment. The study also examined whether military commanders had an important role to play in the management and prevention of stress during homecoming. Variables included in these analyses were social support, potentially traumatic exposures, and select psychological climate factors such as cohesion and the supportive behaviour of proximal leaders.

Chapter 2

METHOD AND MEASURING INSTRUMENTS

Chapter Overview

This chapter describes the HDO project research design, survey methodology and matters of procedure and sampling. In addition, where a measure was developed specifically for this research, or an existing measure was significantly customised, the process of psychometric development is elaborated upon. These measures were the Demands of Military Service Scale (a measure of day-to-day stressors of military service), Symptoms Checklist (strain), Experience of Major Stressors Scale (traumatic stressors), Service Experiences Scale (traumatic stress), Homecoming Issues Scale (homecoming stressors), and the Positive Aspects of Deployment Scale (uplifts). Another key measure of the HDO project, the Unit Climate Profile, is the subject of the third chapter. These instruments were developed to meet the requirement for appropriate scales to measure the relatively unique aspects of peacekeeping when these operations burgeoned during the early post-Cold War era.

Research Design

The HDO project entailed applied behavioural science research into psychological aspects of deployment on peace support duties. The research incorporated a factorial design with mixed features to support correlational analysis. Data collection was primarily by self-report surveys collected from military personnel at different stages of deployment. It was intended to administer surveys before deployment, during deployment, and after deployment (hereafter referred to as predeployment, deployment, and postdeployment). However, operational and resource constraints often prevented the full sequence of survey administrations being conducted for

each sub-sample. This has been a perennial challenge in the military setting, for scientific research is, understandably, rarely a high priority in the minds of operational commanders, and obstacles to scientific inquiry abound (Langholtz, 2003). Time is usually at a premium once units are warned for overseas deployment. To conduct field research during deployment has proven difficult, due to travel costs and security issues for research personnel, and the high workload, reactive tasking and dispersion of peacekeeping personnel. The postdeployment stage also holds inherent challenges for the researcher, such as disbandment of augmented units (those established just for an operational mission), extended leave periods, and the scattering of personnel due to postings, training courses, and discharges.

Despite these challenges, between 1997 and 1999, about 8000 surveys were completed with Canadian Forces personnel as part of the HDO project. Between 1999 and 2002, just over 4500 surveys were completed with ADF personnel.

Partitioning deployment into three stages suggested a prospective design, with predeployment representing pretesting, and deployment and postdeployment providing immediate and delayed outcome data. However, although the predeployment survey did in some respects represent pretesting, the research model attributed theoretical significance to characteristics of the predeployment stage in and of itself, and not just as a means of collecting baseline data.

A prospective design normally involves repeated measures. This research incorporated a partial repeated-measures design, in that not all measures were repeated at all stages of the deployment cycle. There were two main reasons for this. The first was that some issues were not relevant to every deployment stage; for example, positive aspects of the deployment experience, and issues of readjustment upon return from deployment, are obviously not applicable to the predeployment stage. The second reason for

the lack of a full repeated-measures design, even when this was conceptually appropriate, was the obligation to minimise the time required of participants to complete surveys.

The research involved several longitudinal assessment points linked to the deployment cycle, although the participants at each assessment point were not always the same as for the preceding assessment. This was because survey administration was conducted on an opportunity basis, due to difficulties of gaining access to personnel in the dynamic environments characteristic of peace support operations. Nevertheless, respondents were drawn from the same group of deployed personnel, with shared training, a distinct corporate culture, similar deployment experiences, and often a strong group identity. Hence probabilistic equivalence was a plausible assumption for these sub-samples.

Although sampling was both purposive and homogeneous (deployed military personnel), it represented a partial within-subjects design. The use of a unique, voluntary participant code allowed a full within-subjects design, but at the expense of sample size. Due to opportunity sampling, only a portion of participants was surveyed at all stages of the deployment cycle; and only a portion of these would have provided the voluntary participant code. Due to the number of variables involved in the model, the emphasis was generally on maximising sample size.

The research design was multivariate. Surveys incorporated a number of existing psychometric measures, some of which were customised for military personnel in the peacekeeping context. Some component measures were specifically developed as part of the HDO project by the author and his associates. While the data from surveys were predominantly quantitative, about 10-20% of respondents from each survey administration provided qualitative information in the form of written remarks. This

feedback was in response to an invitation to comment on any issue relevant to the survey or the experience of deployment.

In addition to the deployment cycle surveys, the author conducted focus groups with military personnel with experience of peace support operations. The primary goal of these focus groups was to support the development of new or customised psychometric measures.

Survey Design

Piloting survey component measures allowed approximate response times to be determined for each survey. Predeployment and deployment surveys were designed to take 90% of respondents between 25 and 45 minutes to complete. Because time is generally less critical in the period following return from deployment, the postdeployment survey was designed to take about 10 minutes longer than the predeployment and deployment surveys.

Pretesting measures normally involved administration with representatives from three groups: other professional military research personnel, military officers, and military Other Ranks. Debriefings of pretesting participants paid particular attention to issues of format, item clarity, cultural compatibility, and perceived intent. These debriefings were consistent with the 'behaviour coding' pretesting method (Fowler & Cannell, 1996), in that issues raised by participants were regarded as potential 'deviations' requiring assessment for potential modification.

Survey design was governed by two main principles. The first was maximum consistency in format, particularly response scale format, across component measures. Consistency in format was intended to reduce the cognitive work required in generating answers (see Tourangeau, Rips, & Rasinski, 2000). All points on response scales were labelled with words to enhance reliability and validity, as advocated by Krosnick and Berent (1993).

The second design principle was the minimum use of items to achieve psychometric validity. This approach was largely induced by constraints on the duration of access to participants. Short versions of measures were used where available, and in some cases, were specifically developed as the research progressed.

Initial surveys were produced using standard word-processing software. Since late 1997, specialised software (*Teleform*) has been used to design and print surveys. The software has an integrated survey scanning and data transformation capability that reduces the potential for human error in the process of transferring survey responses into a database.

Each survey included a cover sheet that provided information about the purpose of the research and the voluntary nature of the survey. Assurance was given about confidentiality, in particular that survey responses would not be used for individual deployment screening or career management purposes. The covering sheet also contained general instructions for completing the survey, information about available support services in case the survey raised concerns or caused distress, and details of the principal researcher and an alternate professional contact. Consistent with the approach adopted by human dimensions research in the United States military (e.g., Castro & Adler, 2001), the cover sheet also acted as a consent form. Participants were advised that filling out the survey would be regarded as an indication that they consented to their answers being used by professional researchers. Participants were invited to retain the cover sheet. Appendix A provides an example survey cover sheet.

Most surveys administered to Australian military personnel included a section to enable the completion of a 'research participant code.' Participants were asked to generate their own code according to a set of rules – which was kept constant across surveys - so that their responses to separate surveys could be integrated across administrations without the provision of

their name. In this way, a sense of confidentiality for respondents was bolstered. It was made clear to participants that adding an identification code was optional. Appendix B provides an example of the 'Research Participant Code' section. The participant code was not used in surveys with Canadian personnel because it was an innovation, adopted after the author had returned to Australia, in response to advice from the Australian Centre for Post-traumatic Mental Health (M. C. Creamer, personal communication, September 3, 1999). The participant code was introduced in early 2000.

Participants

These were uniformed military members from the Canadian Forces (CF) and the ADF. Most deployment surveys were administered in operational theatres in Bosnia-Herzegovina (CF), Haiti (CF), East Timor (ADF), and Bougainville (ADF). Individual units or contingents were not identified in this research because of the potential sensitivities of some research outcomes for commanders in the units involved. Senior commanders were given this assurance of unit anonymity during the preliminary research phase (further explained below).

Participation in survey completion was voluntary. Very few personnel who presented at administration sessions openly declined to complete surveys. Some respondents indirectly expressed an unwillingness to participate by returning incomplete or invalid surveys. A maximum rejection rate, by administration, of less than 2% of surveys resulted from the survey inspection process that preceded data transfer from surveys to database.[1] Some units, especially those with highly selected personnel, such as Special Forces, were conspicuous in having no survey rejections.

[1] Reasons for survey rejection that resulted from the inspection process included large amounts of missing data (over 75% of items), obvious response sets such as symmetrical patterns on answer sheets or continuous use of the same response option over two or more measures, and frivolous or clearly inconsistent responses, particularly in the demographics section.

A possible exception to this general willingness to participate may be reflected in the relatively poor representation of those of officer rank in completed survey returns. Officers tended not to present at survey administration sessions. The reasons for the apparent under-representation of officers was unclear, but may have included pressing or competing work demands, an unwillingness to present at a mixed-rank venue, and disinterest in, or disapproval of, behavioural science research, particularly research that examined perceptions of leadership and unit and subunit performance.

The HDO project normally examined the deployment cycle related to peace support operations. It has also been used in other circumstances, for example, in units that were not scheduled to deploy on operations, with individuals or units deployed on remote locality operations within national boundaries, and, in rare instances, with personnel who had deployed on war service. Examples of remote locality deployments include Canadian Forces personnel posted to a station in the Canadian Arctic, and Australian Army engineer units deployed on Aboriginal and Torres Strait Islander Commission-Army Community Assistance Program tasks to Aboriginal communities in outback Australia. Due to sampling limitations, these survey samples were considered to provide comparative information, rather than to function as proper control groups.

Sampling

Random sampling was not feasible for this research. One reason for this, as noted earlier, was the difficulty gaining guaranteed access to military personnel during any stage of the deployment cycle. The pre-deployment period is characterised by heavy training and administrative demands, which tend to create tight schedules and disperse personnel across numerous locations. The deployment period is characterised by even greater dispersal of personnel throughout the area of operations in other countries, including extremely remote areas without road access. Upon return from deployment, there is normally a brief period of very intense administrative and logistic

activity. Most personnel then take extended leave. Many personnel are posted to other units during this leave period. Hence characteristics of the post deployment period also prevent ready access to personnel for research purposes.

For the above reasons, samples of research participants were drawn from available personnel at the times and places that surveys were administered. The administration of surveys was contingent upon gaining the commanding officer's consent for each unit or contingent. Although a sampling protocol based on proportional representation by rank was developed for some units, this proved to be impractical, and was never properly implemented. Despite this 'opportunity sampling', it appears reasonable to assume that the resultant samples are fairly representative of deployed populations.[2]

An option to pursue random sampling of personnel warned for deployment by using mail-out surveys was considered. The option was discounted for several reasons. The major reason was the decision to have all surveys administered face-to-face by psychologists or psychological examiners. This decision was driven by ethical concerns due to the sensitive nature of some survey components. Furthermore, if assurances of the confidentiality of survey responses were to have credibility, it was crucial that surveys were administered and collected by independent research personnel. A reason that made the use of mail-out surveys impractical was the general unreliability of postal systems within the nations where peace support operations were conducted. A further impediment to the use of mail-out surveys was the issue of 'survey fatigue' and its implied reluctance to complete surveys. Although surveys conducted within military organisations have

[2] An exception to this lack of random sampling occurred for one survey administered in the Canadian Forces with non-deployed personnel. This 'Omnibus Survey' had a broad human resource management scope and included some measures from the Human Dimension of Operations project. This survey was sent to a random, stratified sample based on rank, gender, language, unit, and location within Canada, and yielded substantial returns.

tended to obtain relatively high response rates, there has been some evidence that response rates are beginning to fall (Department of Defence, 2004).[3]

Procedure

In Canada, the research procedure was developed in accordance with Canadian Psychological Association ethical principles and Department of National Defence approved procedures for research with human subjects (Canadian Forces, 2002). In Australia, research protocols were approved by the Australian Defence Human Research Ethics Committee according to the governance structure and ethical oversight contained in policy documentation (Defence Health Services Branch, 2003).

Preliminary activities. A number of steps preceded survey administration. In all cases, the first step was to brief the commanding officer of a deploying unit about the aims and outcomes of the HDO project. This process normally utilised a written brief (an example is contained in Appendix C) in addition to face-to-face or telephone contact. Research would only proceed if the commanding officer's consent was gained. To enhance the practical outcomes of the research from a commander's perspective, each survey was normally tailored to some degree to each unit or contingent involved. This tailoring was usually limited to the addition or modification of demographic or 'general information' items, and the inclusion of certain 'topical' items. This flexible approach allowed short-term research outcomes to be specifically tailored to the needs and interests of commanders, while providing data for longer-term, more conceptual analysis.

Survey administration. Surveys were administered by military psychologists or, in some cases with Australian samples, by psychological

[3] This decrease presumably has been due to the large number of surveys carried out within the military forces of Western nations in recent years. For example, Newell, Rosenfeld, Harris, and Hindelang (2004) found the main reasons for a 50% decline over a 10 year period in response rates to one U.S. Navy survey were a belief that surveys have no impact, general apathy towards surveys, and survey length.

examiners.[4] While in some cases the author carried out the administration of surveys, it was usually more efficient to have local military psychology assets carry out this task. All military psychologists and psychological examiners receive extensive training in practical and conceptual matters pertaining to research methodology and the administration of psychometric measures. Psychology staff who supported this research were normally provided (by this author) with a written brief on the HDO project (Appendix C) and specific instructions for administering relevant surveys (Appendix D).

Generally, surveys were administered to groups, in some cases numbering up to 80 personnel. Typical group size was around 20. Normally, the administrator supervised the group throughout the administration session. In rare instances in field situations, surveys were distributed during a visit by psychology personnel and collected on a subsequent visit. Occasionally, surveys were administered individually. In some cases, a senior member of the unit involved would preface the administration with supportive comments. The survey administrator would brief the group (Appendix D contains an example administration brief) and direct them to read the cover sheet before commencing the survey proper.

Situations for survey completion varied. Predeployment and postdeployment surveys were usually completed in meeting rooms, classrooms, or assembly halls within barracks. Surveys administered during deployment were completed in numerous locations, such as temporary messes, inside tents, and in the shade of nearby trees. A wide range of environmental conditions was extant across deployment locations and deployment duration. For example, troops in Haiti often completed the surveys in an ambient temperature of over 40 degrees Celsius; those in East

[4] Psychological examiners are noncommissioned members of the Australian Army Psychology Corps who receive paraprofessional psychology training (including Certificate Level 4 in Mental Health (non-clinical)) for duties as 'psychology support personnel.' These duties include psychological test administration, basic psychological screening and mental health support, and training support.

Timor were generally in hot and humid conditions; while those in Bosnia could be in very cold conditions.

Predeployment surveys were usually administered within the month prior to deployment. Most deployments were six months in duration. Canadian Forces personnel were surveyed up to three times during deployment: about six weeks after arrival in theatre, at about the halfway mark, and about a month before returning home. ADF personnel were normally surveyed only once during deployment and this usually occurred in the third or fourth month in theatre. Postdeployment surveys were normally administered four to six months after return.

Data Screening

Survey checking. Prior to coding survey responses into a database, each survey was examined for verity by visually scanning for missing data, qualitative responses suggesting invalid responses, obvious response patterns, and extreme cases. Typically, this visual data screening resulted in the removal of less than 2 percent of returned surveys.

Data entry checking. Prior to conducting data analysis, data sets were examined for accuracy of data entry, particularly before the introduction of software-enabled automatic survey scanning and data transfer. Data sets were examined by checking response ranges and missing data, and crosschecking uncertain data points with the original surveys.

Data screening. Statistical data screening for each scale was conducted in accordance with advice from Tabachnik and Fidell (2001) and Kline (1997). Univariate normality was checked by examining skewness and kurtosis of the data distributions. Skewness values greater than an absolute value of 3 and kurtosis values greater than an absolute value of 8 were considered to indicate univariate normality problems. Scatterplots were examined to check for bivariate normality and linearity. Univariate outliers

were identified by scores greater than an absolute value of 3.29 ($p < .001$, two-tailed test) in frequency distributions of standardised scores. Multivariate normality was assessed by examining Mahalanobis distances. To test for multicollinearity, a correlation matrix of all items within each scale was constructed. Values above .80 were considered to indicate multicollinearity.

Scales and Measures

As research into peace support operations expanded during the 1990s, a great deal of effort was devoted to the development of appropriate scales and measures of the relatively unique characteristics of these post-Cold War operations. However, that effort was rarely integrated across Services or between nations. This lack of integration was not surprising because a large proportion of military research is not reported in the mainstream literature (Ginzburg & Dar-El, 2000; Hagman & Rose, 1983). Furthermore, even though peacekeeping missions usually contain multinational forces, the level of intercultural interaction between coalition elements is often low (Soeters & Bos-Bakx, 2003). As a result, much of the research effort was confined to single nations. In recognition of the potential for research duplication, and in an effort to foster international research collaboration, the U.S. Army Medical Research Unit-Europe hosted a two-day working group of military behavioural scientists to examine methodological issues related to human dimensions research in peace support operations (Castro, 2000). The goal of this working group, attended by representatives from five nations (Canada, Germany, The Netherlands, Norway, and the United States), was to identify common scales for use in human dimensions research within the military. Consensus scales and measures were developed in the areas of demographics, operational tempo/workload, job attitudes, military readiness, health, personality and individual difference variables, family issues and soldier issues. The HDO project, designed in 1996, predated this effort at methodological standardisation. Nevertheless, the similarities in theoretical frameworks,

research design, and even individual survey items across the nations conducting human dimensions research frequently proved to be striking.

A summary of the psychometric measures contained in this research is provided in Table 1. The measures are listed by stage of deployment. Due to various exigencies of deployment, this schedule of measures was not consistently applied. A record of component measures for both Canada and Australia by contingent or unit (coded) and stage of deployment is contained in Appendix E. The component measures used in this dissertation are described in the remainder of this chapter. In cases where a measure was developed specifically for this research, or an existing measure was significantly customised, the process of psychometric development is elaborated upon.

Demographic Information

Every survey, irrespective of the stage of deployment, had a section called 'General Information' that consisted of various items that allowed the determination of sample demographics. Several biodata items allowed for statistical controls to minimise confound variance. Several items sought standard bio-data, such as gender, marital status, age, education, and number of dependants at home. A number of items were related to military characteristics, including unit, subunit, Corps, rank, years of service, operational experience, and career intentions. Other items in the 'General Information' section related to issues that were conceptually relevant to HDO research. Subject areas for these items included indicators of health and wellness behaviours such as typical sleep duration, frequency of exercise, and consumption of alcohol, caffeine, and tobacco.

TABLE 1
Human Dimensions Survey Component Measures by Stage of Deployment

Predeployment	**During deployment**	**Postdeployment**
Information sheet/consent form	Information sheet/consent form	Information sheet/consent form
Participant code	Participant code	Participant code
'General Information' (biodata; demographics; work factors, etc)	'General Information' (biodata; demographics; work factors, etc)	'General Information' (biodata ; demographics; work factors, etc)
'Military Service' (Unit Climate Profile)	'Military Service' (Unit Climate Profile)	'Military Service' (Unit Climate Profile)
'Health' (Symptoms Checklist)	'Health' (Symptoms Checklist)	'Health' (Symptoms Checklist)
'Demands of Military Service' (Stress in Military Service Questionnaire)	'Demands of Military Service' (Stress in Military Service Questionnaire)	'Demands of Military Service' (Stress in Military Service Questionnaire)
General comments	General comments	General comments
Family Matters		
'Dealing with Problems' (COPE Inventory - modified)	'Dealing with Problems' (COPE Inventory - modified)[5]	
'Serious Events During Service' (traumatic stressors)		'Serious Events During Service' (traumatic stressors)
	Positive aspects of the tour	
	Topical issues	'The tour in perspective' (topical issues)
		'Homecoming issues' (readjustment)
		'Organisational Support' (perceived organisational support)
		'Service Experiences' (serious stress reactions)

[5] Canadian Forces HDO only.

Although there was never an intention to identify individual respondents, early feedback indicated that a number of soldiers were concerned about this possibility. To give the assurances of confidentiality and anonymity a degree of credibility, several demographic items included grouped response options, in order to reduce the ability to identify individual respondents. For example, because relatively few officers participated in surveys, the 'rank' item included a response option that grouped all officer ranks together. The 'age' variable was divided into 5 response groupings (18-21 yrs, 22-26 yrs, 27-31 yrs, 32-36 yrs, and 37+ yrs), calculated to provide roughly equal sub-sample sizes for this item.

An example 'General Information' section of a HDO survey is provided at Appendix F.

Demands of Military Service Scale

Given the subjective nature of stress, and the variety of stressors across peace support operations, a systematic approach to the measurement of stressors was required (Litz, 1996). However, research that has identified what has been stressful to peacekeepers has been less than comprehensive (Adler, Litz, & Bartone, 2003). In some cases, efforts to distinguish peacekeeping stressors have been restricted to potentially traumatic events, while other approaches have captured mundane sources of stress related to military service or to living in a deployment environment. Adler, Litz and Bartone (2003) posited that a sensible approach to organising research on the stressors of peace support operations would include both classes of stressors (i.e., high magnitude stressors and daily hassles).

The HDO research model established a requirement to determine the sources of stress for military personnel during the three phases of deployment. These sources of stress were not limited to characteristics of the operating environment such as dust and weapons fire, because it was widely known that several stressor domains impact on deployed personnel (Bartone,

Adler, & Vaitkus, 1998). One of these domains comprised occupational stressors, including characteristics of the workplace, policies of the wider organisation, and interactions with agencies external to the organisation. Another familiar domain involved personal stressors such as health, career progression, and work satisfaction. A third important stressor domain was the interface between work and personal domains, such as family issues, which often becomes particularly salient during deployment. At the commencement of the HDO project, no known psychometric measure could adequately address this broad requirement. Therefore, a specific tool – the Stressors of Military Service Scale (see Appendix G) – was developed in the early stages of the project. Since that time, several stressor scales related to peace support operations have been reported in the literature (e.g., Moldjord, Fossum, & Holen, 2001).

In order to develop a measure of the stressors associated with military service across the deployment cycle, the author's experience of briefing and debriefing Australian operational personnel (e.g., Murphy, 1990) was combined with a review of the literature relating to the stress of military service. This list was subsequently refined during a number of focus groups with Canadian military personnel. These activities led to a list of 105 stressors relating to military service generally, and operational deployment more specifically. This extensive list of stressors, contained in Appendix G Annex G1, was included in three early surveys of Canadian Forces peacekeepers deployed in Bosnia and Haiti. Although this initial version of the 'Stress in Peace Support Operations Scale' showed promising psychometric properties and conceptual structure, there was need for a much more concise measure. The process of reducing the 105-item into shorter, non-operational and operational versions of the scale is outlined in Appendix G.

Two new versions of the stressors scale were labelled: 'Demands of Military Service (Non-operational)' (30 items) and 'Demands of Military Service (Operational)' (35 items). The non-operational version was for use in

the predeployment and postdeployment phases. The operational version was for use with deployed samples. As a result of respondent and focus group feedback, five stressor items that had not been included in the antecedent Stress in Peace Support Operations scale were included in both versions of the new scale. These items were: conditions of Service matters, administrative support, degree of control over work tasks, quality of personal military clothing and equipment, and organisational policies that impact on work. The two versions of the new scale shared 29 items. The non-operational version had one unique item regarding career uncertainty. The operational version included six items that dealt with stressors considered to be unique to the deployment phase. These items canvassed exposure to traumatic stressors (three items), experience of 'culture clash' (one item), an aspect of personal security - non-military threat (one item), and uncertainty about end-of-mission date (one item).

The 'Demands of Military Service (Non-operational)' and 'Demands of Military Service (Operational)' scales are presented in Appendices H and I respectively. These versions incorporated changes to the instructions and to the response scale options. Respondents were asked to rate the trouble or concern caused by each given stressor "during the preceding month," rather than "at any time during the course of this deployment." This change in wording was necessitated by the intention to administer surveys across all three stages of the deployment cycle. This modification also promoted standardisation of the time period used by respondents to make their assessments. The 'Demands of Military Service' scales used a five-point response scale denoting increasing levels of trouble or concern ranging between nil and "very much".

The change of this scale's name from 'Stress in Peace Support Operations' to 'Demands of Military Service' (in Australia) and 'Stress in Military Service' (in Canada) transpired for two reasons. Firstly, it was intended to use the scale across the deployment cycle, and the new names

were compatible with all three stages of deployment. Secondly, the name of the Australian version ('Demands of Military Service'), took into consideration feedback from interviews and focus groups that suggested a need to avoid use of the term 'stress' in military populations because it appeared to have a range of, often imprecise and negative, meanings.

Psychometric analysis of the Canadian Stress in Military Service (Operational) scale was undertaken by the Operational Effectiveness Section of the Directorate for Human Resource Research and Evaluation (DHRRE) in the Canadian Forces (Dobreva-Martinova, 1998b). A PCA with varimax rotation accounted for 54.7% of variance in a merged sample of 694 respondents. The analysis revealed five components of stress experienced by personnel while on a peace support operation in the former Yugoslavia. These areas were labelled: 'work environment', 'external conditions', 'Service/career issues', and 'family concerns' and 'combat stressors'. The component labelled 'combat stressors' included items regarding potentially disturbing sources of stress that normally only would be encountered while overseas in situations characterised by suffering and conflict. Items that comprised this component included "Seeing widespread suffering (starvation, poverty, disease)", "Seeing instances of inhumanity (e.g., neglected children, abuse, exploitation)", and "Experience with death (e.g., seeing someone die, handling corpses)". This 'combat stressors' component perhaps would have been labelled more appropriately as 'Exposure to traumatic experience.'

The psychometric analysis by Dobreva-Martinova (1998b) concluded that the Stress of Military Service scale had good psychometric properties. Full-scale coefficient alpha was .93, and reliability coefficients for the subscales represented by the five extracted factors ranged between .80 and .87. The factor structure was judged as stable and conceptually concordant with expectations derived from a literature review and focus group research with veterans of peacekeeping missions. With the exception of one item (Uncertainty about your own competence to do your job), the instrument was

strongly endorsed as a valid and reliable measure of the stressors associated with military service.

Farley (2002) attempted to confirm the factor structure of the 35-item Stress of Military Service scale using a large sample (n=1,997) of Canadian Forces Peacekeeping personnel. Factor analysis (EQS software) using oblique rotation was conducted, resulting in a five-factor solution very similar to that reported by Dobreva-Martinova (1998b). One factor was relabelled: 'external conditions' became 'living conditions'. Total variance accounted for was 59.9% compared to 54.7% for the previous analysis by Dobreva-Martinova. Reliability coefficient alpha for the five factors improved to a range from .86 to .92 (previously .80 to .87). Four items did not meet the .4 loading cut-off: 'workload', 'dealing with people external', 'uncertainty about end-of-mission date', and 'unit policies and regulations'.

The current study conducted psychometric analysis of the 'Demands of Military Service' scale, using more recent data from Australian respondents. Focus group research with Canadian Forces personnel had provided the Australian researcher with indications that differences in attitudes and opinions existed between Canadian and Australian troops. It was plausible that these differences might alter the underlying dimensions of measures such as the 'Demands of Military Service' scale. In addition to corroborating the factor structure elicited from Canadian data, it was of interest to determine if the scale maintained its component structure across the three stages of deployment. As noted in the introductory chapter, each deployment and each deployment phase appears to be characterised by a unique blend of specific stressors. In order to allow reliable comparisons across and between deployments, a measure of deployment-related stressors that would capture the postulated underlying stressor dimensions was required. Separate factor analyses were conducted using three samples defined by deployment phase (predeployment n=411; deployment n=560; postdeployment n=334).

The three distributions were assessed for normality and screened for univariate and multivariate outliers. Outliers in each sample were discarded.[6] Consistent with a procedure advocated by Tabachnik and Fidell (1989), principal components extraction was used prior to principal factors extraction in order to estimate number of factors and check factorability of correlation matrices. Factorability indices[7] for the separate samples were favourable. Descriptive statistics of the Stressors of Military Service Scale for the three samples are contained in Appendix J.

To allow comparisons with previous psychometric analyses of this instrument, similar statistical procedures were adopted. Principal components extraction with varimax rotation was performed on the predeployment sample of the 30-item version of the scale. Six factors with eigenvalues larger than 1 were extracted, which accounted for 57% of the variance in the data. The components were labelled 'Operational stressors', 'Workplace stressors', 'Family concerns', 'Organisational support', 'Equity issues', and 'Career concerns'. Item component loadings and percent variance explained by these components are shown in Table 3. Two items failed to load at the specified level (.4) on any component. One of these items, 'Dealing with people external to the ADF in your work (eg. local police and officials)', was more likely to be salient for most personnel during deployment rather than at the predeployment stage. This may explain its failure to load on a component. The other item that did not load at the specified level was 'Mental or physical fatigue'. This item loaded above the .36 level on each of the first three extracted components: 'Operational stressors', 'Workplace stressors', and 'Family concerns'. This apparent multidimensionality was not surprising given the variety and complexity of concepts of fatigue (Tepas & Price, 2001).

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[6] There were 17, 41, and 6 univariate outliers and 43, 42 and 22 multivariate outliers in the respective predeployment, deployment, and postdeployment data.

[7] These indices were sufficient subjects-to-variable ratio, presence of correlations above .3 in the correlation matrix; sufficient MSAs values in the diagonal of the anti-image correlation matrix, and statistics for Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity.

TABLE 2
Factor Loadings and Percent of Variance for Principal Components Extraction with Varimax Rotation on the 30-item Demands of Military Service Scale – Predeployment Sample (n=356)

Item	**Component** [a]					
	1	2	3	4	5	6
Harsh environmental conditions	.74					
Threat of serious injury	.73					
Standard of living conditions in the field	.73					
Lack of recreational opportunities	.53					
Lack of privacy	.51					
Dealing with those external to organisation						
Uncertainty about the competence of others		.72				
Uncertainty over own work role		.64				
Boredom at work		.60				
Amount of control over work		.59		.42		
Lack of cohesion among co-workers		.57				
Feedback about your work		.51				
Leadership concerns		.47			.41	
Uncertainty about own competence		.42				
Problems with or in your family			.81			
Impact of deployment on family relations			.78			
Communication with your family			.78			
Time away from family due to service			.62			
Mental or physical fatigue						
Conditions of service matters				.77		
Administrative support				.72		
Training issues				.50		.43
Workload				.48		
Level of support from outside organisation				.48		
Organisation policies that impact work					.76	
Double standards					.51	
Unit policies and regulations					.51	
Quality of clothing and equipment					.48	
Career issues						.69
Uncertainty about future in military						.63
Percent of explained variance	12.00	11.60	10.17	8.84	8.19	6.20
Cronbach's alpha	.80	.82	.85	.77	.70	.58

Note: [a] Component labels:
- C_1 Operational stressors
- C_2 Workplace stressors
- C_3 Family concerns
- C_4 Organisational support
- C_5 Equity issues
- C_6 Career concerns

Three items loaded above the specified level on two components. These 'complex variables' were 'Degree of control over work tasks', 'Leadership concerns', and 'Training issues (eg. relevance, repetition, amount)'. In each case, the dual loadings of these items made conceptual and pragmatic sense. For example, 'Degree of control over work tasks' loaded on both 'Workplace stressors' and 'Organisational support', which was interpreted to indicate that a lack of autonomy was both a source of frustration and a sign of perceived lack of organisational support.

Similar analyses were performed on the 35-item version of the Demands of Military Service scale with a sample of deployed Australian soldiers. Principal components extraction with varimax rotation resulted in six factors with eigenvalues larger than 1, which collectively accounted for 56.4% of the variance. The components were labelled 'Workplace stressors', 'Operational stressors', 'Potentially traumatic stressors', 'Organisational support', 'Family concerns', and 'Ambiguity'. Loadings of items on the components and percents of accounted variance are shown in Table 4. Once again, the item 'Dealing with people external to the ADF in your work' did not load at the specified level (.4). The distinctiveness of this item may be due to a small number of personnel, and in most cases those of relatively senior rank, having regular dealings with external agencies/people whilst deployed overseas. One of the items unique to the deployment version of the scale, 'Uncertainty about end-of-mission date', also failed to load on a component. This may be due to most recent missions having definite end-of-mission dates, unlike some earlier Peace Support Operations.

As expected, a component comprising the items relating to potentially traumatic stressors emerged in the deployment version of the scale. The two components from the predeployment sample PCA that accounted for the least variance - 'Equity issues' and 'Career concerns' - were not present in the deployment sample PCA. A factor labelled 'Ambiguity' emerged, consistent with research that has shown uncertainty to be among

the most powerful stressors during military deployment (Adler et al., 2003). Examination of Table 4 revealed three complex factors with items that loaded above the specified level on two components. These items were 'Degree of control over work tasks', 'Uncertainty over work role', and 'Organisational policies that impact on work'. Again, the dual loadings of these items made conceptual sense. For example, 'Uncertainty over work role' loaded on the 'Workplace stressors' and 'Ambiguity' components, which suggested that work role uncertainty was both a primary stressor and a contributor to a broader sense of ambiguity. Such ambiguity has been characteristic of military operations throughout history, as the expression 'the fog of war' (Clausewitz, 1976) graphically illustrates. The same six-factor structure was discernible in the solutions provided by Principal Axis factoring using Varimax rotation (which accounted for 48.1% of the variance) as that yielded by PCA with Varimax rotation. The Principal Axis factoring solutions produced a slightly different order of factor emergence and contained additional items (four in total) that did not load at the specified level.

A third series of analyses were performed on the 30-item version of the Demands of Military Service scale with a sample of Australian soldiers who had returned from deployment. Principal components extraction with varimax rotation resulted in five factors with eigenvalues larger than 1, which accounted for 65.5% of the variance. All items loaded on at least one component at the .4 level. There were five 'complex' variables, each with items with loadings above .4 on more than one component. Loadings of items on the components and percents of variance are shown in Table 5. The components were labelled 'Operational stressors', 'Workplace stressors', 'Family concerns', 'Equity issues', and 'Organisational support'. With the exception of having one less factor ('Career concerns'), this represents a similar factor structure to that extracted from the predeployment sample. The same five-factor structure emerged in outcomes provided by Principal Axis Factoring using Varimax rotation, accounting for 59.1% of the variance.

TABLE 3
Factor Loadings and Percent of Variance for Principal Components Extraction with Varimax Rotation on the 35-item Demands of Military Service Scale – Deployment Sample (n=518)

Item	Component [a]					
	1	2	3	4	5	6
Leadership concerns	.77					
Double standards	.68					
Unit policies and regulations	.62					
Lack of cohesion among co-workers	.60					
Uncertainty competence of others	.56					
Training issues	.55					
Feedback about your work	.53					
Harsh environmental conditions		.72				
Threat of serious injury		.67				
Lack of recreation opportunities		.65				
Mental or physical fatigue		.64				
Standard of living conditions in field		.64				
Lack of privacy		.57				
Workload		.49				
Uncertainty about end-of-mission date						
Seeing instances of inhumanity			.87			
Seeing widespread suffering			.84			
Impact of a different culture			.80			
Experiences with death			.72			
Risk of contracting serious disease			.48			
Conditions of service matters				.76		
Administrative support				.69		
Quality of clothing and equipment				.64		
Career issues				.58		
Level of support from outside organisation				.53		
Organisational policies that impact work	.49			.52		
Dealing with those external to organisation						
Impact of deployment on family relations					.84	
Problems with or in your family					.78	
Communication with your family					.75	
Time away from family due to service					.72	
Uncertainty own competence						.71
Amount of control over work	.46					.60
Uncertainty over work role	.41					.57
Boredom at work						.55
Percent of explained variance	11.90	10.91	9.77	9.20	8.65	5.96
Cronbach's alpha	.83	.85	.85	.80	.86	.71

Note: [a] Component labels:

C_1 Workplace stressors
C_2 Operational stressors
C_3 Potentially traumatic stressors
C_4 Organisational support
C_5 Family concerns
C_6 Ambiguity/Uncertainty

TABLE 4
Factor Loadings and Percent of Variance for Principal Components Extraction with Varimax Rotation on the 30-item Demands of Military Service Scale – Postdeployment Sample (n=312)

Item [a]	**Component** [b]				
	1	2	3	4	5
Harsh environmental conditions	.78				
Standard of living conditions in field	.71				
Threat of serious injury	.70				
Mental or physical fatigue	.69				
Dealing with those external to organisation	.64				
Level of support from outside organisation	.59			.41	
Lack of recreation opportunities	.56				
Uncertainty about future in military	.47				
Work control		.75			
Uncertainty competence of others		.75			
Leadership concerns		.70			
Uncertainty over work role		.69			
Lack of cohesion among co-workers		.65			
Uncertainty own competence		.54	.40		
Boredom at work		.52			
Feedback about your work	.42	.49			
Communication with your family			.84		
Problems with or in your family			.84		
Impact of deployment on family relations			.80		
Time away from family due to service			.62		
Unit policies and regulations				.67	
Organisation policies that impact work		.44		.65	
Double standards				.60	
Lack of privacy	.49			.56	
Quality of clothing and equipment				.48	
Career issues					.74
Administrative support					.70
Conditions of service matters					.70
Training issues		.50			.58
Workload					.55
Percent of explained variance	16.09	15.91	11.73	11.09	10.68
Cronbach's alpha	.91	.90	.91	.85	.84

Notes: [a] Some item content has been summarised for brevity.
[b] Component labels:
C_1 Operational stressors
C_2 Workplace stressors
C_3 Family concerns
C_4 Equity concerns
C_5 Organisational support

A summary of outcomes from the psychometric assessment of the Demands of Military Service Scale for the three stages of the deployment cycle is provided in Table 6. The factor structure of the scale was remarkably stable across deployment stages, despite different deployment samples being utilised for analysis. The factor labelled 'Potentially traumatic stressors' that emerged in the deployment sample, accorded with the design of this version of the scale, which included extra items to measure this construct. Alpha coefficients for both the full-scale and factor-derived subscales were high, suggesting strong internal consistency. As a measure of the main stressor domains for peacekeeping personnel, the Demands of Military Service Scale showed considerable potential.

TABLE 5
Principal Components and Percent of Variance from Separate Analyses of the Demands of Military Service Scale for Samples at Three Different Stages of the Deployment Cycle

Predeployment Principal Components % variance/Cronbach's alpha	**Deployment** Principal Components % variance/Cronbach's alpha	**Postdeployment** Principal Components % variance/Cronbach's alpha
Operational stressors 12.00/.80	Workplace stressors 11.90/.83	Operational stressors 16.09/.91
Workplace stressors 11.60/.82	Operational stressors 10.91/.85	Workplace stressors 15.91/.90
Family concerns 10.17/.85	Potentially traumatic stressors 9.77/.85	Family concerns 11.73/.91
Organisational support 8.84/.77	Organisational support 9.20/.80	Equity issues 11.09/.85
Equity issues 8.19/.70	Family concerns 8.65/.86	Organisational support 10.68/.84
Career concerns 6.20/.58	Ambiguity in the workplace 5.96/.71	
Total Scale 57.02/.93	**Total Scale** 56.40/.93	**Total Scale** 65.50/.96

Symptoms Checklist (modified)

Strain was an outcome variable in the conceptual model underlying this research. Strain, conceptualised as an adverse reaction to stress, has been a focus of research in numerous occupational stress studies (e.g., Beehr, 1995; Griffith, 1997; Pflanz & Sonnek, 2002) and in several studies of operational effectiveness in peace support environments (Bartone, Vaitkus, & Adler, 1994; Bliese & Castro, 2003; Farley, 1995). Many researchers have explored the inter-relationships between stress, strain and illness (e.g., Baum & Posluszny, 1999; Critelli & Ee, 1996; Dougall & Baum, 2001; Kobasa, Maddi, & Courington, 1981). The Symptoms Checklist (Bartone, Ursano, Wright, & Ingraham, 1989, 2000) measures the frequency of psychological and physical indices of distress. The scale was developed during a study of military disaster assistance workers who were providing long-term support to the families of the 248 soldiers killed in an aircraft crash in Gander, Newfoundland in December 1985. Respondents are asked to indicate how often they have experienced each of the given "troubles or complaints" over the preceding month. Four response options ranged from 'none', through 'sometimes' and 'often' to 'very often'.

The Symptoms Checklist was composed of items from two foregoing instruments. Eleven items were drawn from the Psychosomatic Complaints Scale, initially developed by Stouffer, Guttman, Suchman, Lazarsfeld, Star and Clausen (1950) and subsequently adapted by Bradburn (1969). The scale originated in the extensive studies of United States soldiers carried out during the Second World War, and it was reported to have had sound psychometric properties (Stouffer et al., 1950). Nine items in the Symptoms Checklist were drawn from the Hopkins Symptoms Checklist (Derogatis, Lipma, & Rickels, 1974), in order to canvass additional symptoms commonly encountered in studies of traumatic stress.

Bartone et al. (1989) conducted a factor analysis of the Symptoms Checklist and reported four dimensions accounting for 48% of the variance.

These factors were labelled 'depression/withdrawal', 'hyperalertness', 'generalised anxiety', and 'somatic complaints'. Reliability coefficients (Cronbach's alpha) for these subscales ranged from .90 to .93. Dobreva-Martinova (1998a) replicated a psychometric analysis of the Symptoms Checklist using Canadian data from the HDO project. She found that four similar factors emerged from Principal Components Analysis, accounting for 47% of the variance. Reliability analysis resulted in a total scale alpha coefficient of .87.

The Symptoms Checklist was modified in two ways for this research. The first modification involved changes to the wording of select items. Following feedback from pilot testing, some items were modified to conform better to the corporate language and culture of the military. For example "crying easily" was reduced to "crying". Other items were modified to reflect the realities of peace support duties. For example, the item 'lack of appetite/loss of weight' was split into two items because weight loss on peace support operations often has been due to climatic factors, limited access to rations, and intensive physical activity, rather than a loss of appetite.

The second modification to the scale was the addition of items. The Symptoms Checklist provided a measure of stress that is composed largely of physical and psychological outcomes. Most contemporary views of stress have posited a third dimension of strain: behavioural consequences (Beehr & Newman, 1978). To gain a more balanced representation of these three dimensions of strain, 15 items were added to the scale. Ten of these items were drawn from the Hopkins Symptoms Checklist (Derogatis et al., 1974); and five items came from the author's practical knowledge of psychotrauma and his experience of debriefing/screening with returning peacekeepers. The additional items were concerned mainly with anxiety, traumatic stress reactions, and fatigue, and hence were consistent with three of the dimensions (generalised anxiety, hyperalertness, somatic complaints) of the scale established by Bartone et al. (1989). The resultant scale comprised 36 items

with three conceptualised sub-domains: physiological strain (14 items); psychological strain (12 items); behavioural strain (10 items). Appendix K contains the 36-item 'Symptoms Checklist (modified)', which was entitled 'Signs' in research surveys with Canadian military personnel and 'Health' in surveys with Australian Defence personnel.

The Symptoms Checklist (modified) was subjected to psychometric analysis by Dobreva-Martinova (1998a). Using a merged sample of respondents (n=959) from the HDO project, she compared factor analytic outcomes for the original 21 Symptoms Checklist items with the modified 36-item version. The original version accounted for more variance in the data (47.1% versus 42.8%) and the factor structure that emerged from PCA of the original items was considered conceptually more meaningful. As a result, Dobreva-Martinova recommended the use of the original version of the Symptoms Checklist in future research. However, this author contends that the recommendation was premature, because it was based on an analysis of one sample of respondents, and the interpretation of the resultant factor structure of the modified version was contestable.

More recently, Farley (2002) extracted a similar four-factor structure to Dobreva-Martinova (1998a), that accounted for 45.6% of total variance of a large sample (n=1,927) of Canadian peacekeepers. Nevertheless, in order to examine further the structure of the 36-item Symptoms Checklist (modified), an Australian sample was analysed. A postdeployment dataset (n=334) was chosen. Several scale items had skewness and kurtosis values outside the recommended ranges (specified earlier). These items constituted more serious or culturally unacceptable symptoms (from an organisational perspective), for example, pains in the heart or chest, thoughts of ending one's life, and crying. Non-normal response distributions were expected for such items in military populations, which are defined by norms of masculine behaviour and are highly selected and trained in relation to fitness and health. Previous psychometric analyses of the Symptoms Checklist (Bartone et al.,

1989; Dobreva-Martinova, 1998a) did not report an assessment of normality. This lack of normality may explain why Bartone et al. (1989) used a median split of the Symptoms Checklist total score (transforming a presumably continuous scale into a categorical one) and regression procedures rather than analysis of variance in their study. In view of the expected non-normality of some item distributions in Symptoms Checklist (modified) response sets, all items were retained. Hence, factor analytic outcomes will need to be viewed with caution.

Data screening was conducted and identified 19 univariate and 38 multivariate outliers for the sample. For reasons discussed above, outliers were not discarded from subsequent analysis. Factorability indices for the sample were favourable, including Kaiser-Meyer-Olkin Measure of Sampling Adequacy (.95), Bartlett's Test of Sphericity (approximate χ^2 of 6809.277; df 630; $p < .000$), and MSA above .82. Descriptive statistics for the sample are contained in Appendix L.

PCA with Varimax (orthogonal) rotation was initially performed. Six factors emerged, accounting for 60.7% of the variance. To explore factor structure stability, factor analysis using Maximum Likelihood extraction with Varimax rotation was performed. The amount of variance accounted for dropped to 53.3%. However, the same six factors were recognisable, albeit with generally lower loadings. Tabachnik and Fidell (2001) note that valid data will normally provide similar outcomes irrespective of the factor-analytic approach adopted. The factors were labelled 'Depression/Withdrawal', 'Behavioural/ Mental Anxiety', 'Somatic Complaints', 'Physiological Anxiety', 'Hyper-arousal', and 'Emotional Lability'. The two new factors conformed with the rationale for adding additional items to the original Symptoms Checklist – to capture the behavioural and emotional components of strain widely posited in the literature (e.g., Beehr, 1995). In addition to the emergence of additional, meaningful factors, the expanded version of the Symptoms Checklist accounted for considerably more variance in the data

than previous studies using the original 20-item version (Bartone et al., 1989; Dobreva-Martinova, 1998a; Farley, 2002) (60.7% compared with 48%, 47%, and 46%). Reliability coefficients (Cronbach's alpha) for the six factors ranged from .71 (hyper-arousal) to .91 (depression/withdrawal). Table 7 contains summary data of the PCA of the Symptoms Checklist (modified) using an Australian postdeployment sample. On the basis of these reassuring outcomes, it was decided to utilise the 36-item version in this research. Interestingly, the 10 most frequently reported symptoms across Australian samples usually included three or four of the new items, providing further evidence of the value of the additional scale items.

Experience of Major Stressors Scale

The research model underlying the HDO project established a requirement to determine the sources of stress experienced by military personnel. The Demands of Military Service Scale measured a number of stressor domains, including 'Operational stressors', 'Workplace stressors', and 'Family concerns'. However, the domain coverage of potentially traumatic stressors was necessarily brief in the deployment version of the scale, and was addressed by only five items. Research into the causes of serious reactions such as PTSD has found a robust link between potentially traumatic events and subsequent adjustment (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). The first diagnostic criterion for PTSD, as listed in the Diagnostic and Statistical Manual of Mental Disorders (DSM) (American Psychiatric Association, 1994), is that an individual has been exposed to a life-threatening event to which the individual responded with fear, helplessness, or horror. The Experience of Major Stressors Scale was intended to explore the experience of serious (tragic or life-threatening) incidents associated with military service, particularly during deployment. The items in the scale contribute to the stressor and strain components of the model underlying this research. Scale items include 'armed combat', 'seeing abusive violence',

TABLE 6
Factor Loadings and Percent of Variance for Principal Components Extraction and Varimax Rotation on the Symptoms Checklist (modified) Scale Items – Postdeployment Sample

Item	Component [a]					
	1	2	3	4	5	6
Trouble sleeping	.67					
Being cranky/easily annoyed	.67					
Loss of interest in things	.65					
Overly tired/lack of energy	.64			.46		
Wanting to be alone	.63	.44				
Difficulty relating to others	.58	.58				
Feeling down or blue or depressed	.56	.45				
Increased smoking	.53					
Feeling bored	.51					
Bad dreams/nightmares	.46		.42			
Lack of appetite	.44					
Difficulty making decisions		.78				
Loss of self-confidence		.72				
Feeling anxious or worried		.66	.40			
Mental confusion		.61				
Feeling trapped or confined		.57				
Difficulty concentrating	.44	.51				
Minor accidents		.45			.43	
Rapid heartbeat (not exercising…)			.70			
Nervousness or tenseness			.67			
Shortness of breath (not exercising…)			.60			
Muscle twitching or trembling	.48		.49			
Skin rashes or itching			.42			
Common cold or flu				.62		
General aches or pains	.47			.51		
Dizziness or faintness			.42	.51		
Headaches				.50		
Sweating hands, feeling wet and clammy				.45		
Loss of weight				(.39)		
Pains in the heart or chest					.74	
Taking medication to sleep/calm down					.65	
Upset stomach				.43	.46	
Being jumpy/easily startled					(.39)	
Thoughts of ending your life						.85
Crying						.72
Feeling life is pointless		.51				.60
Percent of explained variance	15.29	13.38	9.25	9.13	7.43	6.27
Cronbach's alpha	.91	.90	.80	.77	.71	.74

Note: [a] Component labels: C_1 Depression/withdrawal; C_2 Behavioural/mental anxiety; C_3 Physiological anxiety; C_4 Somatic complaints; C_5 Hyper-arousal; C_6 Emotional lability

'seeing a colleague die', 'handling/recovering bodies or body parts', 'seeing widespread destruction', and 'dangerous traffic incidents/road conditions'.

The scale asks respondents to undertake three tasks for each item. The first is to rate the frequency they have experienced each listed event: "how often". Response options for the frequency of experience are 'Never', 'Once', 'A few times', and 'Regularly'. Secondly, if applicable, respondents are asked to rate how the event affected them at the time it occurred (i.e., acute impact). Thirdly, they are asked to rate how each applicable event is affecting them at present (i.e., chronic impact). Response options for the acute and chronic impact questions are the same: 'Not at all', 'A little', 'A moderate amount', or 'A great deal'. The scale also provides an option for specifying an additional stressful event that has been experienced by a respondent.

The instrument was designed within DHRRE by the author and a colleague, using their experience of psychological debriefing of, and focus group research with, peacekeepers. The use of the three concurrent rating scales was an effort to overcome limitations in existing exposure instruments that did not attempt to measure the intensity of stressful experience, nor distinguish between acute and chronic responses to potentially traumatic events. In most cases, stress symptomatology associated with serious stress reactions such as PTSD vary in both prevalence and intensity over time (Schnurr & Friedman, 1997).

The psychometric properties of the Experience of Major Stressors scale have not been specified. The issue of psychometric analysis is problematic for several reasons. The scale is complex, having three scale components. The primary component deals with actual exposure to an event over which respondents have no, or very limited, control. Several of the items are rarely encountered, even by deployed troops, and therefore the assumption of normality in the distribution of scores for all three scales is clearly not supported. Furthermore, the scale itself is not theoretically

derived, but rather, simply seeks to explore the sources and self-reported outcomes of stressors that may be presumed to be potentially traumatic for some people. However, the psychometric properties of a variant of the Experience of Major Stressors scale, the 12-item Traumatic Stress Exposure Scale (TSES), developed by Hodson (2002), were analysed by Swann (2004). Based on an analysis that used a sample of 189 ADF personnel, the TSES demonstrated good internal and test-retest reliability. Psychometric analysis supported the three-column response format, although it was concluded that a dichotomous response format within the three scales may be just as efficacious due to the limited use of the upper points of the response scale. Response patterns, however, are likely to vary depending upon the deployment experience of the sample under study. Based on regression analysis, Swann (2004) concluded that the TSES also had good concurrent validity when compared to two scales of PTSD symptomatology (the Impact of Events Scale (Horowitz, Wilner, & Alvarez, 1979) and the PTSD Checklist (Weathers, Litz, Herman, Huska, & Keane, 1993)).

It should be noted that the Experience of Major Stressors scale was intended to be a measure of post-traumatic stress *exposure*, not post-traumatic stress *outcomes*. However, the expectation that exposure to potentially traumatic stressors would be predictive of various stress outcomes is axiomatic in the post-traumatic stress literature. In particular, events characterised by a high level of violence, to which military personnel are at high risk of exposure, are most likely to be etiologically linked to the development of PTSD (Miller et al., 2002). Nevertheless, Bolton, Litz, Adler, and Roemer (2001) caution that the relationship between reports of exposure to potentially traumatic stressors and psychological outcomes is far from isomorphic. The most recent version of the Experience of Major Stressor scale is contained in Appendix M.

Service Experiences Scale

This scale was included in the HDO project to capture more serious stress outcomes associated with traumatic experience that the Symptoms Checklist (modified) was not designed to address. The Service Experiences Scale was based on a version of the Mississippi Scale for Combat-Related PTSD (Keane, Caddell, & Taylor, 1988). The Mississippi Scale is a widely used screening instrument for PTSD, developed to differentiate between clinical and nonclinical cases. The scale was originally developed for military veterans, although several versions are now available for other populations. Reliability analyses of the original scale indicated high internal consistency (alpha coefficients of about .94) and good test-retest reliability (.97) (Newman, Kaloupek, & Keane, 1996). Two short forms of the scale have been developed which show high correlations with the original 35-item scale (Fontana & Rosenheck, 1994; Hyer, Davis, Boudewyns, & Woods, 1991). In keeping with the requirement to develop a concise survey, the Hyer, Davis, Boudewyns and Woods (1991) short version of the Mississippi Scale was utilised.

However, several shortcomings of the Mississippi Scale existed. As an empirically derived measure of PTSD, the structure of the Mississippi Scale did not conform to the diagnostic features of the disorder as specified in the DSM-IV (American Psychiatric Association, 1994). Indeed, the short version was postulated to have only two factors: guilt and anger/numbing (Hyer et al., 1991). Another concern about the Mississippi Scale was its emphasis on clinical symptomatology. Research with peacekeepers generally has found very low rates of psychiatric disorders, but adverse impacts upon mental health status nonetheless (MacDonald, Chamberlain, Long, & Mirfin, 1999). Relatively little research has addressed specifically the prevalence of subclinical symptoms relating to traumatic exposure, but several studies have reported 'partial PTSD' symptoms (such as avoidance or intrusion problems) as a means of increased differentiation of stress outcomes (e.g., Flach &

Zijlmanna, 1997). Such evidence suggests that many veterans of peace support operations may have partial or subclinical symptoms of PTSD, which do not meet 'psychiatric caseness' but nevertheless may warrant mental health support. The Mississippi Scale, however, contains items worded in a strongly clinical tone such as "When I think of some of the things that I have done or seen in the military, I wish I were dead," and "The people who know me best are afraid of me." Irrespective of assurances that survey responses are treated confidentially and there will be no adverse repercussions from participation, there may be reluctance on the part of military members to endorse such items of clearly abnormal behaviour/mood even if they are pertinent.

In order to address the identified shortcomings in the Mississippi Scale, several incremental modifications were made. These included the addition of several items, the deletion of some of the Mississippi items and a conceptual restructuring of the scale in accordance with the DSM-IV diagnostic features of PTSD. New items addressed intrusion, arousal, avoidance, social impairment, occupational impairment, emotional numbing, and Criterion A aspects of PTSD, i.e., there was exposure to a potentially traumatic event, and a significant emotional response to the event. Unlike the Mississippi Scale, which used a separate response scale for each item, the modified instrument introduced a single response scale, consistent with an innovation by Norris and Perilla (1996) in research using the Civilian version of the Mississippi Scale. Respondents were asked to rate the frequency with which each given statement described their current functioning or feelings, using a response scale which contained 5 options: Never, Rarely, Sometimes, Frequently, and Very Frequently.

The resulting scale was called the Service Experiences Scale. Early administrations of the scale were considered an exploratory component of the research. The original version contained 22 items, and this was expanded to 26 items in order to balance the number of items constituting each subscale. Psychometric analysis of early administrations of the Service Experiences

Scale found relatively poor internal consistency for the Short Mississippi Scale component (alpha coefficient of .52 for an early English language sample; n=406). Reliability analysis of the full scale ranged from .77 (English language version) to .86 (French language version; n=228). If one item was deleted from the English language version, the alpha coefficient increased to an acceptable .80. This item was, in retrospect, poorly worded as it presented respondents with a 'double negative' ("I would not hesitate to go on a future overseas operational deployment if I had the opportunity"). Interestingly, the alpha coefficient for the non-Mississippi items was a respectable .86 (when the two Criterion A items and the poorly worded item were excluded).

PCA of the 26-item Service Experiences Scale was performed on data from one survey administration of Australian Forces personnel (n = 321) who had returned from deployment to East Timor. Data screening, including checks for univariate and multivariate outliers were conducted as previously described. Descriptive statistics are contained in Appendix N. Skewness and kurtosis values were within the recommended ranges. Univariate and multivariate outliers were identified and deleted from the data, leaving 297 cases for analysis. Factorability indices were positive, including a Kaiser value of .93, a significant value for Bartlett's Test of Sphericity (approximate χ^2 of 10451.56; df 276; $p < .000$), and appropriate MSA values.

PCA extraction based on Eigenvalues > 1.0 and Varimax rotation produced a four-factor solution, accounting for 51.3% of the variance. Each factor was loaded upon by items from at least two of the conceptualised subscales, yet each was easily interpretable. For example, the first factor, which accounted for 17% of the variance, contained items from the re-experience, avoidance, and arousal subscales, and was labelled 'Disruptive impact of traumatic memories'. The other components were labelled 'Social and emotional impairment', 'Functional (mainly occupational) impairment', and 'Normal adjustment.' The latter factor was comprised of five items that had been worded to reflect positive

functioning. The unintended emergence of this component was a propitious outcome, considering the relatively recent increase in interest in the salutogenic effects of traumatic experience (Linley, 2003; McMillen, 1999) and the attributes of psychological resilience (Paton, Violanti, & Smith, 2003). Total scale alpha was .86. Component scale Cronbach's alpha coefficients were indicative of moderate to high internal consistency. Results of the PCA are contained in Table 8.

The psychometric properties of the Service Experiences Scale appear satisfactory. This scale, along with the Symptoms Checklist (modified), enable the HDO project to examine patterns of responses to the two main classes of stressors (daily hassles and high magnitude stressors) and encompass to some degree, the complexity inherent in the experience of peacekeeping. The most recent version of the Service Experiences Scale is contained in Appendix O.

Homecoming Issues Scale

The Operational Effectiveness Section of DHRRE developed a psychometric instrument entitled "Homecoming Issues." The instrument was designed to address several key issues of reintegration for service personnel returning from deployment. Issues identified in the literature, and in focus group research by this author, included the impact of family reunion, the significance of rewards or formal recognition for service, adjustment into nonoperational roles, use of available support services, and sense of belonging to society (Figley & Leventman, 1980; Gardner, 1995; Mateczun & Holmes, 1996; McLellan, 1997; Murphy, 2003).

The measure had two sections, one that tapped attitudes toward the experience of homecoming and the early postdeployment period; the other sought largely biographical (categorical) details of activities and experiences following return from deployment. The initial section adopted

TABLE 7
Factor Loadings, Percent of Variance, and Reliabilities from Principal Components Extraction and Varimax Rotation of 24 items in the Service Experience Scale

Item	**Component** [a]			
	1	2	3	4
Sometimes things remind me of a disturbing experience	.76			
Find myself trying not to think of upsetting things	.75			
Find myself thinking about negative or disturbing events	.72			
Things have happened that I would rather not talk about with anyone	.70			
Have disturbing dreams of experiences that have really happened	.69			
Used alcohol (or other drugs) to help me sleep or forget	.60			
Unexpected noises startle me or make me jump	.49			
Having difficulties with sleep	.45			
Have a hard time expressing my feelings		.70		
Seem to prefer to be on my own these days		.70		
Many of my friendships have lost their meaning		.61		
Seem to have lost my feelings		.60		
Do not laugh or cry at the same things other people do		.58		
No-one seems to understand me anymore		.54	.45	
Find it hard to motivate myself to do my work			.77	
My performance at work is not what it used to be			.70	
Have trouble concentrating on tasks			.61	
More tense than usual these days		.40	.50	
Lose my cool and explode over minor things			.41	
Still enjoy things that I used to enjoy				.66
Enjoy the company of others				.65
Enjoy my work			.49	.63
Think positively about going on another operational deployment				.62
Fall asleep, stay asleep, only... (normal sleep)				.43
Percent of explained variance	17.06	14.02	12.09	8.15
Cronbach's alpha	.82	.80	.76	.60

Notes: [a] Component labels:
C_1 Disruptive impact of traumatic memories
C_2 Social and emotional impairment
C_3 Functional impairment
C_4 Normal adjustment
[b] Some item content has been summarised for brevity.

items from the West Haven Homecoming Stress Scale (WHHSS, Johnson et al., 1997), a measure developed to examine retrospectively the homecoming experience of American Vietnam veterans. Most of these items were modified to account for cultural differences, or to provide a focus on peacekeeping duty as opposed to combat duty, which was the emphasis of the original research using the WHHSS. Additional items were developed in response to focus group outcomes. The first section of the Homecoming Issues Scale comprised 21 items and used a five-point Likert scale with response categories ranging from "never" to "very frequently." It was conceptualised to comprise six dimensions: adjustment, positive experiences, recognition, relationship problems, resentment, and withdrawal (Dobreva-Martinova, Murphy, & Farley, 1998).

The second section of the Homecoming Issues Scale comprised five items that incorporated multiple response formats. This section explored homecoming activities, specific problems, leave and living arrangements, and the perceived level of support received from various sources (e.g., family, friends, colleagues, the military, the Government, and society).

Psychometric assessment of the Homecoming Issues Scale was conducted at the Defence and Civil Institute of Environmental Medicine under a research agreement that provided for selective sharing of data from the Canadian HDO project. Thompson and Pastò (1999) conducted a series of factor and reliability analyses of the first section of the scale. A four-factor solution accounting for 44% of the variance emerged from PCA with Varimax rotation. The factors were labelled 'Negative attitudes/ disengagement', 'Positive attitudes/engagement', 'Special privileges', and 'Readjustment problems.' A number of refinements to the scale were recommended, which included rewording of some items, item deletions (notably those making up the 'Special privileges' factor), and the transfer of some items from the first section of the scale to the second. Based on these recommendations, the Homecoming Issues Scale was refined and subjected

to further psychometric analysis by Thompson and Pastò (1999). A three-factor solution emerged from PCA. The factors were labelled 'Readjustment problems', 'Negative attitudes/disengagement', and 'Positive attitudes/engagement.' Cronbach alpha coefficients for the three factor subscales were .78, .63, and .75, indicative of moderately high internal consistency. The varied response formats of the second section of the scale were unsuitable for formal psychometric assessment. The researchers concluded that the Homecoming Issues Scale displayed "encouraging … utility" and "psychometric coherence" (Thompson & Pastò, 1999, p. 21) and therefore was a viable means of exploring the experience of homecoming for returning peacekeepers. The version of the Homecoming Issues Scale used in the Australian HDO project and utilised in Chapter 6 analyses is contained in Appendix P.

PCA of the first section of the refined version of the Homecoming Issues Scale was performed on combined samples of Australian Forces personnel (n = 830) who had returned from deployment. Data screening, including checks for univariate and multivariate outliers were conducted as previously described. Descriptive statistics for the sample are contained in Appendix Q. Skewness and kurtosis values were within recommended ranges for all items with the exception of the item "I felt like dropping out of society," which has a Kurtosis statistic of 8.572. Data screening resulted in 547 cases for analysis. Factorability indices were positive, including a Kaiser value of .87, and a significant value for Bartlett's Test of Sphericity (approximate χ^2 of 4022.74; df 190; $p < .000$).

Extraction based on Eigenvalues > 1.0 and Varimax rotation produced a meaningful four-factor solution, accounting for 57.3% of the variance. The four factors were labelled 'Work-related Readjustment Difficulties', 'Social Readjustment Difficulties', 'Alienation and Anger', and 'Positive Adjustment.' Five factors showed multiple loadings, but each made conceptual sense. For example, the item 'Had a period of adjustment to get

back to normal self' loaded on both work-related and social readjustment difficulty components, probably reflecting the situational context of personal readjustment. Compared to the analysis using Canadian data (Thompson & Pastò, 1999), this PCA extracted an extra component, which reflected a division into two factors, 'Social Readjustment Difficulties' and 'Work-related readjustment difficulties', of the 'Negative Affect/ Disengagement' factor of the Canadian analysis. Results of the PCA are contained in Table 9.

TABLE 8
Factor Loadings, Percent of Variance, and Reliabilities from Principal Components Extraction and Varimax Rotation on 20 items of the Homecoming Issues Scale

Item [a]	**Factor** [b]			
	1	2	3	4
Had a period of adjustment getting back into work	.81			
Difficulties maintaining interest at work	.76			
Difficulties maintaining your usual work standards	.76			
Had a period of adjustment to get back to normal self	.60	.51		
When you speak about the deployment others don't listen	DNL			
Experienced marital or relationship problems		.71		
Had serious arguments/conflicts with family/friends		.70		
Had a period of adjustment to fit back into family	.54	.64		
Felt like dropping out of family life		.63		
Felt like a stranger in a strange land after return	.41	.57		
Thought seriously of discharging to return to country of service			.70	
Felt like getting out of the military	.48		.67	
Felt anger at the government			.65	
Regretted having deployed			.62	
Felt like dropping out of society		.43	.61	
Felt resentment over your treatment by others			.54	
Proud of your service on the deployment				.81
Felt family was proud of your service on deployment				.73
Felt you changed for the better due to the deployment				.72
Became interested in politics of the deployment nation				.59
Percent of explained variance	31.4	12.3	7.3	6.3
Cronbach's alpha	.83	.78	.79	.69

Notes: [a] Some item content has been reworded/summarised for brevity.
[b] Component labels:
C_1 Work-related Readjustment Difficulties
C_2 Social Readjustment Difficulties
C_3 Alienation and Anger
C_4 Positive Adjustment

Positive Aspects of Deployment Scale

The theory of Conservation of Resources (Hobfoll, Dunahoo, & Monnier, 1995) postulated that individuals with the greatest resource pool are the most resilient when under stress. With respect to the HDO model, it has been hypothesised that positive aspects of the peacekeeping experience collectively would form an additional coping resource that would influence secondary appraisal and buffer the impact of stressors in the deployment context. The mechanism of influence of such positive experiences on coping resources was postulated to be the fostering of personal meaning, which has been shown to enhance soldier resilience and adaptation during deployment, as well as adjustment following deployment (Bartone et al., 1998; Britt, Adler, & Bartone, 2001). Potentially positive aspects of deployment are presumed to include putting military training into practice, learning new skills, forming relationships with people from different cultures, and personal satisfaction in providing support to the local country. The requirement for a measure of the positive aspects of deployment was met in-house by the Operational Effectiveness Section of the Directorate for Human Resource Research and Evaluation.

The Positive Aspects of Deployment Scale uses a 4-point Likert-type response scale that distinguishes different levels of satisfaction/ enjoyment from nil to "a great deal." The scale is comprised of 30 items. The items in the original scale were generated using this author's experience of psychological debriefing and focus group research with Australian and Canadian peacekeepers. One final item sought positive experiences not addressed by the preceding items. In this way, the scale was refined incrementally across early survey administrations.

PCA of the Positive Aspects of Deployment Scale was performed on data from a survey administered to Australian Forces personnel (n = 561) during deployment in East Timor. Data screening, including checks for univariate and multivariate outliers, were conducted as previously described.

Descriptive statistics for the sample are contained in Appendix R. Skewness and kurtosis values were within recommended ranges for all items. Multivariate outliers were identified and deleted from the data, leaving 520 cases for analysis. No univariate outliers were identified. Factorability indices were positive, including a Kaiser value of .94, and a significant value for Bartlett's Test of Sphericity (approximate χ^2 of 7890.40; df 406; $p < .000$).

Extraction based on Eigenvalues > 1.0 and Varimax rotation produced a five-factor solution, accounting for 60.3% of the variance. The first four factors were labelled 'Professional/personal satisfaction and development', 'Reminders of home', 'Social/helping relationships with the local populace/culture', and 'Novel aspects of the deployment experience.' The fifth factor was not interpretable. It was concluded that the factor structure from the PCA was less than satisfactory. The first factor was overly complex and the final factor contained two items that did not appear conceptually consistent.

In order to examine further the dimensionality of the scale, Principal Axis Factoring (PAF) was conducted, utilising oblique rotation. A more lucid five-factor structure emerged, accounting for 52.3% of the variance. Three factors from the PCA remained largely intact: 'Reminders of home', 'Social/helping relationships with the local populace/culture', and 'Novel aspects of the deployment experience.' The first component from the PCA divided into two factors, reflecting 'Professional development' and 'Personal development and satisfaction.' Although six items failed to load to the 0.4 level on any factor, the PAF solution was simpler and conceptually more attractive. Total scale alpha was .94. Cronbach's alpha coefficients for the five PAF-derived subscales were indicative of high internal consistency (ranging from .78 - .87). Results of the PAF are contained in Table 10. These results compared favourably with an analysis of Canadian data (n=414) from an earlier version of the Positive Aspects of Deployment scale (Murphy, 1998). Factor analysis of that scale resulted in five conceptual dimensions

TABLE 9
Pattern Matrix for Principal Axis Factoring and Oblique Rotation on 29 items from the Positive Aspects of Deployment Scale

Item	Factor [a]				
	1	2	3	4	5
The professional/operational experience	.77				
Putting training into practice	.71				
Doing a real job rather than just training	.68				
Extra responsibilities my role here entails	.48				
Growing as a person/learning more about self	.40				
Doing something different	DNL				
Getting mail from home		.78			
Thoughts of returning home/own country		.69			
Communication with home		.63			
The leave breaks		.58			
Allowances/financial incentives		.47			
Mixing with/helping the children here			.75		
Meeting locals			.74		
Expressions of thanks from locals			.67		
Experiencing the local culture			.55		
Contributing to humanitarian projects			(.36)		
Making new friendships				.72	
New sights				.47	
Contributing to country here				.46	
Pride in being part of (mil org)				.46	
The local climate				DNL	
Sense of teamwork					.53
Strengthen existing friendships					.52
Pride in unit/work team					.47
Opportunity/incentive to get fit					.47
Learning new skills					.44
Working with other country personnel/contingents					(.39)
Positive media reports back home					DNL
Support from people/other organisations at home					DNL
Cronbach's alpha	.87	.78	.84	.85	.80

Notes: [a] Component labels:
- C_1 Professional development (Professionalism)
- C_2 Contact with home (Personal rewards)
- C_3 Contact with and helping the local populace (Humanitarianism)
- C_4 Novel aspects of the deployment experience (Novelty)
- C_5 Personal development and satisfaction (Personal development)

[b] Some item content has been reworded/summarised for brevity.
[c] Equivalent Canadian component labels (Murphy, 1998) provided in brackets.

labelled Humanitarianism, Professionalism, Personal development, Personal rewards, and Novelty of the deployment. Personal rewards and Novelty of the deployment were clearly the most satisfying aspects of deployment for Canadians on peacekeeping duties in Bosnia. The most recent version of the Positive Aspects of Deployment Scale is contained in Appendix S.

Unit Climate Profile

The Unit Climate Profile was designed to measure aspects of psychological and organisational climate in military units. In many respects the Unit Climate Profile is the central measure of the HDO project because it spans all components of the conceptual model underlying this research. For example, certain dimensions of unit climate may act as stressors, as moderator or mediators, and as coping resources. Some unit climate factors also can be conceived as outcomes of the transactional process. Furthermore, the Unit Climate Profile was designed to provide measures at several levels of the organisation: the individual, the work team, and the unit. The next chapter will present the theoretical foundations, conceptual development, and psychometric properties of this measure.

Chapter 3

MEASURING MILITARY CLIMATE: THE UNIT CLIMATE PROFILE – AUSTRALIAN VERSION

Introduction

A cornerstone of the Human Dimensions of Operations (HDO) project is the measurement of aspects of psychological and organisational climate associated with psychological preparedness for duties in demanding environments. This chapter reports the theoretical foundations, conceptual development, and psychometric validation of a multi-dimensional measure of military climate intended for use by unit and subunit commanders: the Unit Climate Profile - Australian (UCP-A). Although military leaders have tended to regard climate factors such as morale, cohesion, motivation, and leadership as the foundation of military effectiveness, there are few tools available for commanders to determine these human dimensions quantitatively, and to better understand the influence of these factors on the preparedness and capabilities of individual troops and working teams.

The concepts of psychological climate, organisational climate and organisational culture will be reviewed in this chapter, as well as climate research within military organisations. The incremental stages of psychometric development of the UCP-A then will be presented, along with data attesting to the underlying factor structure of the instrument, at both the individual and group levels of analysis.

Climate

The construct of climate has featured in the organisational psychology and management literature for decades (e.g., Campbell, Dunnette, Lawler, & Weick, 1970; Cooper, Cartwright, & Earley, 2001; Deal & Kennedy, 1982; Hellriegel & Slocum, 1974; Schein, 1990). This interest

in climate perceptions was spurred by efforts to understand the effects of the work environment on individual and group motivation and behaviour (Lewin, 1951; Lewin, Lippitt, & White, 1939). Grounded as it was in the Gestalt psychology of Kurt Lewin, the concept of climate was intended to explore how people in a given work system made sense of their experience of the processes and behaviours in organisational life (Schneider, Bowen, Ehehart, & Holcombe, 2000). From an applied perspective, interest in climate has been related to the desire to foster or reliably predict a range of individual, group and organisation-level outcomes. These outcomes have included job satisfaction, work performance, retention, personal growth, and even accident rates (e.g., M. Griffin, 2001; Parker et al., 2003; Wilderom, Glunk, & Maslowski, 2001). Climate perceptions are also used diagnostically to underpin organisation improvement interventions (e.g., Murphy & Mombourquette, 1997).

According to Kozlowski & Doherty (1989), the construct of climate originally was conceived as the key functional conduit between the individual and the work organisation. The main purpose of this linkage was to shape the effectiveness of organisational processes and outcomes (James, 1982). Litwin and Stringer (1968) regarded climate as a mediator of systemic organisational factors on individual motivation and behaviour. The mechanism for this mediation appeared to be emotional reactions. James and McInytre (1996) believed that "individuals respond affectively to the work environment based on the meaning and significance (valuations) that they attach to that environment. In turn, affective reactions influence valuations by causing individuals to selectively attend to or redefine situational cues in cognitive processing or to restructure cognitions to make them consistent with beliefs and expectations" (p. 434). Climate perceptions therefore are interactive and reciprocal, in the sense that characteristics of the individual and the workplace interplay dynamically (Kozlowski & Doherty, 1989). These perceptually-based cognitions assist the individual to interpret events, predict potential outcomes, and assess the

appropriateness of intended and actual behaviours within the working environment (A. P. Jones & James, 1979).

The theoretical development of climate has been problematic. In particular, conceptual uncertainty regarding climate perceptions has been perpetuated by a lack of clear operationalisation, and the use of a variety of terms when referring to the perceptions by individuals of their work environment (Denison, 1996; Woodman & King, 1978). These competing terms have included 'social climate,' 'managerial climate' and 'organisational climate,' with the latter having gained precedence by the 1970s. Guion (1973) argued that 'organisational climate' was an ambiguous concept because it could imply attributes either of the organisation or of the perceiving individual. If climate referred to the latter, Guion suggested that the concept of climate might be simply an alternate label for job satisfaction (a point echoed by many authors around that time, e.g., Schneider (1975) and Johannesson (1973)). Fortunately, more recent discussion in the literature has distinguished the two constructs. There is substantial agreement that climate perceptions are descriptions of the work environment made by employees, whereas job satisfaction relates to employee evaluations of such perceptions (Parker et al., 2003). In summary, climate is founded on perceptions, whereas constructs such as job satisfaction are based on attitudes (Hellriegel & Slocum, 1974).

Schneider (2000) lamented that a preoccupation with psychometric purity and methodology has prevented climate researchers from reaching the pragmatic outcomes promised. A complicating factor in climate research related to this psychometric preoccupation has been the use of several levels of measurement and analysis, notably the individual, the work team, and numerous hierarchical or nested organisational elements. Parker and his colleagues (2003) undertook a review of the literature relating to climate perceptions and concluded that, among the terms which had found favour during the past 30 years, there was "considerable confusion

regarding the constructs of psychological climate, organizational climate, and organizational culture" (p. 390). In many cases, the terms were used interchangeably (e.g., Katz & Kahn, 1978). One question is therefore manifest: are these terms conceptually congruent, or do they represent clearly differentiated constructs?

Distinguishing Psychological and Organisational Climate

Moussavi, Jones, and Cronan (1990) declared that disagreement over conceptual and operational distinctions between psychological and organisational climate had been a major point of controversy within social science research for many years. James and Jones (1974) were the first to coin the term 'psychological climate' in order to distinguish between the two main levels of analysis in climate perceptions. Psychological climate was considered an individual attribute and hence was differentiated from organisational climate, which was regarded as a situational attribute. Typically, climate has been *measured* at the level of the individual through surveys, interviews, or observations of individual workers. However, *analysis* of these data has been conducted at multiple levels. From such a methodological perspective, *psychological climate* refers to outcomes derived from analysis at the level of the individual. *Organisational or collective climate* refers to consensus in aggregated individual climate perceptions that is used to represent the specific collective components of interest in an organisation.

There remains contention about whether aggregated perceptual data captured at the level of the individual can validly serve as indices of group/organisational climate (Anderson & West, 1998). As noted by Cooke, Salas, Kiekel, and Bell (2004), aggregation metrics such as averaging typically assume that what is being measured varies only quantitatively. Aggregation is focussed therefore at the collective rather than the holistic level. However, the Gestalt foundations of the climate construct would assume that the influence of various cognitive and socio-emotional

processes would lead to collective climates that are more complex than those represented by simple aggregation of individual member perceptions. Efforts to predict holistic outcomes using techniques such as process-oriented methods are being developed in the fields of group performance, team cognition, and social decision schemas (e.g., Hinsz, 1999). Climate perceptions research has yet to examine such techniques.

Instead, climate researchers have used sophisticated and, in some cases, specifically tailored statistical methods to clarify whether shared (group level) climate perceptions can be validly represented by existing climate measures that capture perceptions at the level of the individual. One approach to this challenge has attempted to determine what degree of variance within psychological climate scores would preclude the use of an aggregated score as a valid measure of collective climate. To this end, Moussavi, Jones and Cronan (1990) examined the level of perceptual agreement within several work groups. Through the use of analysis of variance and intra-class correlation coefficients (the latter interpreted as a measure of inter-rater, or within-unit, agreement), the authors investigated both the conventional across-group difference criteria such as gender, age, education, job classification and salary level, and indices of within-group agreement. Significant across-unit differences were not complemented by high within-unit agreement. For example, 'associations' between several climate dimensions and some job-related variables (notably job classification and salary level) were found. However, the associations were considered to be of insufficient strength to support their classification as 'determinants' of psychological climate. The authors concluded that previous research that had relied solely on aggregate across-unit differences might have overestimated the strength of such relationships.

This assertion by Moussavi et al. (1990) appeared to hinge upon a novel (and, arguably, an insufficiently substantiated) statistical approach. They admitted that there is no consensus in the literature on what intra-class

correlation coefficient value signifies a high level of individual-level perceptual agreement. There appears to be a danger that within-group divergence with respect to climate perceptions may be regarded simply as measurement imprecision, to be dismissed as error variance, or as an indicator of construct shortcomings. Using five diverse organisational samples, Anderson and West (1998) compared the r_{wg} statistic (James, Demaree, & Wolf, 1993), a measure of between-rater agreement, with analysis of variance of aggregated individual perceptions. Average r_{wg} reached acceptable levels, suggesting the measure was consistently tapping shared climate perceptions, rather than simply aggregating diverse individual perceptions. One-way ANOVAs were performed on aggregate variables to examine if group differences existed. Resultant *F* ratios indicated adequate discriminant power and consensual validity of the climate measure being used. Anderson and West (1998) concluded it was possible to meaningfully gauge shared climate perceptions with psychometrically robust measures.

Of course, it should not be surprising that variation should exist in the degree of perceptual agreement both across teams within samples and within teams across particular dimensions. Psychological climate has been conceptualised as a multifaceted, individual attribute that is a function of both perceptual and cognitive processes. Therefore, it should be acknowledged that amongst individuals in the same situation, meaningful perceptual differences are likely (James, Hater, Gent, & Bruni, 1978). These individual-level differences should be just as much a focus of climate research. Anderson and West (1998) confessed that "agreement on dimensions of climate can itself be used as an important defining characteristic of groups" (p. 255). Ironically, an early assumption of theorists in this domain was that climate served as a moderator of individual difference-individual performance relationships (Schneider et al., 2000).

As noted above, the term 'psychological climate' was proposed by James and Jones (1974) in an effort to resolve the complexity posed by the

multiple levels apparent within the climate construct. Psychological climate was defined quite simply by these authors as individuals' perceptions of the work environment. James later expanded the definition of psychological climate to avoid misinterpretations that had begun to appear in the literature regarding the influences of situational stimuli on climate perceptions. However, the refined definition of psychological climate – "the individual's psychologically meaningful cognitive representations of relatively proximal situational conditions" in the workplace (James et al., 1978, p. 786) – has not won nearly as much acceptance as the original construct definition. In this regard, there has been a preference among researchers for simplicity. In contrast, simplicity has not been a recent theme with respect to the postulated *dimensions* of climate.

Dimensions of Climate

There has been general agreement that large work environments or work-related social collectives can be characterised by a limited number of climate dimensions (A. P. Jones & James, 1979). However, there has been a lack of consensus regarding the number and classification of the dimensions of climate. Early researchers tended to propose a small number of primary climate dimensions. For example, Campbell, Dunnette, Lawler and Weick (1970) described four major dimensions of organisational climate: 'Individual Autonomy', 'Degree of Imposed Structure', 'Reward Orientation', and 'Consideration, Warmth, and Support.' Another perspective, proposed by Insel and Moos (1974), entailed three basic climate dimensions labelled 'Relationships', 'Personal Development', and 'System Maintenance.' Both models were similar in that each encapsulated components that comprised individual, work-group, and organisation-level characteristics.

In contrast, more recent research has tended to conceptualise and explore numerous and diverse climate factors (e.g., Anderson & West, 1998; Kozlowski & Doherty, 1989; Newman, 1977). These dimensions have

included, 'Job Understanding', 'Personal Accountability', 'Supervisor Work Emphasis', 'Participation', 'Teamwork', 'Intergroup Cooperation', 'Management Awareness and Concern', 'Communications Flow', 'Job Responsibility/Importance', 'Employee Work Motivation', 'Supervisory Style', 'Task Characteristics', 'Performance-Reward Relationships', 'Co-worker Relations', 'Employee Competence', 'Decision-Making Policy', 'Pressure to Produce', and more structural aspects of the workplace such as 'Work Space', 'Equipment', and 'Arrangement of People and Equipment.' It is acknowledged that structure has long been considered an important ingredient of climate (e.g., Payne & Pugh, 1976). However, subsequent discourse has tended to agree that structural characteristics are much less important to climate perceptions than more proximal factors such as organisational processes, task/role attributes, and situational influences (A. P. Jones & James, 1979).

Among contemporary measures, there appears to be an almost deliberate lack of agreement as to the specific components of climate. For example, the revised Business Organization Climate Index (BOCI) (Payne, Brown, & Gaston, 1992) has 17 scales, none of which is reflected in the preceding list. The uniqueness of several of the BOCI subscales, such as 'Intellectual Orientation', 'Interpersonal Aggression', and 'Readiness to Innovate,' suggests that climate dimensions are as varied as the number of researchers in this field. Typologies range from people, tasks, and roles, to rules, structure, and technology. It is no surprise that there have been strong appeals for standardisation and clear operationalisation of these concept labels, and for consensus on a set of elementary climate dimensions (e.g., see Rousseau, 1988). Of course, this diversity of dimensions may reflect a simple truth: that each organisation has a distinctive climate, which is composed of, or influenced by, a unique blend of factors. Similarly, different researchers and research stakeholders will have different orientations and interests that will influence which climate dimensions are selected for study.

Schneider (1975) was critical of approaches that focused on defining new dimensions of climate, and subsequently (Schneider, 2000) attributed the decline of climate research to the increasing complexity of the construct's conceptualisation. He argued that, in order to be useful, climate had to be what he termed 'strategically focused.' In this view, particular climate dimensions were only salient in the context of specific criteria. Climate needed to be linked to a tangible outcome such as service, safety, or innovation (Schneider, 1975). He therefore called for criterion-oriented climate research. Consistent with this approach have been studies of ethical climate (Catano & Kelloway, 2001), safety climate (Wiegmann, Zhang, von Thaden, Sharma, & Gibbons, 2004), and command climate (S. M. Jones, 2003), as well as climates for service, innovation, creativity, trust, motivation, and leadership (e.g., Abbey & Dickson, 1983; Anderson & West, 1998; Schneider et al., 2000).

A return to the earlier emphasis on a small set of core climate factors would seem desirable if generalisability were a goal. However, generalisation is not necessarily an important objective if situational influences and/or individual determinants of climate are of central interest. Early theorists such as Campbell et al. (1970) had recognised that 'environmental variation' was an important consideration in understanding organisational behaviour. As champions of the conceptual development of the construct of psychological climate, Jones and James (1979) acknowledged the important influence of both situational and individual factors on the development of work-related perceptions. The HDO project is strongly interested in situational factors, such as characteristics of the different stages of deployment, and of different deployment settings. This presumed importance of situationism could be inferred from a study by Murphy and Farley (2000) that used HDO data. No consistent trends in selected climate factors were discerned across different deployment stages for three contingents of Canadian Forces (CF) peacekeepers. Each

contingent appeared to have a different pattern of change over time in selected climate dimensions.[1]

Organisational Culture

Like climate, culture is another popular conceptual approach for examining the influences of work environments on individual and group perception and behaviour (Schneider, 1990). Culture has been especially useful in providing a conceptual foundation and a language for the analysis of the social architectures within organisations (Goffee & Jones, 2001). As noted earlier, there has been confusion as to how the concepts of climate and culture are distinguished, and often they are used interchangeably in the organisational psychology and human resource management literature. 'Culture' was originally an anthropological term that was adopted promptly by sociologists and, somewhat later, by industrial and organisational psychologists (Berthon, 1993). Pettigrew (1979) was perhaps the first to consider culture in the context of organisations. During the 1980s, a multidisciplinary upsurge of interest in cultural phenomena in organisations occurred (Martin, 1992). According to Goffee and Jones (2001), this fascination with organisational culture was driven by a number of pragmatic factors: the need for improved business coordination and integration due to globalisation, broad acceptance that organisational performance could be explained partly by cultural factors, and the expectation that culture could be shaped and harnessed as a source of long-term competitive advantage.

The concept of organisational culture became a mainstream management theme with the commercial success of Peters & Waterman's (1982) *In Search of Excellence.* Many studies and several books devoted to corporate culture subsequently appeared, notably Deal and Kennedy (1982), Denison (1984), Frost (1985), Schein (1985; 1990), Schneider (1990), Martin (1992), Kotter and Heskett (1992), and Trice and Beyer (1993). A result of

[1] Many factors, both internal and external to each contingent, could have contributed to this variation.

this high profile for 'organisational culture' was the virtual displacement of the construct of 'organisational climate' as a research focus. This precedence of culture over climate in the organisational context is particularly evident in two recent reference works: *'The Handbook of Organizational Culture and Climate'* (Ashkanasy, Wilderom, & Peterson, 2000) and *'The International Handbook of Organizational Culture and Climate'* (Cooper et al., 2001). For example, only five titles of the 30 chapters in the first book referred to 'climate' compared with 27 chapter titles that referred to 'culture.' Only two titles in 27 chapters in the latter book referred to 'climate'. Chapter content tended to reflect this imbalance.

The culture of organisations has attracted the interest of scholars from a variety of disciplines, including anthropology, psychology, sociology, human resource management, and organisational behaviour. According to Wiegmann, Zhang, von Thaden, Shar, and Gibbons (2004), the perspectives borne from this diverse attention to organisational culture have been distilled into two broad categories: the *socioanthropological* and the *organisational psychology* perspectives. The socioanthropological approach regarded culture as an enduring and complex characteristic of organisations, and one that is resistant to modification. This perspective has tended to examine the underlying mechanisms of culture that foster shared values, norms, and meaning, such as myths, heroes, and rituals (Mearns & Flin, 1999). Bolman and Deal (1991) referred to this approach to organisational analysis as the 'symbolic frame.' This perspective provides a means for the individual to ascribe meaning to the many uncertainties and ambiguities that occur in the work environment. Symbolic organisational events and processes, which include ritual, myth, and formal ceremony, are generally more important for what they express, rather than for what they produce. In many cases, these symbols are not amenable to scientific analysis.

Bolman and Deal (1991) referred to three other frameworks that they argued must be integrated, along with the symbolic frame, in order to

conduct comprehensive organisational analysis. These frameworks were the 'structural', the 'human resource', and the 'political.' The organisational psychology perspective, in contrast to the socioanthropological approach, has tended to focus on the functional significance of culture in bringing about improved outcomes, particularly enhanced performance (e.g., Lee & Yu, 2004). In several respects, this functional approach most closely resembles Bolman and Deal's (1991) human resource frame. It should be noted that the structural frame postulated by Bolman and Deal (1991) was consistent with the early efforts of organisational psychologists (e.g., Payne & Pugh, 1976) who examined organisational structure and design characteristics in concert with perceptions of the organisation, in order to ascertain the influences on employee motivation and behaviour.

More recently, the culture of organisations has gained prominence in the domain of safety management in complex organisational systems (Wiegmann et al., 2004). Contemporary views of accident causation have been underpinned by analytical models (notably Reason, 1997) that enable the mapping of elaborate error chains across multiple organisational levels. These models include various, potentially contributing factors such as latent failures, unsafe acts, inadequate supervision, and an inappropriate safety-related culture. Findings from investigations of several high-profile accidents such as the Space Shuttle Challenger explosion (Rogers et al., 1986), the Space Shuttle Columbia break-up on re-entry (Gehman et al., 2003), and the Waterfall train derailment in Australia (McInerney, 2005), have concluded that deficiencies in organisational culture contributed to failures that resulted in catastrophe. For example, the Columbia Accident Investigation Board commented with chilling reproach:

> … the Board presents its view that NASA's organizational culture had as much to do with this accident as foam did. …the report notes that only significant structural changes to NASA's organizational culture will enable it to succeed (p. 12).

Distinguishing Climate from Culture

Both organisational climate and organisational culture refer to characteristics of predetermined work groups that may range from the level of a work team to an entire organisation (Parker et al., 2003). It is important to differentiate the two concepts to foster an understanding of how they are used in this research. One element of distinction between the two constructs has been their genesis and orientation with respect to the individual. Organisational culture can be viewed as extra-individual in the sense that the postulated components of culture are external variables that act on the individual. By way of contrast, climate is essentially concerned with perceptual and cognitive processes within the individual. James and McIntyre (1996) stressed that this extra-individual versus intra-individual distinction should not be overstated because "the concept of climate is concerned with the relative importance of individual and situational antecedents of perception in models that recognize both situational and individual causation" (p. 417).

Another approach to distinguishing between organisational climate and organisational culture has been through an examination of their respective points of focus. As explained by Parker et al. (2003), organisational climate has a descriptive focus, whereas organisational culture accentuates the normative aspects of organisations. A further point of complexity is that the descriptive emphasis of organisational climate can be either subjective or objective in nature. The subjective element relates to the sense-making undertaken by group members when attempting to understand or share their experiences of the organisation. This perspective closely resembles the *cognitive schema* approach to the construct of organisational climate, which conceptualised climate in terms of representations or schemata of the work environment, and has tended to focus on how individuals make sense of their workplace (see Anderson & West, 1998). On the other hand, an objective focus would encompass

descriptions by group members of areas of organisational functioning such as the behaviour of supervisors. This objective perspective can be equated with the *shared perceptions* approach to understanding organisational climate, which has been concerned with consensus at the level of the work group in relation to opinions about workplace policies, practices, and procedures (Anderson & West, 1998). In contrast, the normative focus associated with organisational culture would emphasise the prevailing values, beliefs, and assumptions in relation to the appropriate ways to think and behave in a particular organisation or section of an organisation. This normative focus is characteristic of anthropological approaches to research noted previously.

Researchers in the pragmatic domain of human factors have proposed a third perspective on the distinction between climate and culture. Wiegmann et al., (2004) compared the relationship between climate and culture to the popular constructs of state and trait anxiety (Spielberger, 1966). Their analogy was based on a temporal dimension where climate was considered a temporary state, whereas culture was regarded as a relatively enduring characteristic of organisations. This approach has obvious synergies with issues of measurement and research design. For example, climate perceptions would be the focus of interventions designed to measure the short-term impact of events such as accidents, deployments, and unexpected changes in important staff positions. Organisational culture would be a more appropriate focus of research attempting to define normative behaviour or the consistent predictors of effectiveness in a particular group. However, this perspective of culture as enduring and climate as transient is controversial. For example, Schneider, an eminent scholar of culture and climate, noted "I am unable to find a single researcher who studies climate who thinks it is transient" (2000, p. xviii). While Schneider would agree that there are connections between the concepts of climate and culture, a temporal distinction would be firmly rejected.

The preceding review has unveiled several controversial issues associated with climate research. In particular, the issue of differentiating organisational and psychological climate may be intractable, tied as it is to the professional convictions of individual researchers and extant methodological limitations in the measurement of collective perceptions, attitudes and behaviour. All three perspectives regarding the distinction between culture and climate in organisations have helped to consolidate the conceptual focus of the HDO project. This research is interested in the psychologically meaningful perceptions and cognitions of the individual in relation to dynamic changes in the working environment. Due to the importance of coordinated effort to the overall effectiveness of the military, this research was also interested in the implications of perceptions, cognitions, and behaviour at the individual level on superordinate group functioning. Therefore, climate will be analysed at both the level of the individual and beyond the level of the individual.

This research has adopted the view that meaningful outcomes regarding the two main levels of climate (psychological/individual and organisational/collective) can be derived from aggregated perceptual data captured at the level of the individual. This approach was given support by a recent meta-analytic study of psychological climate (Parker et al., 2003), which concluded that individual-level climate perceptions do have significant relationships with work attitudes, motivation, and performance. This approach is also given support by the burgeoning research that has encompassed analysis across multiple levels within organisations (e.g., Bliese & Castro, 2000; Bliese & Jex, 1999, 2002; Cogliser & Schriesheim, 2000; M. A. Griffin & Mathieu, 1997; Rousseau, 1985).

Military Climate

In the military context, the term the 'unit climate' generally has been used as a substitute for organisational climate. The use of the word 'unit' probably serves to reinforce the view that the military organisational

structure and ethos vary markedly from non-military associations. The 'unit' is often the level at which work groups are distinguished within the military, often by primary function (e.g., infantry), and certainly by the leader in command. Dimensions of psychological climate within the military are likely to differ in several tangible ways to most non-military organisations because of the uniqueness of military culture, military organisational structures, and the military mission. Notions of customer satisfaction, customer service, and the profit imperative, so often a focus of organisational outcomes in the corporate world, are largely irrelevant to the operational military context. In addition, the ethos within the military is decidedly different from most other types of organisations. Symbolic rewards such as service medals and promotion in rank are the traditional motivators within the military, as opposed to financial or material rewards.

Gal (1986) appears to have been the first to use the expression "unit climate" in the context of military research. He found an unexpected degree of complexity when examining the factor structure of morale surveys administered to Israeli combat troops prior to the outbreak of war. Consequently, Gal proposed "unit climate" be used to indicate a higher order concept that had multiple component factors, including unit cohesion and morale, confidence in senior commanders, confidence in one's self, one's team, and one's weapons, confidence in immediate commanders, the perceived legitimacy of the war, and general worries and concerns.

Since then, a significant body of published research has examined the impact of a variety of human dimensions on the preparedness and capabilities of combat troops (e.g., Bartone & Adler, 1999; Bartone, Johnsen, Eid, Brun, & Laberg, 2002; Gal & Manning, 1987; Griffith & Vaitkus, 1999; Manning, 1991; Reed & Segal, 2000). There is now a general acceptance that unit climate encompasses several dimensions presumed to be antecedents of individual, team, and unit readiness to undertake hazardous military duties. A review of this research indicated the core

dimensions of unit climate typically include morale, cohesion, espirit de corps, and confidence in leadership. Military commanders themselves widely regard morale, motivation, and leadership to be the cornerstones of military effectiveness. Clausewitz (1976), arguably the most renowned Western thinker on military strategy, makes the point with rhetorical aplomb in *Vom Kriege* (On War), penned during the 1820s:

> …most of the matters dealt with in this book are composed in equal parts of physical and of moral causes and effects. One might say that the physical seem little more than the wooden hilt, while the moral factors are the precious metal, the real weapon, the finely honed blade (originally published 1833, Book 3, Chapter 3).

There is general acceptance within the literature of the need for a set of core climate categories to enable generalisation in climate research (Parker et al., 2003). However, this author believes that situational influences and organisational characteristics must be considered. Certainly, within the military context, there are core categories of interest in relation to individual, group, and organisational readiness and performance. These core categories would include morale, cohesion, esprit de corps, and confidence in leadership (Marlowe, 1986; Stewart, 1991).

Morale. Despite the importance attached to morale and other characteristics associated with psychological climate, there is significant variability in the understanding of these concepts and their interrelationships, both within the military literature (Coates, 1984; Isenhower, 1981) and the academic literature (Doherty, 1988). For example, there is no consensus as to whether morale is fundamentally an individual or group-level construct. In addition, morale is sometimes used to denote a range of individual psychological constructs, including motivation, job satisfaction, and self-confidence (Liefooghe, Jonsson, Conway, Morgan, & Dewe, 2003). Morale also has been regarded as a social or group

phenomenon, helping to explain observations of persistence within groups pursuing common goals under adverse conditions (Gal, 1983).

For the purpose of this research, morale is regarded as an individual-level construct, which is contingent upon an affiliation with a goal-oriented group. Morale is a dynamic psychological state that influences motivation and may vary considerably from situation to situation. Manning's (1991) simple definition, derived from Baynes (1967), will be adopted in this research: "morale is the enthusiasm and persistence with which a member of a group engages in the prescribed activities of that group." This definition suggests that commitment to the work group is fundamental to morale.

Cohesion. The study of "cohesion" exhibits a similar degree of diversity as "morale" in its operationalisation (Dion, 2000). The construct of group cohesiveness has been synonymous with concepts such as attraction, morale, and solidarity. Cohesion has been long a topic of study in the military (e.g., Shils & Janowitz, 1948; Stouffer, Lumsdaine et al., 1949). Like morale, cohesion has been presumed to predict performance and other positive behavioural outcomes (Mullen & Copper, 1994), and research has tended to confirm such a relationship. For example, a meta-analytic review of group cohesion in military units (Oliver, Harman, Hoover, Hayes, & Pandhi, 2000) found cohesion to be positively related to group performance, individual performance, retention, well-being, and readiness; and inversely related to rates of indiscipline.

Like morale, cohesion also has been conceptualised as dynamic and multidimensional. For example, Bliese and Halverson (1996) contended that cohesion could be vertical or horizontal within organisations. A distinction commonly drawn in the literature is that cohesion can be based on social attachment and member affective needs (social cohesion) or it can be based on the shared desire to achieve specified

tasks and objectives (instrumental or task cohesion). Kellett (1982) examined military performance in United States troops in the Vietnam War. He noted that when morale was low, groups were more likely to engage in collective actions that were not consistent with tasks directed by higher levels in the organisation. In these circumstances, social cohesion became stronger than task cohesion as a behavioural incentive. More recently, Griffith (1997) examined how stress, strain, and group disintegration could help to identify the mediating effects of task versus social cohesion on combat effectiveness. Using a sample of over 9,000 soldiers across 112 military subunits, it was shown that the instrumental component of cohesion, as opposed to peer social cohesion, had the strongest relation to perceived individual and group combat performance. Instrumental cohesion also showed the strongest buffering and mediating effects on the relation of stress to perceived combat performance.

Despite a lack of a conceptual precision, there appears to be fundamental agreement that the essence of cohesion is a bonding force between group members (MacIntyre, 2001). In fact, cohesion is derived from the Latin *cohaerere* meaning "to stick together" (Siebold, 1999). For the purpose of this research, in accordance with the approach delineated by Ingraham and Manning (1981), the term "morale" is used for the individual level of analysis and "cohesion" is used for group-level analysis. Hence, cohesion will be regarded as a group-level phenomenon whereas morale will be linked to motivational attributes at the individual level. Insofar as group morale exists, it is presumed to be largely a function of cohesiveness.

The working definition of group cohesiveness (cohesion) in this research is drawn from the work of Carron and his colleagues in the domain of sports psychology (Carron, 1982; Carron, Brawley, & Widmeyer, 1998) and the broader construct of collectivistic motivation as defined by Shamir (1990). Cohesion is defined as a dynamic process reflected in the tendency for a group to stay together, to sustain a sense of collective identity, and to

remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs.

Esprit de corps. Another core dimension of unit climate is postulated to be 'esprit de corps'; more commonly known simply as 'esprit.' Manning (1991) concluded esprit "is a higher order concept, paralleling cohesion at the primary group level, implying above all pride in and devotion to the reputation of a formal organization beyond the primary group" (p. 458). Manning further defined the primary group as "one characterized by intimate face-to-face association and cooperation" (p. 457). Where cohesion reflects a horizontal bond between the member and the primary group, esprit reflects a vertical bond between the soldier and the larger secondary group. Traditionally in the Australian Defence Force (ADF), this secondary group is normally the major unit to which a member belongs, such as a regiment, ship, or squadron. The identification of personnel with the larger military organisation is a vertical or hierarchical perspective of where the individual (and their immediate group) fit into the 'big picture.' This vertical cohesion may extend to the Service (Army, Navy, or Air Force) of the member, to the Defence organisation as a whole, or, in cases of national threat or remembrance, to the wider national society. Esprit de corps implies a sense of pride in, and devotion to, the reputation of a formal organisation beyond the primary group.

There is evidence that esprit exists and is a powerful source of motivation. Rush (1999), in a retrospective analysis of cohesion, morale, and operational effectiveness of the German Army in the closing stages of defeat in World War II, explained the importance of vertical cohesion:

> The flesh and blood of primary groups coalesce around the skeleton of organisational structure, which includes the formal organization of the combat elements and the administrative, logistical, and other support elements that administer to the soldier's primary needs, as well as providing the intangibles of unit

> history and tradition. Subunits link with the organization up, down, and horizontally… Organizational cohesion adds to organizational structure the unit's officer and enlisted leadership … and individual soldier's identification with the organization (p. 479).

In a study of Israeli Defense Force personnel (Shamir, Brainin, Zakay, & Popper, 2000), identification with the military unit (a measure of vertical cohesion or esprit) was the strongest predictor of perceived combat readiness when compared with soldier experience levels, leader's tenure, leader's confidence in the unit, soldiers' confidence in the leader, and unit discipline.

The working definition adopted for esprit de corps is: a dynamic, vertical bond between the soldier and the larger secondary group, implying pride in and commitment to the reputation of formal organisational hierarchies beyond the primary group.

Confidence in leadership. Leadership is defined as the ability to influence and direct people willingly to achieve the team or organisational goal (Thomas, 1998). A great deal of social science research, both inside and outside the military, has focused on leadership. In particular, this research has examined leadership traits and behaviours (see Bass, 1990; Yukl & van Fleet, 1992). Much less attention has been given in the literature to confidence in the leader as a possible determinant of belief in collective efficacy (Manning, 1991). An Israeli study of soldier trust in leaders revealed three determinants of confidence: technical competence, credibility as an information source, and the level of genuine concern demonstrated with respect to subordinate well-being (Kalay, 1983). Soldier trust in immediate leaders was also shown to contribute positively to combat motivation at both individual and group levels within combat units (Gal, 1986).

It is not difficult to accept that level of confidence in the abilities and judgment of leaders is likely to influence group perceptions of collective capability. Furthermore, leaders are presumed widely to play an essential role in the development of morale, cohesion, and esprit de corps, and thereby shape collective performance. However, it takes time to establish military leadership credentials and to contribute to factors such as morale and cohesion that develop effective teams (Shamir et al., 2000). In addition, in the author's experience, military organisations are notorious for not wanting to formally evaluate leadership effectiveness. This reluctance may reflect recognition that leadership can be a double-edged sword. In particular, ineffective leadership may adversely affect both confidence in command and operational readiness. As Manning (1990) noted in the military context:

> Being technically and tactically proficient is a value that is drummed into leaders incessantly, though they are not told as often how important it is for their soldiers to see and know their leader's talents... Yet it is not enough that a leader merely be technically proficient. If he is to inspire confidence, his subordinates must see not only that he will not waste their lives through incompetence, but also that he will not waste them through indifference (p. 464).

Psychological readiness for deployment. Of particular interest in the HDO project is a climate dimension labelled 'readiness for deployment.' The actual conditions of operational deployments are often characterised by uncertainty, both in the actual conditions to be encountered and in the challenges - both situational and personal - to be faced. Psychological readiness is postulated to equate to self-efficacy in the context of the operational military environment. As in Wood and Bandura's (1989) definition of self-efficacy, psychological preparedness for one's operational role is related to "beliefs in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands" (p. 408). A distinction between self-efficacy and psychological

readiness is that readiness for deployment has multiple levels (individual, team, and unit), reflecting the importance of individual and collective performance in the military.

In summary, unit climate is a multi-dimensional construct that comprises individual- and group-level psychological characteristics that are presumed to exist in military units and to affect their performance. Many climate dimensions are probably common to almost all work groups, albeit under different guises (e.g., cohesion (social support) and morale (satisfaction or commitment)). Other climate factors (e.g., esprit de corps and the combat readiness of work teams) are related to traditional military roles, structures, and culture, and therefore are likely to be unique to military and para-military organisations.

Measuring Military Climate

Given the importance of the preceding military climate factors in terms of their contribution to psychological readiness and operational performance, there would seem a compelling need to accurately assess and monitor and better develop these factors in order to assist commanders to enhance operational effectiveness. As discussed previously, conventional military wisdom accepts that human factors such as morale and cohesion are fundamental to military capability, effectiveness, and force preservation. Commanders' perceptions of subordinates' attitudes and morale may be crucial ingredients for command decision making with regard to readiness and the commitment of forces to combat operations. Inaccurate command assessments of subordinate attitudes and mood and of sub-unit cohesion and morale may result in degraded organisational effectiveness. However, questions remain, in particular, how do military leaders gauge the level of morale in their own forces, and how do leaders measure and foster cohesion and esprit?

Evidence regarding the accuracy of military commanders in their assessments of human factors is scarce. United States Army officers in World War II were found to have had consistently inflated views of their subordinates' attitudes toward a range of military issues (Stouffer, Suchman, DeVinney, Star, & Williams, 1949). Korpi (1965) demonstrated that modern-day commanders in the Swedish army had "very unreliable notions of the opinions in their units" (p. 302), and that officers were generally unaware that their perception of subordinate morale might be inaccurate. Indeed, the greater the commander's subjective confidence in such assessments, the greater the absolute error and positive bias (that is, the more certain the commanders were that their assessments of morale were accurate, the more incorrect they were likely to be, and the more likely they were to have erred in the direction of believing that morale was better than it actually was). In addition, Korpi (1965) found that higher-ranking officers tended to express greater confidence in their assessments, but they also exhibited larger errors in those assessments. In a study of individual- and group-level analysis of perceived combat readiness, Shamir et al. (2000) found that officer and NCO evaluations of unit readiness were significantly higher than that of soldiers in all but one of 50 company-sized units. There have been suggestions (e.g., Winslow, 1997) that the disturbing events in the Canadian contingent in Somalia could be partly attributed to a failure by some commanders to accurately perceive the prevailing attitudes, norms, and values in some unit subcultures, leading to erroneous judgments regarding the units' readiness for operations and the inherent potential for misconduct.

Despite the compelling need to measure military climate factors, few mainstream climate instruments have been specifically designed for military organisations. Jones and James (1979) developed the Psychological Climate Questionnaire (PCQ) for use with military samples but the measure was modelled largely upon existing instruments based on non-military organisational climate constructs. While some research with the PCQ in military settings has provided meaningful outcomes (e.g., Alpass, Long,

MacDonald, & Chamberlain, 1996), much of this research has been associated with veteran groups or barracks settings rather than operational units.

Since the 1940s, military psychologists in both Israel and the United States have administered surveys that examined attitudes and issues of mood and morale. Most of this research was not represented in the literature because it was conducted for the benefit of commanders. In addition, a range of questionnaires was utilised, which prevented systematic evaluation and longitudinal studies. It was not until the 1980s that these efforts became more standardised and resulted in an identifiable body of research. The Combat Readiness Morale Questionnaire (CRMQ) was developed in Israel and variants remain in regular use there to this day (Gal, 2006). The Walter Reed Army Institute of Research (WRAIR) began a major research program into the issue of "soldier will" (Siebold, 1999) using methods (questionnaires, interviews, and reviews of unit records) informed by the Israeli research. Both WRAIR and Israeli studies using morale questionnaires yielded almost identical factor structures with the following components: 'Confidence in Senior Commanders', 'Familiarity and/or Self-confidence', 'Readiness, Morale and Cohesion', and 'General Concerns.' The validity of the CRMQ was established by association with criterion measures such as retention rates, the incidence of medical problems, and self-reported satisfaction and well-being.

Throughout the 1980s, the United States Army Research Institute for the Behavioural and Social Sciences (ARI) initiated research into the development and maintenance of unit cohesion (e.g., Kimmel, O'Mara, & Babin, 1984; Siebold & Kelly, 1988). This research was distinguished by a focus on the lower levels of the military organisation (squads and platoons), strong linkages to military training, and the use of ratings of mission performance as criterion measures (Siebold, 1990). ARI also fostered collaborative research, using the Combat Platoon Cohesion Questionnaire,

with other elements of the U.S. military and allied nations, including Canada (Siebold, 1999).

Psychologists within the CF attempted to broaden research beyond the focus on cohesion that had persisted in the United States and Israel, to encompass the "human dimensions" of combat readiness. Wild (1988) proposed a schema (see Figure 6) describing the human variables and constructs that contribute to psychological preparedness for operations. He postulated that the human dimension of operational readiness rested on several psychological components, including confidence, proficiency (achieved through training and experience), and understanding of, and motivation toward, combat missions. Each of these components was presumed to be mediated by aspects of leadership, such as leadership behaviours, perceptions of leadership competence, and perceptions of genuine concern by leaders for personnel under their command.

Reeves and Hansen (1989) applied Wild's concepts in the construction of a psychometric instrument called the Human Dimension Combat Readiness Index - Experimental (HDCRI-X). Their approach emphasised the 'motivational environment' and 'individual perceptions of leadership' components of the model. The initial 152 items of the Index were drawn from a review of the literature and from the aforementioned United States and Israeli instruments. Data reduction techniques resulted in a 56-item measure loading on four factors with four additional sub-scale factors. This factor structure accounted for 54% of the variance. The factors were labelled Leadership Skills/Confidence (comprising five scales - four of which tapped confidence in different levels of superordinate command), Morale/Cohesion, Professional Morale, and Ideology.

NOTE: This figure is included on page 117 of the print copy of the thesis held in the University of Adelaide Library.

FIGURE 6 Schema representing the human dimensions of combat readiness. (Wild, 1988, used with permission)

Development of the Unit Climate Profile

Canadian research into the human dimensions of operations lay dormant for several years following the work of Reeves and Hansen (1989). Renewed interest was apparently sparked by highly publicised incidents of indiscipline on the part of CF personnel during deployment to Somalia (see Winslow, 1997). In late 1995, the senior leadership within the Canadian Land Forces expressed interest in developing an instrument for autonomous use by commanding officers to assess the psychological readiness of units to deploy (Farley & Murphy, 1996). In response, the prototype HDCRI-X was refined, tested, and renamed as the Unit Climate Profile (UCP) (Farley, 1995).

The instrument was introduced in 1996 and has been used in research with Canadian soldiers on operations in Bosnia, Haiti, Kosovo, and Eritrea. The UCP measured 12 human dimensions postulated to reflect the psychological climate of an army unit. These climate dimensions were labelled: 'Morale/Cohesion', 'Professional Morale', 'Military Ethos,' 'Ideology', 'Positive Leadership Climate', 'Negative Leadership Climate', 'Confidence in Section Commander', 'Confidence in Senior Non-Commissioned Officer', 'Confidence in Company/Squadron Sergeant Major', 'Confidence in Platoon/Troop Commander', 'Confidence in Company Commander', and 'Confidence in Commanding Officer.'

UCP dimensions can be plotted in graphic form to create a meaningful profile of the psychological climate within a unit. Profiles can be created for different demographic variables such as rank level, sub-unit, and gender. Profiles mapping trends across the phases of the deployment cycle have been a focus of research into the human dimensions of operations (Murphy & Farley, 2000). An example climate profile of a CF unit surveyed at three stages during deployment is shown in Figure 7.

The most commonly used 62-item version of the UCP was subjected to psychometric evaluation by Dobreva-Martinova (1999) using two samples of CF personnel deployed on peacekeeping missions in the former Yugoslavia. Reliability analysis indicated the UCP was a consistent and dependable measure of climate dimensions. Alpha coefficients for the total scale and the 12 sub-scales ranged between .66 and .95. Principal components factor analysis revealed twelve domains of unit climate consistent with the design of the instrument. The percentage of variance accounted for by this 12-factor solution was a respectable 66.4.

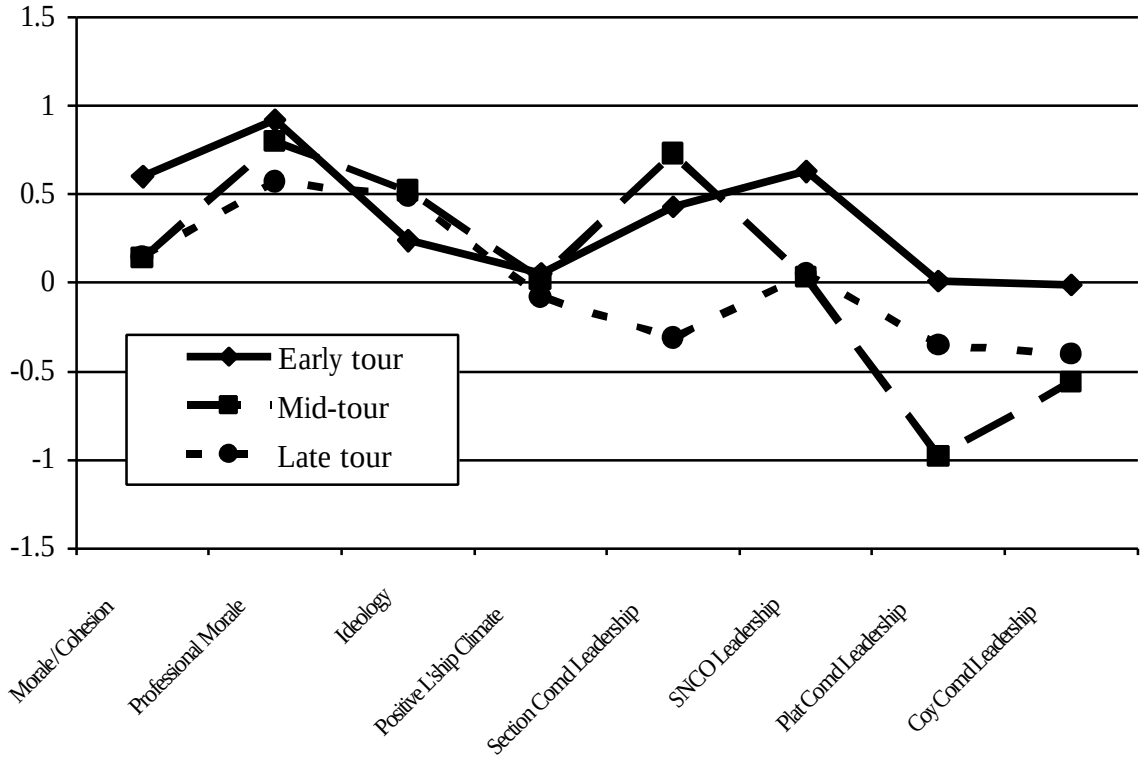

FIGURE 7 Example Unit Climate Profile for three phases of deployment in a Canadian Forces unit. (Murphy & Farley, 2000)

A significant amount of research utilising the Canadian version of the UCP has been conducted, although few studies have been published or presented in the public domain. Murphy and Farley (2000) and Murphy, Farley, Dobreva-Martinova, and Gingras (1998) presented a range of findings from their work with the UCP that had implications for the development of training, policy, and personnel management activities. The authors noted, for example, that the relationship between morale and confidence in leadership lacked consistency across contingents and phases of deployment. They also noted that a general malaise appeared to set in among CF personnel following return from deployment. Little and Thivierge (1999) showed that morale and cohesion, as measured by the UCP, dropped significantly among naval engineering personnel during the trial implementation of a new work schedule. Age and gender differences in the UCP dimensions of morale, cohesion, and confidence in leadership were observed by Izzo, Lapointe, Vileneuve, and Columbe (2000).

The Unit Climate Profile – Australian Version

The Canadian UCP was not without deficiencies as a tool for organisational intervention. For example, design emphasis on only a limited number of components within Wild's (1988) schema of combat readiness made the domain coverage of the UCP suspect. The wording of items meant that the survey was relevant to deployed personnel only. The hierarchical structure and the wording of the confidence-in-leadership items limited the generalisability of the scale across personnel. Further, the number of items loading onto factors varied from three to 17, suggesting a degree of inefficiency in psychometric design. Finally, the instrument was prone to criticism for having a focus on units of the combat arms. In an attempt to rectify these problems, the UCP was substantially modified in late 1997 by incorporating theoretical reformulation, psychometric analysis of data captured over 12 months of administration, and feedback from commanders on the utility of the instrument (Gingras & Murphy, 1998).

The resulting 36-item UCP was designed for administration with all types of Army units, at any stage of the deployment cycle, and to all ranks. The instrument had multiple levels of interest. As noted earlier in this chapter, there is consensus in the literature that decisions regarding the appropriate level of aggregation of climate perceptions should be made on the basis of theory. A characteristic of the revised UCP was that several of the posited dimensions comprised three levels of interest: the individual, the immediate work team, and the military unit. This design was adopted in recognition of what Klein and Kozlowski (2000) called "the nested complexity of real organizational life" (p. 211). An understanding of psychological or organisational climate is not contingent upon just one level of analysis. For example, several studies have shown that individuals with low morale can still be motivated by the level of cohesion within their immediate work group (Stokes, 1983). Similarly, the impact exerted by leadership on group performance can be mediated to a large extent by

group cohesion, that is, poor leadership behaviour may have almost no adverse impact on collective performance in units where cohesiveness is maintained in spite of a lack of effective leadership (MacIntyre, 2001). The design of the revised UCP acknowledged multiple levels of interest within an organisation and predicted that these levels would interact dynamically.

The structural transformation of the revised UCP was considerable. The four hierarchical subscales examining confidence in leadership were distilled into a single, four-item scale. Factor analysis by Gingras and Murphy (1998) supported the theoretical postulation that morale and cohesion were separate dimensions (morale defined as an individual-level variable; cohesion a group-level variable). The 'Ideology' factor was refined and renamed 'Esprit.' Items from both the 'Professional Morale' and 'Military Ethos' factors were combined to form a 'Military Values' scale. The positive and negative 'Leadership Climate' factor items were refined. As a result of theoretical reformulation and feedback from commanders (Gingras & Murphy, 1998), additional dimensions were added, including measures of 'Performance' (at individual, team and unit levels), 'Commitment' (to the team, unit and wider organisation), 'Satisfaction', and 'Readiness'.

The revised, 36-item UCP did not gain acceptance in the CF and was used rarely there. However, versions of the instrument (each containing the 36 original items) have been used extensively in the ADF. These versions are known collectively as the Unit Climate Profile – Australian (UCP-A). The original items were designed to provide 13 interpretative scales canvassing 11 dimensions. The 'Psychological Readiness' dimension comprises two scales that address readiness for Operations Other Than War (such as Peace Support Operations and disaster relief) and readiness for war. The 'Leadership Climate' dimension has two scales addressing negative and positive climate indicators. The dimension labels and their construct considerations are listed in Table 11.

The three most common versions of the UCP-A (36, 40 and 43-item versions) are contained in Appendix T. In Appendix U, scale items are grouped according to their *a priori* factor structure.

TABLE 10
Dimensions and Construct Considerations of the UCP-A

Dimension	**Construct considerations**
Psychological Readiness	Two scales; each examining perceptions of preparedness of unit/work team/individual to undertake primary duties – in the first scale these duties relate to operations other than war; in the second these duties relate to war or warlike operations.
Cohesion	Work team cohesiveness (mutual reliability and respect) and pride.
Individual Morale	Sense of belonging and of contributions being valued, strong social relations.
Commitment	A sense of commitment to the work group, unit, organisation.
Leadership Climate	Two scales; the first comprising positive human resource management behaviours of the immediate supervisor; the second comprising negative human resource management behaviours of the immediate supervisor that can undermine effective leadership.
Confidence in Leadership	Confidence in the abilities of leaders at the JNCO, SNCO & Officer levels.
Leadership Behaviour	Leadership skills and behaviours at the unit level: caring support; communicating a sense of mission, responsivity to leadership.
Esprit	Belief in the wider ADF organisation and its role in society; patriotism; ideology.
Satisfaction	Personal sense of satisfaction and meaning from one's work and work relations.
Performance	Effectiveness at the individual, team, and unit levels.
Organisational Values	Acceptance of organisational values: institutionalism, group focus, and personal sacrifice.

The survey form of the UCP-A is entitled 'Military Service' in the Australian HDO project. Respondents are informed in the written instructions that the purpose of the 'Military Service' section of the survey is to "measure morale, cohesion and other aspects important to military performance." Respondents are instructed to use the given scale to indicate their level of agreement with each statement and to make their ratings on "how things are at present." Each item has a seven-point Likert response scale ranging from 'Strongly Disagree' to 'Strongly Agree.'

Early Psychometric Assessment of the UCP-A

Levey (2003) conducted a psychometric analysis of the 43-item UCP-A using data from 3,417 Australian Army personnel who deployed during the period 2000-2002. Two randomly divided sub-samples were created. The first sample was utilised to examine the reliability and validity of the postulated 13-subscale model of the UCP-A. Alpha reliability scores for the 13 subscales ranged from .48 to .77, with a total scale reliability coefficient of .92. PCA with oblique rotation, specifying a 13-component model, resulted in seven components with eigenvalues greater than one. Adopting Zwick and Velicer's (1986) psychometric guidance on evaluating components, Levey identified five major, three minor and five trivial components. Visual inspection of component loadings indicated that the UCP-A items did not cluster according to their theoretically postulated structure. Levey suggested that there were eight components of the UCP-A offering "some psychometric robustness for the researcher" (p. 26).

Using the same data sample, Levey (2003) then conducted an 'exploratory' PCA without specifying the number of components to be extracted. This analysis extracted seven major components, accounting for 58% of the variance in the data, which were labelled: Workteam Cohesion/Morale, Immediate Leadership Behaviour, Confidence in Unit Leadership and Management, Team and Unit Operational Readiness, Esprit, Personal Operational Readiness/Commitment, and Personal Career

Satisfaction. Levey then attempted to replicate this component structure using the second data set.

Replication study. PCA (with oblique rotation) of the second sample resulted in a seven-component model, which accounted also for 58% of variance. The component structures of the principal components analyses for the two samples showed remarkable consistency, with 33 of 40 used items loading the same way in both analyses. Nevertheless, several modifications to the second sample component labels were evident, suggesting some subtle changes in the meaning of each component. The second sample component labels were: Work Team Cohesion and Readiness, Esprit, Personal Career Satisfaction, Team and Unit Operational Readiness and Leadership, Immediate Leadership Behaviour, Personal Operational Readiness, and Commitment.

Levey (2003) concluded the UCP-A was a valid and reliable instrument and that there was "considerable psychometric, construct and intuitive support for a seven-component model of unit climate dimensions" (p. 34). However, a potentially significant limitation of Levey's approach to psychometric analysis of the UCP-A was his use of random sampling from a data pool that integrated numerous units and several different deployments. This approach was inconsistent with the advice of Tabachnik and Fidell (2001), who warned against pooling the data of several samples for factor analytic purposes because of the potential for dissimilar sample characteristics or response patterns. This would appear particularly inappropriate when attempting to validate an instrument designed to distinguish psychological climate within units and between subunits. By pooling data irrespective of unit or contingent, some of the potential complexity in the data may be diluted, and certainly the influence of collective climate perceptions is discounted.

Nevertheless, several findings by Levey (2003) were not unanticipated. A reduced number of components from psychometric analysis compared to the postulated dimensionality of the UCP-A were expected. Consistent with the earliest versions of military unit climate measures, the UCP-A was designed as a tool for commanders. This has resulted in scale dimensions that are perhaps an oversimplification of the complexity and interdependence of climate factors. Hence the statistical loading of items from both the Positive Climate and Negative Climate subscales onto one component labelled Immediate Leader Behaviour shows that it is not the type of leadership behaviour that is perceptually important to respondents, but rather the source of this behaviour. However, for commanders who are seeking an understanding of unit and subunit climate, and guidance with respect to command interventions to enhance climate, an understanding of the type of behaviour shown by leaders is likely to be more useful.

Similarly, individual and unit level items from both readiness subscales (Readiness for Operations Other Than War, Readiness for War) loaded onto one component, suggesting that *levels* of readiness within the unit were more salient to respondents than *type* of readiness. An encouraging outcome of Levey's study was evidence for the appropriateness of the multilevel design of the UCP-A. This was evidenced by his comment that "a general pattern of responses that reflect distinctions between the individual, the workteam (or small group), the larger unit, and the entire organisation (the Australian Defence Force) on certain components" (Levey, 2003, p. 26) was evident in the outcomes of his psychometric analyses.

Individual-level Analysis of the UCP-A Component Structure

Two samples of UCP-A data were used in the current analysis, drawn from separate contingents surveyed during deployment in East Timor. Sample 1 consisted of 561 respondents; Sample 2 consisted of 627 respondents. Data screening as previously described in Chapter 2 was conducted for each item of the UCP-A for the two samples; leaving 460 and

508 cases in the respective samples for further analysis. Descriptive Statistics (means, standard deviations, skewness and kurtosis) of the two screened samples are provided in Appendix V. Skewness and kurtosis values for each item were within prescribed ranges. Select demographic characteristics of the participants are presented in Table 12.

TABLE 11
Select Demographics for Samples 1 and 2

Demographic	Category	Sample 1 Percentage	Sample 2 Percentage
Gender	Male	97.1	95.1
	Female	2.9	4.9
Age group	18-21 years	16.3	17.9
	22-26 years	27.7	35.8
	27-31 years	26.8	26.6
	32-36 years	18.1	12.7
	37+ years	11.1	7.0
Education Level	Some High School	25.7	24.8
	Completed High School	45.7	49.5
	Some University/College	20.2	19.4
	University/College Degree	8.5	6.3
Marital status	Married	54.5	51.9
	Single	40.0	43.6
	Separated	4.6	3.6
	Other	.9	1.0
Years of Service	0 – 4 years	33.0	44.0
	5 – 9 years	29.0	33.1
	10 – 14 years	25.5	13.3
	15+ years	12.4	9.7
Rank group	Private Soldier (equivalent)	50.4	56.2
	Junior NCO	25.7	24.6
	Senior NCO	15.4	10.5
	Officer	8.6	8.7
Previous Operational Experience	No	39.5	17.8
	Yes	60.5	82.2

The two samples showed good equivalence on the selected demographic variables, with the exceptions that members of the second sample had more operational experience (82 per cent with previous operational deployment compared with 60 per cent of Sample 1) yet less duration of Service (23 per cent having 10 or more years of Service compared with 38 per cent of Sample 1). Both samples showed an under-representation of females when compared to the total Australian Regular Army population, where females constitute 10 per cent of personnel. This lack of representation is explained by the preponderance of Combat Arms units in the survey samples. The Combat Arms have only male soldiers.

Exploratory Factor Analysis. Factorability indices for each sample were favourable, including Kaiser-Meyer-Olkin Measure of Sampling Adequacy (both .92), Bartlett's Test of Sphericity (approximate χ^2 of 9406.088; df 903; $p < .000$; and approximate χ^2 of 93139.855; df 903; $p < .000$ respectively), and MSA above .87 and .85. As expected, the component structures from samples drawn from specific deployed contingents were more complex than those extracted by Levey (2003) using a large, pooled sample. Varimax rotation led to nine-factor solutions for each sample, and accounted for 59.52 and 61.14 percent of the variance in each sample data set. Oblimin (oblique) rotation was performed on both samples to aid interpretation of component structures and because it was reasonable to assume that many unit climate factors are correlated to some extent. Tables 13 and 14 contain summary data of the oblique-rotation PCAs.

A table comparing the component structure and item loadings for the two samples is contained in Appendix W. Inspection of this appendix reveals the component structure across the two samples to be remarkably stable. Eight of nine extracted components from each of the samples are recognisably similar. Item loadings are reasonably consistent (28 of 43 items load onto the same components). The number of cross-loadings was small.

TABLE 12
Factor Loadings, Percent of Variance, and Cronbach's Alpha for Oblique Rotation
PCA on the 43-item UCP-A – Deployment Sample 1 (n=508)

Item	Component [a]								
	1	2	3	4	5	6	7	8	9
Cohesion 1: The members of my workteam encourage each other…	.73								
Cohesion 2: My workteam is proud of its standards and achievements.	.68								
Satisfaction 2: It feels good to be part of my workteam.	.65								
Performance 1 – Team: My workteam is effective in its regular duties	.65								
Commitment 2 – Team: If the ADF were going to war, I would want to remain…	.57								
Negative Climate 1: My immediate commander blames the team for his/her own inadequacies.		.84							
Negative Climate 3: My immediate commander refuses to explain his/her actions.		.79							
Negative Climate 2: My immediate commander lets others interfere with my work.		.77							
Positive Climate 1: My immediate commander is willing to listen to problems.		-.63							
Positive Climate 2: My immediate commander puts suggestions made by members of the workteam…		-.58							
Positive Climate 3: My immediate commander respects my military skills and experience.		-.45							
Ldr Confid 4 – WO: I am usually confident in the abilities of the Warrant Officers in my unit.			-.68						
Ldr Conf 2 – SNCOs: I am usually confident in the abilities of my unit SNCOs (SGT, SSGT).			-.65						
Standards of discipline in my unit are high.			-.54						
Ldr Confid 1 – JNCO: I am usually confident in the abilities of…			-.41						
Performance 3 – Unit: My unit generally maintains high standards of performance.			(-.39)						
Satisfaction 1: I am making a contribution to Australia by serving…				-.73					
Espirit 1: The military has an important job to do in defending Australia.				-.72					
Espirit 2: I feel proud to be a member of the ADF				-.63					
Values 2: Being in the military more than just a job				-.47					
Ldr Beh 1: I know what my unit is trying to…				(-.37)					
Satisfaction 3: I enjoy my job.					-.64				
Commitment 1 Military: I plan on making the military my career.					-.64				
Individual Morale 3: My level of morale is high.					-.64				

TABLE 12 (contd)

Item	Component [a]								
	1	2	3	4	5	6	7	8	9
Commitment 3 – Unit: I want to stay in my current unit…					-.58				
Espirit 3: A career in the ADF is worthwhile.				-.48	-.53				
Cohesion 3: The level of morale in my workteam…	.50				-.52				
Unit morale is high.					-.52				
Performance 2 – Indiv: I perform my routine duties to a high standard.						.60	.43		
I am given meaningful tasks.						.53			
Individual Morale 2: My job is important to the mission of the unit						.46			
Individual Morale 1: My closest friendships are with the people I…						-.41			
Ready War 1 – Indiv: I am ready to perform effectively if sent to war.							.75		
Ready OOTW 3 – Indiv: I am ready to deal with any demand or situation…							.64		
Values1: I am prepared to risk my life for the members of my workteam.							(.39)		
Ldr Beh 2: Officers almost always get willing eager and cooperation from members in my unit.								.63	
Ldr Confid 3 - Offr: I am usually confident in the abilities of the Officer(s) in my unit.								.60	
Values 3: The requirements of the mission should normally take priority over the needs of individuals.								.45	
Ldr Beh 3: Commanders in my unit are interested in my personal welfare.								.41	
Ready War 2 – Unit: My unit is ready for its wartime role.									.64
Ready OOTW 1 – Unit: My unit is ready for deployment on operations other than war.									.60
Ready War 3 – Team: The members of my workteam are ready to go to war.									.53
Ready OOTW 2 – Team: The members of my workteam are ready to deploy on operations…									.52
Percent of explained variance	28.3	6.6	5.8	4.0	3.7	3.0	2.8	2.6	2.5
Cronbach's alpha (Total scale = .92)	.85	.83	.74	.76	.83	.52	.72	.63	.75

Note: [a] Component labels:

- C_1 Cohesion
- C_2 Proximal Leader Behaviour
- C_3 Leadership Effectiveness
- C_4 Military Ethos (Meaning)
- C_5 Morale
- C_6 Work Motivation
- C_7 Individual Readiness
- C_8 Senior Leadership Acceptance
- C_9 Collective Readiness

TABLE 13
Factor Loadings, Explained Variance, and Cronbach's Alpha for Oblique Rotation
PCA on the 43-item UCP-A – Deployment Sample 2 (n=460)

Item	Component [a]								
	1	2	3	4	5	6	7	8	9
Ldr Confid 3 - Offr: I am usually confident in the abilities of the Officer(s) in my unit.	.77								
Ldr Beh 2: Officers almost always get willing and eager cooperation from members in my unit.	.75								
Ldr Beh 3: Commanders in my unit are interested in my personal welfare.	.57								
Ldr Conf 2 – SNCOs: I am usually confident in the abilities of my unit SNCOs (SGT, SSGT).	.52								
Ldr Confid 4 – WO: I am usually confident in the abilities of the Warrant Officers in my unit.	.42								
Standards of discipline in my unit are high.	.39								
Satisfaction 1: I am making a contribution to Australia by serving in the military.		.84							
Espirit 1: The military has an important job to do in defending Australia.		.78							
Espirit 2: I feel proud to be a member of the ADF.		.57							
Commitment 1 Military: I plan on making the military my career.			.64						
Espirit 3: A career in the ADF is worthwhile.			.58						
Values 2: Being in the military more than just a job.			.42						
Negative Climate 1: My immediate commander blames the team for his/her own inadequacies.				.81					
Negative Climate 3: My immediate commander refuses to explain his/her actions.				.77					
Positive Climate 2: My immediate commander puts suggestions made by members of the workteam…				-.73					
Positive Climate 1: My immediate commander is willing to listen to problems.				-.72					
Negative Climate 2: My immediate commander lets others interfere with my work.				.71					
Positive Climate 3: My immediate commander respects my military skills and experience.				-.49					
Individual Morale 3: Own level of morale is high.					.67				
Cohesion 3: Level of morale in my workteam…					.66				
Unit morale is high.	.43				.56				
Commitment 3 – Unit: I want to stay in current unit for as long as possible.					.43				-.43
Satisfaction 2: It feels good to be part of my workteam.						.54			
Individual Morale 1: My closest friendships are with the people I work with.						.73			

TABLE 13 (contd)

Item	Component [a]								
	1	2	3	4	5	6	7	8	9
Cohesion 2: My workteam is proud of its standards and achievements.						.52			
Ldr Confid 1 – JNCO: Am usually confident in the abilities of the JNCOs (LCPL, CPL) in my unit.						.48			
Commitment 2 – Team: If the ADF were going to war, I would want to remain with current …						.47			
Cohesion 1: Members of my workteam encourage each other to work together as a team.						.44			
Performance 1 – Team: My workteam is effective in its regular duties						.44			
Ready OOTW 2 – Team: The members of my workteam are ready to deploy on operations…						.41			-.41
Individual Morale 2: My job is important to the mission of the unit							-.71		
I am given meaningful tasks.							-.65		
Satisfaction 3: I enjoy my job.							-.52		
Performance 2 – Indiv: I perform my routine duties to a high standard.							-.42		
Values 3: Requirements of the mission normally take priority over needs of individuals.								-.70	
Ready OOTW 3 – Indiv: Am ready to deal with any demand or situation that may arise during…								-.60	
Ready War 1 – Indiv: I am ready to perform effectively if sent to war.								-.59	
Values1: I am prepared to risk my life for the members of my workteam.								-.39	
Ready War 2 – Unit: My unit is ready for its wartime role.									-.76
Ready OOTW 1 – Unit: My unit is ready for deployment on operations other than war.									-.71
Performance 3 – Unit: My unit generally maintains high standards of performance.									-.56
Ready War 3 – Team: The members of my workteam are ready to go to war.						.43			-.45
Ldr Beh 1: I know what my unit is trying to accomplish.									(-.32)
Percent of explained variance	28.9	7.5	6.0	4.8	3.6	2.9	2.6	2.5	2.4
Cronbach's alpha (Total scale = .92)	.81	.77	.72	.83	.83	.84	.72	.66	.76

Note: [a] Component labels:

- C_1 Leadership Effectiveness
- C_2 Military Ethos (Meaning)
- C_3 Commitment
- C_4 Proximal Leader Behaviour
- C_5 Morale
- C_6 Cohesion
- C_7 Work Motivation
- C_8 Individual Readiness
- C_9 Collective Readiness

The themes evident in item loadings led to the following component labels for Sample 1: Cohesion, Proximal Leader Behaviour, Leadership Effectiveness, Military Ethos (Meaning), Morale, Work Motivation, Individual Readiness, Senior Leadership Acceptance, and Collective Readiness. While the 'Cohesion' component comprised items from the postulated dimensions of Cohesion, Satisfaction, Performance, and Commitment, the common theme was a focus on immediate workteam functioning. This outcome suggests that respondents use *level* of organisational function as a primary means of appraising the dimensionality of unit climate.

The 'Proximal Leader Behaviour' component combined all six items from the two postulated dimensions of Positive Leadership Climate and Negative Leadership Climate. It is noteworthy that items from the two dimensions load in opposite ways (with Negative Leadership Climate items loading negatively). According to G. Fogarty (personal communication, August 15, 2005), it is not uncommon for items that tap opposing concepts to load together in this way when data reduction statistical techniques are applied.

The third extracted component comprised three Confidence-in-Leadership items (JNCO, SNCO, Warrant Officer), an exploratory item about standards of unit discipline, and a Performance item at the unit level. These items appear to equate perceived quality or competence of Non-commissioned and Warrant Officer leadership with standards of discipline and general performance. This component was labelled 'Leadership Effectiveness.'

Four items loaded at an acceptable level (above .4) on the fourth component. The items were from the postulated unit climate dimensions of Esprit (two items), Satisfaction (one item), and Military Values (one item). These items relate to the worth and uniqueness of the Defence Force, the importance of the individual to the Defence organisation, and consequent

sense of pride in belonging to Defence. This component was labelled 'Military Ethos' and was considered to reflect the sense of meaning or purpose that many military members receive from serving in the Defence Force. It equates to the concept of Esprit de Corps where military members have a sense of vertical cohesion or affiliation across various levels of the organisation, even including the wider society that it protects. This relationship between belief in the organisation and personal pride is consistent with the model of Person-Organisation fit (see Kristof, 1996).

The 'Morale' component also comprised items from multiple postulated climate dimensions as well as an exploratory item: "Unit morale is high." The items spanned morale at multiple levels: the individual, the immediate work team, and the unit. Two items from the Commitment dimension loaded on this component, suggesting that perceptions of morale are also influenced by positive outcomes of morale such as a sense of organisational commitment.

A component labelled 'Work Motivation' included an item on individual performance standards, two items from the postulated Individual Morale dimension, and an exploratory item "I am given meaningful tasks." One of the Individual Morale items – "My closest friendships are with the people I work with" - appears problematic in that it is the only item that negatively loads onto the component and a conceptual basis for its incorporation is not evident.

The seventh and ninth extracted components reflect Individual Readiness and Collective (workteam and unit) Readiness. Both components include items from the postulated dimensions regarding Readiness for War and Readiness for Operations Other Than War. This dimensional duality suggests that soldiers themselves do not significantly distinguish the psychological readiness attributes for these different types of deployment. The Individual Readiness component also includes a Values dimension item

"I am prepared to risk my life for the members of my workteam." Not surprisingly, it would appear that part of the individual psychological preparedness process for many soldiers is a conscious willingness to sacrifice oneself for the group if required. It is noted that this item's factor loading was below the preferred .4 cut-off criterion level stipulated for this research. However, some authors such as Pedhazur & Schmelkin (1991) have contended that cut-offs as low as .3 are 'reasonable' to accept, particularly if the item loading is conceptually sensible and theoretically consistent.

The final component has been labelled 'Senior Leadership Acceptance." Three of the four items relate to confidence in or acceptance of leadership at the officer levels. The fourth item is from the postulated Values dimension – "The requirements of the mission should normally take priority over the needs of individuals" – that was designed to reflect the traditional military value of organisational need overriding individual safety in some operational circumstances. The reason for this item loading on this component is uncertain. It may reflect that acceptance of the senior leadership also includes acceptance of the less palatable military value of self-sacrifice for organisational need (as distinct from self-sacrifice for the sake of immediate workteam safety, as discussed above, embodied in an item loading on the Individual Readiness component).

As a result of examination of item loadings and reliability analysis provided in Table 13, and conceptual justification of the component structure, three items and two components of the UCP-A scale were considered problematic. These two components – 'Work Motivation' and 'Senior Leadership Acceptance' - were the only subscales to have marginal Cronbach alpha reliability coefficients (α of .52 and .63 respectively). It is noteworthy that these two components were the only subscales that could not be associated directly with the postulated factor structure of the instrument.

The pattern matrix and reliability coefficient alphas for the Sample 2 PCA (Table 14) were examined. As noted previously, nine components emerged from the analysis. Eight of these warranted the same labels as the Sample 1 components despite some variation among item loadings between the two pattern matrices. A single leadership component (Leadership Effectiveness) merged most items from the two leadership components (Leadership Effectiveness, Senior Leadership Acceptance) in the Sample 1 analysis. In contrast, items forming the Military Ethos component from Sample 1 had fractured into two components, the second labelled Commitment.

Cronbach alpha reliability coefficients for the second sample were generally improved and acceptably high, with the exception of the Individual Readiness component (α of .66). Two of the three problematic items from the Sample 1 analysis loaded strongly. The third item – "I am prepared to risk my life for the members of my workteam" – with a component loading of -.39 fell only marginally short of the preferred factor-loading cut-off. As noted, the Senior Leadership Acceptance component, which was theoretically problematic in the Sample 1 analysis outcomes, was absorbed into a broader Leadership Effectiveness component in the Sample 2 analysis. The Work Motivation component reliability coefficient improved to an acceptable .72.

As a result of these analyses, it was concluded that the UCP-A had a robust and conceptually rational structure that was reasonably concordant with the model postulated in its design. Nine-factor models emerged from data reduction techniques with two samples, in comparison with a postulated 11-dimensional model (with two of these dimensions presumed to have dual subscales). However, as Levey (2003) also found, many scale items did not cluster in accordance with postulated loadings. Nevertheless, the conceptual clarity of the resulting components is evident. For example, two psychological readiness subscales are apparent, although distinguished by level (individual and collective) rather than type of operation (war, operations other

than war). The morale subscale is manifest, although rather than being a measure of individual morale as postulated, it has tapped morale across multiple levels within the military unit (consistent with some perspectives in the literature). The cohesion subscale in each analysis comprised items from at least four of the postulated climate dimensions, yet they each related to the functioning or interpersonal relationships of the workteam or the respondent's own connection to the team. The Positive and Negative Leadership Climate items loaded onto one component now called Proximal Leadership Behaviour. Items from across the postulated Performance, Organisational Values, Esprit, and Satisfaction dimensions have loaded together to form Military Ethos and Work Motivation components.

Items from the postulated dimensions of Confidence in Leadership and Leadership Behaviours tended to load together on a component labelled Leadership Effectiveness. From the perspective of the soldier, this is not surprising. Studies of operational leadership, particularly in the Israeli Defence Force (e.g., Catignani, 2004; Solomon, Margalit, Waysman, & Bleich, 1991), have shown that perceived competence in fundamental military skills is the most important factor in soldier confidence in their commanders.

In summary, the nine-component models extracted from PCA are conceptually lucid and psychometrically robust, with significant component loadings, clear patterns to item clusters, and acceptable subscale reliability. The main pragmatic impact of this result is the need to consider modifying the reporting templates of UCP-A outcomes used to brief commanders on HDO survey outcomes for their units to reflect an eight-factor model of unit climate rather than the designated 13 subscales. The eight climate subscales and their constituent items to be used in further individual-level data analysis are detailed in Table 15. Two components - Senior Leadership Acceptance and Commitment - that each appeared once across the two PCAs were omitted on the grounds of lack of item stability and, in the case of Senior Leadership Acceptance, lack of conceptual clarity and acceptable reliability.

TABLE 14
Psychometrically-derived UCP-A Subscales – Individual Level of Analysis

UCP-A Subscale	**Constituent Items** [a]
Individual Readiness	I am ready to perform effectively if sent to war. I am prepared to risk my life for the members of my workteam. I am ready to deal with any demand or situation that may arise during operational service.
Collective Readiness	The members of my workteam are ready to go to war. The members of my workteam are ready to deploy on operations other than war. My unit is ready for its wartime role. My unit is ready for deployment on operations.
Morale	My own level of morale is high. The level of morale in my workteam is high. Unit morale is high. I want to stay in my current unit for as long as possible.
Cohesion	It feels good to be part of my workteam. My workteam is effective in its regular duties. My closest friendships are with the people I work with. My workteam is proud of its standards and achievements. The members of my workteam encourage each other to work together as a team. If the ADF were going to war, I would want to remain with my current workteam.
Proximal Leader Behaviour	My immediate commander (next in the chain-of-command above you) blames the team for his/her own inadequacies. My immediate commander is willing to listen to problems. My immediate commander refuses to explain his/her actions. My immediate commander lets others interfere with my work. My immediate commander respects my military skills and experience. My immediate commander puts suggestions made by members of the workteam into operation.
Leadership Effectiveness	I am usually confident in the abilities of my unit JNCOs (LCPL, CPL). I am usually confident in the abilities of my unit SNCOs (SGT, SSGT). I am usually confident in the abilities of the Warrant Officers in my unit. I am usually confident in the abilities of the Officer(s) in my unit. Commanders in my unit are interested in my personal welfare. Standards of discipline in my unit are high. My unit generally maintains high standards of performance. Officers almost always get willing and eager cooperation from members in my unit.
Military Ethos (Esprit)	I am making a contribution to Australia by serving in the military. The military has an important job to do in defending Australia. I feel proud to be a member of the Australian Defence Force. I plan on making the military my career. A career in the Australian Defence Force is worthwhile. Being in the military is more than just a job.
Work Motivation (Meaning)	I enjoy my job. I am given meaningful tasks. My job is important to the mission of the unit. I perform my routine duties to a high standard.

Note: [a] Omitted items:

1. I know what my unit is trying to accomplish.
2. The requirements of the mission should normally take priority over the needs of individuals.

Group-level Analysis of the UCP-A

Over the previous two decades, recognition of the importance of *level* in organisational theory and research has grown (e.g., Anderson & West, 1998). Level of analysis would appear to be especially relevant to the military organisation where differentiation is both vertical and horizontal, suggesting the need for both across-level and cross-unit assessment. For example, in a recent study of U.S. military personnel, cohesion was found to function differently at the individual and group levels of analysis (Griffith, 2002). Perceptions of soldier emotional support were associated with positive outcomes at the individual level with respect to well-being, unit identification, solidarity (defined as resistance to disruptive forces on group structure and functioning), and perceptions of psychological readiness for combat. However, at the group level, soldier emotional support was associated with negative outcomes such as lower levels of group well-being, higher levels of disintegration (the converse to solidarity), and lower levels of perceived individual combat readiness. Although the relations of cohesion to the study outcome variables were statistically significant at both levels of analysis, cohesion explained most of the variance in well-being, unit identification, solidarity, and perceptions of psychological readiness for combat at the individual level. Nonetheless, relations among variables were not consistent across the two levels, suggesting cohesion fosters different sociopsychological processes at different levels of analysis (Griffith, 2002).

Researchers have been counselled to address explicitly the role of level in organisational phenomena in order to avoid biases of misspecification and aggregation resulting from poorly considered fusion of data (Rousseau, 1985). Considering the debate regarding the need to distinguish level of measurement, level of analysis (the unit to which data are assigned for hypothesis testing and statistical analysis) and the focal unit of analysis (the level to which generalisations are made), an examination of the suitability and effectiveness of the UCP-A as a group-level measure appeared warranted.

Put simply, can aggregated perceptual data captured at the level of the individual validly serve as indices of group or organisational climate?

Derived as it is on self-report data, the UCP-A would be considered individual-level data, yet several UCP-A factors drawn from the preceding analysis consisted of items that reflect constructs valid at the focal level of the group. Collective Readiness, Morale, Cohesion, and Leadership Effectiveness appear to be shared group attributes. In addition, the factor of Proximal Leadership Behaviour represents individual-level self-reports of behaviour at a higher level in a clearly defined organisational hierarchy. It is clearly important to examine whether the UCP-A is useful as a tool for analysis above the individual level. Are the UCP-A components (constructs) valid at the level of grouped data? Do the characteristics of a particular level alter the meaning of and the relationships among variables? Does aggregation actually add meaning to individual level data? Questions such as these would appear particularly important in the highly differentiated military organisation where associations among climate variables across levels are widely considered to be crucial to operational effectiveness. For instance, does individual work motivation influence perceptions of collective readiness? Does aggregated data concerning leadership add meaning or increase construct validity by reducing the error component of individual-level data?

Procedure. The sample utilised for group level analysis of the UCP-A comprised a total of 145 teams (total N individuals = 3,311). Teams were identified on the basis of the subunit item in the 'General Information' section of the HDO survey. The criterion for inclusion of a subunit was a frequency count of at least five. Data for each team were aggregated and mean scores were calculated for each UCP-A item for each team. Eight teams were found to have missing item data and were discarded from the analysis. Examination of univariate and multivariate outliers at the level of the aggregated data led to the exclusion of a further 14 teams, leaving 123 groups (aggregated from 2,777 cases) for further analysis. Of the remaining

groups, number of respondents ranged from five to 74 (mean 22.58; median = 19; mode = 10).

Factorability indices for the aggregated data were acceptable (Kaiser-Meyer-Olkin Measure of Sampling Adequacy (.89), Bartlett's Test of Sphericity (approximate χ^2 of 5331.629; df 820; $p < .000$), and MSA above .81. Two issues of concern were examined: the ratio of cases to items, and the applicability of familiar factor analysis procedures to item-level data. The case to item ratio for the aggregated data was 123 : 43, or 2.87 : 1. This ratio is lower than the recommended by many statisticians (e.g., Nunnally, 1978). However, other factor analysts (e.g., Kline, 1986) have argued that a minimum number of 100 cases is more important than the case-to-item ratio.

Results. Principal Components Analysis was utilised. Solutions using both varimax and oblique rotation yielded nine-factor solutions that were highly concordant. The rotated component matrix for the varimax solution is provided in Table 16. The component loadings are relatively unambiguous, although some cross-loadings on two and sometimes three components are evident.[2] Total variance accounted for by this solution was 74.7%. Reliability analysis revealed a total scale Cronbach's alpha of .94. Alpha coefficients for the nine component scales ranged between .75 and .92, with only the ninth component's alpha falling below .80.

The components to emerge from the group-level analysis were labelled Team Climate (Cohesion), Senior Leader Effectiveness, Proximal Leader Behaviour, Readiness, Individual Morale, Esprit, SNCO/WO Leadership, Work Motivation, and Commitment. This outcome differs in a number of ways from the UCP-A subscales that were psychometrically derived using individual-level data (see Table 15). The group-level analysis has associated all psychological readiness items (across the individual, team,

[2] Using a threshold of .50 to retain items instead of .40 would reduce the number of cross loadings to three – with the loss of two items: "Standards of discipline in my unit are high" and "Being in the military more than just a job" (Values 2).

and unit levels) whereas the individual-level analysis distinguished Individual Readiness from Collective Readiness (in the team and unit). In contrast, the Morale subscale from the individual-level analysis comprised items that spanned the three levels, whereas the component from the group-level analysis that dealt with morale had a focus on individual-level items. Another difference between the two analyses related to the Senior Leader Effectiveness component. At the group level of analysis, items relating to Senior NCO/Warrant Officer leadership emerged as a separate component. This is not a surprising outcome because the style, responsibilities, and presumed effectiveness of Senior NCOs, as compared to commissioned officers, is an immutable theme within most military institutions (Janowitz, 1960). A final, conspicuous difference between the two analyses was the emergence of a 'Commitment' component in the group-level analysis. The items making up this component were associated – at the individual-level analysis – with the Military Ethos (Esprit) component.

Because of the potential impact of item distribution similarities when conducting item-level factor analysis, O'Connor (2004) recommended a check of response levels for items that load together. The means and standard deviations for the items loading on each component were examined for large differences. No statistical patterns were evident, for example, no factor included mostly items with high response levels; nor did any factor include exclusively intermediate or low response levels. Furthermore, the distinctive component solution for the group-level analysis is complex and conceptually cogent. The lack of consistent changes in the group-level analysis component structure (demonstrated, for example, by reduced or simplified components; or reduced salience of the organisational level in the interpretation of components) when compared to the individual-level analysis outcomes, suggests that the different component structures are not simply the result of statistical artefact. The unit climate subscales and their items to be used in data analysis at the group level are provided in Table 17.

TABLE 15
Factor Loadings, Explained Variance, and Cronbach's Alpha for PCA with Varimax Rotation on the 43-item UCP-A – Group-level Analysis (n=123)

Item	Component [a]								
	1	2	3	4	5	6	7	8	9
Cohesion 2: My workteam is proud of its standards and achievements.	.84								
Cohesion 1: The members of my workteam encourage each other…	.82								
Performance 1 – Team: My workteam is effective in its regular duties	.80								
Satisfaction 2: It feels good to be part of my workteam.	.66								
Ready OOTW 2 – Team: The members of my workteam are ready to…	.65			.51					
Ldr Confid 1 – JNCO: I am usually confident in the abilities of…	.63						.51		
Positive Climate 2: My immediate commander uses suggestions…	.57		.48						
Cohesion 3: The level of morale in my workteam…	.55	.44							
Ldr Beh 2: Officers almost always get willing cooperation…		.80							
Ldr Confid 3 - Offr: I am usually confident in the abilities of…		.68					.42		
Unit morale is high.		.59			.42				
Ldr Beh 3: Commanders in my unit are interested in my…		.53					.46		
Ldr Beh 1: I know what my unit is trying to accomplish.		.50							
Negative Climate 1: My immediate commander blames the team…			-.85						
Negative Climate 3: My immediate commander refuses to explain…			-.82						
Negative Climate 2: My immediate commander lets others interfere…			-.79						
Positive Climate 1: My immediate commander is willing…			.64						
Positive Climate 3: My immediate commander respects my skills	.46		.55						
Ready OOTW 3 – Indiv: I am ready to deal with any demand or situation…				.64					
Ready War 1 – Indiv: I am ready to perform effectively if sent to war.				.64		.41			
Values 3: The requirements of the mission should normally take priority…				.63					
Ready OOTW 1 – Unit: My unit is ready for deployment on operations…				.56					

TABLE 15 (contd)

Item	Component [a]								
	1	2	3	4	5	6	7	8	9
Ready War 3 – Team: The members of my workteam are ready to go to war.	.52			.54					.43
Ready War 2 – Unit: My unit is ready for its wartime role.				.53					.43
Standards of discipline in my unit are high.				.40					
Commitment 1 Military: I plan on making the military my career.					.73				
Espirit 3: A career in the ADF is worthwhile.					.70				
Espirit 2: I feel proud to be a member of the ADF					.61	.54			
Individual Morale 3: My own level of morale is high.		.41			.54				
Values 2: Being in the military more than just a job					.42				
Satisfaction 1: I am making a contribution to Australia by serving…						.85			
Espirit 1: The military has an important job to do in defending Australia.						.77			
Values1: I am prepared to risk my life for the members of my workteam.	.41			.45		.49			
Ldr Confid 4 – WO: I am usually confident in the abilities of…							.76		
Ldr Conf 2 – SNCOs: I am usually confident in the abilities of…							.65		
Performance 3 – Unit: My unit generally maintains high standards of performance.		.42					.49		.41
Performance 2 – Indiv: I perform my routine duties to a high standard.								.78	
Individual Morale 2: My job is important to the mission of the unit.								.75	
I am given meaningful tasks.		.41						.71	
Satisfaction 3: I enjoy my job.								.56	
Commitment 3 – Unit: I want to stay in current unit									.72
Commitment 2 – Team: If the ADF were going to war, I would want to remain…									.67
Individual Morale 1: My closest friendships are with the people I…	.47								.55
Percent explained variance (Cumulative 74.7%)	14.4	9.7	9.3	7.7	7.1	7.0	6.7	6.4	6.4
Cronbach's alpha (Total scale = .94)	.92	.88	.88	.85	.84	.78	.81	.80	.75

Note: [a] Component labels:

- C_1 Team Climate
- C_2 Senior Leader Effectiveness
- C_3 Proximal Leader Behaviour
- C_4 Readiness
- C_5 Individual Morale
- C_6 Esprit
- C_7 SNCO/WO Leadership
- C_8 Work Motivation
- C_9 Commitment

TABLE 16
UCP-A Subscales Derived from Group-Level Analysis

UCP-A Subscale	Constituent Items
Team Climate	My workteam is proud of its standards and achievements. The members of my workteam encourage each other to work as a team. My workteam is effective in its regular duties. It feels good to be part of my workteam. The members of my workteam are ready to deploy on OOTW. I am usually confident in the abilities of my unit JNCOs (LCPL, CPL). My immediate commander puts suggestions made by members of the workteam into operation. The level of morale in my workteam is high.
Senior Leader Effectiveness	Officers almost always get willing and eager cooperation from members in my unit. I am usually confident in the abilities of the Officer(s) in my unit. Unit morale is high. Commanders in my unit are interested in my personal welfare. I know what my unit is trying to accomplish.
Proximal Leader Behaviour	My immediate commander (next in the chain-of-command above you) blames the team for his/her own inadequacies. My immediate commander refuses to explain his/her actions. My immediate commander lets others interfere with my work. My immediate commander is willing to listen to problems. My immediate commander respects my military skills and experience.
Readiness for Deployment	I am ready to deal with any demand or situation that may arise during operational service. I am ready to perform effectively if sent to war. The requirements of the mission should normally take priority over the needs of individuals. My unit is ready for deployment on operations. The members of my workteam are ready to go to war. My unit is ready for its wartime role. Standards of discipline in my unit are high.
Individual Morale	I plan on making the military my career. A career in the Australian Defence Force is worthwhile. I feel proud to be a member of the Australian Defence Force. My own level of morale is high. Being in the military is more than just a job.
Military Ethos (Esprit)	I am making a contribution to Australia by serving in the military. The military has an important job to do in defending Australia. I am prepared to risk my life for the members of my workteam.
SNCO/WO Leadership	I am usually confident in the abilities of the Warrant Officers in my unit. I am usually confident in the abilities of my unit SNCOs (SGT, SSGT). My unit generally maintains high standards of performance.
Work Motivation	I perform my routine duties to a high standard. My job is important to the mission of the unit. I am given meaningful tasks. I enjoy my job.
Commitment	I want to stay in my current unit for as long as possible. If the ADF were going to war, I would want to remain with my current workteam. My closest friendships are with the people I work with.

Chapter Summary and Conclusions

This chapter has reported the conceptual development and psychometric validation of a multi-dimensional measure of psychological readiness in a military environment: the Unit Climate Profile - Australian (UCP-A). As a result of analyses at the individual level using two deployed samples, it was concluded that the UCP-A has a robust structure that is conceptually concordant with its theoretical development and design. In addition, the component structure of the UCP-A varies in a meaningful way at the group level of analysis. The unit climate subscales and their items to be used in data analysis at individual and group levels are provided in Table 15 and Table 17 respectively. In both cases, the underlying structures display a meaningful pattern of item loadings, largely consistent with the postulated model of military unit climate.

Chapter 4

PSYCHOLOGICAL READINESS FOR OPERATIONS

Introduction

> *Battle is more than a combination of fire and movement. It is the integration of fire, movement, and consciousness. The commander, therefore, cannot rest content with guiding the fire and directing the movement; he must guide the soldier's mental reactions to battle. Hence the commander is responsible for the mental preparation of his men no less than for their physical and technical training and their being brought to battle.*
>
> General Yigal Allon, *The Making of Israel's Army,* 1970

Enhanced understanding of psychological readiness can inform command decision-making on how to improve soldier and unit preparedness for operations. The purpose of this chapter was to examine the antecedents of psychological readiness in deployed Australian military units. The interrelationships among human dimensions variables that predict psychological readiness outcomes at the individual and collective levels were explored. These variables included operational experience, health behaviours, morale, cohesion, proximal leader behaviour, and perceptions of leadership effectiveness.

The Construct of Psychological Readiness

Operational readiness has been an important component in models of military effectiveness (e.g., Villeneuve, Dobreva-Martinova, Little, & Izzo, 2001). Military organisations have well-established procedures for gauging the preparedness of units for deployed operations. Such readiness evaluations typically have included assessments of unit-level tactical proficiency, equipment serviceability checks, manning levels, audits of logistic stocks and supply processes, and reviews of each unit member's

individual readiness status (typically medical, dental, and weapons test compliance). Yet, as noted in Chapter 1, despite affirmations by military leaders throughout history that the human dimensions of capability are crucial to operational effectiveness, formal assessments of the psychological aspects of readiness appear to be the exception rather than the norm in today's military forces. This may be explained partly by the uncertainty surrounding which factors impact upon psychological readiness and how they influence one another.

As discussed in Chapter 3, Wild (1988) proposed a schema of military readiness (see Figure 6, p. 117) describing the human dimensions that contribute to psychological preparedness for operations. He postulated that the human components of operational readiness rested on several psychological components, including confidence, proficiency (achieved through training and experience), and understanding of and motivation toward combat missions. Each of these components was presumed to be mediated by aspects of leadership, such as leadership behaviours, perceptions of leadership competence, and perceptions of genuine concern by leaders for personnel under their command. Wild's readiness schema was postulated to provide a means to predict operational effectiveness using individual- and group-level antecedent variables drawn from the human factors of military performance.

Wild's schema was operationalised in the construction of the Human Dimension Combat Readiness Index – Experimental (HDCRI-X) (Reeves & Hansen, 1989) and its refinement, the Unit Climate Profile (UCP) (Farley, 1995). While a considerable amount of research has been conducted using versions of the UCP with both deployed Canadian and Australian military personnel (e.g., Brown, 2005; Dobreva-Martinova, 2000; Farley, 1995, 2002; Little & Thivierge, 1999; Murphy & Farley, 1998, 2000; Murphy & Skate, 2000), the main emphasis of these studies has not been related to Wild's (1988) original concern with predicting readiness, but

rather with the examination of the interrelationships between human dimensions factors and both stress and strain. This focus on stress and its outcomes appears to have been a by-product of the difficulty in applied military research of capturing adequate outcome measures of collective performance or operational effectiveness (Villeneuve et al., 2001).

Wild's concept of readiness does not appear to have influenced researchers beyond Canada and Australia. In the wider literature, there has been a lack of consensus about how to define psychological readiness in the military context and to what degree to focus on the human dimension of readiness. Several publications that specifically examined soldier or unit readiness have not defined readiness (e.g., Castro & Adler, 1999; Norwood, 1997), and appear to have assumed that the concept is universally understood. Other authors in the behavioural science domain (e.g., Sarkesian, 1980) have not distinguished between the traditional, more technical concept of operational readiness – involving skills proficiency, logistics system efficiency and equipment serviceability – and the narrower component of psychological preparedness. Kirkland, Bartone and Marlowe (1993) regarded psychological readiness as analogous to morale or spirit. Scheflen (1996) recognised the human element in a definition that conceptualised readiness as the interaction of personnel, equipment and training. Some research has attended expressly to the human dimension of readiness. For example, studies conducted in the U.S. Marine Corps operationalised 'personal readiness' as a multidimensional construct canvassing issues at the individual level such as readiness to deploy, ability to perform, and motivation to perform (see Kerce, 1995). In a similar vein, McGonigle, Casper, Meiman, Cronin, Cronin, and Harris (2005) postulated that readiness included the constructs of physical and mental fitness, unit cohesion, organisational citizenship behaviour, organisational commitment, preparedness to deploy, and technical competence (both job-related and broader military skills).

In a subsequent paper, Castro and Adler (2000) defined soldier readiness as "the state of being prepared mentally or physically for some experience or action" (p. 4). However, this definition does not acknowledge explicitly the postulated motivational component of readiness or the multilevel nature of readiness in the strongly hierarchical military organisation. These limitations were addressed to some degree in an earlier definition by Harris, Blair and O'Neill (1995) who defined individual readiness as the "extent to which an individual is prepared, able, and motivated to perform his or her job as part of the larger military mission" (p. iii). The importance of assessing readiness at different levels in the military was demonstrated by Shamir, Brainin, Zakay, and Popper (2000), who found that aggregated readiness perceptions at the soldier level were only modestly correlated with aggregated perceptions at the level of instructional staff. The authors concluded that the two groups employed different standards to assess the combat readiness of units. The danger of disparate perceptions of readiness operating across different levels of an organisation has been tragically demonstrated by incidents of indiscipline and atrocious behaviour on the part of deployed military personnel (Winslow, 1997).

Bartone and Kirkland (1991) distilled three themes from the literature regarding command approaches to promoting psychological readiness. These themes were the demonstrated caring of subordinates by superiors, the fostering of trust and other emotional bonds across ranks to enhance cohesion, and the empowerment of subordinates in order to nurture initiative when confronted with the unexpected or novel challenges which commonly occur during the 'fog of war' (the uncertainty typically surrounding the conduct of actual operations). According to Bartone and Kirkland (1991), the military literature at that time suggested that the priorities, values and behaviour of commanders have a causal influence on the psychological readiness of subordinates. Outcomes from leadership studies in the civilian sector (e.g., van Dierendonck, Haynes, Borrill, &

Stride, 2004) have suggested that proximal leadership is normally the most important influence on subordinate behaviour. However, in the context of the military, the most influential level of leadership in relation to readiness perceptions does not appear to have been consistently identified.

The premise that psychological readiness is important to operational effectiveness was examined by Kirkland, Bartone and Marlowe (1993). The authors noted a growing tendency to regard psychological readiness as one of many human dimensions that acts as "an intermediate variable between the leaders' behavior and the psychological foundations of performance" (p. 581). In their study, leader behaviour was considered an expression of command priorities. This behaviour was postulated to have the potential to affect the self-esteem and commitment of subordinates by engendering a positive psychological climate of trust and concern. The authors argued that the aggregate impact of such affective responses to command constitute the elements of psychological readiness and other human dimensions factors within a unit. Psychological readiness, along with factors such as morale and cohesion, in turn, would impact on military performance. A flow chart of these postulated relationships is shown in Figure 8.

NOTE: This figure is included on page 151 of the print copy of the thesis held in the University of Adelaide Library.

FIGURE 8 Flowchart of the relationship between command priorities and human dimensions outcomes in subordinates.
(adapted from Kirkland et al., 1993)

The Kirkland et al. (1993) study was not the first time that the construct of psychological readiness has been closely associated with the

human dimensions factors of morale and cohesion. For example, Gal (1986) reported on a psychometric tool developed for use in the Israeli Defence Force that was called the "Combat Readiness Morale Questionnaire" (CRMQ). A subsequent factor analysis of the CRMQ, utilising respondents from both the Israeli Defence Force and the United States Army, revealed an eight-factor solution, with the first factor labelled, rather elaborately, as *Unit Readiness, Morale, and Cohesion* (Gal & Manning, 1987). More recently, Shamir et al. (2000) conceptualised perceived combat readiness as one of the motivational components of the broader construct of morale. Consistent with Bandura's (1997) self-efficacy theory, and research on group efficacy (e.g., Marks, 1999), Shamir and his colleagues postulated that perceptions of readiness were derived from collective efficacy beliefs about the ability of the group or unit to be effective on operations. Such beliefs about group effectiveness were presumed to influence individual attitudes and behaviour; including the degree of effort made towards group tasks and the degree of persistence that occurred when group efforts did not deliver expected outcomes. It therefore is not difficult to understand why Shamir et al. (2000) regarded psychological readiness as an important component of morale.

Kirkland, Bartone and Marlowe (1993) also featured morale in their research into psychological readiness. They examined command priorities in U.S. Army units. By comparing soldier perceptions in units distinguished by low or high command priority with respect to fostering morale, significant correlations were found with six soldier readiness variables: commitment to the company, vertical bonding, confidence in leadership, general well-being, confidence in both self and weapons, and work satisfaction. Six other command priorities (combat skills, discipline, decisiveness, control, horizontal bonding, and vertical bonding) realised only one other significant correlation with a soldier readiness variable; that between the priority of combat skills and soldier life satisfaction. It would appear that the fostering and maintenance of morale – i.e., commanders

who placed a high priority on issues of subordinate morale – were associated with high scores on a number of human dimension outcomes, particularly psychological readiness.

In the Shamir et al. (2000) study, hypothesised correlates of collective efficacy beliefs in Israeli Defence Force combat units were examined. The variables included soldier experience levels, leader tenure in the current unit, leader confidence in the unit, soldier confidence in leadership, unit discipline levels, and identification with the unit. The strongest predictor of perceived combat readiness was found to be identification with the unit; which could be regarded as an element of esprit de corps, or what is sometimes variously referred to as 'vertical cohesiveness' (Salo & Siebold, 2005), 'vertical bonding' (Kirkland et al., 1993), or 'organisational cohesion' (Siebold, 1999).

Another approach to understanding psychological readiness was taken by Castro and Adler (2000); wherein soldier readiness to perform was posited to be associated with the *pace* or *tempo* of military operations. It was argued that a high operational tempo would lead to issues related to chronic fatigue and preclude adequate respite to enable military personnel to be adequately prepared – mentally or physically – "for some experience or action" (p. 5). The authors reported research that showed that the context of military activity had important implications for understanding the relationships between factors affecting psychological readiness. For instance, both training and deployment environments typically produced an increase in workload and hours of work for military personnel. While soldiers assessed during deployment reported, as a group, decreased military readiness; soldiers assessed in training environments typically reported increased military readiness. This distinction was subsequently explained by the high role ambiguity – "role overload" – associated with actual operations but normally absent from training scenarios (Thomas, Adler, & Castro, 2005).

At that time, the Castro and Adler (2000) study, which focussed on operational tempo as an important moderator of psychological readiness, was unusual in the sense that the construct of readiness was founded on an assumption consistent with Conservation of Resources Theory (see Hobfoll, 1989). Deployment 'load' was presumed to have an adverse, cumulative effect on the physical and cognitive resources necessary to respond to operational demands. This approach was evidenced in the choice of readiness indicators, such as the number of alcoholic drinks consumed during the preceding week. This conservation of resources approach was implicit and novel – distinct from the familiar perspective of readiness as essentially a motivational factor resulting from a constellation of psychosocial influences.

Other studies have examined the impact of readiness on the *type* of military operations undertaken. For example, special forces personnel have reported decreases in readiness following non-combat duties such as embassy support (Government Accountability Office, 1997). Rumsey (2002) concluded that peacekeeping duties were associated with tangible reductions in readiness for conventional operations. Excessive time on particular tasks such as training exercises and equipment inspections has also been associated with degraded readiness (Fossen, Hanser, & Stillion, 1997). It should be noted that the construct of readiness in these studies was related to system-level factors such as disruptions to immediate work team composition, equipment wear and tear, and lack of training for certain military skills; rather than related to psychological readiness per se.

Not all studies have found that psychological readiness was impaired by factors such as operational tempo. For example, Adlerks (1998) found a neutral association between time away from garrison for training and perceptions of individual or unit readiness. More significantly, several studies have found positive associations between operational/personal tempo and perceptions of individual readiness (e.g., Castro & Adler, 2001;

Ramsberger & Wetzel, 1998). While Castro and Adler (2001) found that sustained operational tempo could lead to an increase in operational readiness, they noted that this apparently positive outcome came at a cost – that of decreased family well-being. This decline in "family readiness" was due presumably to the extended absence of the Service member from home.

In summary, numerous socio-psychological variables have been postulated, or have been found, to predict psychological readiness. These variables include deployment appraisals and expectations, morale, cohesion, proximal leader behaviour, perceptions of leadership effectiveness, trust in leadership, commitment to the unit, esprit de corps, general well-being, level of military experience, and individual coping ability (Thompson & Pastò, 2003). Inconsistent findings exist with respect to the impact of personal / operational tempo on outcomes such as performance, family well-being, and readiness. In addition, psychological readiness has been found to differ at the individual level compared to the collective level (Shamir et al., 2000).

Hypotheses

Several hypotheses emerged from an integration of the preceding review of the literature on psychological readiness and the HDO conceptual schema underpinning this research (Figure 5, p. 35). Firstly, from a self-efficacy perspective, previous experience of deployment should provide an individual with the confidence that he or she can perform effectively during future deployments. Whilst the challenges and context of each military deployment differ, the essential military skills required are generally considered consistent. In addition, because the military is essentially a training organisation, general military experience should also foster a sense of self-efficacy. Across much of the military organisation, when personnel are not deployed on operations, they are training for the next deployment. Another conventional indicator of military experience and competence is rank. Progression in rank is normally associated with prescribed minimum periods of effective performance at preceding rank levels, as well as success

in promotion courses and other military training activities. Rank level is therefore an explicit indication of professional mastery in a number of military performance domains. For the present study, it was hypothesised that:

1. *Individual readiness will be enhanced by military experience, as evidenced by previous operational deployment, years of service, and rank.*

Psychological well-being has been often associated with human dimensions constructs (e.g., Oliver, Harman, Hoover, Hayes, & Pandhi, 2000). For example, military research has pointed to a buffering effect of human factors such as cohesion and confidence in leadership on the relationship between stress and strain (Britt, Davison, Bliese, & Castro, 2004; Farley, 1995, 2002; Griffith, 1997; Griffith & Vaitkus, 1999; Izzo, Lapointe, Villeneuve, & Columbe, 2000). With respect to psychological readiness, Kirkland et al. (1993) postulated that physical health, mental health and general well-being were important components of preparedness. A particularly interesting finding from that study was that married soldiers had significantly more positive experiences in their work and family lives when in units with commanders who emphasised morale as a readiness priority. It is plausible that the demonstrated motivational and performance outcomes of robust psychological status will impact also on psychological readiness in military personnel. It was therefore hypothesised that:

2. *Individual readiness will be higher in those soldiers with greater self-reported psychological and physical health and well-being.*

The preceding review confirmed a general acceptance that human factors are an important component of psychological readiness. However, the literature has been inconsistent with respect to which factors – and to what extent these factors – influence readiness. Some of this inconsistency may have been due to the neglect of level-of-analysis issues. Of the human

dimensions tapped by the HDO project, morale, motivation, and the behaviour and attitudes of the proximal leader were presumed to be most relevant at the individual level of analysis. The human dimensions of ethos (broadly defined as identification with the military organisation and its values) and perceptions of the effectiveness of the senior leadership were postulated to be most relevant at the collective level of analysis.

The construct of cohesion has proven to be complex. Initially it was considered a unitary construct measuring horizontal bonding among small teams. However, social bonds can generate at multiple levels within an organisation. Furthermore, cohesion has been shown to have both social (or affective) and task (or instrumental) components (Griffith, 1988; Mullen & Copper, 1994). The U.S. Army Research Institute for the Behavioral and Social Sciences has developed an extensive research program focused on military cohesion. This body of research has suggested that small unit cohesion has three components: *horizontal cohesion* reflecting peer bonding and teamwork, *vertical cohesion* reflecting leader competence and concern for subordinates, and *organisational cohesion* reflecting pride, shared values, and goal achievement (Siebold, 1996, 1999). In light of this multidimensionality, cohesion will be examined at both individual and collective levels of analysis in this chapter by adopting the psychometric outcomes of the UCP-A from Chapter 3 that yielded distinct individual and collective human factors component structures. Two further hypotheses were that:

3. *At the level of the individual soldier, there will be positive associations between psychological readiness and the human dimensions of cohesion, morale, motivation, and proximal leader behaviour.*

4. *At the collective level, there will be positive associations between psychological readiness to deploy and the human dimensions of ethos, cohesion ('team climate'), and perceptions of higher-level leader effectiveness.*

The final hypothesis in this section stemmed from previous discussion with respect to the association between the constructs of morale and readiness. Despite the importance attached to morale and other characteristics associated with psychological climate such as psychological readiness, there has been significant variability in the understanding of these concepts and their interrelationships, within both the military literature (Coates, 1984; Isenhower, 1981) and the academic literature (Doherty, 1988; Liefooghe, Jonsson, Conway, Morgan, & Dewe, 2003). Some researchers (e.g., Gal & Manning, 1987; Kirkland et al., 1993) have not distinguished unit climate constructs with any degree of precision, preferring to group variables such as morale, cohesion and readiness together as human dimensions outcomes. The assumption that underpinned these studies appeared to be that morale was so closely related to psychological readiness as to be conceptually and perceptually indistinct.

Another perspective about the relationship between morale and psychological readiness was evident in Wild's (1988) proposed schema of military readiness (see Figure 6, p. 117). In this approach, morale was one of several human dimensions constructs, moderated by aspects of leadership, which contributed to psychological preparedness for operations. Readiness was considered superordinate to morale.

A converse approach, where perceived combat readiness was conceptualised as a motivational component of the broader construct of morale, was adopted in recent research by Shamir et al. (2000). Perceptions of readiness were postulated to be derived from collective efficacy beliefs about the ability of the group or the unit to be effective on operations. Such beliefs about group effectiveness were presumed to influence individual attitudes and behaviour. In this view, psychological readiness was subordinate to morale, although readiness was accepted as an important component of morale outcomes.

The latter approach to the relationship between psychological readiness and morale was favoured in this study and was reflected in the final hypothesis of this chapter:

5. *Morale and psychological readiness will be distinguishable at the collective level by their relationship to other human dimensions constructs.*

Method

Procedural matters such as sampling, participation rate, survey administration, and initial data screening (deletion of univariate and multivariate outliers) were consistent with the generic methodology described in Chapter 2. Additional data screening was conducted in order to meet the requirement of the AMOS statistical software being utilised. (SPSS, 2006). The presence of missing data in the raw data would prevent the calculation of modification indices by AMOS. Without these indices, AMOS cannot provide information to assist in re-specification of a poorly fitting model. Graham, Hofer, and MacKinnon (1996) recommended the Expectation Maximisation treatment of missing data in order to delete or replace all missing values prior to submitting data to AMOS. Each of the samples being utilised in this study was subjected to Missing Values Analysis using SPSS. All cases with missing biographic variables were deleted (listwise) from the data files. For each of the particular scales being used in this study (Symptoms Checklist (modified), UCP-A), cases with more than 10% missing data were also excluded. Missing Values Analysis was then conducted to replace any missing values for remaining cases. Arbuckle (1996) demonstrated that this procedure was reasonably robust to deviations from assumptions such as the random nature of missing data. The measures utilised for this chapter were the Symptoms Checklist (Modified) (Chapter 2, pp. 71-76), the UCP-A (Chapter 3), and select variables from the demographic section of the HDO surveys (Appendix F).

The primary dataset utilised for this study was a predeployment sample initially comprising 411 respondents. It was postulated that the construct of psychological readiness would be most salient in a unit that was about to embark on an operational deployment. Two other predeployment samples were used selectively for comparative analyses. Of course, psychological readiness to perform operational duties should remain germane during (and even after) deployment because the cycle of deployment is essentially continuous (Australian Army, 2006). For this reason, comparison samples from two deployed units were also utilised in the following analyses. Table 17 provides select demographic characteristics for the five samples (following standard data cleaning and missing values analysis).

For the primary dataset, all participants were members of a single unit about to be deployed to East Timor as part of Operation WARDEN. The distributions for these demographic variables were largely unremarkable in the context of an Australian Army military unit. For example, the normal rank distribution across an Australian infantry battalion is approximately 60% Privates, 25% Junior NCOs, 10% Senior NCOs/Warrant Officers, and 5% Commissioned Officers. Table 17, column PD1, reveals that the sample closely resembled this rank distribution. The sample was split almost evenly between the two main marital status groups: married and single members. As expected for a Combat Arms element, respondents were mainly in the younger age groupings and over half were in their first four years of service. Nonetheless, just over half the sample (52%) had previous operational experience. Most respondents had completed Year 12 education (70%). Women were under-represented when compared to their 13% representation in the Army as a whole at the time of survey administration. The deploying unit was comprised mainly of 'Combat Arms' employment categories, which are exclusively male. The characteristics of the other samples will be discussed as they are introduced into the analysis.

TABLE 17
Select Demographics for five HDO Samples

Demographic	**Sample** (PD = Predeployment; D = Deployment)[1]				
Rank	**PD1**	**PD2**	**PD3**	**D1**	**D2**
Private (equivalent)	64.1%	70.6%	33.9%	48.9%	57.1%
Junior NCO	21.0	19.1	36.0	26.9	24.4
Senior NCO	9.0	5.9	24.9	15.6	10.4
Commissioned Officer	5.9	4.4	5.2	8.6	8.2
Age group					
18-21 years	27.1%	42.6%	1.4%	15.2%	17.9%
22-26 years	35.0	23.5	23.5	29.4	35.2
27-31 years	26.7	16.2	35.3	24.9	27.2
32-36 years	6.4	14.0	26.6	19.0	13.0
37+ years	4.9	6.6	13.1	11.5	6.7
Marital Status					
Married	47.7%	33.1%	64.7%	56.4%	51.1%
Single	46.7	62.5	26.6	37.8	44.0
Separated	3.6	3.7	7.6	4.2	3.9
Other	1.7	0.7	1.0	1.5	1.1
Years of Service					
0-4 years	54.5%	68.4%	7.6%	31.3%	43.8%
5-9 years	25.1	13.2	34.3	29.5	33.7
10-14 years	14.4	11.8	33.2	26.4	13.6
15+ years	6.1	6.6	24.9	13.0	8.9
Previous tours					
None	47.7%	93.5%	19.4%	38.1%	18.1%
One	42.6	5.1	29.8	36.3	33.2
Two	8.5	1.5	24.9	17.0	38.5
Three or more	1.1	0	26.0	8.7	10.3
Highest Education					
Some High School	30.2%	23.5%	28.4%	25.6%	26.8%
Completed High School	49.1	50.7	47.1	45.8	49.1
Some University/College	13.9	19.1	18.3	19.8	17.6
University/College degree	6.8	6.6	6.2	8.8	6.5
Gender					
Male	94.2%	100%	97.2%	96%	94.7%
Female	5.8	0	2.8	4	5.3

Note: 1. Sample sizes: PD1 n=369; PD2 n=136; PD3 n=289; D1 n=452; D2 n=587

Results and Discussion

Analysis overview. To test the first four hypotheses, Pearson Product Moment correlation coefficients were calculated between the dependent variable (psychological readiness) and the respective independent variables (military experience in Hypothesis 1, health and well-being in Hypothesis 2, and select human dimensions factors in Hypotheses 3 and 4). The psychological readiness variable for Hypotheses 1 through 3 was based on the individual-level analysis of the UCP-A, whereas the psychological readiness variable for Hypotheses 4 was based on the collective-level analysis (see Chapter 3). For each hypothesis, the analysis was extended by developing a regression model in order to examine sets of predictor variables. AMOS version 7.0.0 software (SPSS, 2006) was used to conduct multiple regression.

To test the fifth hypothesis, which examined the modelling of human dimensions constructs at the collective level, Structural Equation Modelling (SEM) (Jöreskog, 1969) was used. SEM has developed from a combination of path analysis, multiple regression, and exploratory factor analysis. This integration of statistical techniques allows a set of relationships between one or more independent variables and one or more dependent variables to be examined (Ullman, 2001). SEM is an *a priori* method that offers two major advantages over traditional multivariate statistical techniques. Firstly, SEM accounts for error inherent in the measures used. Secondly, SEM provides tests of goodness-of-fit that allow a determination with respect to how satisfactorily the data matches a specified, theoretical model (Fogarty, 2004).

SEM AMOS version 7.0.0 software (SPSS, 2006) was used to conduct SEM in this research. Preliminary steps in testing Hypothesis 5 entailed a model-building approach using SEM, as advocated by Cunningham (2007).

Hypothesis 1.

Individual readiness will be enhanced by military experience, as evidenced by previous operational deployment, years of service, and rank.

The measures of military experience utilised were years of service, rank, operational experience (previous deployment), and age group. The dependent variable was the UCP-A subscale labelled 'Individual Readiness'; derived psychometrically from individual-level PCA (Chapter 3). Data screening as described in Chapter 2 resulted in a sample size of 369 for the primary dataset, a predeployment sample (PD1 in Table 17, p. 161). Means and standard deviations for the variables used in testing Hypothesis 1 (for this and a subsequent partial sample) are contained in Table 18. Table 19 displays the correlation matrix for this sample. Correlations between the independent variables were all significant (at the $p<.01$ level) and ranged from a low of .23 to a high of .75 (the latter between Years of Service and Age Group). Correlations between the dependent variable of Individual Readiness and the independent variables were not significant, with the exception of Years of Service ($r = .127$, $p<.05$). Figure 9 shows the regression model using four correlated exogenous variables (Rank, Operational Experience, Years of Service, and Age) with direct links that predicted the endogenous variable (Individual Readiness). The model included an additional exogenous (residual) variable that accounted for unmeasured sources of variance.

TABLE 18
Descriptive Statistics of Variables used in Testing Hypothesis 1

Variable	Mean	Standard deviation	Mean	Standard deviation
	4 Rank categories (n=369)		3 Rank categories (n=346)	
Age group	2.30	1.101	2.27	1.101
Yrs of service	1.73	.947	1.71	.936
Op experience	.63	.729	.64	.733
Rank (3 categories)	1.59	.905	1.43	.679
Ind Readiness	18.72	2.167	18.70	2.169

TABLE 19
Predeployment Sample 1 Correlations: Select Demographic Variables and Individual Readiness (n=369)

Variable	Age group	Yrs of service	Op experience	Rank (4 categories)	Ind Readiness
Age group	1.000				
Yrs of service	.747**	1.000			
Op experience	.328**	.426**	1.000		
Rank (4 categories)	.551**	.666**	.230**	1.000	
Ind Readiness	.064	.127*	.083	.069	1.000

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

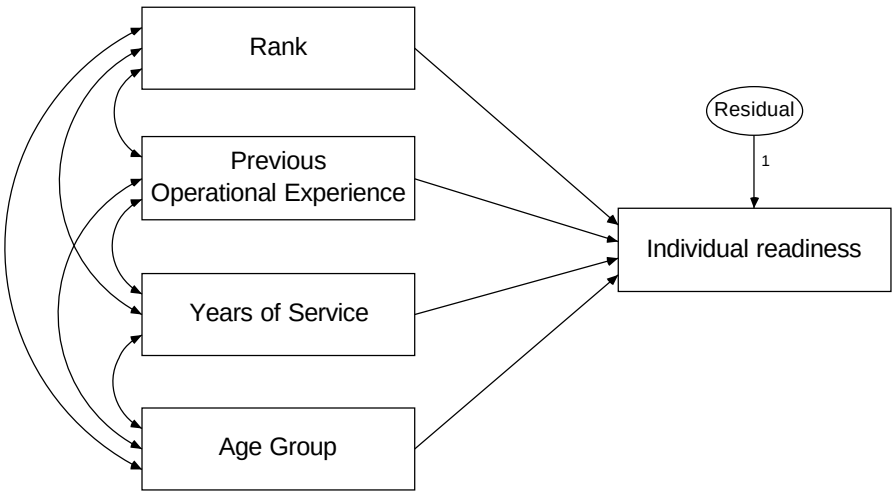

FIGURE 9 Regression model predicting individual readiness from rank, operational experience, years of service, and age.

The solution for the regression model with standardised estimates is shown as Figure 10. The standardised regression coefficients shown on the pathways between the independent variables and the dependent variable indicate the amount of change in standard deviations in Individual Readiness for each standard deviation change in each predictor. In all structural models, a boldface font indicates a statistically significant effect size. Consistent with the correlation matrix at Table 19, Years of Service had the strongest influence on psychological readiness, and had the only statistically significant effect (p = .05). The Squared Multiple Correlation value (R^2 = .020) was of little practical significance.

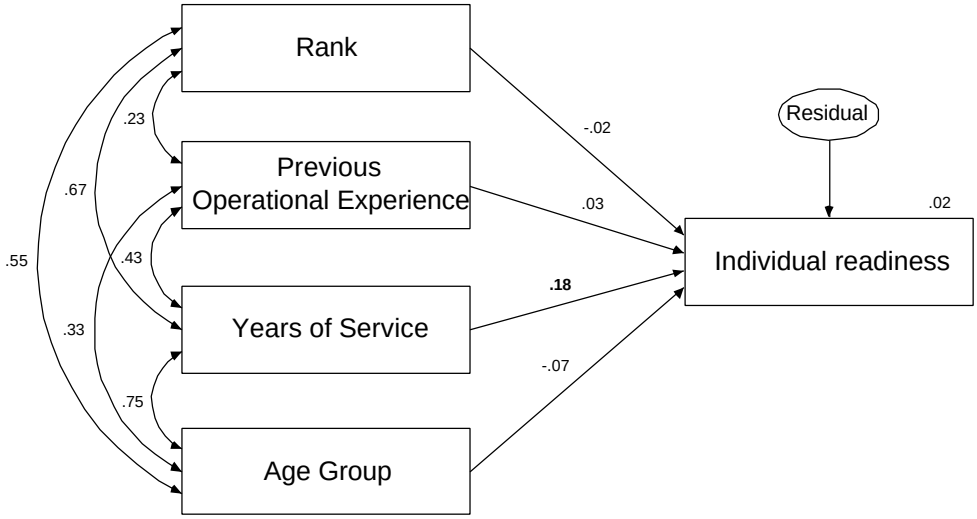

FIGURE 10 Multiple regression predicting individual readiness from rank, operational experience, years of service, and age.
(Predeployment Sample 1, n=369)
(Note: boldface font indicates statistically significant effect size.)

The lack of associations between three of the measures of military experience and psychological readiness may have reflected limitations in the measures used. For example, with respect to age, the majority of military members enlist at a relatively young age (17 – 22 years), but there has been a recent trend for an increasing number of older recruits to enlist (Wallace, 2006). Therefore, age alone may not be a suitable proxy for military experience. Another potential limitation in the measures used was that the assumption of continuous (i.e. interval or ratio scale data) may have been violated. It has been common practice to assume many categorical variables to be continuous in nature for the purpose of statistical analysis. Although this assumption was plausible for the age-group variable, the rank variable was more problematic when used as a measure of experience. Three of the four items related to soldier/NCO rank groups (Private equivalent; Junior NCO; Senior NCO/Warrant Officer), which in most cases would reflect military experience related to time in rank and – due to the Army's comprehensive promotion training system – degree of military training. However, the fourth rank group – Commissioned Officers – could have included a diverse range of military officers in terms of experience: from

direct-appointment Specialist Officers with less than a year of tenure, through newly graduated General Service Officers (possibly with less than two years of military experience), to skilled and experienced officers with decades of Service. In view of the limitations of rank as a continuous measure of military experience, two additional regressions were conducted.

The first regression removed the Commissioned Officer category from the Rank variable, leaving three rank categories and 346 cases. Table 18 provides descriptive statistics and Table 20 provides the correlation matrix with the 3-category rank variable. Univariate correlations among the independent variables remained significant. The correlation between Age Group and Rank increased from .55 to .66 suggesting, as expected, that there was more age variability within the Commissioned Officer category of the Rank variable than for the other Soldier/NCO categories. The solution for the regression analysis is contained in Appendix X.

TABLE 20
Predeployment Sample 1 Correlations: Select Demographic Variables and Individual Readiness (with 3-category rank variable, n=346)

Variable	Age group	Yrs of service	Op experience	Rank (3 categories)	Ind Readiness
Age group	1.000				
Yrs of service	.739**	1.000			
Op experience	.338**	.439**	1.000		
Rank (3 categories)	.663**	.840**	.379**	1.000	
Ind Readiness	.069	.136*	.094	.081	1.000

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

Years of Service continued to have the strongest influence on the dependent variable, and the standardised regression coefficient for Rank increased from -.02 to -.11 (but remained nonsignificant, $p = .28$). The Squared Multiple Correlation value was slightly higher ($R^2 = .025$), but once again remained of little practical significance, indicating that only 2.5% of variation in Individual Readiness was explained by the combination of the

four independent variables postulated to represent elements of military experience.

The second subsequent regression removed the Rank variable altogether, leaving three independent variables to represent military experience. The remaining standardised regression coefficients and the R^2 statistic (.019) for this latest model were almost identical to the initial SEM regression model solution depicted in Figure 10. It would appear that rank has the potential to contribute to our understanding of Individual Readiness; however, a variable encompassing the rank of all military respondents is not amenable to a continuous scale measure. A subsequent ANOVA compared mean scores on Individual Readiness across the four rank groups. This resulted in a non-significant outcome ($F(3,365) = 1.004$, $p = 0.39$), which indicated that rank as a categorical variable also was not useful. A measure encompassing level of military training may be a more appropriate indicator of military experience.

Hypothesis 1 discussion. In terms of the first hypothesis, that psychological readiness at the individual level will be enhanced by military experience, the results of the preceding analyses were of equivocal value. While Years of Service uniquely predicted a statistically significant amount of variance in Individual Readiness in the presence of other variables, this regression analysis outcome was of no practical utility because it accounted for less than 2% of the variance. The Rank variable, even as a categorical variable, was not useful in predicting psychological readiness for operational deployment. Future research might profit from the use of a variable that measures level of professional and technical military training.

Perhaps the most unexpected result in this section was the lack of influence of the Operational Experience variable. It was expected that previous operational experience would increase perceptions of self-efficacy – at least for those who had chosen to remain in the military following

operational deployment. A plausible explanation for this unanticipated outcome was the restricted response range for this variable in this sample – over 90% had either no or one previous tour. Imbalances of this nature impose a mathematical restriction on the size of the correlation coefficient (i.e., the correlation is likely to be attenuated). Another reason for this surprising lack of effect may have been that there are non-linear relationships within the data. Research in the U.S. military has reported both positive and negative effects of deployments on re-enlistment. For example, Hosek and Totten (2002) found soldiers with one or two deployments actually had higher rates of reenlistment, although this trend levelled off or reversed with three deployments or more. Figure 11 demonstrates similar complexity of trends within Australian military data with respect to operational experience.

NOTE: This figure is included on page 168 of the print copy of the thesis held in the University of Adelaide Library.

FIGURE 11 Proportion of agreement in a deployed sample for expected work level; including agreement by number of tours. (adapted from Murphy, 2006)

The data presented in Figure 11 were drawn from the HDO project as part of a comparative analysis between actual and expected workload during deployment (Murphy, 2006). The responses were captured at mid-deployment with a sample of ADF personnel in East Timor. The main graphic in the figure showed that about half of the respondents disagreed with the statement and a further 22% were undecided (option 'neither agree nor disagree'). The embedded graphic suggested a non-linear relationship among a subset of the data – those respondents who agreed with the statement, grouped by number of previous tours. Those with three or more operational tours were most likely to agree with the statement (60% from this group agreed with the statement), followed by those without previous experience of operational deployment. Respondents with either one or two previous deployments were less likely to agree with the statement that actual work level had been lower than expected.

With so little of the variance within the Individual Readiness dependent variable accounted for by the construct of military experience, the analysis shifted to the second hypothesis to examine factors relating to health and well-being.

Hypothesis 2.

Levels of self-reported psychological and physical health and well-being will predict individual readiness.

A number of HDO project variables were relevant to an examination of the influence of physical and psychological health behaviours and status on psychological readiness in military personnel. Variables utilised to test this hypothesis were 'Medical Visits' – the number of medical visits in the preceding 6 weeks (other than for regular/routine health check-ups and inoculations), 'Sleep hours/day' – average number of hours per day of sleep over the previous seven days, number of 'Exercise

sessions in the previous week', and a total scale score for self-reported 'Health Symptoms.' In light of the Kirkland et al. (1993) study, which found that married soldiers had significantly more positive experiences in their work and family lives, 'Marital Status' was also examined. Finally, in recognition of the significant body of research showing gender differences in health and wellness behaviours (including psychological coping) and health outcomes (Barnett, Biener, & Baruch, 1987; Tamres, Janicki, & Helgeson, 2002; Weidner & Collins, 1993), gender was also examined. Descriptive statistics and the correlation matrix for these variables and the Psychological Readiness dependent variable are provided in Tables 21 and 22.

TABLE 21
Descriptive Statistics: Select Health-related Variables and Individual Readiness (Predeployment Sample 1, n=369)

Variable	Mean	Standard deviation
Marital status	1.6	0.644
Gender	1.07	0.247
Health symptoms	14.26	122.665
Exercise	3.74	2.111
Sleep duration	6.79	1.209
Medical visits	0.93	0.772
Individual Readiness	18.72	2.167

TABLE 22
Correlations for Health-related Variables and Individual Readiness (Predeployment Sample 1, n=369)

	Marital Status	Gender	Health symptoms	Exercise	Sleep duration	Medical visits	Individual Readiness
Marital status	1.000						
Gender	.017	1.000					
Health symptoms	.038	.014	1.000				
Exercise	.191**	.017	-.045	1.000			
Sleep duration	-.015	.046	-.268**	-.014	1.000		
Medical visits	-.044	.151**	.220**	-.114*	-.039	1.000	
Ind Readiness	-.039	-.143**	-.237**	.148**	-.019	-.021	1.000

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

Eight of 21 possible bivariate correlations reached significance. The highest correlation was -.27 between Health Symptoms and Sleep Duration. Three independent variables – Gender, Health Symptoms, and Exercise Sessions per Week – correlated significantly with Individual Readiness.

The regression model developed to examine the health-related predictors of psychological readiness is shown in Figure 12.

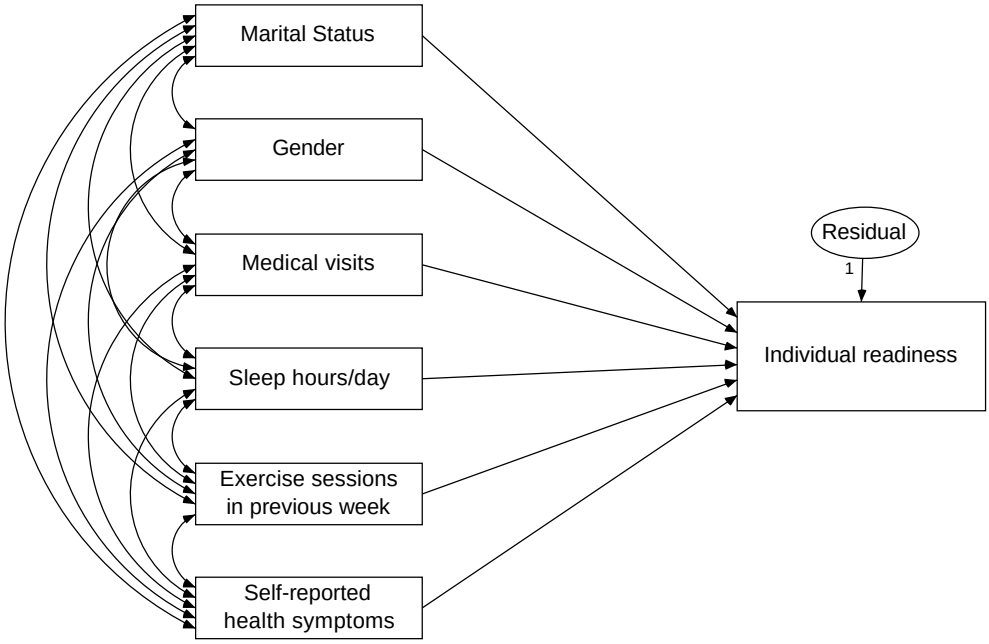

FIGURE 12 Multiple regression model predicting individual readiness from health-related variables.

The regression solution with standardised estimates is shown as Figure 13. Three of the six independent variables significantly contributed to explaining the variance in Individual Readiness, namely Exercise Sessions, Gender, and self-reported Health Symptoms. R^2 for the regression was .109, indicating that the combined specific variances of each health status/healthy behaviour variable explained 10.9% of the variation in Individual Readiness scores. The standardised regression coefficient for

Health Symptoms (-.26) made the largest unique contribution to explaining the variance in Individual Readiness. The negative direction of this effect was consistent with the expectation that lower levels of strain would be associated with higher psychological readiness.

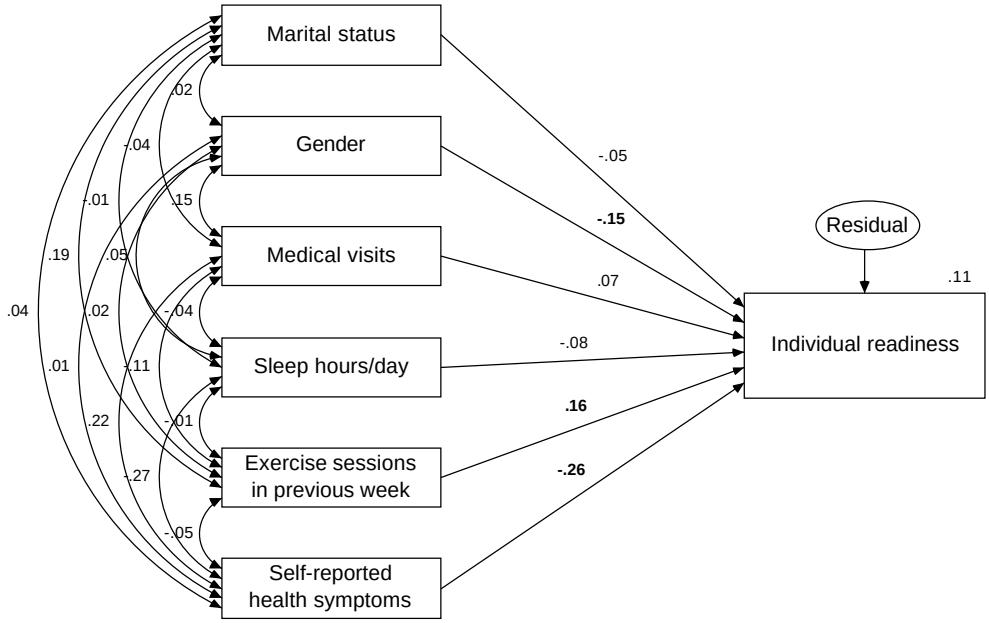

FIGURE 13 Multiple regression predicting individual readiness from six health-related variables. (Predeployment Sample 1, n=369)

The negative coefficient for Gender indicated that female soldiers reported being less ready than their male counterparts for deployment. The relatively small proportion of females in this predeployment sample (5.8%) may have influenced this gender difference. Nevertheless, the difference could represent a consequence of the masculine culture typical of military forces (Winslow, 1997). Certainly, the majority of respondents in this sample were members of the Combat Arms (restricted to males), and these are usually the most highly trained members of military forces (which should lead to relatively high perceptions of psychological readiness). Alternatively, the difference in Individual Readiness between genders may simply reflect a

gender-based difference in willingness to report adverse psychological status or negative affect (e.g., Conger, Lorenz, Elder, Simons, & Ge, 1993).

Higher frequency of exercise was also associated with higher Individual Readiness. This relationship was not surprising. Physical fitness is considered an important component of military performance. For example, all military members are required to pass a fitness test at least annually and many units allow physical fitness training during routine work hours in recognition of its importance. Having exercise as a component of one's daily routine may reflect the degree of commitment one has to the broad ideals of military service, and in turn, one's perceptions of readiness for operational service.

The Medical Visits variable was not predictive of Individual Readiness despite being correlated .22 ($p < .01$) with Health Symptoms – the latter being the strongest predictive variable. There are many anecdotal accounts in the military historical literature about Medical Officers who have claimed, on the basis of medical attendance rates and symptoms, to be able to predict, not only what units were to be sent into battle, but which ones would be at the vanguard of the offensive (e.g., Copp & McAndrew, 1990). The variable utilised in this analysis was concerned with medical attendance rates (frequency over the preceding six months) rather than presenting symptoms. It may be that the complexity of the item ("Other than regular or routine check-ups and inoculations, how many times have you sought medical advice or treatment during the last six months?") inflated its measurement error. Alternatively, it simply may be difficult for respondents to recall accurately the number of medical visits over such an extended period. Another explanation is that medical attendance may not be a satisfactory proxy for health concerns, due to perceived barriers to seeking health care. There is considerable evidence that stigma surrounds issues of mental health in military populations and that this stigma can pose a significant barrier to seeking support (Erbes, Westermeyer, Engdahl, &

Johnsen, 2007; Fikretoglu, Brunet, Guay, & Pedlar, 2007; Gall, 2006; Hoge et al., 2004; Manning & Fullerton, 1988; Pincus & Benedek, 1998). For some individuals or groups within Defence, this stigma may extend to physical health concerns as well.

Finally, two other independent variables, marital status and average sleep duration per day in the preceding week, did not correlate with or predict Individual Readiness. With respect to marital status, epidemiological studies have suggested a link between marital status and health and well-being, particularly for males (Coombs, 1991). In this sample, the variable Marital Status did not predict psychological readiness for deployment. While Kirkland et al. (1993) found that higher levels of well-being were associated with military members who were married, this was in a garrison population. It is plausible that the strain on family of impending deployment might outweigh the positive effects of marital status; or that single members had relatively fewer concerns about deploying that counterbalanced the presumed beneficial effects of partner and, in some cases, child(ren) social support. Contrary to the Kirkland et al. study, Izzo et al. (2000) found that deployed Canadian peacekeepers without partners had significantly lower mean scores on three measures of strain.

As expected, average sleep duration was significantly and negatively correlated with reported health symptoms (see Table 22). However, sleep duration was not correlated with Individual Readiness. It may be that during the busy predeployment stage, organisational demands – rather than individual need or choice – dictated opportunities for sleep; and this may have caused a degree of range restriction in the data. There did appear to be limited variability in this item; nearly 83% of personnel reported an average of 6, 7, or 8 hours of sleep (range 3 – 11 hours).

Cross validation. A second HDO sample was used to test Hypothesis 2. Due to omitted items and small sample sizes, another

adequate predeployment sample was not available. Instead, a deployed sample (n=452) from another unit was utilised. Sample demographics were provided in Table 17, column D1. Comparisons between the Predeployment and Deployment sample demographic data (see Table 17) revealed a number of differences. Collectively, this deployment sample was older and had more years of service. Perhaps as a consequence of this increased age and experience, the deployment sample had fewer Private (equivalent) respondents, more married members, and more operational experience. The deployment sample had higher levels of completed education. The sample comprised only 4% females (down from 5.8% in the predeployment sample).

The correlation matrix for Deployment Sample 1, containing the health-related independent variables and Individual Readiness, is provided as Table 23. Six bivariate correlations reached significance, with the highest correlation between Health Symptoms and Medical Visits (.29). Consistent with the predeployment sample, Gender, Health Symptoms, and Exercise Sessions per Week correlated significantly with Individual Readiness.

TABLE 23
Correlations for Health-related Variables and
Individual Readiness (Deployment Sample 1, n=452)

	Marital Status	Gender	Health symptoms	Exercise	Sleep duration	Medical visits	Individual Readiness
Marital status	1.000						
Gender	.010	1.000					
Health symptoms	.011	.122**	1.000				
Exercise	.072	-.092	-.064	1.000			
Sleep duration	.061	.004	-.122**	.057	1.000		
Medical visits	-.079	.089	.290**	-.057	-.055	1.000	
Ind Readiness	-.015	-.139**	-.260**	.157**	.046	-.028	1.000

** Correlation is significant at the 0.01 level (2-tailed)

A multi-group analysis of the two samples was conducted using AMOS to test for measurement invariance across the groups, i.e., to confirm that the regression model outcomes were statistically comparable. Following advice from Byrne (2001) regarding the stringency of invariance

testing, a structural weights model was used. Advice from Fogarty (2004) and Cunningham (2007) guided the adoption of fit indices. It should be noted that chi-square is the most common fitness test. The chi-square fit index tests the hypothesis that an unconstrained model fits the covariance/correlation matrix as well as the given model. The chi-square value should not be significant if there is a good model fit. A problem with chi-square is that the larger the sample size (beyond about 200 cases), the more likely the rejection of the model and the more likely a Type II error. The chi-square fit index is also sensitive to violations of the assumption of multivariate normality. This is why alternative measures of fit have been developed and why a variety of fit indices are normally used to evaluate SEM outcomes (Arbuckle, 2006). A summary of the fit indices used to assess structural model fit in this dissertation, including desirable and acceptable ranges for goodness-of-fit, is provided in Table 24. Appendix Y contains additional information about these fit indices and the rationale for their selection.

TABLE 24
Goodness of fit indices for structural models

Level of 'fitness'	χ^2 (*p* value); Bootstrap *p*	χ^2/df	RMSEA; SRMR	GFI; AGFI	TLI; CFI
Desirable	p > .05	< 1.96	< 0.05	> 0.95	> 0.95
Acceptable	p > .01	< 3.0	< 0.08	> 0.90	> 0.90

Notes: χ^2 = chi-square; Bootstrap *p* refers to the *p* value computed by the Bollen-Stine Bootstrap procedure; χ^2/df represents the normed chi-square (a measure of Absolute Fit and Model Parsimony); SRMR = Standardised Root Mean-square Residual (Absolute Fit); GFI = Goodness-of-Fit Index (Absolute Fit); AGFI = Adjusted Goodness-of-Fit Index (Parsimony-adjusted Absolute Fit); RMSEA is the Root Mean-Square Error of Approximation (Absolute Fit measure relatively independent of sample size); TLI = Tucker–Lewis Index (Incremental fit); CFI = Comparative Fit Index (Incremental fit).

When structural weights were compared, there was no difference between the two groups (Predeployment Sample 1 and Deployment Sample 1) (χ^2 = 2.32, df = 5, χ^2/df = .464, *p* = .803). The chi-square (χ^2) statistic here represents the difference in chi-square tests of the two samples. The

nonsignificant χ^2 indicated that the regression model held across the two samples with respect to structural weights. In addition, all other fit indices were clearly acceptable (RMSEA = .047, GFI = .999, AGFI = .991, TLI = 1.116, CFI = 1.000).

It was concluded that despite the different deployment status of the two samples, the regression model resulted in comparable solutions. This suggested that a meaningful proportion of the variance in perceptions of Psychological Readiness at the individual level may be reliably accounted for – irrespective of deployment stage – by health-related variables, particularly self-reported health symptoms, exercise levels, and gender.

Self-reported health symptoms. The strongest health-related predictor of Individual Readiness in the two preceding regressions was self-reported health symptoms, which was drawn from the Symptoms Checklist (modified). Psychometric analysis of the Symptoms Checklist in Chapter 2 revealed a meaningful six-component structure for this measure, with the components labelled 'Depression/withdrawal', 'Behavioural/mental anxiety', 'Physiological anxiety', 'Somatic complaints', 'Hyper-arousal', and 'Emotional lability'. To explore further the relationship between health symptomatology and Individual Readiness, a regression model with the six component scales of the Symptoms Checklist was adopted, as illustrated in Figure 14.

Three samples were subjected to analysis. Predeployment Samples 1 and 2 were chosen because psychological readiness is most strongly associated with the predeployment stage. In addition, Deployment Sample 2 was chosen because it was drawn from the same military unit as Predeployment Sample 1. The broad equivalence of these two samples was expected to enable comparison across the deployment stages and perhaps aid the interpretation of statistical outcomes. The shared unit origin of these two samples was reflected in their generally consistent demographic

profiles in Table 17 (Columns PD1 and D2). Predeployment Sample 2 was a different unit. Comparisons between this sample and the two samples drawn from the same unit revealed a number of differences (see Table 17). Collectively, Predeployment Sample 2 was much younger (over 42% were 12 years or younger compared with 27.1 and 17.9% respectively for the Predeployment and Deployment samples from the same unit), was less likely to be married (62.5% were single compared with 46.7 and 44%), had fewer years of service (68.4% were in their first four years of service compared with 54.5 and 43.8%), and had much less previous operational experience (93.5% had no previous deployment experience compared with 47.7% for the other predeployment sample). Of further interest was that the second predeployment sample was entirely male (compared with 94.2 and 94.7% respectively for the first predeployment sample and the deployment sample).

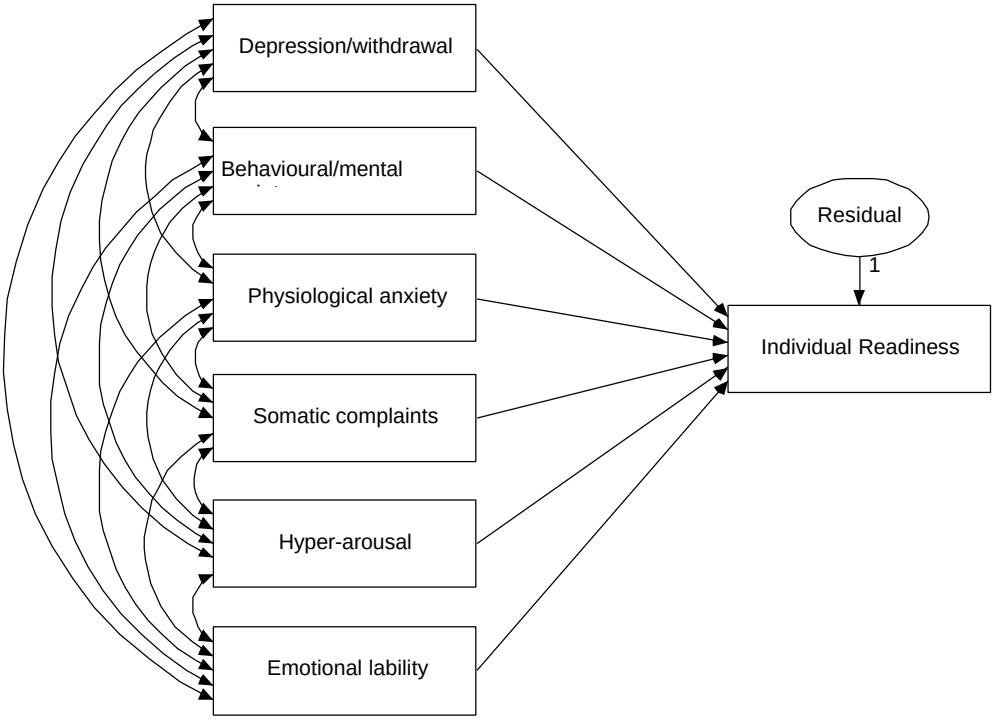

FIGURE 14 Regression model predicting individual readiness from six health subscales.

Table 25 provides descriptive statistics for the variables in the regression model for the three samples.

TABLE 25
Descriptive Statistics: Health Subscales and
Individual Readiness (for three Samples)

Variable	Predeploy 1		Predeploy 2		Deployment 2	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Depression/withdrawal	5.47	5.280	5.36	5.930	7.91	5.752
Behavioural/mental anxiety	1.93	2.771	1.91	3.173	2.31	2.950
Physiological anxiety	1.25	1.576	1.52	2.512	1.99	2.070
Somatic complaints	3.51	2.430	3.21	2.729	4.50	2.996
Hyper-arousal	0.69	1.102	0.93	1.636	1.08	1.324
Emotional lability	0.28	0.776	0.45	1.470	0.33	0.965
Individual Readiness	18.72	2.167	18.76	2.244	18.11	2.591

Table 26 displays the correlation matrices for the three samples. With one exception, in Deployment Sample 2, all bivariate correlations were significant. Correlations between the health symptom variables ranged from .40 to .77 for Predeployment Sample 1, from .57 to .91 for Predeployment Sample 2, and between .20 and .72 for Deployment Sample 2. Correlations between Individual Readiness and the health symptom variables were all negative, and ranged between -.11 and -.30 for Predeployment Sample 1, from -.23 to -.42 for Predeployment Sample 2, and from -.05 to -.26 for Deployment Sample 2. Behavioural/ Mental Anxiety, Emotional Lability, and Depression/Withdrawal had the strongest bivariate correlations with Readiness across the samples.

TABLE 26
Correlation Matrices for Health Symptom Variables
and Individual Readiness (for three Samples)

Predeployment Sample 1	Depression / withdrawal	Behavioural / mental anxiety	Physiological anxiety	Somatic complaints	Hyper-arousal	Emotional lability	Individual Readiness
Depression / withdrawal	1.000						
Behav'ral / mental anxiety	.767**	1.000					
Physiological anxiety	.616**	.576**	1.000				
Somatic complaints	.649**	.580**	.595**	1.000			
Hyper-arousal	.619**	.629**	.598**	.555**	1.000		
Emotional lability	.531**	.646**	.400**	.421**	.466**	1.000	
Ind Readiness	-.234**	-.281**	-.149**	-.106*	-.154**	-.304**	1.000
Predeployment Sample 2	**Depression / withdrawal**	**Behavioural / mental anxiety**	**Physiological anxiety**	**Somatic complaints**	**Hyper-arousal**	**Emotional lability**	**Individual Readiness**
Depression / withdrawal	1.000						
Behav'ral / mental anxiety	.909**	1.000					
Physiological anxiety	.800**	.701**	1.000				
Somatic complaints	.753**	.638**	.736**	1.000			
Hyper-arousal	.817**	.750**	.859**	.764**	1.000		
Emotional lability	.704**	.661**	.739**	.569**	.808**	1.000	
Ind Readiness	-.391**	-.420**	-.311**	-.241**	-.284**	-.234**	1.000
Deployment Sample 2	**Depression / withdrawal**	**Behavioural / mental anxiety**	**Physiological anxiety**	**Somatic complaints**	**Hyper-arousal**	**Emotional lability**	**Individual Readiness**
Depression / withdrawal	1.000						
Behav'ral / mental anxiety	.721**	1.000					
Physiological anxiety	.641**	.625**	1.000				
Somatic complaints	.607**	.465**	.610**	1.000			
Hyper-arousal	.618**	.582**	.611**	.556**	1.000		
Emotional lability	.455**	.521**	.344**	.197**	.396**	1.000	
Ind Readiness	-.168**	-.264**	-.121**	-.046	-.138**	-.209**	1.000

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

A regression weights table with summary statistics for the three regression analyses is provided in Table 27. The only significant parameter estimate for Predeployment Sample 1 was Emotional Lability ($p < .000$). Behavioural / Mental Anxiety was the only significant predictor ($p = .041$) of Individual Readiness for Predeployment Sample 2. Both Emotional Lability and Behavioural / Mental Anxiety had significant regression weights in the Deployment Sample analysis ($p < .000$ and $p = .049$ respectively). The model predicted 11.6, 19.0, and 8.4% of the variance in Individual Readiness for the respective samples.

TABLE 27
Combined Regression Weights Table for the Unconstrained Model Predicting Individual Readiness from Health Symptom Components (for three Samples)

Predeployment Sample 1 (R^2 = .116)		Standardised Regr weight	Estimate	S.E.	C.R.	*p*
Individ Read <---	Physiological anxiety	-.011	-.015	.095	-.156	.876
Individ Read <---	Somatic complaints	.122	.109	.062	1.765	.078
Individ Read <---	Hyper-arousal	.048	.094	.137	.681	.496
Individ Read <---	Behavioural/mental anxiety	-.160	-.125	.069	-1.812	.070
Individ Read <---	Emotional lability	-.218	-.609	.180	-3.377	***
Individ Read <---	Depression/withdrawal	-.098	-.040	.035	-1.143	.253
Predeployment Sample 2 (R^2 = .190)		Standardised Regr weight	Estimate	S.E.	C.R.	*p*
Individ Read <---	Physiological anxiety	-.168	-.150	.147	-1.016	.310
Individ Read <---	Somatic complaints	.084	.069	.110	.633	.527
Individ Read <---	Hyper-arousal	.113	.155	.270	.575	.566
Individ Read <---	Behavioural/mental anxiety	-.390	-.276	.135	-2.044	.041
Individ Read <---	Emotional lability	.098	.149	.208	.719	.472
Individ Read <---	Depression/withdrawal	-.127	-.048	.090	-.537	.591
Deployment Sample 2 (R^2 = .084)		Standardised Regr weight	Estimate	S.E.	C.R.	*p*
Individ Read <---	Physiological anxiety	.036	.045	.075	.598	.550
Individ Read <---	Somatic complaints	.079	.069	.048	1.435	.151
Individ Read <---	Hyper-arousal	-.013	-.025	.110	-.229	.819
Individ Read <---	Behavioural/mental anxiety	-.271	-.238	.056	-4.273	***
Individ Read <---	Emotional lability	-.094	-.252	.128	-1.973	.049
Individ Read <---	Depression/withdrawal	.007	.003	.030	.106	.916

It is of interest that the Depression/Withdrawal variable, which had relatively strong bivariate correlations with Individual Readiness, did not influence the regression model outcomes when in the presence of the other dependent variables. There appears to have been a degree of collinearity between the Depression/Withdrawal and Behavioural/Mental Anxiety variables (bivariate correlations were .77, .91, and .72 in the three samples).

Multi-group analysis. A multi-group analysis of the three HDO samples was conducted to test for measurement invariance. A structural

weights model again was used. The chi-square statistic (χ^2 = 11.956, df = 12, p = .449) was nonsignificant and all other fit indices were clearly acceptable (χ^2/df = .996, RMSEA = .000, GFI = .997, AGFI = .978, TLI = 1.000, CFI = 1.000). It was therefore concluded that the regression model held across the three samples.

Hypothesis 2 discussion. The second hypothesis, that levels of self-reported psychological and physical health and well-being will predict individual readiness, has been supported by the preceding analyses. A combination of variables relating to health status and healthy behaviours explained about 10% of the variation in Individual Readiness scores in two samples. In particular, lower levels of self-reported strain were associated with higher psychological readiness. Higher reported frequency of physical exercise also predicted readiness. Gender was also predictive, with males reporting higher levels of readiness than females. In the presence of other predictor variables, sleep duration, frequency of medical visits, and marital status did not predict psychological readiness. These outcomes suggested that a meaningful proportion of the variance in perceptions of psychological readiness at the individual level might be reliably accounted for by health-related variables, particularly self-reported health symptoms and exercise levels, irrespective of deployment stage. There were indications that gender might be a useful predictor of psychological readiness, although the reasons for such a gender difference remain unexplained. Of course, the small number of females in the samples used for analysis (0.0, 5.8 and 5.3%) means that any gender-related outcomes need to be treated with caution.

Due to the strength of the relationship between health symptomatology and psychological readiness, further analysis was conducted using the six component scales of the Symptoms Checklist. Two of the six component scales – Emotional Lability and Behavioural/Mental Anxiety – each significantly predicted Individual Readiness in two of the three samples utilised. The multi-group analysis indicated that a model with

significant paths between Individual Readiness and both Behavioural / Mental Anxiety and Emotional Lability also fitted the third sample data. The regression model accounted for between 8.4 and 19% of the variance in Individual Readiness across the three samples.

The coping literature is replete with studies that have shown a consistent gender difference that females prefer emotion-based coping whereas males do not (Weidner & Collins, 1993; Zeidner & Endler, 1996). The issue of gender roles in military organisations continues to be topical (Bowser et al., 2004; Browne, 2007; Davis, 1998; Norwood, Gabbay, & Ursano, 1997; Pierce, 2006). The Australian Federal Government has recently questioned, as a matter of social equity, why females are prevented by current Defence policies from participating in several combat employments (e.g., infantry) (Nicholson, 2008). Unfortunately, the lack of sufficient female participants in the samples available for analysis made an examination of gender differences here pointless. However, if reasonable female participation can be achieved in future HDO samples, research should examine whether gender differences play an important role in reported health symptomatology. Whether the increased emotional lability reported by females was simply a function of a different, innate propensity to report emotional state (e.g., Conger et al., 1993), or a reflection of a preference to adopt emotion-focussed coping (e.g., Zeidner & Endler, 1996), remains conjectural, particularly in the military context.

Hypothesis 3.

> **There will be positive associations between individual readiness and the human dimensions of morale, motivation, proximal leader behaviour, and cohesion.**

The human dimensions constructs of Morale, Motivation, Proximal Leader Behaviour, and Cohesion were derived from UCP-A data utilising the component structures drawn from individual-level psychometric

analysis of this measure (see Chapter 3). The Predeployment Sample 1 correlation matrix for the variables selected for Hypothesis 3 is provided in Table 28. All correlations were significant at an alpha level of .01 and ranged between .19 and .65. The highest correlations were between Morale and Cohesion, and Morale and Motivation.

TABLE 28
Correlation Matrix for Select Human Dimensions Variables
(Predeployment Sample 1, n=369)

	Morale	Motivation	Cohesion	Proximal Ldr Behaviour	Individ Readiness
Morale	1.000				
Motivation	.641**	1.000			
Cohesion	.654**	.538**	1.000		
Proximal Ldr Behaviour	.553**	.510**	.562**	1.000	
Individual Readiness	.301**	.403**	.374**	.193**	1.000

** Correlation is significant at the 0.01 level (2-tailed)

Based on the Pearson Product Moment correlation coefficients, Hypothesis 3 is supported. Consistent with preceding sections of this chapter, the analysis was extended by developing a regression model in order to examine sets of predictor variables. Descriptive statistics for the regression model variables for Predeployment Sample 1 are provided in Table 29. The regression model is shown in Appendix Z.

TABLE 29
Descriptive Statistics: Four Human Dimensions Variables and
Individual Readiness (Predeployment Sample 1, n=369)

Variable	Mean	Standard deviation
Morale	20.36	5.120
Motivation	22.45	3.437
Cohesion	33.90	5.589
Proximal Ldr Behaviour	31.44	6.437
Individual Readiness	18.72	2.167

The regression model outcomes for Predeployment Sample 1 are provided at Figure 15. Motivation, Cohesion, and Proximal Leader Behaviour each made a significant, unique contribution to the prediction of psychological readiness. The combination of human dimensions variables explained 20.7% of the variation in Individual Readiness scores (R^2 = .207). The negative coefficient for the relationship between Proximal Leader Behaviour and Individual Readiness (-.12) was counter-intuitive and most likely an artefact of the high level of correlation among several of the independent variables. This assertion is supported by the bivariate correlation between theses two variables, shown in Table 28, which was positive .19.

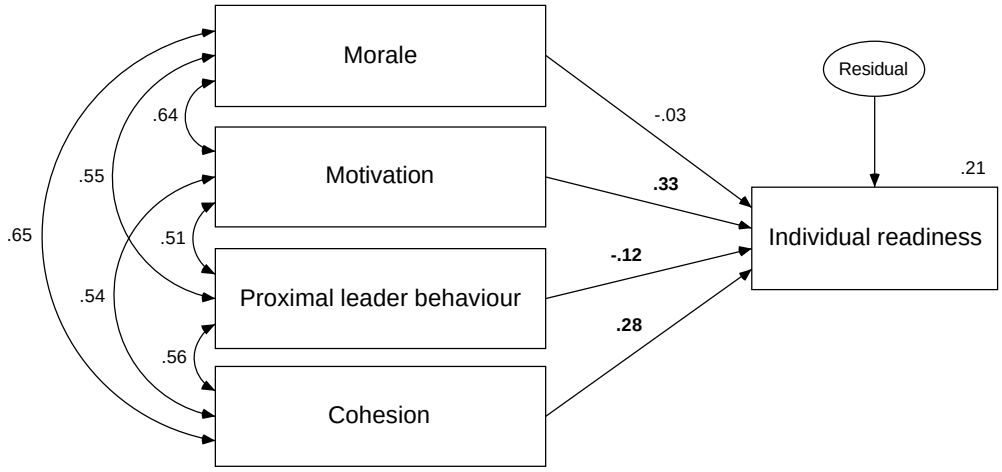

FIGURE 15 Multiple regression predicting individual readiness from morale, motivation, proximal leader behaviour, and cohesion.
(Predeployment Sample 1, n=369)

For comparative purposes, two additional predeployment samples were utilised in the same regression model using multi-group analysis. Select characteristics of the second and third predeployment samples were provided in Table 17. Perusal of Table 17 suggested that the third predeployment sample was quite distinctive compared to the other two predeployment samples with respect to the pattern of biographic variable

descriptives. This distinctiveness was expected because of the specialist role of the unit from which the sample was drawn. This sample had a greater proportion of members from the Junior and Senior NCO rank groups. Consequently, it was older, had more military experience (a quarter had over 15 years of military service), and more operational experience (less than 20% had no previous operational tours). Nearly two-thirds of the sample was married. Females were represented, albeit at a low level (2.8%). Despite the preceding differences, the education profiles across the three samples were remarkably similar.

Correlation matrices for the two additional samples are provided in Table 30. All correlations in each matrix were significant, ranging from .42 to .72 and .23 to .64 for the second and third predeployment samples respectively. A combined regression weights table, displaying the unstandardised regression coefficients, standard errors, critical ratio *t* values, and *p* values for both sample regressions, is provided at Table 31.

The variance explained in Individual Readiness scores by the human dimensions variables was 49.1% for Predeployment Sample 2 and 32.6% for Predeployment Sample 3. For the second predeployment sample, Motivation made the largest unique contribution towards explaining Individual Readiness, with Proximal Leadership emerging as the other significant predictor (this time with a positive coefficient). In sample 3, Motivation and Cohesion each significantly contributed to the prediction of psychological readiness. Morale was not influential in either model. Despite correlating strongly with the dependent variable in all three samples, (correlation coefficients of .30, .38, and .49) in the presence of the other independent variables, the Morale variable did not contribute to the prediction of readiness in any of the three regression models.

TABLE 30
Correlation Matrix for Additional Predeployment Samples

	Morale	Motivation	Cohesion	Proximal Ldr Behaviour	Ind Readiness
Predeployment Sample 2					
Morale	1.000				
Motivation	.717**	1.000			
Cohesion	.557**	.562**	1.000		
Proximal Ldr Behaviour	.425**	.438**	.608**	1.000	
Ind Readiness	.488**	.636**	.538**	.527**	1.000
Predeployment Sample 3					
Morale	1.000				
Motivation	.636**	1.000			
Cohesion	.593**	.638**	1.000		
Proximal Ldr Behaviour	.422**	.445**	.437**	1.000	
Ind Readiness	.371**	.478**	.541**	.226**	1.000

** Correlation is significant at the 0.01 level (2-tailed)

TABLE 31
Regression Weights Table for Analyses Predicting Individual Readiness with Four Psychological Climate Indicators (Predeployment Samples 2 & 3)

Predeployment Sample 2			Estimate	S.E.	C.R.	p
Individual Readiness	<---	Proximal leader behaviour	.094	.029	3.200	.001
Individual Readiness	<---	Cohesion	.054	.034	1.596	.111
Individual Readiness	<---	Motivation	.390	.076	5.157	***
Individual Readiness	<---	Morale	-.022	.056	-.397	.691
Predeployment Sample 3			Estimate	S.E.	C.R.	p
Individual Readiness	<---	Proximal leader behaviour	-.021	.019	-1.111	.267
Individual Readiness	<---	Cohesion	.175	.028	6.183	***
Individual Readiness	<---	Motivation	.227	.066	3.467	***
Individual Readiness	<---	Morale	-.002	.036	-.053	.958

Multi-group analysis. A multi-group analysis of the three predeployment samples was conducted to test for measurement invariance across these groups with respect to the human dimensions predictors of Individual Readiness. For the structural weights model, the chi-square

statistic (χ^2 = 36.2, df = 8, p < .000) was highly significant and χ^2/df (4.524) was outside the acceptable range. Most other fit indices were acceptable or better (RMSEA = .067, GFI = .983, AGFI = .904, TLI = .930, CFI = .981). On balance, it was concluded that the regression model did not hold well across the three samples with respect to structural weights.

A series of constraints were imposed on the model to identify where the structural weights differed among the three predeployment samples. When Morale was constrained to have identical structural weights across the samples, there was almost no difference to the unconstrained model outcomes (χ^2 increased by .1, χ^2 = .1, df = 2, p = .947, χ^2/df = .054). The same constraint was applied to Motivation, which resulted also in a nonsignificant outcome (χ^2 = 4.55, df = 2, p = .103, χ^2/df = 2.274). However, separate analyses that constrained the structural weights for Proximal Leader Behaviour and Cohesion led to significant outcomes (χ^2 = 14.48, df = 2, p = .001, χ^2/df = 7.24, for Proximal Leader Behaviour; χ^2 = 7.59, df = 2, p = .023, χ^2/df = 3.79, for Cohesion). It was concluded that the structural weights for these two variables differed across the three predeployment samples. In order to ascertain specifically where these differences lay, separate multi-group analyses for each of the two variables were conducted.

The model that examined the covariance between Proximal Leader Behaviour and Individual Readiness obtained a significant chi-square outcome (χ^2 = 11.39, df = 2, p = .003). Examination of the correlations and variances for the three predeployment samples showed that samples 1 and 3 were nearly identical. In comparison, Proximal Leader Behaviour had smaller variance and was more strongly correlated with Individual Readiness in sample 2. Proximal leadership for this group was more strongly associated with psychological readiness for operations at the individual level. A similar analysis for Cohesion resulted in a nonsignificant outcome (χ^2 =

4.06, df = 2, p = .131). Examination of correlations and variances for the three samples showed that sample 3 had the strongest consensus (lowest variance) in Cohesion scores and the highest correlation with Individual Readiness. However, in a model lacking the influence of other independent variables, the three samples were not significantly different with respect to Cohesion.

The promising outcome of the analyses of the Predeployment samples was that substantial variance in Individual Readiness (up to 49%) was explained in each case by human dimensions variables – much more than the regression analyses with demographic and health-related independent variables.[1] The preceding analyses demonstrated that the human dimensions constructs of motivation, cohesion, and proximal leadership can make significant, unique contributions to the prediction of psychological readiness. There were different patterns of results across the three samples utilised, for instance in one group the influence of proximal leadership with respect to individual psychological readiness was stronger.

The different patterns of results across the three samples were not unexpected. As Goyne (2007) has noted, a sign and a strength of valid psychological climate research is its ability to discriminate between units and subunits according to human dimensions constructs. The samples were drawn from different military units at different times. It was anticipated that different units might generate different patterns of regression coefficients. On the other hand, establishing some degree of measurement invariance across different samples was important so that the possibility of constructs having different meanings for different groups could be ruled out. Multi-group analysis showed that the three samples shared similar structural weights for two of the four variables in the regression model, namely Morale and Motivation.

[1] Because all these human dimensions variables were drawn from the one self-report measure, the potential for common method variance is conceded.

Deployment samples. In view of the differing patterns of results for the three predeployment samples, and interest in whether psychological readiness was as salient in deployed personnel, the same regression model depicted in Figure 15 was utilised with two deployment samples. Correlation matrices for the two samples are provided in Table 32. A combined regression weights table for both sample regressions is provided as Table 33.

TABLE 32
Correlation Matrix for Additional Predeployment Samples

	Morale	Motivation	Cohesion	Proximal Ldr Behaviour	Ind Readiness
Deployment Sample 1					
Morale	1.00				
Motivation	.566**	1.00			
Cohesion	.570**	.482**	1.00		
Proximal Ldr Behaviour	.549**	.412**	.531**	1.00	
Ind Readiness	.391**	.387**	.530**	.300**	1.00
Deployment Sample 2					
Morale	1.000				
Motivation	.623**	1.000			
Cohesion	.584**	.470**	1.000		
Proximal Ldr Behaviour	.452**	.403**	.485**	1.000	
Ind Readiness	.384**	.463**	.523**	.262**	1.000

** Correlation is significant at the 0.01 level (2-tailed)

The correlation matrices and the results of the multiple regressions were remarkably similar for the two deployment samples. All variable intercorrelations were significant at the .01 level in both samples. With respect to the regression outcomes, in the presence of all four independent variables, Cohesion and Motivation showed significant effects on Individual Readiness, while Proximal Leader Behaviour and Morale were not influential. Indeed, the standardised estimates for the variable Proximal Leader Behaviour were close to zero in both model solutions. The variance explained in both models exceeded 30% (R^2 = .336 and R^2 = .307). A multi-group analysis of the two deployment samples was conducted. The chi-

square test was just significant; all other fit indices were acceptable (χ^2 = 27.20; df = 15; p = .027; CMIN/df = 1.813; AGFI = .979; TLI = .991; RMSEA = .028). Therefore, it was concluded that the regression model fitted the data for the two deployment samples.

TABLE 33
Regression Weights Table for Analyses Predicting Individual Readiness from Four Psychological Climate Indicators (for two Deployment Samples)

Deployment Sample 1			Estimate	S.E.	C.R.	p
Individual Readiness	<---	Proximal leader behaviour	-.011	.016	-.685	.493
Individual Readiness	<---	Cohesion	.182	.022	8.391	***
Individual Readiness	<---	Motivation	.098	.032	3.029	.002
Individual Readiness	<---	Morale	.033	.022	1.449	.147
Deployment Sample 2			Estimate	S.E.	C.R.	p
Individual Readiness	<---	Proximal leader behaviour	-.018	.014	-1.304	.192
Individual Readiness	<---	Cohesion	.178	.019	9.617	***
Individual Readiness	<---	Motivation	.198	.029	6.866	***
Individual Readiness	<---	Morale	-.013	.022	-.561	.575

Hypothesis 3 discussion. The degree of consistency in the influence of Motivation and Cohesion on Individual Readiness is potentially very useful for commanders. The lack of influence of Morale in the regression analyses was intriguing, considering the bivariate correlations between Morale and Readiness were consistently significant and varied between .30 and .49. It is apparent – as Wild (1988) also noted – that there is a good deal of common variance among human dimension variables. Therefore, it is plausible that a simple statistical artefact accounts for Morale failing to gain significant effects in the regression analysis – the important variance is being picked up by other variables. Similarly, Proximal Leader Behaviour did not achieve significant influence on Individual Readiness in the regression analyses, despite significant bivariate correlations of .30 and .26 with Individual Readiness in the two deployment samples. Based on the

strong correlations evident in Table 32 between all the human dimensions variables and Individual Readiness, the regression outcomes can be challenged. Furthermore, the lack of influence of the immediate leader on subordinate readiness perceptions has contradicted recent research that suggested proximal leadership is a powerful influence on subordinate well-being (Castro, 2007).

A pragmatic application of these results is perhaps that the HDO can dispense with some human dimension constructs. The amount of shared variance between these human factors suggests that a more concise measurement tool could be developed. The preceding results indicate that Cohesion and Motivation would be most useful in capturing the variance in perceptions of individual readiness. Of course, commanders are likely to have their own opinions about what they prefer to be measured, so that compromise may be difficult. Morale has proven to be the most pervasive human factors construct in the military, despite ongoing difficulties in standardising its meaning and operationalising the construct for use in measurement tools (see Liefooghe et al., 2003). A comprehensive measure with some item redundancy may be an acceptable compromise.

The combination of predictor variables accounted for substantial amounts of the variance in Individual Readiness (between 21 and 49% across different unit samples). Overall, it was concluded that Hypothesis 3 was supported by the analysis outcomes. There were positive associations between Individual Readiness and the human dimensions constructs of Motivation (correlations between .39 and .63 across the five samples examined), Proximal Leader Behaviour, and Cohesion (correlations between .37 and .54). Despite correlating strongly with the dependent variable in all samples, in the presence of the other independent variables, the Morale variable did not contribute to the prediction of psychological readiness in any regression sample. This suggested that Morale may play a role other than that of an antecedent of psychological readiness. This supposition

adds some support to the premise that underpins Hypothesis 5; namely that psychological readiness is subordinate to, or an antecedent of, morale. Put another way, morale may be a superordinate outcome variable in relation to the construct of psychological readiness and other human dimensions variables.

Modelling Individual Readiness. The preceding regression analyses were informative, but did not exploit the full capabilities of SEM, particularly the use of latent variables. In this section, additional fit indices are reported for the structural models under examination. Appendix Y describes the fit indices used, including measures of absolute fit and model parsimony ($\chi^2$and normed χ^2), other measures of absolute fit (RMSEA, SRMR, GFI, AGFI), and measures of incremental fit (TLI, CFI). The Bollen-Stine Bootstrap, a modification of a model's chi-square, was used when required (i.e., when chi-square was significant) to test model fit by adjusting for possible distributional misspecification (i.e., lack of multivariate normality). This bootstrapping procedure calculates a new critical chi-square value, compares this with the original chi-square, and calculates an adjusted p-value. When bootstrapping was appropriate, one thousand bootstrap samples were used to ensure standard errors were stabilised and to allow p-values to be interpretable (Nevitt & Hancock, 2000).

The broad constructs from the first three hypotheses – military experience, health behaviours, and human dimensions factors – were combined in a model that examined their influence on Individual Readiness. The simplified path diagram is shown in Figure 16. Several previously utilised variables were excluded from the model. The Health Symptoms variable was excluded because it was considered to represent a different construct (a health *outcome* rather than a health-related *behaviour*). The Military Experience latent variable comprised three items: Age, Operational Experience, and Years of Service. Due to the categorical nature of the variables utilised, a Health Behaviours index was developed in lieu of a

latent variable. A number of Health Behaviour indices were examined. The index that best fitted the model comprised three variables: Exercise Sessions per Week, Average Working Hours per Day over the preceding week, and Smoker/Non-smoker status. Inherent limitations with the other health-related behaviour items – medical visits and average sleep duration – were discussed previously and may explain why these items did not contribute reliably or coherently to the model. Gender was not included in the overall model due to the small number of females represented. Marital Status was excluded because of the preceding regression model outcomes.

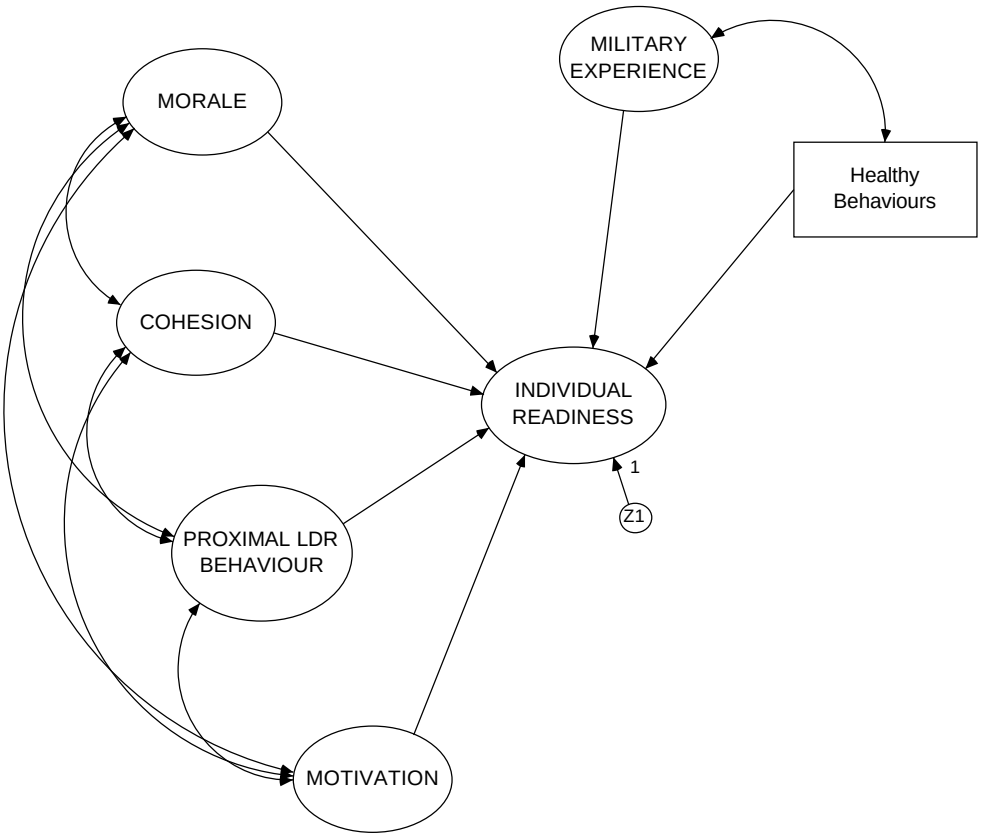

FIGURE 16 Simplified, hypothesised path diagram examining the influence of military experience, health behaviours, and human factors on Individual Readiness. (indicator variables omitted from illustrated model)

The three items loading onto the Individual Readiness component from the individual-level PCA of the UCP-A (listed in Table 14, Chapter 3, p. 137) served as indicators of the Individual Readiness construct. The

human dimensions latent variables of Morale, Cohesion, Proximal Leader Behaviour, and Motivation were also constructed from items drawn from the individual-level PCA of the UCP-A. To reduce the complexity of the model, the number of indicators for each latent variable was restricted to a maximum of four items. Table 34 contains the intercorrelations for the variables in the model. Predeployment Sample 1 was utilised for the analysis (n=363, following exclusion of cases with missing categorical data).

The solution for the full, hypothesised model was inadmissible, due to problems with the integrity of the covariance matrix. It was decided to delete a variable from the model. Relative to the constructs of morale, cohesion, and proximal leadership, motivation was of secondary interest in this research, and therefore was removed. Furthermore, examination of partial models (see Appendix AA) suggested that Morale and Motivation appeared to be measuring the same construct. All correlations between the Morale and Motivation items were significant at the $p < .01$ level, and ranged from .19 to .66.

Outcomes for the modified model are shown as Figure 17. For this model, with the exception of chi-square, fit indices (including the bootstrap p) were acceptable (χ^2 (111, N = 363) = 189.252, $p < .000$, bootstrap $p = .012$, $\chi^2 / df = 1.705$, RMSEA = .044, SRMR = .054, GFI = 0.944, AGFI = 0.923, TLI = 0.956, CFI = 0.964). The only non-significant path coefficient between latent variables was between Morale and Individual Readiness. The negative path coefficient between Proximal Leader Behaviour and Individual Readiness appeared to be a statistical artefact because correlations between relevant indicator items were all positive (see Table 34). The negative covariance between Military Experience and Healthy Behaviours was consistent with preceding models and was reflected in the variable intercorrelations (see Table 34). All pathways between the observed variables and their associated latent variable were significant. It was concluded that the model fitted the data satisfactorily.

TABLE 34
Intercorrelations, Means and Standard Deviations among the Model Variables
(Predeployment Sample 1, n=363)

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
1. health	1.00																
2. hn12	.096	1.00															
3. a8	-.272	-.029	1.00														
4. hn21r	-.029	.165	.094	1.00													
5. hn16	-.027	.198	.094	.332	1.00												
6. hn26	-.034	.200	.040	.410	.455	1.00											
7. hn9r	-.053	.111	.128	.394	.369	.385	1.00										
8. hn4	-.085	.194	.060	.430	.450	.577	.396	1.00									
9. a5	-.100	-.047	.331	.026	-.031	-.032	.035	-.079	1.00								
10. a7	-.308	-.011	.749	.051	.100	.066	.103	.012	.423	1.00							
11. hn2	.039	.259	.009	.342	.506	.369	.305	.362	-.056	.011	1.00						
12. hn14	-.001	.339	.090	.441	.533	.428	.347	.383	.020	.050	.656	1.00					
13. hn41	-.121	.267	.057	.372	.660	.343	.298	.395	.033	.088	.393	.457	1.00				
14. hn10	-.038	.326	.003	.322	.435	.366	.264	.375	-.052	-.025	.584	.549	.357	1.00			
15. hn37	.111	.365	.076	.086	.086	.042	.072	.044	.128	.138	.205	.170	.136	.168	1.00		
16. hn25	.088	.363	.125	.105	.198	.014	.075	.021	.152	.203	.182	.128	.171	.156	.493	1.00	
17. hn30	-.042	.211	.086	.350	.639	.381	.351	.402	-.029	.092	.434	.472	.648	.315	.165	.224	1.00

Notes:
1. Correlations above .102 were significant at $p < .05$; those above .137 were significant at $p < .01$
2. Items in full, with means and standard deviations:

	Variable	Mean	SD	Factor	Item
1	health	4.99	2.34	Healthy Behaviours	The Health Behaviours index combined: Exercise Sessions per Week, Average Working Hours per Day, and Smoker/Non-smoker status items
2	hn12	6.12	1.11	Individual Readiness	I am prepared to risk my life for the members of my workteam.
3	a8	2.31	1.11	Mil exp	Age group
4	hn21r	4.77	1.67	Prox Ldr Beh	My immediate commander lets others interfere with my work.
5	hn16	5.33	1.34	Prox Ldr Beh	My immediate commander puts suggestions made by members of the workteam into operation.
6	hn26	5.21	1.70	Morale	The level of morale in my workteam is high.
7	hn9r	5.22	1.63	Prox Ldr Beh	My immediate commander blames the team for his/her own inadequacies.
8	hn4	5.63	1.44	Prox Ldr Beh	My immediate commander is willing to listen to problems.
9	a5	0.64	0.73	Mil Exp	Number of previous operational tours
10	a7	1.74	0.95	Mil Exp	Years of service
11	hn2	5.72	1.26	Cohesion	The members of my workteam encourage each other to work together …
12	hn14	5.63	1.20	Cohesion	My workteam is proud of its standards and achievements.
13	hn41	5.15	1.41	Morale	Unit morale is high.
14	hn10	5.88	0.97	Cohesion	My workteam is effective in its normal duties.
15	hn37	6.42	0.80	Individual Readiness	I am ready to perform effectively if sent to war.
16	hn25	6.18	0.89	Individual Readiness	I am ready to deal with any demand or situation that may arise during operational service.
17	hn30	5.45	1.50	Morale	My own level of morale is high.

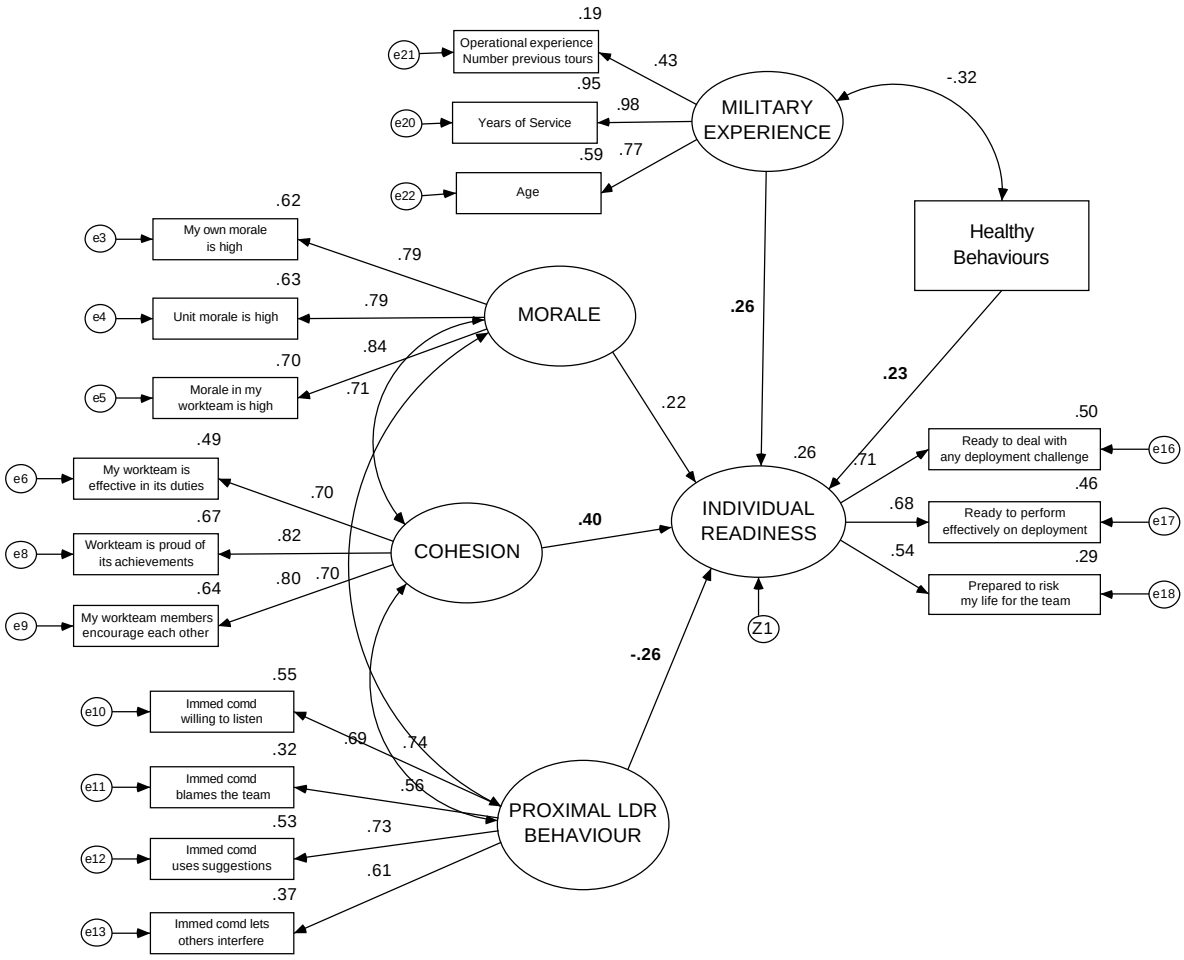

FIGURE 17 Fitted model examining the influence of military experience, health behaviours, and human factors on Individual Readiness (n=363).

Alternate model with higher-order factor. Once again, the issue of the relative lack of influence of the Morale latent variable in the structural model – despite strong correlations with many other items in the model – led to questioning of the approach adopted. It was postulated that there may be a higher order factor binding the three human dimensions variables, and that this higher order factor would predict readiness. A model was constructed and tested. Modification indices suggested that an error covariance pathway be fitted between two items of the Proximal Leader Behaviour latent variable. The resulting fit indices were acceptable if the bootstrap *p* is adopted in lieu of the chi-square: χ^2 (112, N = 363) = 190.891,

$p < .000$, bootstrap $p = .012$, $\chi^2 / df = 1.704$, RMSEA = .044, SRMR = .056, GFI = 0.944, AGFI = 0.923, TLI = 0.956, CFI = 0.964. The outcome is depicted in Figure 18.

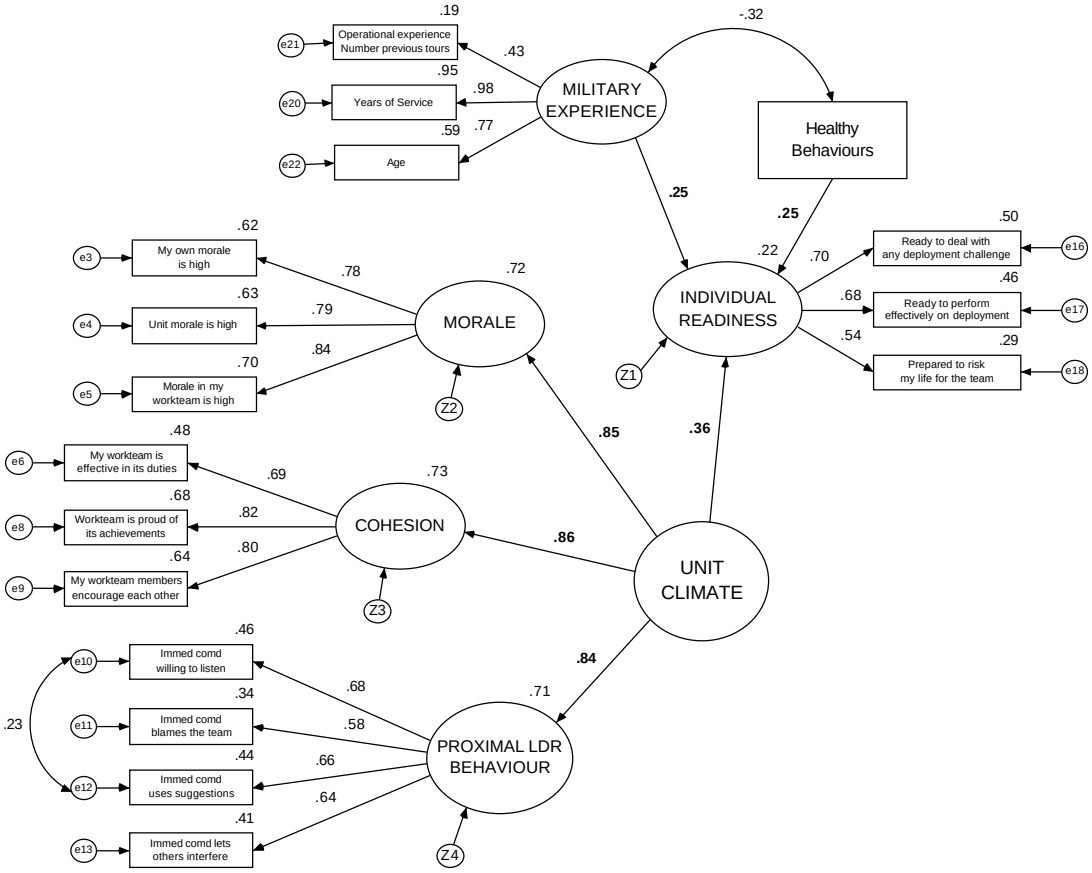

FIGURE 18 Fitted model with higher order factor examining the influence of military experience, health behaviours, and human factors on Individual Readiness (n=363).

The standardised regression coefficients for the pathways between the human dimensions latent variables (including Morale) and the higher order factor, which was labelled 'Unit Climate', were all significant and similar in magnitude. This outcome was consistent with the pattern of strong bivariate correlations among the human dimensions indicator items. Another notable change was that the path coefficient between Proximal

Leader Behaviour and Unit Climate was positive – as would be expected. While the amount of explained variance in Individual Readiness dropped slightly from 26 to 22%, the second model was more appealing because it more accurately reflected the associations evident in the correlations. Also, the second model has, finally, recognised Morale as an influential latent variable, commensurate with Cohesion and Proximal Leader Behaviour.

Multi-group analysis. Deployment Sample 1 was used to cross-validate both preceding models. Results of a structural weights comparison showed that, with the exception of χ^2 and Bollen-Stine bootstrap, fit indices were acceptable for both models. The fit indices for the initial model (χ^2 (242, N = 363/431) = 517.213, $p < .000$, bootstrap $p = .001$, $\chi^2/df = 2.137$, RMSEA = .038, SRMR = .061, GFI = 0.928, AGFI = 0.909, TLI = 0.935, CFI = 0.942) were, in the main, slightly poorer than those for the model with the higher order factor (χ^2 (241, N = 363/431) = 505.576, $p < .000$, bootstrap $p = .001$, $\chi^2/df = 2.098$, RMSEA = .037, SRMR = .060, GFI = 0.930, AGFI = 0.911, TLI = 0.937, CFI = 0.944). It was concluded that the data from both samples adequately fitted both models. Considerably more variance was explained in Individual Readiness in the deployment sample for both models (48.6% compared with 26.0% in the first; 42.2% compared with 21.7% in the second model).

Modelling Collective Readiness. The impact of human dimensions factors on collective readiness was examined next. The four items loading onto the Collective Readiness component from the individual-level PCA of the UCP-A (listed in Table 14, Chapter 3, p. 137) served as indicators of the Collective Readiness latent variable. The human dimensions latent variables of Morale, Cohesion, and Proximal Leader Behaviour, drawn from the individual-level PCA of the UCP-A, were again utilised. Because it was reasoned that the Military Experience and Healthy Behaviours variables from the preceding model would not influence

perceptions of collective readiness, these individual biographic variables were omitted.

The simplified version of the modified, hypothesised model is illustrated in Appendix AB. Intercorrelations for the variables in this model are provided in Table 35. All correlations were significant at an alpha level of $p < .01$.

Model assessment. The goodness-of-fit statistics for the model were generally poor, with five indices outside acceptable levels (see Table 24): (χ^2 (71, N = 369) = 235.219, $p < .000$, bootstrap $p = .001$, χ^2 / df = 3.313, RMSEA = .079, SRMR = .040, GFI = 0.922, AGFI = 0.885, TLI = 0.911, CFI = 0.931). Modification indices suggested that error correlations between most of the Collective Readiness items should be specified. This was accepted as appropriate because a degree of perceived redundancy in the item content for the Collective Readiness latent variable was likely. The model was re-specified with these error covariances as free parameters.

The results of the fitted model are schematically presented in Figure 19. The fit indices for this model were much improved (χ^2 (66, N = 369) = 127.236, $p < .000$, bootstrap $p = .039$, χ^2 / df = 1.928, RMSEA = .050, SRMR = .032, GFI = 0.953, AGFI = 0.925, TLI = 0.964, CFI = 0.974). Explained variance in Collective Readiness was 75.6%.

TABLE 35
Intercorrelations, Means and Standard Deviations among the Model Variables
(Predeployment Sample 1, n=363)

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. hn1	1.00													
2. hn38	.484	1.00												
3. hn21r	.142	.215	1.00											
4. hn26	.262	.352	.327	1.00										
5. hn16	.178	.160	.421	.447	1.00									
6. hn9r	.136	.145	.394	.367	.386	1.00								
7. hn4	.174	.170	.422	.451	.568	.392	1.00							
8. hn2	.314	.362	.336	.507	.362	.301	.367	1.00						
9. hn14	.360	.423	.438	.529	.426	.349	.379	.649	1.00					
10. hn41	.304	.453	.370	.658	.343	.295	.396	.394	.453	1.00				
11. hn10	.315	.377	.323	.431	.367	.268	.373	.578	.551	.354	1.00			
12. hn39	.363	.611	.264	.518	.301	.267	.239	.529	.620	.394	.451	1.00		
13. hn13	.544	.377	.285	.445	.343	.251	.288	.491	.576	.322	.420	.630	1.00	
14. hn30	.282	.297	.341	.640	.372	.346	.403	.434	.467	.645	.308	.379	.364	1.00

Notes:

1. All correlations were significant at $p < .01$
2. Items in full, with means and standard deviations:

	Variable	Mean	SD	Factor	Item
1	hn1	5.63	1.32	Collective Readiness	My unit is ready for deployment on operations
2	hn38	5.64	1.28	Collective Readiness	My unit is ready for its wartime role.
3	hn21r	4.77	1.67	Prox Ldr Beh	My immediate commander lets others interfere with my work.
4	hn26	5.21	1.70	Morale	The level of morale in my workteam is high.
5	hn16	5.33	1.34	Prox Ldr Beh	My immediate commander puts suggestions made by members of the workteam into operation.
6	hn9r	5.22	1.63	Prox Ldr Beh	My immediate commander blames the team for his/her own inadequacies.
7	hn4	5.63	1.44	Prox Ldr Beh	My immediate commander is willing to listen to problems.
8	hn2	5.72	1.26	Cohesion	The members of my workteam encourage each other to work together …
9	hn14	5.63	1.20	Cohesion	My workteam is proud of its standards and achievements.
10	hn41	5.15	1.41	Morale	Unit morale is high.
11	hn10	5.88	0.97	Cohesion	My workteam is effective in its normal duties.
12	hn39	5.45	1.35	Collective Readiness	The members of my workteam are ready to go to war.
13	hn13	5.76	1.23	Collective Readiness	The members of my workteam are ready to deploy on operations
14	hn30	5.45	1.50	Morale	My own level of morale is high.

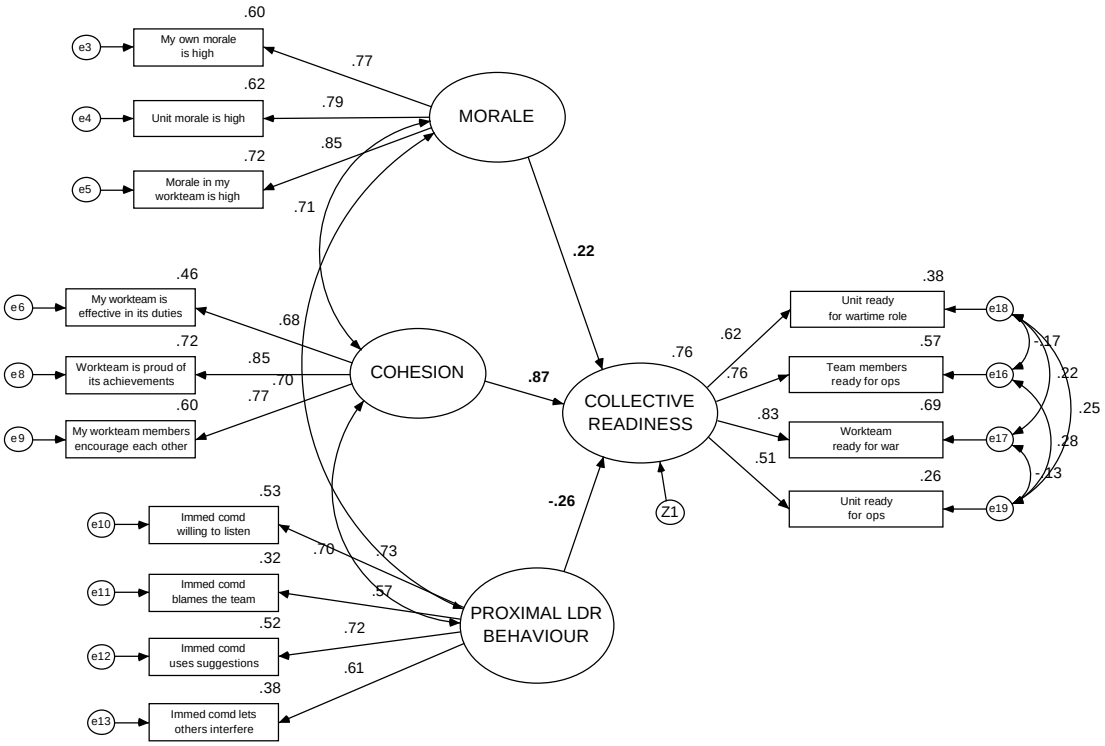

FIGURE 19 Fitted model examining the influence of three human dimensions factors on Collective Readiness (n=369).

In order to explore further the human dimensions that influenced perceptions of collective readiness, the model was re-specified to include a Leadership Effectiveness latent variable. Testing this model revealed that senior leadership did not contribute to explaining the variance in Collective Readiness (path coefficient -.06, regression weight $p = .454$). In fact, this additional human dimension variable degraded model fit (χ^2 (119, N = 369) = 198.704, $p < .000$, bootstrap $p = .109$, $\chi^2/df = 1.670$, RMSEA = .043, SRMR = .040, GFI = 0.945, AGFI = 0.921, TLI = 0.965, CFI = 0.973).

Multi-group analysis. A multi-group analysis of Predeployment Sample 1 and Deployment Sample 1 was conducted using structural weights for the model depicted in Figure 19. Fit indices were generally acceptable (χ^2 (146, N = 369/452) = 371.904, $p < .000$, bootstrap $p = .001$, χ^2/df = 2.547, RMSEA = .043, SRMR = .043, GFI = 0.939, AGFI = 0.912, TLI =

0.943, CFI = 0.955). It was therefore concluded the data for both samples fitted the model.

Alternate model with higher-order factor. Another possible model was generated where the covariances between the human dimensions latent variables were influenced by a higher order factor that, in turn, influenced perceptions of collective readiness. The higher order factor was labelled Unit Climate. Fit indices for this re-specified model were satisfactory (χ^2 (65, N = 369) = 98.671, p = .004, bootstrap p = .248, χ^2 / df = 1.518, RMSEA = .038, SRMR = .029, GFI = 0.963, AGFI = 0.940, TLI = 0.980, CFI = 0.986). The model outcomes are shown in Figure 20.

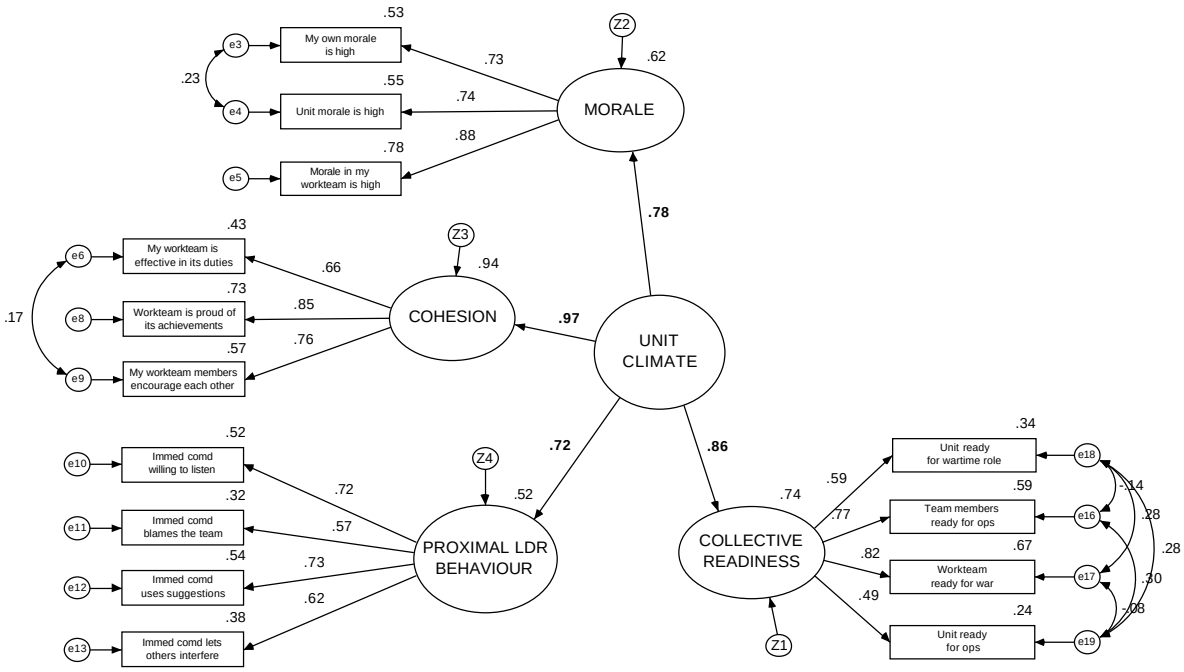

FIGURE 20 Fitted model with higher order factor examining the influence of three human dimensions factors on Collective Readiness (n=363).

According to the standardised regression weights, the influence of the three human dimensions latent variables on Unit Climate was relatively consistent. Explained variance in Collective Readiness was 74%. Multi-

group analysis with the two samples identified earlier using a structural weights model produced mixed goodness-of-fit outcomes (χ^2 (145, N = 369/452) = 450.823, $p < .000$, bootstrap $p = .001$, $\chi^2/df = 3.109$, RMSEA = .051, SRMR = .049, GFI = 0.927, AGFI = 0.894, TLI = 0.923, CFI = 0.939).

Discussion – modelling readiness. SEM resulted in meaningful models with adequate statistical fit for the prediction of both individual and collective readiness. Multi-sample analyses to cross-validate these models generally achieved adequate fit, demonstrating that the data from predeployment and deployment samples were consistent in how they fitted each model. Unlike the earlier regression analysis outcomes, the combined measurement model for Individual Readiness demonstrated that military experience could have a significant effect (see Figure 17). The variables Cohesion, Proximal Leader Behaviour, and Healthy Behaviours also had significant effects on Individual Readiness.

For Collective Readiness, the causal paths from the variables of Morale, Cohesion, and Proximal Leader Behaviour were significant (Figure 19). The strong covariances among human dimensions latent variables led to the inclusion of a higher order factor – labelled Unit Climate – which was postulated to bind these variables and predict readiness. The two models that incorporated a higher order factor proved to have strong explanatory power and reflected the associations between variables evident in bivariate correlations more closely.

Hypothesis 4.

> **At the collective level, there will be positive associations between psychological readiness to deploy and the human dimensions of ethos, cohesion ('team climate'), and perceptions of higher-level leader effectiveness.**

Analyses to test and explore this hypothesis used the dependent variable 'Readiness for Deployment' which was derived from group-level PCA of the UCP-A, as described in Chapter 3 (note Table 16, p. 144). The independent variables - also derived from the UCP-A – represented constructs postulated to be valid at the focal level of the group. The UCP-A subscales labelled Senior Leadership Effectiveness, Ethos, Team Climate, and SNCO/WO Leadership, were utilised. Senior Leadership Effectiveness and SNCO/WO Leadership were intended to represent perceptions of higher-level leader effectiveness).

In light of the preceding analyses, where the variable Morale did not contribute to explaining Individual Readiness, it was decided to add the Individual Morale variable from the group-level PCA to the analyses conducted here. As discussed in Chapter 3, the construct of morale is contested with respect to whether it is most relevant at the focal level of the individual or of the group. One incongruous outcome of the component analyses of the UCP-A in Chapter 3 was that the group-level analysis resulted in a Morale component with greater homogeneity among its constituent items than the individual-level analysis. The individual-level analysis produced a Morale component with constituent items spanning three levels (the individual, work team, and unit) whereas all items loading onto the Individual Morale component from the group-level analysis had an individual-level locus. Due to the importance accorded to the construct of morale in the military history and performance literature, it seemed justified to add the Individual Morale variable to the variables of interest in Hypothesis 5 in order to determine its influence at the collective level.

Descriptive statistics for these variables across four samples are contained in Table 36. Predeployment Sample 3 was excluded due to the degree of missing data for two items.

TABLE 36
Descriptive Statistics for Group-level Human Dimensions
Variables and Readiness for Deployment across Four Samples

Sample	Snr Leader Effectiveness	Ethos	Team Climate	SNCO/WO Leadership	Individual Morale	Readiness to Deploy
PD Sample 1 (n=369)						
Mean	25.60	18.77	45.20	17.10	27.55	39.55
Standard Deviation	5.29	2.33	7.34	2.66	5.49	5.07
PD Sample 2 (n=136)						
Mean	21.65	18.65	46.85	16.36	27.76	34.75
Standard Deviation	4.11	2.41	6.84	2.96	5.98	4.65
Dep Sample 1 (n=431)						
Mean	22.60	18.14	43.82	14.84	25.89	37.95
Standard Deviation	6.34	2.41	7.22	3.60	5.67	5.58
Dep Sample 2 (n=587)						
Mean	23.65	18.18	43.67	16.35	26.23	38.04
Standard Deviation	5.65	2.70	7.74	2.97	5.81	6.07

Table 37 displays intercorrelations across the four samples for the group-level human dimensions variables of interest. All correlations were significant at the .01 level across the four samples, and ranged from .27 to .72. Team Climate had consistently high correlations (above .62) with Collective Readiness in all four samples. Clearly, there were positive associations between psychological readiness for deployment at the collective level and the human dimensions constructs of interest.

Once again, a regression model was developed to examine how the hypothesised group-level human dimensions constructs would predict psychological readiness for deployment. The regression model is shown at Figure 21.

TABLE 37
Correlation Matrices for Group-level Human Dimensions Variables and Collective Readiness across Four Samples

PD1 Sample	Snr Leader Effectiveness	Ethos	Team Climate	SNCO/WO Leadership	Individual Morale	Readiness to Deploy
Snr Leader Effectiveness	1.000					
Ethos	.401**	1.000				
Team Climate	.580**	.407**	1.000			
SNCO/WO Leadership	.691**	.422**	.630**	1.000		
Individual Morale	.581**	.487**	.508**	.540**	1.000	
Readiness to Deploy	.509**	.466**	.631**	.565**	.441**	1.000
PD2 Sample						
Snr Leader Effectiveness	1.000					
Ethos	.401**	1.000				
Team Climate	.593**	.624**	1.000			
SNCO/WO Leadership	.725**	.354**	.541**	1.000		
Individual Morale	.505**	.537**	.591**	.503**	1.000	
Readiness to Deploy	.554**	.440**	.685**	.487**	.545**	1.000
D1 Sample						
Snr Leader Effectiveness	1.000					
Ethos	.403**	1.000				
Team Climate	.594**	.486**	1.000			
SNCO/WO Leadership	.718**	.267**	.510**	1.000		
Individual Morale	.564**	.529**	.547**	.473**	1.000	
Readiness to Deploy	.635**	.419**	.628**	.644**	.529**	1.000
D2 Sample						
Snr Leader Effectiveness	1.000					
Ethos	.370**	1.000				
Team Climate	.566**	.483**	1.000			
SNCO/WO Leadership	.653**	.390**	.542**	1.000		
Individual Morale	.565**	.531**	.510**	.506**	1.000	
Readiness to Deploy	.565**	.558**	.624**	.596**	.529**	1.000

** Correlation was significant at the 0.01 level (2-tailed)

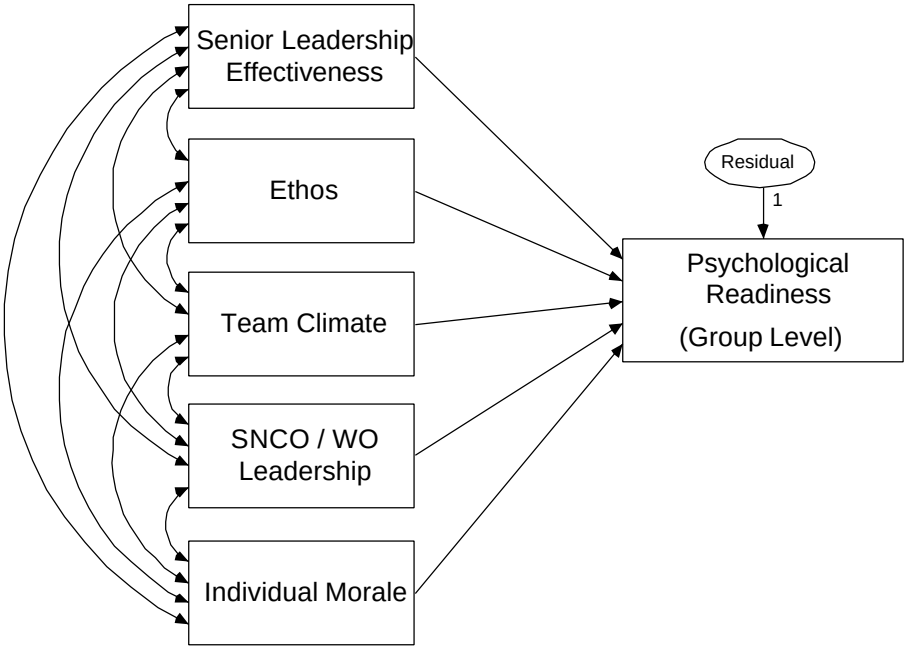

FIGURE 21 Multiple regression model predicting psychological readiness from five group-level human dimensions constructs.

Multiple regression statistics for each sample are provided in Table 38. The combination of human dimensions variables explained between 48.1 and 56.6% of the variation in Collective Readiness scores across the samples. Inspection of Table 38 revealed remarkable consistency in the salience of some predictors. For instance, according to the standardised regression weights, Team Climate made the strongest unique contribution in four of the five samples and was the second strongest predictor in the other sample. This influence was reflected in the correlation matrix.

In the presence of other variables, both the Ethos and SNCO/WO Leadership variables were significant predictors in all but the smallest sample (Predeployment Sample 2). Senior Leader Effectiveness and Individual Morale were less consistent predictors; significant in two samples each. It was noteworthy that Senior Leader Effectiveness gained significance in the two deployment samples. A plausible explanation for this outcome was that members of the senior leadership generally are busy

planning behind the scenes in the lead-up to deployment; but their role and influence are more apparent and accepted in the deployment context where their major focus is on day-to-day operations.

TABLE 38
Regression Weights Table for Analyses Predicting Psychological Readiness from Five Psychological Climate Indicators for Four Samples

Predeployment Sample 1 (n=369): R^2 = .481					
Predictor	Estimate	S.E.	C.R.	p	Std regression weight
Snr Leader Effectiveness	.074	.054	1.366	.172	.077
Ethos	.431	.096	4.467	***	.198
Team Climate	.269	.035	7.591	***	.389
SNCO/WO Leadership	.342	.109	3.137	.002	.180
Individual Morale	.004	.047	.096	.924	.005
Predeployment Sample 2 (n=136): R^2 = .522					
Predictor	Estimate	S.E.	C.R.	p	Std regression weight
Snr Leader Effectiveness	.199	.105	1.904	.057	.176
Ethos	-.073	.153	-.481	.631	-.038
Team Climate	.332	.062	5.394	***	.488
SNCO/WO Leadership	.029	.140	.205	.838	.018
Individual Morale	.139	.062	2.235	.025	.179
Deployment Sample 1 (n=452): R^2 = .566					
Snr Leader Effectiveness	.132	.046	2.889	.004	.145
Ethos	.205	.089	2.298	.022	.088
Team Climate	.219	.033	6.628	***	.281
SNCO/WO Leadership	.529	.073	7.251	***	.330
Individual Morale	.091	.042	2.145	.032	.091
Deployment Sample 2 (n=587): R^2 = .556					
Snr Leader Effectiveness	.139	.043	3.211	.001	.129
Ethos	.571	.076	7.474	***	.254
Team Climate	.210	.029	7.255	***	.268
SNCO/WO Leadership	.477	.079	6.074	***	.233
Individual Morale	.070	.039	1.778	.075	.067

Multi-group analyses. As in preceding sections of this chapter, sample comparisons were conducted with the variables in the regression model using the multi-group analysis function of AMOS to check for measurement invariance using a structural weights model. Fit indices for comparisons between the two predeployment samples and between the two deployment samples were adequate (χ^2 = 11.315, df = 5, p = .045, bootstrap p = .283, χ^2/df = 2.263, GFI = .993, AGFI = .939, TLI = .973, CFI = .995, RMSEA = .050; and χ^2 = 11.558, df = 5, p = .041, bootstrap p = .214, χ^2/df = 2.312, GFI = .996, AGFI = .969, TLI = .986, CFI = .998, RMSEA = .036, respectively). In addition, fit indices for a comparison of structural weights of all four samples were adequate (χ^2 = 11.550, df = 5; p = .041, bootstrap p = .236, χ^2/df = 2.310, GFI = .998, AGFI = .958, TLI = .982, CFI = .998, RMSEA = .029). It was concluded that the regression model fitted the data from the four samples.

Hypothesis 4 discussion. Hypothesis 4 was supported. Using variables derived at the collective level of analysis, there were consistent, positive associations between Psychological Readiness and the human dimensions constructs of Team Climate, Ethos, SNCO/WO Leadership, Senior Leader Effectiveness, and Individual Morale. With respect to the prediction of readiness for deployment, regression modelling found that Team Climate was the strongest most consistent predictor. This was consistent with the item correlations in Table 37, which showed that Team Climate tended to have the largest correlation with readiness to deploy. Ethos and SNCO/WO Leadership were regularly associated with Psychological Readiness. Another independent variable, Senior Leadership Effectiveness, was strongly predictive of readiness in the two deployment groups.

In the regression analyses, Individual Morale was less reliable as a predictor of Psychological Readiness, but it did significantly predict

readiness to deploy in two samples drawn from the same unit at Predeployment and Deployment stages. Once again, with respect to the measure of morale, regression outcomes were at odds with the associations evident in the bivariate correlations. Table 37 shows that Individual Morale was strongly correlated with Readiness to Deploy across the samples utilised (correlations ranged from .44 to .55; all were significant at the $p < .01$ level).

The amount of variance explained in Psychological Readiness (48.1 to 56.6%) was higher and more consistent than in the preceding regression models that examined associations between Individual Readiness and military experience, Individual Readiness and health-related behaviour, and Individual Readiness and human dimensions constructs postulated to be relevant at the focal level of the individual.

It proved compelling that the most consistent and influential predictors of readiness in this research could be directly equated with Siebold's (1996; 1999) conceptualisation of military unit dynamics where cohesion, in its numerous forms, was fundamental. Specifically, the construct of Team Climate could be equated with horizontal cohesion, while Ethos was consistent with organisational cohesion, and both SNCO/WO Leadership and Senior Leadership Effectiveness reflected components of vertical cohesion. The most salient predictor of collective readiness appeared to be horizontal cohesion – a sense of collective identity at the level of the work group.

As noted above, in regression analysis, the Individual Morale variable proved to be inconsistent with respect to its influence as a predictor of psychological readiness, in this case readiness at the collective level. This outcome added further impetus to the attempt to distinguish whether morale plays a different role in the interaction of human factors postulated to underpin military climate and performance. The question of the role of morale was the theme of the final hypothesis in this chapter.

Hypothesis 5.

Morale and psychological readiness will be distinguishable at the collective level by their relationship to other human dimensions constructs.

Two conceptual models, depicted in Figures 22 and 23, were defined and compared using SEM. The model represented in Figure 22 postulated that a range of correlated exogenous latent variables, including Individual Morale, would directly predict psychological readiness ("Readiness to Deploy"). The second model, represented in Figure 23, postulated that several latent human dimensions constructs would influence psychological readiness, but that readiness in turn would be subordinate to the construct of morale. That is, morale was expected to be the overarching outcome variable among the range of human dimensions constructs measured by the UCP-A. For simplicity, higher-level leadership effectiveness was measured by only one latent variable in this section. Senior Leader Effectiveness was adopted because it was considered to address the construct considerations more comprehensively than SNCO/WO Leadership.

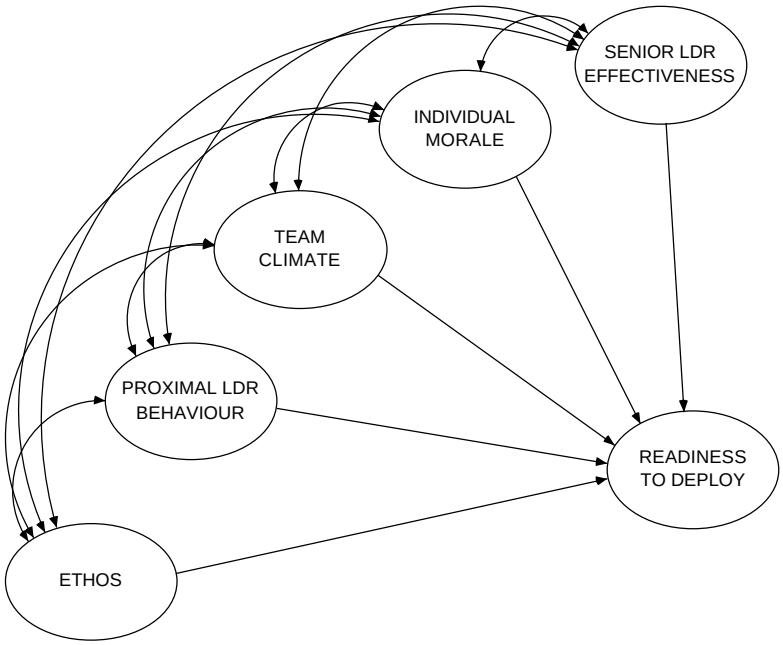

FIGURE 22 Predicting psychological readiness: Measurement model 1.

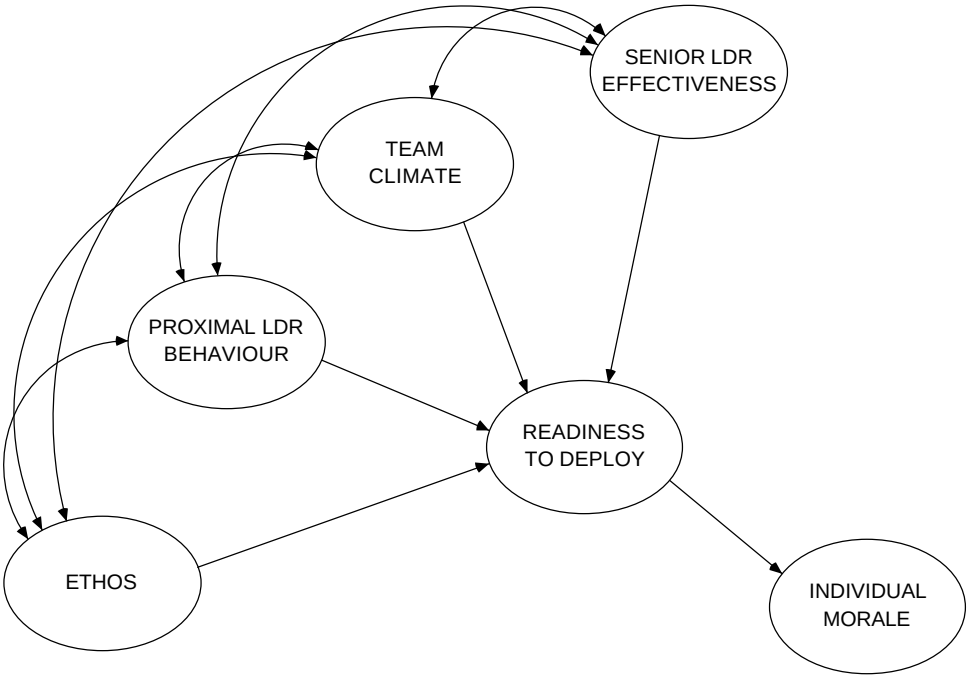

FIGURE 23 Predicting morale through readiness: Measurement model 2.

Model 1. Consistent with previous analyses, data from Predeployment Sample 1 were used to test model fit. Intercorrelations among the model variables are provided in Table 39. Initial testing led to minor re-specification of the model – error covariance was specified between two items of the Team Climate latent variable and among the items of the Readiness to Deploy variable. A simplified version of the re-specified model outcomes is shown in Figure 24. A complex version showing indicator items is provided in Appendix AC. The data fitted the model satisfactorily: χ^2 (116, N = 369) = 172.683, p = .001, bootstrap p = .124, χ^2 / df = 1.489, RMSEA = .036, SRMR = .040, GFI = 0.952, AGFI = 0.930, TLI = 0.967, CFI = 0.975. Four of the five pathways to Readiness to Deploy were significant: those from Ethos (p = .025), Team Climate (p < .001), Proximal Leader Behaviour (p = .031), and Individual Morale (p = .016). Explained variance in Readiness to Deploy was 69.2%.

TABLE 39
Intercorrelations Means and Standard Deviations among Model Variables
(Predeployment Sample 1, n=369)

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
1. hn8	-																
2. hn7	.52	-															
3. hn38	.22	.22	-														
4. hn1	.19	.23	.48	-													
5. hn39	.21	.12	.61	.36	-												
6. hn23	.26	.22	.21	.19	.09	-											
7. hn13	.17	.15	.38	.54	.63	.21	-										
8. hn35	.25	.19	.27	.23	.18	.36	.49	-									
9. hn11	.27	.26	.33	.28	.15	.39	.45	.43	-								
10. hn4	.19	.10	.17	.17	.00	.23	.40	.33	.20	-							
11. hn9r	.08	.07	.15	.14	.03	.12	.30	.22	.16	.39	-						
12. hn21r	.09	.08	.22	.14	.06	.18	.37	.25	.23	.42	.40	-					
13. hn3	.22	.23	.12	.07	.06	.22	.24	.20	.27	.16	.15	.12	-				
14. hn19	.48	.33	.29	.13	.36	.21	.27	.24	.25	.20	.11	.14	.36	-			
15. hn5	.27	.23	.33	.29	.15	.26	.42	.34	.31	.34	.23	.33	.13	.28	-		
16. hn10	.21	.21	.38	.32	.05	.23	.35	.24	.22	.37	.27	.32	.13	.22	.52	-	
17. hn14	.27	.20	.42	.36	.05	.22	.45	.29	.28	.38	.35	.44	.17	.28	.53	.55	-
18. hn2	.26	.16	.36	.31	.02	.19	.39	.27	.23	.37	.30	.34	.19	.29	.59	.58	.65

Notes:
1. Correlations above .10 are significant at $p < .05$; those above .130 are significant at $p < .01$
2. Items in full, with means and standard deviations:

	Variable	Mean	SD	Item
1	hn8	6.20	1.01	I am making a contribution to Australia by serving in the military
2	hn7	6.45	0.91	The military has an important job to do in defending Australia
3	hn38	5.65	1.28	My unit is ready for its wartime role.
4	hn1	5.63	1.31	My unit is ready for deployment on operations other than war.
5	hn39	5.46	1.34	The members of my workteam are ready to go to war.
6	hn23	4.84	1.37	Officers almost always get willing and eager cooperation from unit members.
7	hn13	5.76	1.22	Workteam members are ready to deploy on operations other than war.
8	hn35	5.11	1.48	Commanders in my unit are interested in my personal welfare.
9	hn11	5.67	1.29	I know what my unit is trying to accomplish.
10	hn4	5.63	1.43	My immediate commander is willing to listen to problems.
11	hn9r	5.24	1.62	My immediate commander blames the team for his/her own inadequacies.
12	hn21r	4.79	1.67	My immediate commander lets others interfere with my work.
13	hn3	4.79	1.87	I plan on making the military my career.
14	hn19	6.18	1.11	I feel proud to be a member of the Australian Defence Force.
15	hn5	5.69	1.18	Overall, I am confident in the abilities of the Junior NCOs in my unit.
16	hn10	5.88	0.96	My workteam is effective in its normal duties.
17	hn14	5.63	1.19	My workteam is proud of its standards and achievements.
18	hn2	5.72	1.26	The members of my workteam encourage each other to work together as a team.

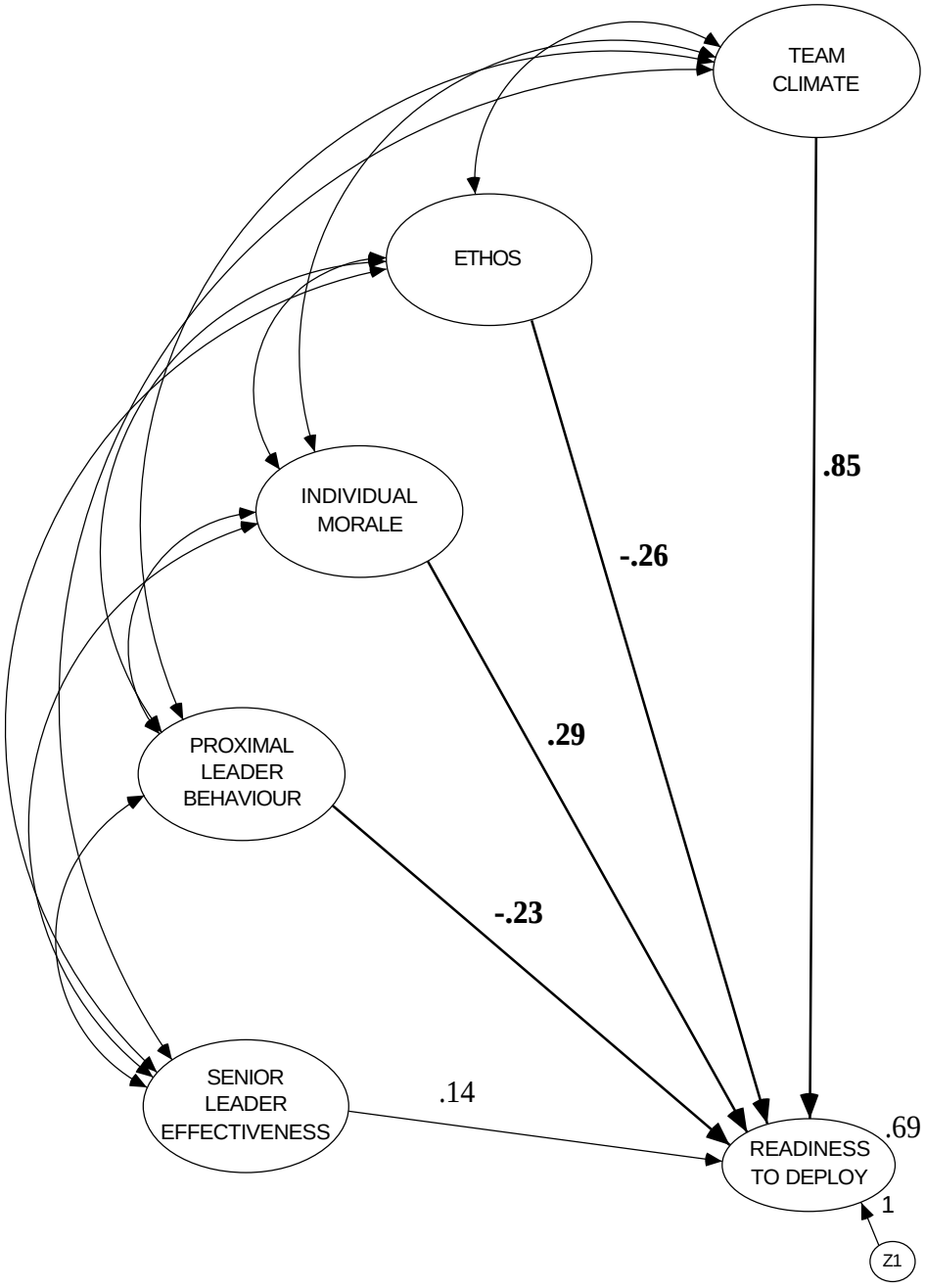

FIGURE 24 Simplified output version of a model predicting collective readiness to deploy: Re-specified measurement model 1 with a predeployment sample (n=369).

Multi-group analysis. A check of measurement invariance between Predeployment Sample 1 and Deployment Sample 1, which used a structural weights model, resulted in acceptable fit indices, with the exception of chi-square and the bootstrap *p* (χ^2 (249, N = 369/452) = 535.473, $p < .000$, bootstrap $p = .005$, $\chi^2/df = 2.150$, RMSEA = .037, SRMR = .041, GFI = 0.932, AGFI = 0.907, TLI = 0.926, CFI = 0.940). It was concluded that the model adequately fitted the data from both samples.

Model 2. The hypothesised model as shown in Figure 23 was tested using Predeployment Sample 1. Fit indices were reasonable if the bootstrap *p* was used (χ^2 (119, N = 369) = 253.307, $p < .000$, bootstrap $p = .010$, $\chi^2/df = 1.977$, RMSEA = .052, SRMR = .054, GFI = 0.936, AGFI = 0.909, TLI = 0.934, CFI = 0.949). The structural pathways from Senior Leader Effectiveness, Team Climate, and Proximal Leader Behaviour that flowed to Readiness to Deploy were each significant. As postulated, the pathway from Readiness to Deploy to Morale was also significant. Variance explained in Readiness to Deploy was 75.3%, and in Individual Morale was 30.4%.

The Ethos latent variable did not influence the initial version of model 2. Subsequent re-specification changed the structural pathway that flowed from Ethos to Readiness to Deploy to flow directly to Morale. This modification to the model made theoretical sense because the Ethos items appeared to be tapping into values, and values were postulated to be relevant to the intrinsic construct of morale, more so than to psychological readiness. The re-specified and fitted model is shown in Figure 25. The predeployment sample data fitted the re-specified model adequately after bootstrapping (χ^2 (119, N = 369) = 164.919, $p = .003$, bootstrap $p = .303$, $\chi^2/df = 1.386$, RMSEA = .032, SRMR = .038, GFI = 0.954, AGFI = 0.933, TLI = 0.974, CFI = 0.980). The pathway from Ethos to Individual Morale had a significant effect ($p<.001$), and the explained variance in Morale

increased from 30.4 to 57.2%; whereas explained variance in Readiness to Deploy dropped marginally (from 75.3% to 71.0%). The Akaike Information Criterion (Akaike, 1978) dropped substantially across the initial and re-specified models (339.307 to 268.919), indicating that the re-specified model was the more parsimonious.

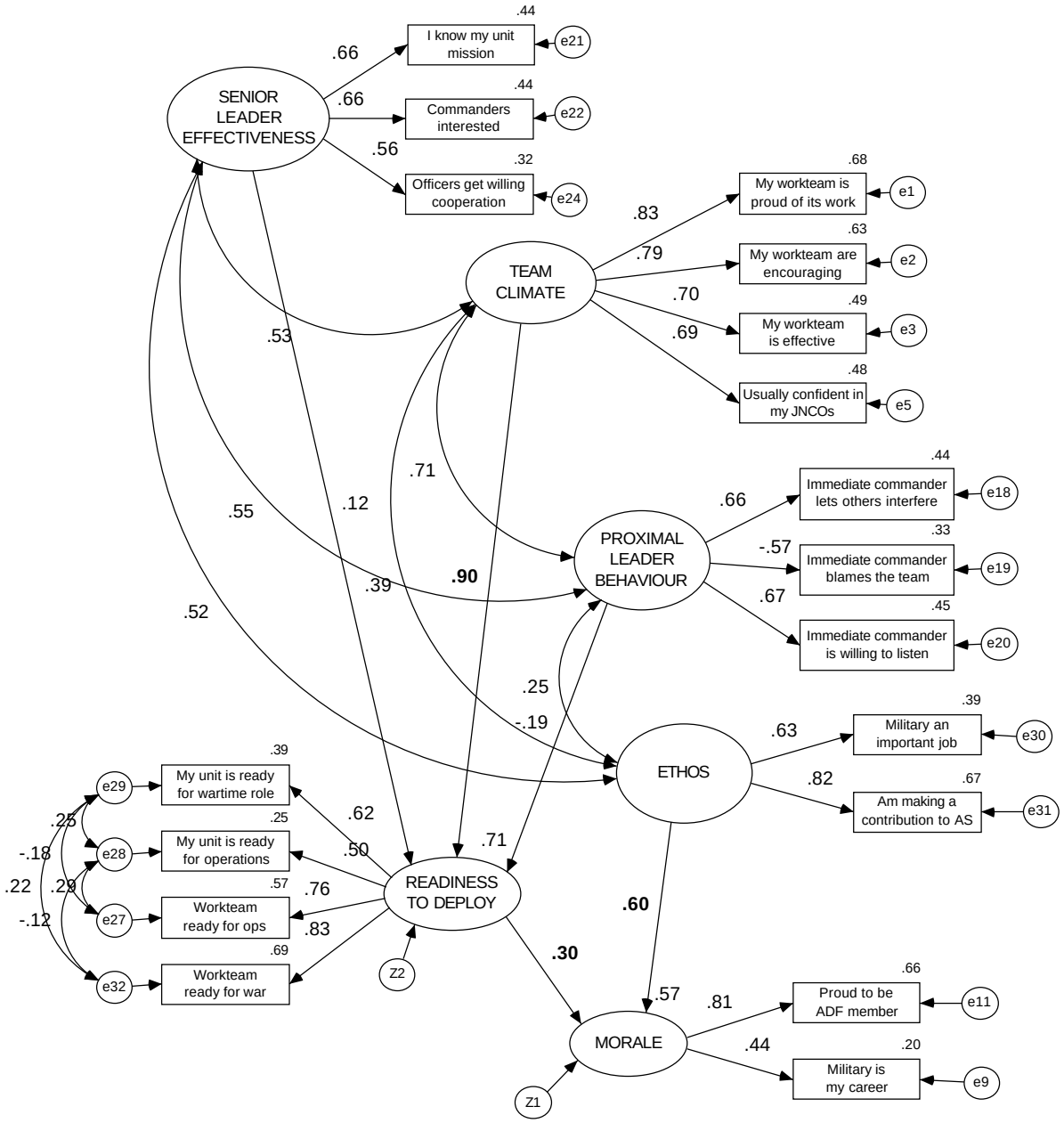

FIGURE 25 Predicting morale through readiness: Re-specified measurement model 2 with predeployment sample (n=369).

Multi-group analysis. Measurement invariance between Predeployment Sample 1 and Deployment Sample 1 was examined through the use of a structural weights model. This resulted in acceptable fit indices, with the exception of the chi-square and the bootstrap *p* values (χ^2 (255, N = 369/452) = 518.599, $p < .000$, bootstrap $p = .005$, $\chi^2/df = 2.034$, RMSEA = .036, SRMR = .040, GFI = 0.934, AGFI = 0.911, TLI = 0.934, CFI = 0.945). It was concluded that the model adequately fitted the data from both samples. Furthermore, all direct paths in the unconstrained model for the Deployment Sample showed highly significant effects ($p < .001$), and explained variance increased for both endogenous variables: Readiness to Deploy to 79% and Individual Morale to 75.4%.

Chapter Summary and Conclusions

The first four postulated hypotheses were supported by the patterns of bivariate correlations and by the regression analyses. Nevertheless, the practical implications for predicting psychological readiness at individual and collective levels generally were disappointing because of the limited variance explained by the regression outcomes. In particular, the predictive value of military experience on psychological readiness appeared to be of equivocal value. In the regression models, human dimensions constructs were more powerful predictors of readiness than biographical variables, the former accounting for reasonable amounts of the variance in individual and collective readiness. The examination of the impact of health outcomes on readiness showed more promise, with a meaningful proportion of variance in perceptions of psychological readiness at the individual level accounted for by health-related variables. The regression analyses that examined the associations between human dimensions constructs and psychological readiness to deploy at the collective level were the most compelling in terms of explained variance.

Different patterns of influence among the human dimensions constructs across different samples were evident in the patterns of correlations and the regression analysis outcomes. While the various models generally achieved fit across different samples when multi-group analysis was conducted, there are many indications that subtle differences in the data exist between groups and deployment stages. Future HDO research will examine these differences. Group differences were neither unexpected nor unwanted. A goal of psychological climate research is to discriminate between units and sub-units according to human dimensions constructs that are presumed to be sensitive to temporal, situational, and group influences.

The complexity of the postulated readiness models encouraged the use of the model generating/testing framework enabled by SEM (Cunningham, 2007). This approach resulted in meaningful models with adequate statistical fit for the prediction of psychological readiness. Multi-sample SEM analysis was used for cross-validation of each model. These multiple group analyses used structural weights to test for measurement invariance, adopting the level of stringency recommended by Byrne (2001). These analyses generally achieved adequate fitness, demonstrating that the data from predeployment and deployment samples were comparable in relation to the models used.

In contrast to the regression analysis outcomes, the combined measurement model for readiness at the individual level demonstrated that military experience could have a significant effect (see Figure 17). The variables Cohesion, Proximal Leader Behaviour, and Healthy Behaviours also had significant effects on the construct of individual readiness in this model. For perceptions of collective readiness, the causal paths from the variables of Morale, Cohesion, and Proximal Leader Behaviour were significant (Figure 19). The strong covariances among human dimensions latent variables led to the inclusion of a higher order factor in models examining the prediction of both individual and collective readiness. The

higher order factor – labelled Unit Climate – was postulated to bind the human dimensions variables and to predict readiness. The two models that incorporated this higher order factor proved to have strong explanatory power, albeit marginally lower explained variance than the original models. Nevertheless, both models reflected more closely the associations between variables evident in the bivariate correlations.

SEM of Readiness to Deploy tested two plausible measurement models: one where all exogenous variables were correlated (Model 1 – see Figure 22) and one where readiness was predicted by a number of correlated exogenous variables but the readiness variable itself was antecedent to Morale (Model 2 – see Figure 23). Both models, following a degree of re-specification, showed acceptable fit. However, the second model, where Readiness was considered antecedent to Morale, appeared to be superior for several reasons. Firstly, this model had greater explanatory power, showing slightly more explained variance for Readiness to Deploy – 69% compared with 75% – as well as explaining considerable variance in Individual Morale. Secondly, a broader implication of the Model 2 outcomes was that it brought into question assumptions inherent in some models purporting to explain the human dimensions of military service. For example, the flowchart postulated by Kirkland et al. (1993), illustrated in Figure 8 (page 151), depicted psychological readiness, morale and cohesion as essentially homogeneous human dimensions outcomes of command priorities and leadership behaviours.

The outcomes of Model 2 suggested that sequential relationships may exist between human dimensions variables, specifically that team climate (cohesion) is antecedent to psychological readiness, and readiness, along with ethos (Esprit), are antecedent components of morale.

Nevertheless, the relative simplicity of Model 1 is appealing, particularly when endeavouring to explain psychological readiness to

commanders. Applying the principle that parsimony takes precedence, this would be the model of choice. Further, almost all of the latent constructs represented in this model can be mapped directly onto Siebold's (1996; 1999) multidimensional conceptualisation of cohesion. In this approach, "Team Climate" would be re-labelled "Horizontal Cohesion"; "Ethos" would become "Organisational Cohesion"; "Morale" would become "Organisational Commitment"; "Senior Leader Effectiveness" would become within-unit "Vertical Cohesion"; and "Proximal Leader Behaviour" would retain the same label (see Figure 26 for a graphical depiction). Although some of these transferred labels may not appear intuitively justifiable, examination of the contributing items generated a quite compelling case. For example, the Morale latent variable items, "I plan on making the military my career" and "I feel proud to be a member of the ADF," each strongly reflects the organisational commitment construct.

However, it should be noted that the group-level morale variable, labelled Individual Morale, is substantially different to the Morale variable that emerged from the individual-level analysis of the UCP-A (see Chapter 3). Somewhat paradoxically, the items constituting the 'Individual Morale' variable were consistently focussed at the level of the respondent, and many items resembled issues of organisational commitment, whereas the 'Morale' variable which emerged from the individual-level PCA had items related to three organisational levels (the individual, the workteam, and the military unit). It may be that the Morale variable used for collective level analyses was not an effective or an appropriate measure. Certainly, as previously noted, the difficulty in operationalising and measuring the construct of morale is not a new challenge for military researchers (see Liefooghe et al., 2003).

It was noteworthy that both model outcomes in the Hypothesis 5 section were inconsistent with the research of Shamir et al. (2000) who found that a vertical cohesion factor – identification with the unit – was the

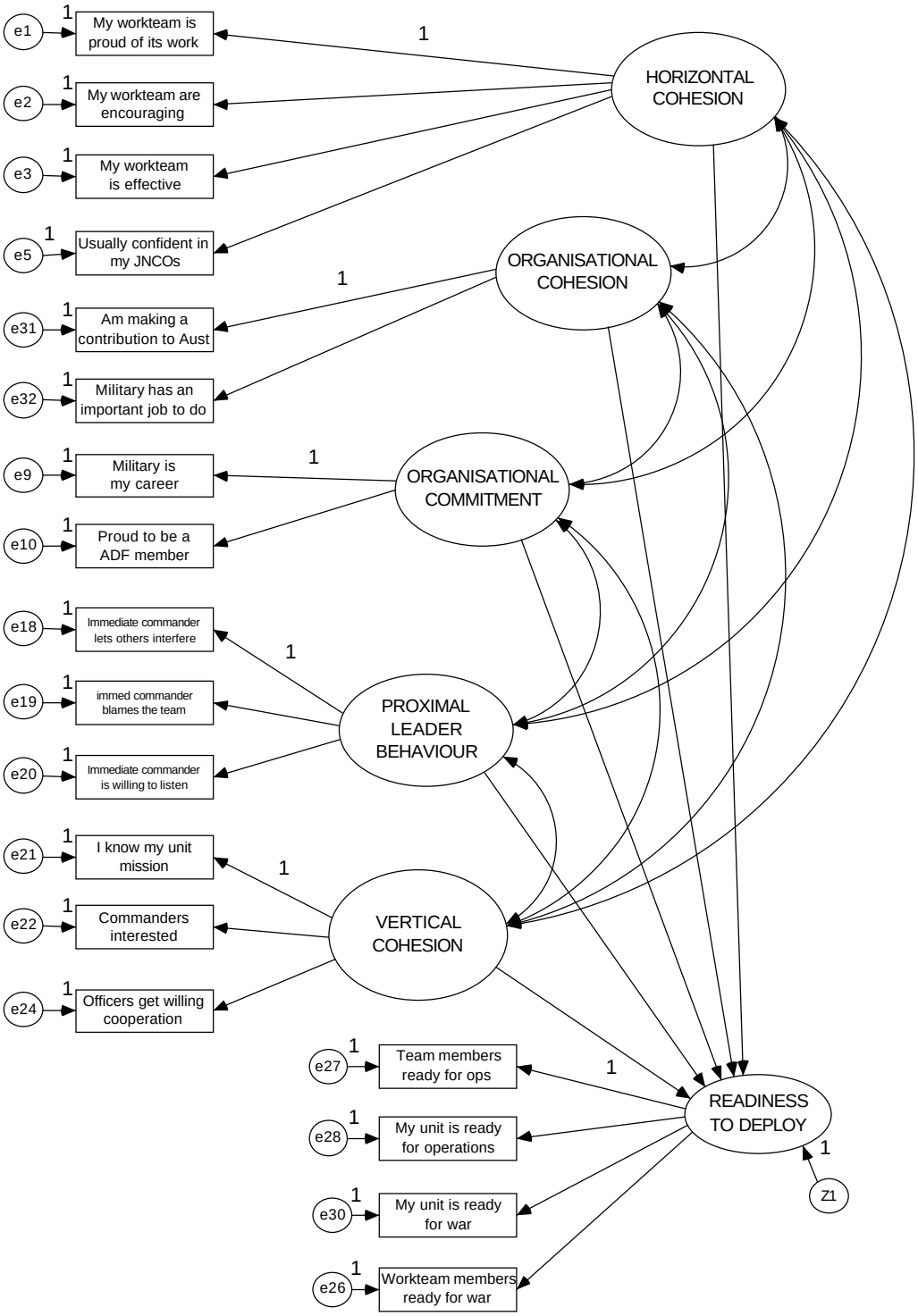

FIGURE 26 Psychological readiness model using Siebold's latent construct labels.

strongest predictor of perceived combat readiness. In Model 1, Senior Leader Effectiveness was the only structural pathway to Readiness to Deploy that did not achieve significance. In contrast, Team Climate (horizontal cohesion) was the strongest predictor of collective readiness to deploy (see Figure 24) in Model 1. While Proximal Leader Behaviour was a significant predictor of collective readiness to deploy in Model 1, in many military units the proximal leader is just as much a component of horizontal cohesion as vertical cohesion. Senior Leader Effectiveness also failed to influence psychological readiness in Model 2 (see Figure 25).

The SEM results demonstrated that psychological readiness can be modelled meaningfully using latent constructs derived from data from the HDO project, particularly the psychological climate constructs measured by the UCP-A. Theoretically-derived psychological readiness models for both individual and collective levels were tested, with acceptable statistical fit. Explained variance for collective readiness was consistently greater than for individual readiness. These outcomes added credence to the postulation that a distinction between self-efficacy and psychological readiness can be drawn, in that readiness for deployment has multiple levels (e.g., individual, team, and unit readiness), reflecting the importance of individual and collective performance in the military.

Although the multi-group analyses suggested in most instances that the tested models can be fitted to the data for different samples, there were intriguing differences among actual correlations and means. The focus of this dissertation is the validity and utility of the HDO measures and predictive models incorporating these measures. The examination of differences between the stages of deployment and individual differences (e.g., gender, level of operational experience) will be a focus of future research.

The subtle patterns in the data across different samples with respect to how the exogenous variables affect readiness supported current advice to commanders that climate assessments be conducted in each deploying unit in order to develop tailored interventions to optimise the human factors underpinning capability and operational effectiveness. There is unlikely to be a 'Holy Grail' of antecedent factors that will ensure each unit will be optimally prepared in a psychological sense for deployment. Psychological climate has been conceptualised as a multifaceted, individual attribute that is a function of both perceptual and cognitive processes. Therefore, it should be acknowledged that amongst individuals in the same situation, meaningful perceptual differences are likely (James, Hater, Gent, & Bruni, 1978). From this perspective, variation should exist in the degree of perceptual agreement both across teams and sub-units within samples, and within teams and sub-units across particular dimensions. When individuals are in *different* situations, meaningful perceptual differences are surely inevitable, as are collective-level variations. In an applied setting such as the military, these individual- and collective-level differences should be *the* focus of climate research.

Multilevel psychological climate information should enable commanders to enhance the human factors contributing to readiness and effectiveness. Each unit would benefit from a unit climate assessment prior to – and during – deployment so that the unique constellation of human factors in that unit, at that time, can be assessed in order to provide advice to command. Nevertheless, it would be advantageous to examine trends in a single unit across the deployment cycle; and to compare units at the same stage of deployment. Such analyses await further data sets that contain all the items found to be important in modelling psychological readiness.

Finally, the preceding results have raised questions about the interrelationships among stressors, psychological factors such as cohesion, morale, and readiness, and strain. It is noted that in one of the regression

models examining self-reported health symptoms, the Depression/Withdrawal variable, which had relatively strong bivariate correlations with Individual Readiness, did not influence the regression model outcomes when in the presence of the other independent variables. There appears to have been a high degree of shard variance between the Depression/Withdrawal and Behavioural/Mental Anxiety variables (bivariate correlations between these variables were .77, .91, and .72). Several studies (e.g., Hoge, Auchterlonie, & Milliken, 2006; Lawrenson & Ogden, 2003) have calculated prevalence data, proposed policy decisions, and posited resource requirements based on summary statistics of self-reported depression symptoms in returned soldiers. In addition, psychological screening processes for deployment have often used measures of self-reported depression as decision markers (e.g., Martinez, Huffman, Castro, & Adler, 2000). The outcomes of this study suggest that such conclusions may need to be reassessed and that future research into veteran adjustment should adopt multivariate designs and analysis.

The influence of health-related behaviours, evident in the initial SEM analyses, was consistent with findings that behaviours such as level of alcohol consumption can be usefully employed as indicators of deployment readiness (Castro & Adler, 2000). The rationale for this approach was that deployment was postulated to generate adverse effects on well-being that could be countered through the use – or, in some cases, avoidance – of particular coping and health maintenance behaviours and techniques. The emergence of this issue should not be surprising because so much research into the human dimensions of operations has had a stress-strain focus (e.g., Adler, Litz, & Bartone, 2003; Bourne, 1970; Farley, 2002; Griffith, 1997; Lamerson & Kelloway, 1996; Moldjord, Fossum, & Holen, 2003). The following chapter will address this popular theme by examining how human factors such as morale, team climate, and senior leader effectiveness might mediate or moderate the stress-strain relationship among deployed Australian Service personnel.

Chapter 5

PSYCHOLOGICAL RESILIENCE DURING DEPLOYMENT

Introduction

> *The most negative experience for me? The usual stuff: mass graves, death and destruction, sick and injured, run-ins with RPA troops. The general day-to-day of my job.*
>
> Australian Army Corporal, reflecting on his experience with UNAMIR II in Rwanda, 1994-95, Human Dimension of Operations survey comment

As the quote above attests, Service personnel can be exposed to a range of stressors during peacekeeping deployments. However, as Bartone (2006) observed, although some military personnel suffer detrimental physical and mental health outcomes following such exposures, a substantial majority show remarkable resilience by remaining psychologically robust, both during and after deployment, in spite of such experiences. Another consistent finding in the literature has been that, in the main, routine occupational stressors appear to cause more concern to deployed Service personnel than potentially traumatic stressors do (e.g., Gifford, Jackson, & DeShazo, 1993).

The purpose of this chapter was to examine factors that may account for resilience during deployment. Variables that mediate or moderate the effects of deployment stressors on strain, psychological climate, and performance outcomes were examined. If these protective and adaptive factors, these 'pathways to resilience' (Bartone, 2006), can be clearly identified and understood, it is plausible that effective coping can be enhanced for even those most vulnerable to the stress of deployment. The factors studied in this chapter included cohesion, leadership, morale, and meaning. The broader goal was to contribute to our understanding of the uniqueness and complexity of the human dimensions of modern military

operations in order to maximise the effectiveness of ADF personnel and minimise the potential for adverse psychological outcomes.

The attention to occupational stressors notwithstanding, there has also been a preoccupation with clinical outcomes at the individual level in the psychological literature. Salas, Driskell and Hughes (1996a) contended that this preoccupation with illness outcomes in stress research has been a consequence of the early psychoanalytic paradigm that generated a persistent emphasis on disordered behaviour, maladaptive coping, and treatment. In this approach, there was little interest in how stress affected performance, effectiveness, or productivity. As a consequence, "the bulk of stress research has almost ignored effective task performers in real-world work environments" (Salas, Driskell, & Hughes, 1996b, p. 10).

Despite the crucial importance to the military of effective task performers in real-world environments, a preoccupation with clinical outcomes also has been evident in the psychological literature pertaining to almost every aspect of military service. For example, Britt and Dickinson (2006) surveyed the relevant literature over a 20-year period from 1984 and found that articles on PTSD in military populations were five times more frequent than studies on morale in military contexts (252 separate citations compared with 46). This imbalance has persisted despite calls to move away from the dominant stressors-strain approach in the occupational stress literature (Hart & Cooper, 2001), and encouragement to research the positive aspects of deployment that might foster adaptive coping (Gifford, 1993).

There are promising signs that the balance is beginning to shift as positivistic psychology gains ground. Seligman, while president of the American Psychological Association, affirmed the need for positivism within psychology: “Modern psychology has been co-opted by the disease model. We’ve become too preoccupied with repairing damage when our

focus should be on building strength and resilience" (Seligman, 1998, p. 1). This shift towards positivism has been evident in studies of the salutogenic aspects of trauma (Christopher, 2004; Paton, Violanti, & Smith, 2003; Suedfeld, 1996; Tedeschi & Calhoun, 1996), growing interest in resilience training (Cohn, in press; Thompson & McCreary, 2006), and multivariate studies that have combined individual well-being with organisational health and performance variables, including positive work experiences (Murphy & Cooper, 2000).

In a similar vein, Britt and Dickinson (2006) argued the need for military psychology to enhance understanding of the characteristics of positive psychological health, such as happiness, belonging, satisfaction, and sense of purpose. Proponents of positivism in the domain of occupational stress have postulated that maladaptive coping and adaptive functioning are likely to be separate constructs or pathways between stressors and psychological outcomes rather than opposing ends of a single dimension (Hart & Cooper, 2001). In this view, insight into effective functioning will not be gained simply from extrapolation from factors contributing to dysfunctional patterns of behaviour. Hart and Cooper (2001) also commented that occupational stress viewed from a perspective of the individual becomes little more than a general health issue rather than being a topic of crucial importance to the effectiveness of the work organisations to which these individuals belong.

Three broad topics were examined in this chapter. First, the types of stressors encountered by Australian troops in peace support operations were examined along with the relationship between these stressors and strain. The influence of different stressor components on human dimensions factors was then explored. Finally, a SEM model that examined the moderators and mediators of stressors on both strain and select performance outcomes was considered. The latter inquiry was consistent with the conclusion that Britt and Adler (2003) drew in their edited book

The Psychology of the Peacekeeper: Lessons from the field, where they listed first "the search for moderators of adjustment and performance during peacekeeping operations" (p. 316) as an area that warranted further research.

The broader conceptual model underpinning the Human Dimensions of Operations project (Figure 5, Chapter 1, p. 35), with stressor, moderator/mediator, coping, and outcome components, provided the foundation for the constituent models in this chapter. Initially, the literature related to a number of constructs was reviewed. These constructs included deployment stressors, strain, the stressor-strain relationship, cohesion, morale, operational military leadership, the management of meaning, and psychological resilience. Several of these constructs have been examined in some detail in previous chapters so the relevant reviews in this chapter were intentionally brief.

The Stressors of Deployment

There has been consensus in Australian society that soldiers in the ADF have performed well under conditions of combat. Dating back to the First World War, Australian troops have been known to demonstrate great courage and resilience in the face of adversity. Gallipoli, Tobruk, and the Kokoda Track are examples of campaigns that have achieved iconic status within the Australian community because of the reported behaviour of our soldiers. Courage and resilience have become expected characteristics of Australian combat troops. Of course, this almost mythical reputation of the 'Digger' (Gerster, 1987; Ross, 1985) has tended to mask the fact that Australian Service personnel have not been immune to adjustment disorders and serious stress reactions during war (e.g., Butler, 1943; Coulston, 1942; O'Keefe, 1994). Several authors have catalogued retrospectively many of the stressors that Australian troops have been exposed to during war (notably, Barter, 1994; Hall, 2000; Johnston, 1996), such as threat of death and injury, sleep deprivation and fatigue, workload and time pressures, and

environmental hazards such as noise, heat, cold, altitude, and various fauna (e.g., snakes, scorpions, mosquitoes, and ticks).

There has existed a general assumption that peacekeeping missions lack the serious threats to life and limb associated with warfare. The term peacekeeping generally is applied to any operation that involves dispute resolution between or within nation states undertaken by the United Nations. The range of activities associated with peacekeeping is broad, reflected in the number of labels that have arisen to describe these activities, including preventative diplomacy, peace making, peace enforcement, peace monitoring, peace building, and post-conflict peacekeeping. This complexity was unforeseen at the time the United Nations' Charter was written – peacekeeping as a singular concept was not described nor defined therein. Most of the time, most forms of peace support operations go beyond the diplomatic means for peaceful dispute settlement described in Chapter VI of the United Nations' Charter, but fall short of the military and other enforcement provisions of Chapter VII. Irrespective of the given label, or the political authority underpinning these missions, peace support operations have covered a range of activities within a framework of dispute settlement. In many instances, for example, in the former Yugoslavia and Somalia, peace support operations have become embroiled in warlike combat.

While the nature and the duration of these contemporary operations often appeared to differ significantly from the traditional ANZAC experience of war, the personal impact of deployment remains profound in many cases. By its very nature, any military service poses potentially high risk of exposure to psychological and physical threat. In a study of Canadian Forces personnel (Murphy & Gingras, 1997), 55% of a sample of respondents reported that their life had been threatened at least once during service and 78% reported having "seen or experienced things that (had) really disturbed or upset" them. Not surprisingly, personnel who

had been deployed on peace support operations were more likely to have faced serious threats: 70% of these respondents reported that their life had been threatened at least once during service, compared with 29% of respondents without operational experience.

The lesson for researchers was that the range of operational stressors in peacekeeping can be equivalent to conventional warfare, but the pattern of stressors is likely to be different for each particular operation (Thomas & Castro, 2003). Consistent with advice from Adler, Litz and Bartone (2003), the Human Dimensions of Operations project has endeavoured to measure the type and intensity of a broad range of mission-specific stressors (using the Demands of Military Service scale) as well as a range of possible reactions to these stressors (using the Symptoms Checklist – Modified, as well as the Unit Climate Profile). In this way, a comprehensive understanding of the challenges faced by peacekeepers may be developed.

Since the demise of the Cold War in 1989, deployed ADF psychologists have gathered both qualitative and quantitative data as a routine component of return-to-Australia psychological screenings and debriefings. A focus of such research has been the stressors of deployment. Table 40 (drawn from Murphy, Collyer, Cotton, & Levey, 2003) presents comparative data of selected stressors from five different Australian Contingents (ASC) in the early 1990s. The numbers in the table represent the percentage of respondents from each contingent who stated the given stressor caused them "extreme stress" (the highest response level on a five point Likert-type scale). It was readily apparent that each deployment had a different pattern of stressors that reflected the differing nature of these operations. For example, Somalia was perceived as the most threatening, Western Sahara raised the most concerns about physical health, and the Sinai mission experienced a sense of what could be described as organisational neglect. As expected, domestic problems caused about the

same level of concern in most missions, while other factors, such as working as part of the United Nations, caused surprisingly high levels of frustration in more than one contingent. Such information has been used to modify subsequent pre-departure training and to brief unit commanders. The senior command structure has also been provided with summary reports on this information.

TABLE 40
Percentage of Respondents from Five Australian Contingents who found Given Stressors Caused 'Extreme' Stress

Stressor	ASC Sinai	ASC Western Sahara	ASC Cambodia	ASC Somalia	ASC Rwanda
Threat of danger	0	2.4	17.8	22.2	5.2
Health concerns	9.1	21.4	17.5	6.3	9.4
Sorting out problems at home	22.3	21.4	26.9	18.8	10.8
Lack of concern shown by Army	38.9	7.2	31	31.3	10.9
Double standards	31.8	35.7	36.3	18.9	48
The United Nations	22.7	26.1	49.2	50	21.4

Note: ASC = Australian Contingent

A surprising, yet consistent finding from the extensive, but largely unpublished ADF research on the stressors of operations has been that what would be regarded typically as routine stressor categories – such as separation from friends and family, and issues relating to the workplace such as perceived inequities – have usually generated more negative impact on satisfaction and wellbeing than operational hazards such as fear of death and injury (e.g., Australian Army, 2006, 2007; Murphy, 1990). Preliminary findings from research with Australian Army troops who had returned from East Timor revealed that almost 75% had regularly seen widespread

destruction during their deployment, 84% had witnessed widespread suffering (57% regularly), and 52% had seen dead bodies (Murphy & Skate, 2000). Forty-one percent of this small sample (n = 297) reported that their life had been threatened during military service, and 44% had been disturbed by their experiences. Nevertheless, 61% of respondents felt that the experience of the deployment to East Timor had "had a positive effect on me overall."

The experience of other nations has mirrored these trends. For example, Canadian peacekeepers in the former Yugoslavia rated work stressors (including 'double standards', superiors overreacting to situations, and being 'treated like kids') as the most stressful events experienced during deployment (Farley, 1995). Halverson, Bliese, Moore, and Castro (1995) found that potentially traumatic stressors during peacekeeping deployment tended to be relatively inconsequential compared to more mundane stressors such as work overload and being assigned unwanted tasks. Bliese and Castro (2003) noted that, in peacekeeping operations at least, few soldiers have developed serious stress syndromes; hence their research (prior to the current operations in Iraq and Afghanistan) tended to de-emphasise traumatic events and model non-traumatic stressors.

More specifically, with respect to the peacekeeping mission in Somalia, Gifford et al. (1993) reported a widespread expectation among soldiers from the United States that they would be exposed to gruesome scenes such as disease, starvation, and death, as well as dangerous combat and a harsh physical environment. While most soldiers were exposed to these types of stressors, in general they were not the experiences that caused the most concern. The most common cause of significant stress for the first U.S. contingents deployed to Somalia was uncertainty over when the mission would end. The second major source of stress was difficulty communicating with home. Lack of media exposure was also a major issue, with many soldiers feeling that they were unappreciated or forgotten in their

home country. Operationally, the major source of frustration was difficulty interpreting and implementing the Rules of Engagement.[1]

Gifford et al. (1993) noted that despite the stress experienced in Somalia, soldiers functioned well. This assessment appeared to be based on the small number of discipline problems and the lack of a large clinical caseload for in-theatre mental health professionals. Gifford and his colleagues concluded: "while soldiers reported that these problems affected their morale, there were no serious affects on either performance or mental health." The information used to substantiate this conclusion appeared to be drawn from interviews conducted during the deployment. Soldiers generally self-reported that they were dealing adequately with the stress of the mission. However, the stigma of not coping or performing to expectations in the military means that few members would admit to serious inadequacies, especially while on deployment. Issues of stigma and social desirability as confounding factors were not discussed by Gifford et al. (1993).

The finding that non-traumatic stressors generate the most stress for peacekeeping personnel may be explained by the fact that these soldiers were – in most respects – away from their normal support networks and out of their regular roles and routines, so that relatively minor issues tended to assume excessive importance.[2] Further exacerbating a sense of dissonance may be that peacekeepers were routinely tasked to undertake a variety of roles for which they may have had limited, if any, training. Such roles/tasks have included supporting the delivery of humanitarian aid, providing secure environments for the conduct of elections, training paramilitary and police

[1] Rules of Engagement, or ROE, are legal guidelines that govern the use of force, normally issued as a directive by a competent and legitimate military authority in order to delineate the limitations and circumstances under which military personnel can initiate and wield armed force against other military forces or hostile entities.

[2] This phenomenon of inflated importance being placed on mundane or trivial events has been observed in other stressful, isolated environments such as Antarctic stations during winter (Taylor, 1987, 1991).

forces, crowd control, carrying out 'hearts and minds' activities, negotiating with people from different cultures, acting as impartial 'umpires' in local area disputes, and restoring the rule of law in areas lacking central civil order. Novel roles have led to role conflict for peacekeepers; for example, not being able to intervene to alleviate suffering despite one's identity as a peacekeeper, and being constrained from capturing or punishing identified perpetrators despite one's identity as a soldier have generated frustration and angst (Adler et al., 2003).

On the other hand, deployed soldiers expect to encounter – and are specifically trained for – operational hazards such as being the targets of weapons fire, sustained operations, and exposure to the injured and diseased. It is a matter central to professional ethos, competence, and pride that military personnel cope with these sorts of stressors that have for centuries justified the uniqueness of the profession of arms (Ignatieff, 1998). Military sociologists have referred to the experience of combat as the basic rite of passage for military personnel (Lewis, 1985).

By way of summary for this section, Bliese and Castro (2003) noted that the quest to identify the unique stressors associated with peacekeeping has been an evolutionary process with a number of surprises. In particular, the more unusual and potentially traumatic stressors that many researchers have focussed on appear to be relatively unimportant in understanding the strain experienced by most soldiers. Ordinary stressors commonly examined in occupational research appeared to be the most important. The deployment version of the Demands of Service Scale contained six stressor components – Workplace stressors, Operational stressors, Potentially traumatic stressors, Organisational support, Family concerns, and Ambiguity/Uncertainty in the workplace (see Chapter 2) – that provided a degree of complexity in analysis often absent in efforts to gain a comprehensive understanding of the challenges faced by peacekeepers. These challenges were presumed to include the daily hassles of deployment,

routine stressors found in any work environment, and mission-specific stressors associated with peacekeeping duties. Adler et al. (2003) have argued that adequate domain coverage of potential stressors is an essential precursor if research is to provide a valid and pragmatic understanding of stress and strain associated with peacekeeping deployments.

The Strain of Operational Service

Determination of the actual sources of stress for deployed personnel would assist commanders, those responsible for the design and delivery of training, and policy makers in their primary duties. Perhaps more important, however, is the impact of these stressors. Table 41 reveals the most common stress symptoms reported in a sample from the Australian contingent in Somalia in 1993 and a control group drawn from a battalion in Australia at the same time (Walters & Murphy, 1994). The soldiers had responded to a 48-item version of the Symptoms Checklist. The results were remarkable in several respects. The two groups shared 10 signs of strain in their respective lists of the most common 12 'symptoms'. Very broadly, the two groups were differentiated by those on operations in Somalia, as a group, smoking more than normal, and experiencing some depression, while the resident battalion was having sleeping difficulties and headaches. The ordering of symptoms was different in several respects. The most common sign of strain in the battalion resident in Australia (lower back pain) was ninth highest for those in Somalia. This was not surprising given the nature of their operational role (a parachute battalion) and the training required to maintain readiness.

Walters and Murphy (1994) postulated that, although the types of stressors varied considerably between the two units, stress outcomes would be roughly similar. This relative equivalence in strain between units in disparate situations was also a finding in a Canadian Forces study that compared peacekeeping personnel in Bosnia with personnel serving at an Arctic military station (Murphy & Mombourquette, 1997). Perhaps the

most telling conclusion to be drawn from the findings summarised in Table 41 was the need for control/comparison groups and/or longitudinal studies to ensure that findings from peace support missions can be placed in a wider context.

TABLE 41
Signs of Strain in an Australian Contingent in Somalia and a Battalion in Australia

	Battalion Group in Somalia (n = 823)		Battalion in Australia (n = 252)	
Rank	Most Common Signs of Stress	Percentage of sample	Most Common Signs of Stress	Percentage of sample
1	Feeling bored	64	Lower back pain	62
2	Feeling angry or hostile	50	Feeling bored	54
3	Feeling emotionally flat or drained	48	Feeling low in energy or slowed down	53
4	Feeling low in energy or slowed down	48	Easily annoyed/cranky	48
5	Extreme fatigue/tiredness	47	Extreme fatigue/tiredness	47
6	Wanting to be alone	46	Feeling emotionally flat or drained	44
7	Temper outbursts to minor events	45	Having no interest in things	42
8	Easily annoyed/cranky	44	Temper outbursts to minor events	40
9	Increased smoking	40	Feeling angry or hostile	39
10	Lower back pain	38	Wanting to be alone	38
11	Feeling upset or blue	35	Difficulty falling asleep	38
12	Having no interest in things	35	Headaches	37

Interestingly, in the Soldier Adaptation Model (Figure 3, Chapter 1, p. 33), Bliese and Castro (2003) classified the strains of peacekeeping duties into three broad categories that went beyond the usual focus on strain as a health-related outcome. The first category was health-related aspects such as general well-being, depression, and physical health symptoms. The second category of strain was work-related attitudes such as job satisfaction

and commitment. Attitudinal outcomes were postulated to be more sensitive to differences among groups and situations than health and well-being outcomes. The third category of strain was performance outcomes. Drawing upon a performance taxonomy proposed by Campbell (1999), the multifaceted nature of performance was posited to include a range of archival and self-report measures such as proficiencies in communication, level of effort, maintenance of personal discipline, facilitation of peer and team performance, supervision and leadership, management and administration, and both job-specific and non-technical task proficiencies. In contrast, the model that underpinned the Human Dimension of Operations project did not regard attitudinal and performance outcomes as components of strain. The HDO model acknowledged that there are interrelationships among the different outcome variables, but that they do not fall under a conceptual umbrella of strain.

Of course, the 'criterion problem' of performance measurement has remained one of the most important and most difficult challenges in human science research (Gottfredson, 1991). Performance can be measured in many ways, and despite decades of research in this area, no consensus has been achieved with respect to performance measurement in most work domains. In research into the human dimension of operations, the criterion problem of performance measurement has been particularly complex. Part of this complexity was due to the uncertainty of activities associated with most peace support operations. These uncertainties included lack of predictability regarding when a particular challenge may arise, the nature of particular challenges that do arise, and the physical locations where these challenges occur. Added to this uncertainty and complexity was the fact that the training that military personnel undergo prior to peacekeeping deployment was ordinarily limited by time and resources. Therefore, it was not surprising that performance measures of personnel on peace support operations were very generic. Another matter that complicates performance measurement on peace support operations is the duration of deployment,

which is typically six months but has ranged from a matter of days or weeks to 12 months or longer. Furthermore, the intensity of operations, an emphasis on operational activities, and the group nature of most operational tasks have meant that individual performance assessment normally receives a low priority of effort during deployment. Finally, the appraisal of military performance during deployment has a political dimension that has attracted intense media interest.

Consequently, the performance of deployed forces often has been measured by the absence of negative outcomes such as fatal and non-fatal casualties, instances of indiscipline, mental health-related repatriations, and failure to achieve stated objectives. In many cases, the lack of any evident negative outcomes will result, by default, in a perception of effective performance. Therefore, objective and reliable measures of performance of peacekeeping personnel and peacekeeping missions have remained difficult to capture. For this reason, performance measures in the HDO project have relied upon self-report data.

Cognitive-Relational Theory

In a comprehensive critique of the dominant stressor-strain theme in the occupational stress literature, Hart and Cooper (2001) argued that a more complex framework that integrated stress, strain and both individual and organisational performance was required to advance the area of occupational health. Four assumptions that underpinned the stressors and strain approach were identified and called into question. These assumptions were that: (1) occupational stress was associated with unpleasant emotions, (2) positive and negative stress reactions were inversely related, (3) stress can be measured by a single variable, and (4) stress was caused primarily by adverse work experiences. The essence of their criticism was twofold: that the stressors-strain approach was too simplistic – as were most research designs and instruments used to measure stressors and strain – and that the approach rarely has taken into consideration the moderating factors that can

make the stressor-strain relationship so dynamic. In particular, positive outcomes of stress and the positive aspects of work experiences generally have been ignored.

Cognitive-relational theory (Lazarus & Folkman, 1984) has been perhaps the leading transactional theory of stress. As discussed in Chapter 1, the major contribution of transactional theory has been the introduction of interdependent components into a synergistic process. These components were appraisal and coping. Together these transactional components mediate the relationship between the stressors that a person experiences and the adaptive – or maladaptive – outcomes that occur. Appraisal was defined as a cognitive process where people monitor and appraise their environment for threats to well-being (primary appraisal) and determine how to react to identified threats (secondary appraisal). Coping referred to cognitive and/or behavioural efforts to marshal resources to deal with a threat (active coping) or to manage the emotional responses to a perceived threat (emotion-focussed coping). As discussed in Chapter 2, there has been increasing recognition that maladaptive coping processes represent a third distinct coping style worthy of research attention. Theorists such as Hobfoll (1989) have argued that coping as a strategy should be distinguished from coping as a process. The distinction reflected the range and efficacy of resources that people have in their coping repertoires, compared to how people actually utilise these resources.

The multiple stages in the transactional process suggested that the relationship between exposure to stressful conditions and stress reactions should not be isomorphic (a one-to-one correspondence between two components). Nevertheless, many studies have focussed on an examination of the strength of the direct relationship between stressors and strain. Research studies into peace support operations have not avoided this focus. For example Izzo, Lapointe, Villeneuve, & Columbe (2000) examined the relationship between the stressor of operational tempo, as measured by

number of operational tours of duty, and several indicators of strain. They found a clear trend for physiological strain levels to increase as the number of operational tours increased. Physiological strain was significantly lower for military personnel on their first mission compared to those with more operational experience, and physiological strain was significantly higher for the most experienced peacekeepers (defined as four or more tours) compared with other groups. In contrast, psychological strain did not increase significantly until four or more tours, and there was a non-significant trend for behavioural symptoms of strain to increase as operational experience increased. The pattern of results suggested that psychological and physiological outcomes of strain appear sooner than do behavioural indications of strain.

While this sort of information can assist commanders and health personnel in informing operational planning and health assessments, it does not provide guidance on how to bolster resilience. As Adler, Litz, and Bartone (2003) pointed out, the fact that exposure to severe and potentially traumatic stressors has led to diagnosed stress disorders in a relatively small percentage of those exposed, reinforced the presumed importance of mediating variables in the stressor/strain relationship. Mediating variables can include cognitive appraisal strategies, temperament and personality traits, coping styles, skills, and resources, psychological climate factors, and the social context. The mediating variables to be examined in this study are examined next.

Buffers of the Stressor-Strain Relationship

From a pragmatic perspective, mediator and moderator variables were the most important component of the HDO model because they represented the constructs that were most amenable to intervention. Efforts aimed at reducing strain require either a reduction in the level or frequency of stressors, or an increase in factors that enhance psychological resilience. Unfortunately, in the context of peace support operations,

mission-specific stressors such as threats to life and limb were often unpredictable and uncontrollable. In addition, mission accomplishment required soldiers to endure a range of unavoidable stressors such as difficult living conditions, environmental hazards, and restrictive safety regulations. Some deployment stressors were simply beyond individual and organisational control. Conversely, it was feasible – both theoretically and practically – to reduce strain by attempting actively to influence moderating and mediating factors (Bliese & Castro, 2003).

Moderators are variables that affect the direction and/or the strength of the relation between an independent variable and a dependent variable. Hence, moderator variables specify when certain effects will hold. On the other hand, mediators influence how or why such effects occur, by actively intervening and therefore accounting for the relation between the predictor and criterion variables (Baron & Kenny, 1986). Many researchers prefer to use the inclusive term 'buffer' when factors that moderate or mediate responses to stress are discussed. Buffers are usually described as operating in two distinct ways: first as "a salutary, independent effect on strain" (i.e., a moderator), and second, as a mechanism that can "also reduce the relation between a typically stressful event and strain" (i.e., a mediator) (Greller, Parsons, & Mitchell, 1992, p. 37). Research has shown that social support, coping skills, job engagement, job control, self-efficacy and leadership have moderating effects on occupational stressors (see Jex & Bliese, 1999).

In general, statistical analytic techniques have been effective in clarifying whether a variable is acting as a moderator or mediator. Sometimes in complex models, a variable has had both moderating and mediating roles. Nevertheless, there should be a conceptual basis to a variable having a mediating or moderating role in a transactional stress framework. With respect to operational deployment, it was anticipated that numerous factors would impinge upon the appraisal and coping processes,

thereby influencing the impact of stressors. Examples of mediators, which are often characterised by internal transformational processes, were perceptions of organisational support, task satisfaction, confidence in equipment, and individual morale. Many moderators are essentially resources, and in the military context, these have included effective leadership, realistic training, high levels of physical fitness, ample recreational assets, and aspects of psychological climate such as strong group cohesion. The Human Dimensions of Operations project collects information on several factors hypothesised to buffer the impact of deployment stressors, including leadership effectiveness, positive aspects of the experience of peacekeeping, and perceptions of support provided by a variety of external agents.

Farley (2002) examined morale, cohesion and confidence in leadership as moderators of the stress-strain relationship among Canadian peacekeepers. Task and social cohesion were found to be effective moderators because individuals who reported using or seeking higher levels of these resources also experienced lower strain. Confidence in leadership (at the platoon and company levels) was found to play a mediating role in the generation of the interaction between cohesion variables and strain. Farley also examined the roles of positive and negative coping strategies in the stressor-strain relationship. Interestingly, he found that both positive and negative coping played moderating roles. In addition, positive coping strategies had a mediating role in the interaction between cohesion and strain.

Bliese and Castro (2003) postulated that there are three levels where effective intervention might occur in military settings: the individual, the group or local leader, and the organisation. At the individual level, moderators reflect characteristics and behaviours of the soldier, such as self-efficacy, job engagement, and coping preferences. With respect to the organisational level, the military unit is often the logical point for

intervention. Previous peacekeeping research has focussed on psychological climate at the unit level, such as effective leadership and strong group cohesion, as critical determinants of adjustment and coping during military operations (see Thomas & Castro, 2003). The attractive utility of organisation-level moderators is that even minor interventions at this level can have wide-reaching impact on individuals and groups.

Cohesion

One of the main attenuating factors between stressors and stress identified in the broad research literature was social support (Lazarus & Folkman, 1984). In the military context, social support normally has been referred to as cohesion. Chapter 4 discussed definitions of cohesion and various dimensions or components of cohesion. These different dimensions of cohesion have been distinguished by directionality and function (Griffith, 1988). The direction of cohesion concept contrasted vertical cohesion (superior-subordinate relations) with horizontal cohesion (peer relations), while the concept of functions of cohesion contrasted instrumental cohesion (task-focussed) and affective cohesion (based on interpersonal support/relations). This section will further review the construct of cohesion by examining social support as a moderator of stress in military contexts.

It is axiomatic that cohesion in military groups is beneficial to well-being and performance (Griffith, 1988). The quality of the social structures within a military unit is presumed to determine the strength of the buffering capacity against operational stressors (Moldjord, Fossum, & Holen, 2003). There is considerable evidence to support these assumptions. For example, studies of U.S. combat soldiers in World War Two reported group cohesion as the single most important factor in reducing stress outcomes such as psychiatric casualties (Glass, 1973; Grinker & Spiegel, 1945; Stouffer, Lumsdaine et al., 1949). Glass (1973) noted that group or relationship phenomena (which he labelled variously as ‘group identification’, ‘group

cohesiveness', and the 'buddy system') explained the marked differences in psychiatric casualty rates observed among units exposed to similar levels of combat stress.

A study of Israeli combat veterans by Milgram, Orenstein, and Zafrir (1989) concluded that group cohesiveness was a major stress-buffering variable. They postulated that the cohesive military unit would be especially effective in stressful situations "because support is forthcoming from people with similar situational experiences and heightened empathic understanding" (p. 196).

Cohesion also has been demonstrated to promote well-being in garrison and contemporary deployment environments (Bliese & Halverson, 1996, 1998; Manning & Fullerton, 1988). Studies of peace support operations have yielded similar results. In a study of over 3,400 U.S. veterans from the peacekeeping mission to Somalia, a variable called 'general military pride and cohesion' was the most powerful protective factor of postdeployment psychological status (Orsillo, Roemer, Litz, Ehlich, & Friedman, 1998). Among Norwegian peacekeepers deployed to the Lebanon, Weisaeth and Sund (1982) found that strong group identification, along with effective leadership and strong motivation, increased soldier tolerance of stress. More recently, both task and social cohesion were found to be moderators of strain in Canadian peacekeepers (Farley, 2002). Moldjord, Fossum, and Holen (2003) cited several studies of peacekeepers that found social support and comradeship were relevant to coping with distress. In general, individuals exposed to stressful incidents were more likely to recover quickly when they felt their emotional and behavioural reactions were understood and supported by their peers.

In addition to the concept of social support, cohesion has been underpinned by social identity theory (Hogg, 1992). Social identity refers to that part of the individual's self-concept that is derived from membership of

a social group or a number of groups. Each attachment or group membership was presumed to have perceived value, emotional significance, and mutual benefits. In the military, group identification continues to be deliberately fostered through many means (for example, socialisation and shared adversity during initial training, unique customs and traditions, uniforms, employment specialisation, and rank). An important premise of social identity theory was that people establish social identities through normative group comparisons between favoured in-groups and unfavoured out-groups.

The military is notorious for fostering numerous subgroups and subcultures, for example, Combat Arms versus Support elements, Aircrew versus Ground crew, and rivalries between the three single Services (Army, Navy, and Air Force) (Murphy, 1993). Of course, the primary aim of these strong group identifications was not to sow discord, but rather to cement the potent group allegiances and close social relationships that have been found to be crucial in enhancing resilience in the face of deployment stressors (Hobfoll et al., 1991). As the studies reviewed above attest, the stronger an individual's commitment to a particular group, the more likely the individual will perceive group norms and values as part of their self-concept.

Leadership

The military unit with strong cohesion is presumed to be characterised by collective confidence, mutual trust, and respect between both soldiers and officers of all ranks. Of course, as Bliese and Castro (2003) have pointed out, both cohesion and leadership can be regarded as forms of social support. Therefore, it is not surprising that a strong relationship between cohesion and leadership should exist. In particular, the vertical dimension of cohesion was founded on member confidence and trust in the fairness and competence of leaders, and perceptions that leaders were genuinely concerned about subordinate welfare. For their part, leaders

needed to recognise the importance of developing healthy and supportive social environments within military units that would foster strong and positive group identities (Siebold, 2006).[3]

Human factors such as morale, cohesion, and confidence in leadership generally are presumed to correlate highly with each other (Gal, 1986). The results from Chapter 4 also supported this presumption of psychological climate factors as elements of an interrelated, mutually influencing system. Siebold (2006) was confident enough in these relationships to suggest that researchers should expect correlations of about r = .6 between horizontal cohesion and performance in units with effective leadership, and correlations "much lower and not significant under less effective leadership" (p. 197).

By extension, it would seem plausible that morale also should be boosted by high confidence in leadership, and that high levels of morale should be fostered by cohesion. However, laboratory studies of cohesion and performance (e.g., Bowers, Urban, & Morgan, 1992) have not supported such relationships, possibly because such studies failed either to capture the complexity of authentic group interaction or to consider other mediating factors that are crucial components of unit climate.

There is some evidence of the attenuating influence of effective leadership on strain in peacekeeping contexts. Weisaeth and Sund (1982) found that effective leadership was one of three variables that increased tolerance of stress in Norwegian peacekeepers deployed to the Lebanon. Farley (2002) reported that confidence in one's platoon commander and one's company commander played mediating roles in the interaction between cohesion and strain. Bliese and his colleagues (Bliese & Britt, 2001; Bliese & Halverson, 2002) reported a series of studies examining the

[3] Siebold (2006) cited four other theoretical approaches that he considered relevant to the development and maintenance of cohesion: theories of Collective (Public) Goods, Social Capital, Social Function, and Basic Needs.

buffering effect of leadership among U.S. peacekeeping troops in Haiti. A novel *consensus about leadership* variable was used to explore whether the agreed quality of unit leadership would induce a more positive social climate and hence generate stronger moderating effects on stress. The results showed that soldiers in units with low consensus about leadership were more strongly impacted by work stressors.

The preceding results are interesting because they suggested that both the means and the variance of perceptions of leadership reveal important insights about the group's social environment. This research also reported an interaction between low task significance and poor leadership climate that resulted in high levels of hostility. This finding was interpreted to demonstrate that soldiers could accept being deployed and having low task significance as long as the unit leadership was strong (Bliese & Britt, 2001). An alternative interpretation, posited here, is that the interaction demonstrated the critical role of leadership in managing the meaning of the mission. This reinterpretation is supported by a finding that U.S. troops in Haiti who were regularly briefed about the accomplishments of the operation were more positive about the operation itself and their contributions to the success of the operation (Halverson et al., 1995). It would appear that effective leaders ensured that soldiers understand the broader importance and significance of their tasks – no matter how inherently mundane.

The Management of Meaning

> *With seven weeks down and ten or eleven ahead, the glamour and panache of the overseas deployment was worn off somewhat. We have a long haul to keep motivation going and troops interested.*
>
> Major Blumer, Company Commander, 1 RAR Group, Somalia
> Cited in Bob Breen, *A little bit of hope: Australian Force - Somalia*, 1998

In recent years, research into stress and coping has broadened to include the search for meaning in stressful encounters (Folkman &

Moskowitz, 2000). In a similar way, a growing theme in research examining the human dimensions of Peace Support Operations has been the importance of the meaning of the mission to soldier satisfaction, performance, and post-deployment adjustment. Given the challenging and potentially stressful nature of Peace Support Operations, it is important to understand how members have made sense of their mission and assigned meaning to their participation. How have they justified to themselves and their families the time, effort, and sacrifices made? Tait and Silver (1989) contended that when individuals are placed in a stressful, challenging or unusual situation, the search for a meaningful perspective on their circumstances would underpin adequate adjustment and performance.

The concept of meaning. It is aphoristic within the behavioural sciences that observed behaviour is a function of the salience or meaning of the situation. According to cognitive social learning theory and interactional psychology, behaviour generally has been conceptualised as the outcome of a sensemaking process (James, Hater, Gent, & Bruni, 1978). This sensemaking process has numerous components such as identification, filtering, interpretation, and the attachment of meaning (Schneider, 2000). Humans behave in a manner consistent with their cognitive representations of the situations that engage them. Individuals perceive or cognise situations in terms of their personal or acquired meaning. A good deal of organisational climate / culture research has examined how this sensemaking happens and the consequences of the process. According to James & McIntyre (1996), the meaning that an individual has assigned to a situation is often the most influential situational factor affecting subsequent behaviour.

Baumeister (1991) postulated that meaning is derived from the achievement of four basic needs. These needs were: (1) a sense of purpose, in that goals and intrinsic motivations are fulfilled, (2) required behaviours are compatible with one's values, i.e., that one's actions are right and justified, (3) a degree of self-efficacy so that the individual perceives some

control over the event, and (4) a degree of self-worth is gained so that individuals felt that they and their actions were of some value. Clearly, the characteristics of many Peace Support Operations are such that Baumeister's four basic needs often are unlikely to be attained. For example, rules of engagement may prevent soldiers from taking their preferred action (intrinsic motivation unfulfilled; lack of self-efficacy) and soldiers may be tasked to undertake duties that conflict with personal values. Further, the situations that soldiers are faced with on deployment are notoriously chaotic and uncontrollable, such as widespread destruction and suffering.

Meaning in military duties. Components of meaning often postulated to explain military behaviour include patriotism, ideology, and politics. Military pride has even been found to predict psychological status in military personnel after a stressful deployment (Orsillo et al., 1998). However, Dinter (1985), discussing the protective layers that prevent psychological breakdown in the face of combat, suggested that factors such as patriotism and ideology were the first layers to be peeled away. Other factors, particularly cohesion in the immediate work team, have been found to be much more important and persistent as combat motivators (Marshall, 1947). Clearly, soldiers need some justification, some source of meaning, to carry out duties that few would do willingly in other circumstances (Kellett, 1987; Manning, 1991).

Franke (2003) argued that the decisions soldiers make and how they perform during a mission will depend to a large extent on their understanding of the mission: "If the mission makes sense and confirms their self-conceptions, if members of their most important reference groups (family, friends, company, platoon, etc) share this meaning, and if society at large supports the operation, motivation and performance will be high" (p.39). Cognitive frameworks, social identity, and group norms and values will influence what meaning is derived from or is projected upon the

deployment. This sense of meaning, in turn, will influence attitudes, motivation, morale, and behavioural choices.

Meaning on peacekeeping missions. In many nations, soldiers have derived a sense of meaning from the traditional combat-oriented warrior identity (Janowitz, 1960). The unique nature of many Peace Support Operations has called into question what it means to be a soldier (Franke, 2003). Undertaking non-combat roles such as peacekeeping (as opposed to peace enforcement), police actions (such as the eviction of illegal settlers), and border protection tasks has been a challenge to the prevailing collective social identity and a source of dissatisfaction in military personnel (Miller & Moskos, 1995). This dissatisfaction has been particularly acute in nations such as the United States and Israel, which have strong conventions about how the military should be utilised (Gal, 2006; Halverson & Bliese, 1996). For military personnel engaged in traditional peacekeeping duties such as observer/monitor, adverse psychological sequelae tended to be associated with the experience of boredom, isolation, frustration with the constraints placed on their ability to take action, and disillusionment with the lack of tangible outcomes or clear success (Henshaw, 1993; Orsillo et al., 1998).

Britt (2003) developed a theoretical schema to explain the determinants of meaning during peacekeeping operations. Like Baumeister's (1991) more generic model with four meaning components discussed above, Britt also postulated four factors that contributed to meaning and provide consequent personal benefits. The first of these factors was the individual soldier's attitudes towards the operation, which have the potential to help an individual make sense of the environment, allow for self-expression, and provide a sense of importance to various ongoing activities. A second factor was the relevance of the mission to one's identity, job, and career. Making sense of participation in such an operation was more likely when (1) identity images were relevant and (2) one's role was considered relevant to job and career. The military

leadership's views of the mission constituted the third factor posited by Britt. Soldiers were more likely to see the personal significance of a peacekeeping operation when their role was made clear and constantly reinforced by the leadership, and when leaders communicated successes to the soldier. Such leadership communication supported three of Baumeister's needs that underpinned meaning: sense of purpose, self-efficacy, and self-worth. Britt's fourth contributing factor to the derivation of meaning was the prevailing attitude of the public toward the mission. It was postulated that positive appraisals of peacekeeping experiences would be linked in part to support from and understanding by the public at home.

Of course, the deployment experience – whether for warlike operations or peace support missions – seldom matches expectations (Garland, 1993). Personnel who are unable to adjust their pre-deployment expectations in light of operational realities, or whose appraisals of their coping resources are not consistent with the challenges of the deployment, may experience more adjustment problems (Thompson & Pastò, 2003). Gifford, Jackson, and DeShazo (1993) reported that many American soldiers in Somalia began to doubt the value of their mission when hostility from the local populace grew and bandits were not disarmed because of inconsistent United Nations' policies. Furthermore, many peacekeepers questioned whether any improvements made by Coalition forces would endure once the United Nations forces left the country. Unlike the initial U.S. contingents in Somalia, later contingents reported their major stressor to be the ambiguous nature of the mission. As the mission became more complex and conflicted, and as Coalition casualties mounted, Gifford et al. (1993) found that soldiers found the dual roles of combatant and humanitarian support provider very difficult to assimilate at the emotional level. In comparison, Operation Uphold Democracy in Haiti was much less dangerous than Somalia, yet many U.S. personnel there expressed similar disillusionment that the lives or prospects of Haitians were not being

tangibly improved by the Coalition presence (Kirkland, Halverson, & Bliese, 1996).

It has been postulated that the nature of peacekeeping tasks subsumed under the nation-building role will mean greater exposure to the local civilian population. It generally has been presumed that such contact with a 'grateful populous' would increase the satisfaction of peacekeeping personnel and provide commanders with a repository of positive experiences with which to justify and exemplify the meaning of the mission. Actuarial evidence, however, has shown that contact with the local population can be destructive to satisfaction, individual morale and a sense of meaning (e.g., Dallaire, 2000, 2003; Davis, 1997). Gifford et al. (1993) found that 71% of U.S. soldiers in one research sample reported that they had never experienced a positive interaction with Somalis during the course of their peacekeeping mission in that country. Many soldiers admitted that they had developed negative feelings towards Somalis in general and towards the mission in Somalia. Only 37% of respondents agreed or strongly agreed with the survey item: "I believe in the value of my mission in Somalia."

Meaning as a buffer of stress. An assumption in the literature has been that the assignment of meaning to one's participation in a peacekeeping mission would predict the degree to which personal benefits were derived from the deployment experience. There is growing evidence that this assumption was well founded. In a longitudinal study of military medical personnel supporting a peacekeeping mission in the former Yugoslavia, Bartone, Adler and Vaitkus (1998) concluded that belief in the mission could act as a stress buffer, presumably by enhancing soldiers' resilience and adaptation during deployment. With respect to serious stressors, Britt (2003) cited several studies from the traumatic stress literature which showed that the perception of personal benefits from a

stressful experience was associated with improvement in psychological and physical health.

Positive aspects of deployment. Most studies that have examined the concept of meaning appear to utilise reported beneficial aspects as a proxy for meaning (e.g., Britt, Adler, & Bartone, 2001). It seems credible that positive experiences during deployment would bolster meaning for the individual in their situation, as well as develop a sense of individual efficacy – and, presumably, collective efficacy – in the face of challenge and threat. From the perspective of Conservation of Resources theory (Hobfoll, Dunahoo, & Monnier, 1995), individuals with the greatest resource pool would be the most resilient when under stress. Positive experiences could be regarded as a resource that bolsters a sense of meaning and efficacy.

The theory of Daily Hassles and Uplifts (see Kohn, 1996) is also pertinent. Hassles are defined as the mundane yet nevertheless irritating, frustrating, and anxiety-provoking situations that occur in everyday life. They can range from minor annoyances to substantial pressures, problems, and difficulties. Examples of daily hassles include time pressure, traffic congestion, interpersonal conflict, and critical feedback. In contrast, uplifts are those regular yet unpredicted positive occurrences that help to offset the adverse impact of daily hassles. Uplifts could include a small financial windfall, better than expected exam results, a new friendship, and positive appraisal at work. The relations between daily hassles and a wide range of adverse physiological, psychological, and social outcomes have been well-documented, so much so, that it is increasingly accepted that daily hassles can have a more detrimental effect on well-being than negative life events (Boekaerts, 1996; Landreville & Vezina, 1992). Positive aspects of deployment could represent daily uplifts; albeit in the situation of the deployment context.

With respect to the Human Dimensions of Operations model, it was hypothesised that positive aspects of the peacekeeping experience would form, collectively, an additional coping resource that would influence secondary appraisal and buffer the impact of stressors during deployment. The mechanism of influence of such positive experiences on coping resources was postulated to be the fostering of personal meaning. Potentially positive aspects of deployment were presumed to include putting military training into practice, learning new skills, forming relationships with people from different cultures, and personal satisfaction in providing support to the local country (see Appendix S for the full scale used in this research).

Meaning and postdeployment adjustment. Successful transition following operational deployment has been strongly linked to the nature of appraisals made concerning deployment (Thompson & Pastò, 2003). In a study of peacekeepers, Britt, Adler, and Bartone (2001) found that perceived meaning during deployment was strongly predictive of reported psychological benefits following homecoming. Soldiers at mid-deployment who felt personally engaged, and considered the mission both important and relevant, were much more likely to report benefits from participation. Interestingly, the more that soldiers reported such events as witnessing destruction and having contact with locals, the more likely they were to report having derived benefits from the deployment. The authors surmised that the experience of such events helped to place the deployment in a meaningful context.

Aldwin, Levenson, and Spiro (1994) found that the relationship between combat stress exposures and PTSD was lessened in veterans who could recount positive effects of their military service. These positive personal outcomes included increased self-discipline, recognition of one's ability to cope with adversity, improved resilience, and the reassessment and/or augmentation of life values and one's sense of purpose in life. In

reviews of the benefits of participation in peacekeeping missions, both Britt (2003) and Thompson & Pastò (2003) noted that numerous studies have cited deployment-specific positive outcomes, including a belief in the value of the deployment, a sense of having contributed to humanitarian causes, expanded political understanding, enhanced sense of self-worth, improved sense of life balance, and an appreciation of cross-cultural contact (e.g., Aldwin et al., 1994; Garland, 1993; Hall & Jansen, 1995; Mehlum, 1995; Tedeschi & Calhoun, 1995).

All peacekeepers – presumably on some level – will seek to make sense of, and derive meaning from, their experience of deployment. Of course, a key component of a sense of meaning during deployment is likely to stem from morale – i.e. a sense of satisfaction and commitment. The construct of morale was therefore revisited.

Morale

Morale proved to be an elusive construct in Chapter 4. Morale had strong bivariate correlations with other human dimensions variables, including psychological readiness. However, in most regression analyses, morale failed to influence models predicting psychological readiness. Yet when morale contributed to a higher order Unit Climate factor (e.g. Figure 18, p. 198), and when it was considered an outcome variable (see Fig 20, p. 203), it did have significant influence in the structural model. These inconsistencies mirror the variability in the literature of perspectives on the construct of morale. As discussed in Chapter 3, there is no consensus as to whether morale is fundamentally an individual or group-level construct, or an intrapersonal or a social construct. Further, morale has been regarded as both a specific construct – the enthusiasm and persistence with which a member of a group engages in the prescribed activities of that group (Baynes, 1967) – and an umbrella term that encompasses a range of psychological constructs such as motivation, job satisfaction, and self-confidence. For the purpose of this research, morale was regarded as an

individual-level construct, a dynamic psychological state that influences motivation, may vary considerably from situation to situation, and which is contingent upon an affiliation with a goal-oriented group.

Because of the importance attached to morale in the military, it is included as a moderator variable in this research. The possibility that morale will best fit into the stressor-strain transactional model as an outcome variable rather than a moderating variable has not been discounted. A model with morale as an outcome variable is consistent with the Soldier Adaptation Model (Bliese & Castro, 2003) described in Chapter 1 (see Figure 3, p. 33). The construct of morale conforms to the second broad category of strain that Bliese and Castro described as work-related attitudes such as job satisfaction and commitment. These attitudinal outcomes were postulated to be more sensitive to differences among groups and situations than health and well-being outcomes.

Most studies of morale have concentrated on the determinants of morale and the postulated motivational and performance outcomes of strong morale (see Britt & Dickinson, 2006). With respect to morale and its relationship with stress outcomes, Stouffer and his colleagues (Stouffer, Lumsdaine et al., 1949; Stouffer, Suchman, DeVinney, Star, & Williams, 1949) found strong moderating relationships between morale and strain in their landmark studies of the U.S. Army during World War II. However, there appears to have been limited research in the domain of peace support operations with respect to the buffering impact of morale. An exception was field research conducted by Farley (1995) with Canadian military personnel deployed as peacekeepers. That study confirmed a strong relationship between morale and strain. Soldiers with poor morale were more likely to show signs of illness than personnel with high levels of reported morale. This relationship, often intuitively recognised, has obvious ramifications for commanders who are trying to maximise operational effectiveness and maintain the well-being of subordinates.

Psychological Resilience

The concept of psychological resilience is gaining increasing exposure in the public media, despite lack of conceptual clarity, methodological agreement, and generalisability of findings in the research literature (Wald, Taylor, Asmundson, Jang, & Stapleton, 2006). This increasing interest is perhaps another indication that the historical emphasis in the research literature on adverse reactions to trauma is being replaced with a desire to understand better how most individuals successfully cope with acute and chronic stress (Bonanno, 2004). Broadening research to focus more on adaptive responses and outcomes to trauma exposure should lead to a more balanced and comprehensive understanding of how individuals adapt to stressful life events.

Whereas coping refers to the thoughts and behaviours used to manage the internal and external demands of situations appraised as stressful (Folkman & Moskowitz, 2004), psychological resilience refers to the ability of personnel to adapt to changing and potentially difficult circumstances and to recover previous functioning and psychological status and even to experience personal growth as a result of this adaptation (Paton et al., 2003; Wald et al., 2006). Coping is therefore an active process, whereas resilience is more an outcome of successful coping and adaptation.

Relatively few studies have investigated resiliency per se in military populations, although the related concept of psychological hardiness has certainly been championed by researchers such as Bartone (Bartone, 1999, 2003; Bartone, Marlowe, Gifford, & Wright, 1992; Dolan & Adler, 2006). Interestingly, in recent years, Bartone has replaced 'hardiness' as a research theme with the construct of 'resilience' (Bartone, 2004a, 2006). Those studies that have examined resilience in military populations have focussed on veterans of combat and former prisoners of war. One exception was a study of U.S. peacekeepers by Dolan and Adler (2006). The authors reported that military hardiness, defined as the context-specific adaptation

of psychological hardiness, moderated the impact of deployment stressors on depression after deployment.

In this research, psychological resilience was used to denote the collective outcomes of the stressor-strain transactional process from a positivistic perspective. Rather than discussing trauma and maladjustment, a resilience framework was utilised to discuss the outcomes evident in the data.

Hypotheses

Based on the literature review, the description of the HDO model, and the findings in the preceding chapters, three hypotheses were proposed. The first addressed the relationship between the stressors of peace support operations and stress outcomes during deployment. This question was whether the HDO data demonstrated relationships among these variables consistent with the broad psychological literature. It was hypothesised that:

1. *There will be a dose-response relationship between the stressors of military service and strain during peacekeeping deployment.*

Secondly, the influence of different stressor components on human dimensions outcomes during deployment was tested. Understanding these interactions might provide commanders with more precise guidance as to where to invest scarce resources in response to the stressors of peace support operations. It was hypothesised that:

2. *During deployment, different stressor domains will differently influence the human dimensions of leadership effectiveness, proximal leader behaviour, cohesion, and morale.*

Finally, a model examining the potential buffering variables between stressors and strain for peacekeeping troops during deployment was

examined. The HDO design allowed for the postulated moderating/ mediating variables of cohesion, meaning, morale, and leadership to be studied. It was hypothesised that:

3. *Cohesion, Meaning, Morale, and Leadership will buffer the influence of stressors on strain during deployment.*

In light of a finding from Chapter 4 – that morale acted just as well as an outcome variable as a predictor – the structural modelling that examined Hypothesis 3 in this chapter considered morale in these dual functions. Morale might fulfil the role of a positive outcome variable as well as the more common role in the literature as a stressor (i.e., when morale was perceived as low). If morale proved to fit better the role of outcome variable, then it may represent a dimension of the construct of resilience.

Method

Procedural matters such as sampling, participation rate, survey administration, and initial data screening (deletion of univariate and multivariate outliers) were consistent with the generic methodology described in Chapter 2. Additional data screening to meet the requirement of AMOS statistical software was conducted in accordance with the procedure described in Chapter 4.

The measures utilised in analyses for this chapter were:

a. the Demands of Military Service Scale (Chapter 2, pp. 59-70), as a measure of deployment stressors,

b. the Symptoms Checklist (Modified) (Chapter 2, pp. 71-76) to measure strain,

c. select variables from the Unit Climate Profile (Chapter 3), to provide measures of unit climate factors, and

d. the Positive Aspects of Deployment Scale (Chapter 2, pp. 87-90).

Only one deployment sample that contained all these variables had sufficient cases for analysis. Following data screening, this deployment sample consisted of 428 respondents. Table 42 provides select demographic characteristics for the sample.

TABLE 42
Select Demographics for the Deployment Sample

Deployment Sample Demographics (n = 428)			
Rank		**Years of Service**	
Private (equivalent)	49.3%	0-4 years	30.8%
Junior NCO	26.2	5-9 years	29.7
Senior NCO	15.9	10-14 years	26.6
Commissioned Officer	8.6	15+ years	12.9
Age group		**Previous tours**	
18-21 years	15.4%	None	37.6%
22-26 years	29.7	One	36.7
27-31 years	25.2	Two	17.1
32-36 years	18.9	Three	6.1
37+ years	10.7	Four or more	2.6
Marital Status		**Highest Education**	
Married	56.8%	Some High School	25.7%
Single	37.6	Completed High School	46
Separated	4.2	Some University/College	19.6
Other	1.4	University/College degree	8.6
Gender			
Male	96.3%		
Female	3.7		

All participants were members of a contingent deployed to East Timor. The distributions for these demographic variables warranted a number of comments. Privates were moderately under-represented (49.3% compared with an expected 60%), and consequently the other three rank

groupings were each slightly over-represented. There were considerably more married members than single members, perhaps because of the small percentage of participants (15.4%) in the youngest (18-21 years) age category. Over half the sample (62.4%) had previous operational experience. Most respondents had completed Year 12 education (74.2%). Women were under-represented (3.7% of sample) when compared to their 13% representation in the Army as a whole at the time of survey administration. The deploying unit largely contained 'combat arms' employment categories, which are exclusively male.

Results and Discussion

Hypothesis 1.

There is a positive relationship between stressors and strain during peacekeeping deployment.

Testing Hypothesis 1. There were various ways of testing this hypothesis. The simplest way was to calculate Pearson Product Moment correlation coefficients between the dependent variable (a total strain score) and the factor-analytically derived stressor variables. A second method involved the formation of high, medium, and low strain groups and the use of ANOVA to test for significant within group differences on all six stressors. This would allow for a more fine-grained analysis of the effect of stressors at different levels of strain. A third method involved computing the correlations between factor-analytically-derived strain variables and the stressor variables. A fourth method was to use SEM to form a measurement model with the stressor variables and a second measurement model that involved the measures of strain, and then computing the effect of the latent Stressor trait on the latent Strain trait. All four methods were used and are reported here.

Correlations. As a first step, scores were calculated for the six components of the Demands of Military Service Scale (see Chapter 2).

These components were Workplace Stressors, Operational Stressors, Traumatic Stressors, Concerns about Organisational Support, Family Concerns, and Ambiguity/Uncertainty. Bivariate correlations between these stressor component variables and total strain were calculated (see Table 43). All correlations were significant and positive. It was clear that all stressors were correlated with the total strain variable. Operational Stressors had the highest correlation (.53) with total strain and Organisational Support the lowest (.25). Differences between these correlations were not tested. Based on these correlations, there was support for Hypothesis 1.

TABLE 43
Intercorrelations for Stressors and Strain Variables

Variable	1.	2.	3.	4.	5.	6.
1. Workplace stressors	1.00					
2. Operational stressors	.58**	1.00				
3. Traumatic stressors	.35**	.46**	1.00			
4. Organisational support	.59**	.47**	.31**	1.00		
5. Family concerns	.35**	.52**	.33**	.36**	1.00	
6. Ambiguity/Uncertainty	.59**	.48**	.29**	.44**	.34**	1.00
7. Total strain	.43**	.53**	.32**	.25*	.43**	.38**

Note: * indicates significance at $p < 0.05$ level; ** indicates significance at $p < 0.01$ level (2-tailed)

ANOVA. A three-group median split of the Symptoms Checklist total score was performed so that one-way between groups (low, medium and high strain) ANOVAs could be performed for each stressor component variable. As noted in Chapter 2, item distributions of the Symptoms Checklist (modified) were not expected to meet the assumption of normality. Furthermore, based on the review of the literature, it was expected that there would be significant differences in reported experience of stressors among the strain groups – the homogeneity of variance assumption was not expected to hold. Therefore, the ANOVAs had planned comparisons for the six stressor component variables and Strain. In accordance with the procedure described by Coakes and Steed (1999),

contrast coefficients (-2, -1, 3) were determined, based on the expected dose-response relationship between stressors and strain. Descriptives for the analysis sample are contained in Table 44.

Examination of the Levene test for homogeneity of variances (Table 45) suggested that the assumption had been violated, as expected, for five of the six independent variables (the exception being concerns over perceived organisational support). ANOVA outcomes are provided in Table 46. The results show that the level of stress experienced significantly influenced strain for each of the six stressor domains.

TABLE 44
ANOVA Sample Descriptives

		N	Mean	Std. Dev	Std. Error	95% Confidence Interval for Mean		Min	Max
						Lower Bound	Upper Bound		
Workplace stressors	Low strain	136	14.23	4.947	.424	13.39	15.07	7	29
	Medium strain	148	17.13	5.611	.461	16.22	18.04	7	33
	High strain	144	20.02	6.056	.505	19.02	21.02	9	33
	Total	428	17.18	6.030	.291	16.61	17.75	7	33
Operational stressors	Low strain	136	11.46	4.598	.394	10.68	12.24	7	27
	Medium strain	148	14.24	4.952	.407	13.44	15.05	7	30
	High strain	144	18.13	5.792	.483	17.18	19.09	7	33
	Total	428	14.67	5.810	.281	14.11	15.22	7	33
Traumatic stressors	Low strain	136	6.99	2.632	.226	6.55	7.44	5	18
	Medium strain	148	7.64	2.897	.238	7.17	8.11	5	22
	High strain	144	9.24	3.715	.310	8.62	9.85	5	25
	Total	428	7.97	3.253	.157	7.66	8.28	5	25
Organisational support	Low strain	136	12.60	5.062	.434	11.74	13.46	6	30
	Medium strain	148	14.17	5.179	.426	13.33	15.01	6	28
	High strain	144	15.50	5.226	.436	14.64	16.36	6	29
	Total	428	14.12	5.278	.255	13.62	14.62	6	30
Family concerns	Low strain	136	7.25	3.483	.299	6.66	7.84	4	20
	Medium strain	148	8.24	3.682	.303	7.64	8.83	4	20
	High strain	144	10.87	4.279	.357	10.16	11.57	4	20
	Total	428	8.81	4.117	.199	8.42	9.20	4	20
Ambiguity/ Uncertainty	Low strain	136	6.35	2.408	.206	5.94	6.75	4	16
	Medium strain	148	7.41	2.869	.236	6.95	7.88	4	16
	High strain	144	8.95	3.387	.282	8.39	9.51	4	18
	Total	428	7.59	3.105	.150	7.30	7.89	4	18

TABLE 45
Test of Homogeneity of Variances

Stressor domain	Levene Statistic	df1	df2	Sig.
Workplace stressors	3.683	2	425	.026
Operational stressors	5.392	2	425	.005
Traumatic stressors	7.559	2	425	.001
Organisational support	.258	2	425	.773
Family concerns	4.572	2	425	.011
Ambiguity/Uncertainty	10.696	2	425	.000

TABLE 46
ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Workplace stressors	Between Groups	2347.715	2	1173.86	37.859	.000
	Within Groups	13177.432	425	31.006		
	Total	15525.147	427			
Operational stressors	Between Groups	3157.750	2	1578.88	59.617	.000
	Within Groups	11255.472	425	26.483		
	Total	14413.222	427			
Traumatic stressors	Between Groups	376.678	2	188.34	19.320	.000
	Within Groups	4142.985	425	9.748		
	Total	4519.664	427			
Organisational support	Between Groups	587.587	2	293.79	11.043	.000
	Within Groups	11307.336	425	26.605		
	Total	11894.923	427			
Family concerns	Between Groups	989.574	2	494.79	33.652	.000
	Within Groups	6248.716	425	14.703		
	Total	7238.290	427			
Ambiguity/ Uncertainty	Between Groups	482.171	2	241.09	28.201	.000
	Within Groups	3633.275	425	8.549		
	Total	4115.446	427			

The contrast coefficients table, contrast tests table, and post hoc tests for multiple group comparisons are contained in Appendix AD. The contrast tests showed that the t-probability values of the separate variance estimates were highly significant ($p < .000$) for all six stressor component variables, even when equal variances were not assumed. Post hoc tests for

multiple group comparisons revealed that the low, medium, and high strain groups were significantly differentiated from each other for the Workplace Stressors, Operational Stressors, and Ambiguity/Uncertainty variables. The low and medium strain groups were not significantly differentiated from each other for the Family Concerns and Traumatic Stressors variables, but were each significantly differentiated from the high strain group. Finally, the medium and high strain groups were not significantly differentiated from each other for the Organisational Support variable, but the low strain group was significantly differentiated from both medium and high strain. These relationships can be visualised with the aid of Figure 27, which plots the mean stressor component impact scores by level of strain.

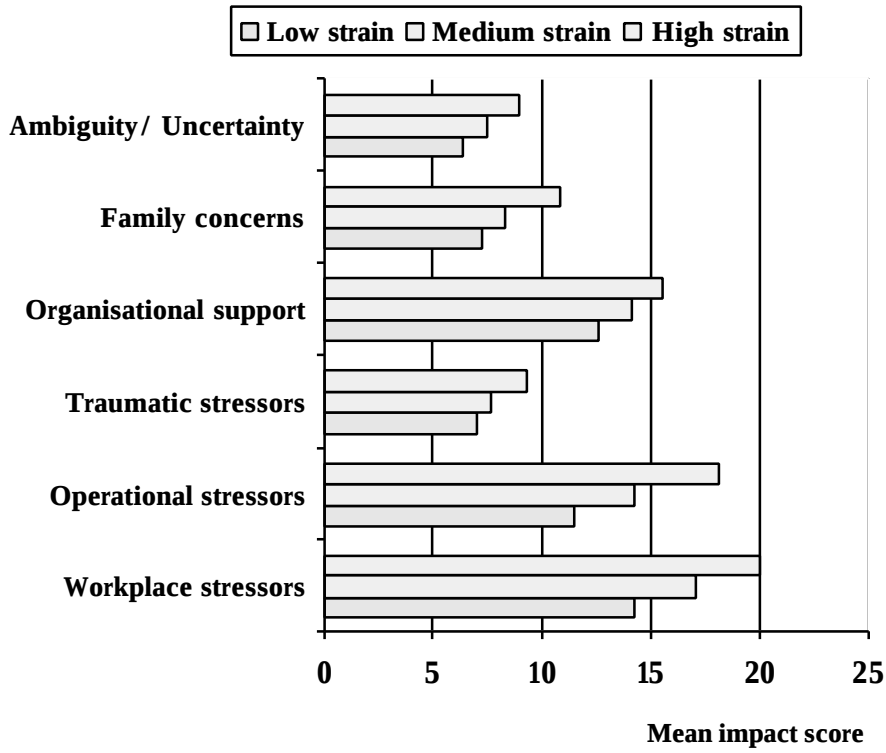

FIGURE 27 Mean impact scores by strain group (low, medium, high) for six stressor component variables.

One-way between-groups ANOVAs with planned comparisons were also conducted for each individual variable from the Demands of Military Service Scale with Strain (low, medium, and high strain groups).

The results of this analysis are contained in Appendix AE. In summary, similar results to the ANOVAs with the component stressor independent variables were obtained. All but one independent variable (conditions of service matters) showed significant between group differences with respect to level of impact. Post hoc contrast tests confirmed the ANOVA outcomes that there was a significant group difference for all but the conditions of service matters stressor variable. The tests showed that three variables had significant differences between low and high strain groups, 23 variables had significant differences for two out of the three possible group comparisons, and eight variables showed significant differences between all three groups (low-medium, low-high, and medium-high strain). Mean stressor impact scores by group (low, medium, high strain) for a selection of individual items (one from each of the stressor domains) are shown in Figure 28.

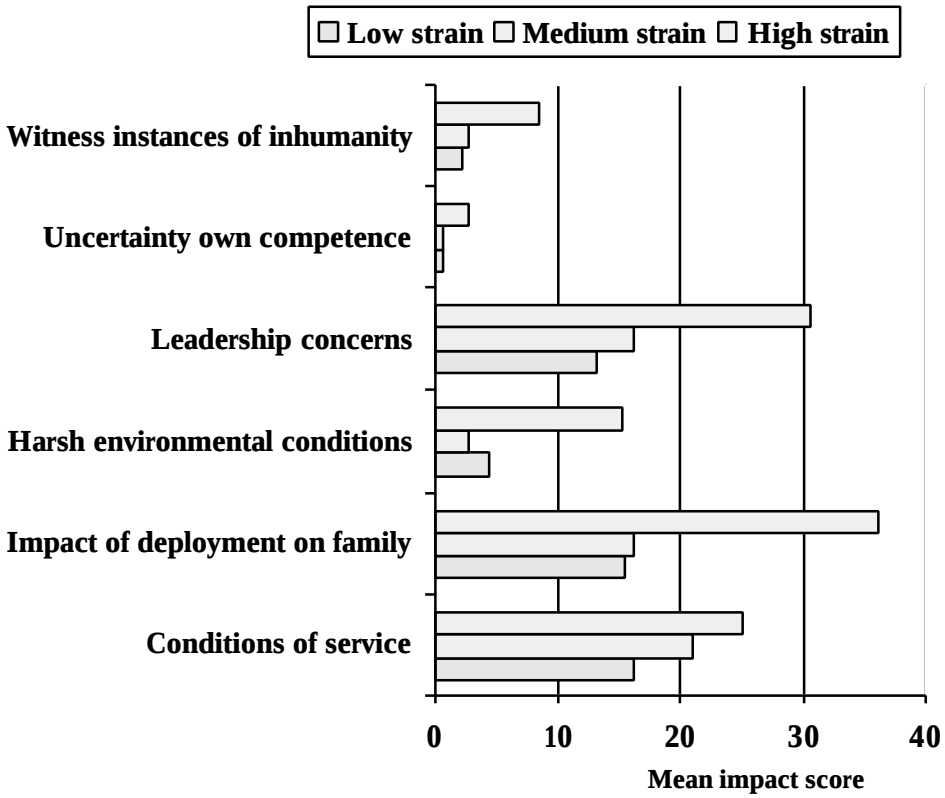

FIGURE 28 Mean impact scores by strain group (low, medium, high) for select individual stressor variables.

When commanders are briefed about the Human Dimensions of Operations survey outcomes in their units, the graphic in Figure 28 is typical of that provided. Like the preceding results in this section, the figure illustrates that there is a strong and positive relationship between the impact of particular stressors and self-reported strain.

It was concluded that these Analysis of Variance outcomes provided further support for Hypothesis 1.

Correlations between aggregated variables. The correlation matrix in Table 47 contains aggregated variables derived from factor analysis for both measures of stressors and strain. Six stressor component variables were derived from the Demands of Military Service Scale (see Chapter 2). Six strain component variables were derived from the Symptoms Checklist (Modified) (also in Chapter 2).

TABLE 47
Sample Correlations for the Stressors and Strain Structural Model Variables

Variables[1]	bfc6	bfc5	bfc4	bfc3	bfc2	bfc1	str1	str2	str3	str4	str5	str6
bfc6	1.00											
bfc5	.33	1.00										
bfc4	.23	.50	1.00									
bfc3	.22	.52	.53	1.00								
bfc2	.44	.56	.50	.59	1.00							
bfc1	.42	.61	.64	.56	.68	1.00						
str1	.23	.35	.27	.27	.33	.45	1.00					
str2	.22	.42	.38	.37	.46	.51	.58	1.00				
str3	.18	.28	.23	.25	.30	.27	.35	.46	1.00			
str4	.10[2]	.23	.19	.17	.15	.25	.59	.47	.31	1.00		
str5	.16	.34	.27	.26	.38	.43	.35	.52	.33	.36	1.00	
str6	.21	.26	.20	.27	.35	.40	.59	.48	.29	.44	.34	1.00

Notes:

1. Variable labels: bfc1 = depression/withdrawal, bfc2 = behavioural/mental anxiety, bfc3 = physiological anxiety, bfc4 = somatic complaints, bfc5 = hyper-arousal, bfc6 = emotional lability, str1 = workplace stressors, str2 = operational stressors, str3 = traumatic stressors, str4 = organisational support, str5 = family concerns, str6 = ambiguity/uncertainty.

2. All correlations were significant at $p < .01$ level except the correlation between bfc6 (Emotional lability) and str4 (Organisational support) which was significant at the $p < .05$ level.

Table 47 showed strong support for Hypothesis 1. All bivariate correlations among the 12 variables were significant at the $p < .01$ level, with the exception of the correlation between the Emotional Lability strain variable and the Organisational Support stressor variable, which was significant at the $p < .05$ level. It was notable that the Organisational Support variable had several of the lowest (but nevertheless significant) correlations with the various measures of Strain.

Structural model. The hypothesised model incorporated a latent variable labelled 'Stressors' that used as indicator variables the six component variables of the Demands of Military Service Scale. This latent variable predicted a 'Strain' latent variable derived from the component variables of the Symptoms Checklist (Modified). There has been debate within the literature about how to model such latent variables (e.g., MacCallum & Browne, 1993), and different modelling approaches have been recommended, particularly when the indicator variables are not correlated. In the present case, however, it was clear that all the stressor and strain indicators were correlated and therefore a conventional measurement model approach where the indicators are reflective, rather than causal, was chosen. The hypothesised model is shown in Appendix AF.

The model was tested using AMOS version 7.0.0. Operational Stressors and Workplace Stressors had the highest loadings (.79 and .77 respectively) on the Stressors latent variable; Traumatic Stressors the lowest loading (52). For the Strain latent variable, Depression/Withdrawal (.87) and Behavioural Anxiety (.79) had the highest loadings while Emotional Lability had the lowest loading (.46). Forty-one percent of the variance in Strain was accounted for. However, the model achieved six unacceptable fit indices (χ^2 (53, N = 428) = 209.8, $p < .000$, Bollen-Stine Bootstrap $p = .002$, $\chi^2/df = 3.959$, RMSEA = .083, SRMR = .053, GFI = 0.922, AGFI = 0.885, TLI = 0.908, CFI = 0.926). As a consequence of these generally poor fit indices, a model fitting process was undertaken.

During the model fitting process, four variables were deleted as follows. The Organisational Support (str4, Table 47) and Ambiguity / Uncertainty (str6, Table 47) variables were removed from the Stressors latent variable. Also, two variables, Physiological Anxiety (bfc3, Table 47) and Emotional Lability (bfc6, Table 47), were deleted from the Strain latent variable. The correlation between the constructs of Stressors and Strain did not change appreciably as a result of these item deletions (r = .67 for full model; r = .69 for model with deleted items). Modification indices also suggested that a covariance pathway be fitted between error terms for two indicator variables of the Stressors latent variable. Standardised parameter estimates for re-specified structural model are shown in Figure 29.

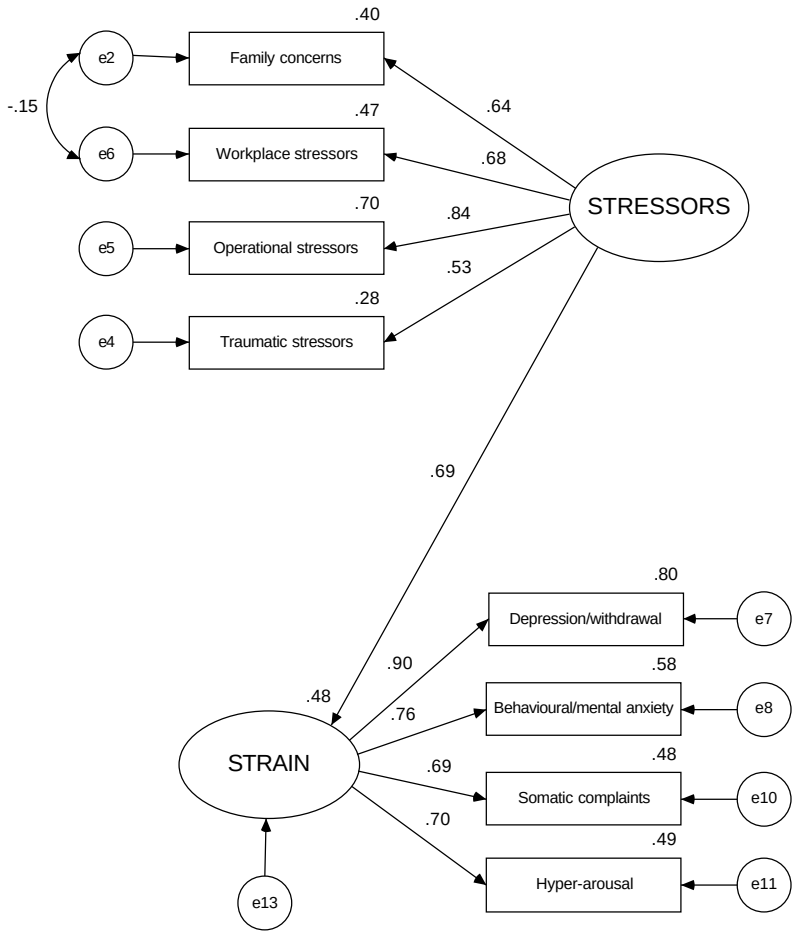

FIGURE 29 Stressors predicting strain: Re-specified structural model displaying standardised parameter estimates.

Fit indices for the re-specified model were good (eight in the desirable range, one in the acceptable range): χ^2 (18, N = 428) = 30.373, p = .034, bootstrap p = .147, χ^2/df = 1.687, RMSEA = .040, SRMR = .023, GFI = 0.983, AGFI = 0.966, TLI = 0.986, CFI = 0.991). The explained variance in Strain increased from 41% to 48% as a result of this model fitting process. All parameter estimates in the model were significant at the p < .001 level. Operational Stressors and Workplace Stressors again had the highest loadings (.84 and .68 respectively) on the Stressors latent variable. Similarly, Depression/Withdrawal (.90) and Behavioural/Mental Anxiety (.76) again had the highest loadings on Strain.

Hypothesis 1 discussion. Hypothesis 1 was strongly supported. There was a strong and positive relationship between the stressor and strain measures that were collected during peacekeeping deployment. Correlations, ANOVAs, and the structural model each showed that stressors and strain were strongly related. These relationships were evident for individual stressor items as well as variables derived from components drawn from factor analysis of the measurement scales utilised. The SEM outcomes were particularly interesting. It was decided to drop two variables – Organisational Support and Ambiguity/Uncertainty – from the Stressors latent variable in the structural model rather than fit covariance pathways among the error terms because a model without these two predictors gave a better account of the variance in Strain. However, because these two stressor domains are among the most amenable to command intervention (along with workplace stressors), analyses for command briefings should retain these variables. Similarly, Physiological Anxiety and Emotional Lability were removed from the model in this instance, but because these two variables are, arguably, the most amenable to detection by observation, there are pragmatic implications for commanders that suggested the fitting of covariance pathways among the error terms in order to retain all variables would be more appropriate in future HDO intervention briefings.

The finding that operational stressors have the highest loading on the stressors latent variable is particularly interesting. End-of-deployment briefings to commanders by deployed psychologists almost invariably have emphasised the primary importance of workplace stressors (e.g., Australian Army, 2006, 2007), based on the individual item means of a stressor scale. This finding suggested that operational stressors may be more influential in terms of the stressor-strain relationship than has generally been accepted – within the Australian Defence Force at least. This has implications for what commanders and trainers should focus on during predeployment preparation (e.g., awareness of likely operational stressors and how to deal effectively with them) and during deployment itself (taking appropriate preventative and remedial actions in response to operational stressors when they are encountered).

The finding that symptoms of depression and withdrawal have the highest loading on strain also has pragmatic implications for support policies and procedures in military organisations. This finding accords with several studies that have found depression to be the most common serious mental health disorder in peacekeeping veterans. For example, Richardson, Naifeh, and Elhai (2007) reported the rates of probable clinical depression were 30.4% for Canadian veterans deployed once on peace support operations (rising slightly to 32.6% for those deployed more than once). These rates of probable clinical depression were nearly three times higher than the probable rates of PTSD in the same samples. As discussed earlier in this chapter, posttraumatic stress outcomes in military veterans appear to have captured the major share of recent efforts in research and mental health service delivery. Some experts in the field of military stress casualties have been arguing for years that depression and associated subclinical symptoms warrant much more attention than they receive (e.g., Ursano, 1999). Solomon (1993) also emphasised the prevalence of depressive symptoms in her comprehensive studies of Israeli combat veterans. She noted that anxiety and depression were predominant symptoms in nonpolymorphic

cases of combat stress reaction. In such cases, anxiety was usually the first manifestation of combat stress reaction, with depression being the most likely subsequent manifestation.

Nonetheless, it is noted that all stressor and strain variables in the modified structural model had significant influence. Thus, there is strong evidence that several stressor domains have strong and significant effects on the outcomes of stress in deployed peacekeepers. The question to be next explored is whether these stressors also affect the human factors of military performance and member well-being.

Hypothesis 2.

> **During deployment, different stressor domains will differently influence the human dimensions of leadership effectiveness, proximal leader behaviour, cohesion, and morale.**

Testing Hypothesis 2. To examine this hypothesis, the dependent variables of Leadership Effectiveness, Proximal Leader Behaviour, Cohesion, and Morale were used. These were aggregated variables drawn from the Unit Climate Profile according to the individual-level Principal Component Analysis outcomes in Chapter 3 (Table 14, p. 137). These variables were chosen because leadership, cohesion, and morale emerged most prominently from the review of the literature that examined the buffering effects of psychological climate factors on stress. Leadership was represented by both the leadership-related variables in the Unit Climate Profile.

There were no *a priori* expectations about which of the predictor variables was likely to have the strongest influence. Therefore, the Pearson Product Moment correlation coefficients in Table 48 were examined initially to check for associations. Then, stepwise multiple regression was used to determine the best statistical combination of predictors.

TABLE 48
Intercorrelations for Variables in Hypothesis 2 (n = 428)

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Workplace stressors	1.00									
2. Operational stressors	.58	1.00								
3. Traumatic stressors	.35	.46	1.00							
4. Organisational support	.59	.47	.31	1.00						
5. Family concerns	.35	.52	.33	.36	1.00					
6. Ambiguity/Uncertainty	.59	.48	.29	.44	.34	1.00				
7. Leadership Effectiveness	-.58	-.32	-.13	-.23	-.12	-.35	1.00			
8. Proximal Leader Behav'r	-.44	-.26	-.11	-.10	-.16	-.34	.50	1.00		
9. Morale	-.51	-.32	-.06	-.12	-.19	-.34	.64	.52	1.00	
10. Cohesion	-.34	-.24	-.07	-.07	-.19	-.21	.44	.56	.56	1.00

Notes: Correlations above .10 are significant at the $p < 0.05$ level (2-tailed)
Correlations above .13 are significant at the $p < 0.01$ level (2-tailed)

Correlations. The correlations in Table 48 showed that all six stressor variables were positively and significantly correlated with each other; and all four unit climate variables were positively and significantly associated with each other. The correlations between the stressor variables and the unit climate variables were, in the main, negative and significant. The exceptions were that neither Morale nor Cohesion was associated with Traumatic Stressors, and Cohesion was not associated with Organisational Support. Proximal Leader Behaviour had relatively low correlations (albeit still significant at the $p < .05$ level) with both Traumatic Stressors and Organisational Support. Leadership Effectiveness had a relatively low, yet significant ($p < .05$), correlation with Family Concerns.

The pattern of correlations provided some support for Hypothesis 2. For example, the Traumatic Stressors variable was not associated with either Morale or Cohesion, but correlated with Proximal Leader Behaviour at the $p < .05$ level, and with Leadership Effectiveness at the $p < .01$ level.

Stepwise regression. A series of stepwise multiple regressions was conducted with the six Demands of Military Service stressor components as independent variables and the four individual-level Unit Climate Profile aggregated variables as separate dependent variables. Descriptive statistics for the sample, including mean and standard deviation, are presented in Table 49.

Morale. Four independent variables met the selection criteria for being entered into the regression equation. Together, Workplace Stressors, Organisational Support, Traumatic Stressors, and Operational Stressors (in that order) explained 33.4% of the variance in self-reported morale at the level of the individual. Table 50 provides R^2, regression coefficients, and t-test values for the four stepped models. The Workplace Stressors variable made a unique contribution of 26.1% of the variance in Morale. Concerns about organisational support accounted for another 5% of the variance.

TABLE 49
Descriptive Statistics for Variables in Hypothesis 2 (n = 428)

Variable	Mean	Standard deviation	Skewness	Kurtosis
Workplace stressors	17.18	6.03	.45	-.46
Operational stressors	14.67	5.81	.72	-.08
Traumatic stressors	7.97	3.25	1.50	2.91
Organisational support	14.12	5.28	.54	-.18
Family concerns	8.81	4.12	.78	-.11
Ambiguity/Uncertainty	7.59	3.10	.94	.31
Leadership Effectiveness	27.30	7.09	-.38	-.35
Proximal Leader Behaviour	24.54	6.50	-.52	-.41
Morale	17.73	6.03	-.47	-.56
Cohesion	32.62	5.78	-.63	.11

TABLE 50
Summary for Stepwise Regression with Morale as Dependent Variable

Model			Unstandardised Coefficients		Standardised Coefficients		
		R Square	B	Std. Error	Beta	t	Sig
1	(Constant)		26.516	.759		34.946	.000
	Workplace stressors	R^2 = .261	-.512	.042	-.511	-12.275	.000
2	(Constant)		24.860	.792		31.407	.000
	Workplace stressors	R^2 = .311	-.676	.050	-.676	-13.528	.000
	Organisational support		.318	.057	.278	5.564	.000
3	(Constant)		24.038	.856		28.081	.000
	Workplace stressors		-.704	.051	-.703	-13.811	.000
	Organisational support	R^2 = .321	.299	.057	.261	5.212	.000
	Traumatic stressors		.195	.080	.105	2.441	.015
4	(Constant)		24.333	.855		28.474	.000
	Workplace stressors		-.645	.054	-.644	-11.863	.000
	Organisational support	R^2 = .334	.327	.058	.286	5.667	.000
	Traumatic stressors		.274	.084	.148	3.273	.001
	Operational stressors		-.159	.054	-.153	-2.915	.004

Proximal Leader Behaviour. The Proximal Leader Behaviour score was aggregated from six items from the Unit Climate profile, after three of the items with negative wording were reverse scored. Three independent variables were entered into the regression equation. Collectively, Workplace Stressors, Organisational Support, and Ambiguity/Uncertainty (in that order) explained 25.1% of the variance in perceptions at the individual level of Proximal Leader Behaviour. Table 51 provides R^2, regression coefficients, and t-test values for the three stepped models. The Workplace Stressors variable made a unique contribution of 19.4% of the variance in Proximal Leader Behaviour. Concerns about Organisational Support and Ambiguity/Uncertainty respectively accounted for another 4.0% and 1.7% of the variance.

TABLE 51
Summary for Stepwise Regression with
Proximal Leader Behaviour as Dependent Variable

Model			Unstandardised Coefficients		Standardised Coefficients		
		R Square	B	Std. Error	Beta	t	Sig
1	(Constant)		32.712	.854		38.30	.000
	Workplace stressors	R^2 = .194	-.475	.047	-.441	-10.13	.000
2	(Constant)		31.118	.900		34.59	.000
	Workplace stressors	R^2 = .234	-.634	.057	-.588	-11.16	.000
	Organisational support		.306	.065	.248	4.71	.000
3	(Constant)		31.779	.916		34.69	.000
	Workplace stressors		-.546	.063	-.506	-8.66	.000
	Organisational support	R^2 = .251	.335	.065	.272	5.15	.000
	Ambiguity/uncertainty		-.340	.110	-.162	-3.09	.002

Leadership Effectiveness. The independent variables of Workplace Stressors and Organisational Support met the selection criteria for being entered into the regression equation. The two variables explained 35.5% of the variance in perceptions at the level of the individual of leadership effectiveness. Table 52 provides R^2, regression coefficients, and t-test values for the two stepped models. The Workplace Stressors variable made a unique contribution of 33.4% of the variance in Leadership Effectiveness. Concerns about Organisational Support accounted for another 2.1% of the variance.

TABLE 52
Model Summary for Stepwise Regression with
Leadership Effectiveness as Dependent Variable

Model			Unstandardised Coefficients		Standardised Coefficients		
		R Square	B	Std. Error	Beta	t	Sig
1	(Constant)		38.978	.846		46.056	.000
	Workplace stressors	R^2 = .334	-.680	.046	-.578	-14.623	.000
2	(Constant)		37.718	.900		41.914	.000
	Workplace stressors	R^2 = .355	-.805	.057	-.685	-14.164	.000
	Organisational spt		.242	.065	.180	3.723	.000

Cohesion. Three independent variables were entered into the regression equation. Collectively, Workplace Stressors, Organisational Support, and Family Concerns (in that order) explained 14.9% of the variance in perceptions at the individual level of workteam Cohesion. Table 53 provides R^2, regression coefficients, and t-test values for the three stepped models. The Workplace Stressors variable made a unique contribution of 11.3% of the variance in Cohesion. Concerns about organisational support and family respectively accounted for another 2.5% and 1.1% of the variance.

TABLE 53
Stepwise Regression with Cohesion as Dependent Variable

Model			Unstandardised Coefficients		Standardised Coefficients		
		R Square	B	Std. Error	Beta	t	Sig
1	(Constant)		38.152	.796		47.908	.000
	Workplace stressors	R^2 = .113	-.322	.044	-.336	-7.362	.000
2	(Constant)		37.037	.848		43.657	.000
	Workplace stressors	R^2 = .138	-.433	.054	-.452	-8.078	.000
	Organisational support		.214	.061	.195	3.494	.001
3	(Constant)		37.647	.882		42.675	.000
	Workplace stressors		-.409	.054	-.427	-7.547	.000
	Organisational support	R^2 = .149	.243	.062	.222	3.914	.000
	Traumatic stressors		-.162	.069	-.116	-2.370	.018

Hypothesis 2 discussion. The pattern of results from the stepwise regression analyses supported the hypothesis that stressor domains will differentially impact human dimension variables. The amount of variance explained by the independent stressor variables varied between 15 and 35.5% for the four psychological climate variables examined. However, it could be argued that the hypothesis is only partially supported because the Workplace Stressors and Organisational Support variables showed a consistent pattern of primary influence (i.e., they ranked first and second respectively) in all four stepwise regressions. Table 54 provides an overview

of R^2 and the ranked order of stressor variables that were significant predictors in the stepwise regressions for the human dimensions variables. Three further regression analyses were conducted with the psychological climate variables of Commitment, Ethos, and Work Motivation from the Unit Climate Profile as separate dependent variables. The outcomes of these analyses were included in Table 54 to demonstrate that the leading influence of Workplace Stressors and Organisational Support was not maintained across all climate variables. These additional variables showed very different patterns in the regression equations. For example, the Ambiguity/Uncertainty variable made a significant contribution to both the Commitment (ranked fourth) and Work motivation (ranked first) dependent variables. Furthermore, the one-two ranking of the Workplace stressors and Organisational support variables was not repeated in any of the three additional regressions. This result suggested that these less prominent climate factors (at least with respect to studies of military populations) deserve more attention.

TABLE 54
R^2 and Ranked Order of Significant Stressor Predictors in Stepwise Regression for Seven Human Dimensions Variables

	Morale	Proximal leader behaviour	Leadership effectiveness	Cohesion	Commitment	Ethos	Work motivation
R^2	.334	.251	.355	.149	.129	.037	.186
Workplace stressors	1	1	1	1	1	-	3
Organisational support	2	2	2	2	-	-	2
Traumatic stressors	3	-	-	-	3	1	-
Operational stressors	4	-	-	-	2	2	-
Family concerns	-	-	-	3	-	-	-
Ambiguity/ Uncertainty	-	3	-	-	4	-	1

These results have practical implications for commanders. There appears to be considerable leverage for commanders to exploit if they have an understanding of what stressors are affecting their unit. Armed with such knowledge, commanders can tailor their management efforts to achieve specific outcomes. For example, if work motivation appears to be faltering then priority of effort should be to reduce ambiguity and uncertainty in the workplace and/or regarding the mission. Another example is that if members of the unit have experienced traumatic stressors, commanders should be alert to the potential for adverse impacts on cohesiveness across the unit (adopting Siebold's (1996; 1999) conceptualisation of ethos as organisational cohesion); particularly the relationship of these members with their immediate leaders.

Having found support for the first two hypotheses, a dose-response relationship between stressors and strain, and differential impacts of stressors on unit climate factors, the analysis turned to the issue of whether human factors buffer the impact of stressors on strain during peacekeeping deployment.

Hypothesis 3.

Cohesion, Meaning, Morale, and Leadership will buffer the influence of stressors on strain during deployment.

A model comprising latent variables was developed to examine the relationships between stressors, strain, and the human factors postulated to have a buffering effect on stress. Leadership was again represented by two latent factors, Leadership Effectiveness and Proximal Leader Behaviour, from the individual-level analysis of the Unit Climate Profile. Cohesion and Morale from the Unit Climate Profile were also utilised. The Meaning latent variable was derived from the components of the Positive Aspects of Deployment Scale (see Chapter 2). The initial model (simplified version without observed variables) is shown as Figure 30. The full model showing

observed variables is contained in Appendix AG. The deployment sample was divided into two subsamples via a random split procedure using SPSS. Due to its large size, the correlation matrix for the first subsample is displayed in Appendix AH.

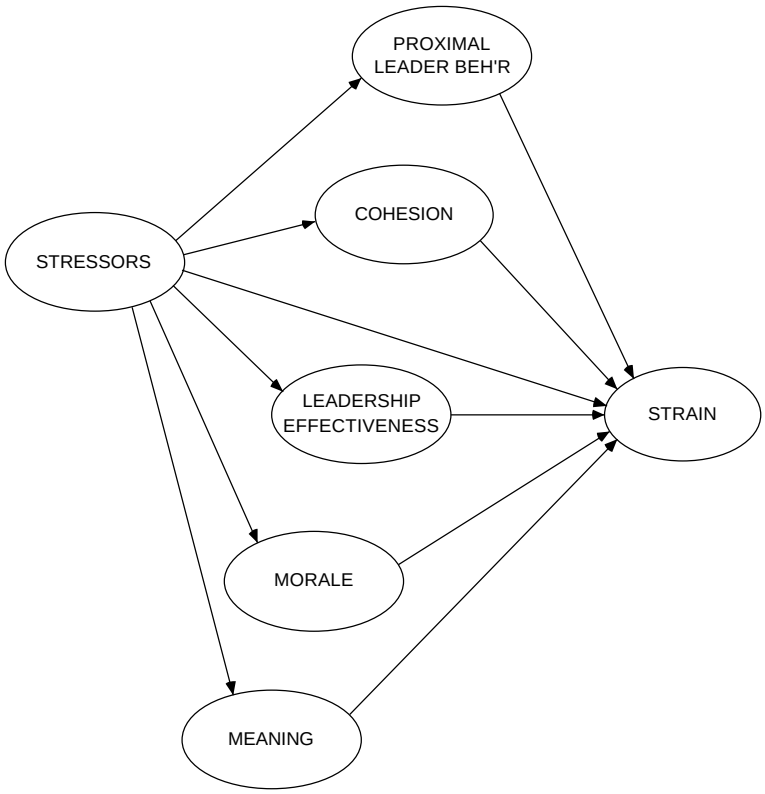

FIGURE 30 Structural model – simplified version with postulated mediating effects of human factors between stressors and strain.

Correlations. Several patterns were apparent from an examination of the correlation matrix (Appendix AH). In general, there were strong relationships among the stressor variables, among the variables drawn from the Unit Climate Profile, and among the strain variables. Non-significant correlations were common between the meaning variables and variables used to measure the Stressor, Strain, and Proximal Leadership Behaviour latent variables. For example, the Meaning aggregate variable of 'Home Support' correlated significantly with only nine of the 40 variables in the matrix. Several of the variables used to measure Leadership

Effectiveness did not correlate with any of the Strain aggregate variables. Different Stressor variables failed to correlate with several Unit Climate Profile variables used to measure Cohesion, Leadership Effectiveness, Proximal Leader Behaviour, and Morale.

Structural model. In view of the strong correlations between most variables, pathways were fitted among all latent variables. Relationships between the human dimensions factors were expected in view of the results in Chapter 4. The first data set was used to test the model. Assessment of model fit revealed that the full model did not fit the data well, with only two goodness-of-fit indices falling in the acceptable range (χ^2 = 1541.231, df = 758, p < .000, bootstrap p = .001, χ^2/df = 2.033, RMSEA = .068, SRMR = .075, GFI = .751, AGFI = .717, TLI = .811, CFI = .826). Therefore, model re-specification was conducted, according to procedures detailed in Cunningham (2007). This re-specification entailed scrutiny of the AMOS output standardised residual covariances, sample correlations, modification indices, eigenvalues, standardised regression weights, and modification indices in order to determine, in conjunction with theoretical considerations, if item error variances should covary and if items warranted deletion.

Appendix AI contains the model that achieved acceptable fit. The fit indices for the model were mixed, with three desirable, three acceptable and three unacceptable results: (noting that the 'desirable' bootstrap p would over-ride the unacceptable χ^2 result) (χ^2 = 545.86, df = 380, p < .000, bootstrap p = .108, χ^2/df = 1.436, RMSEA = .044, SRMR = .055, GFI = .869, AGFI = .840, TLI = .930, CFI = .939). Overall, model fit was considered acceptable. A simplified schematic of the significant pathways between latent variables in the model is shown in Figure 31. The figure shows that the model accounts for 76% of variance in Strain, as well as 83% of variance in Morale.

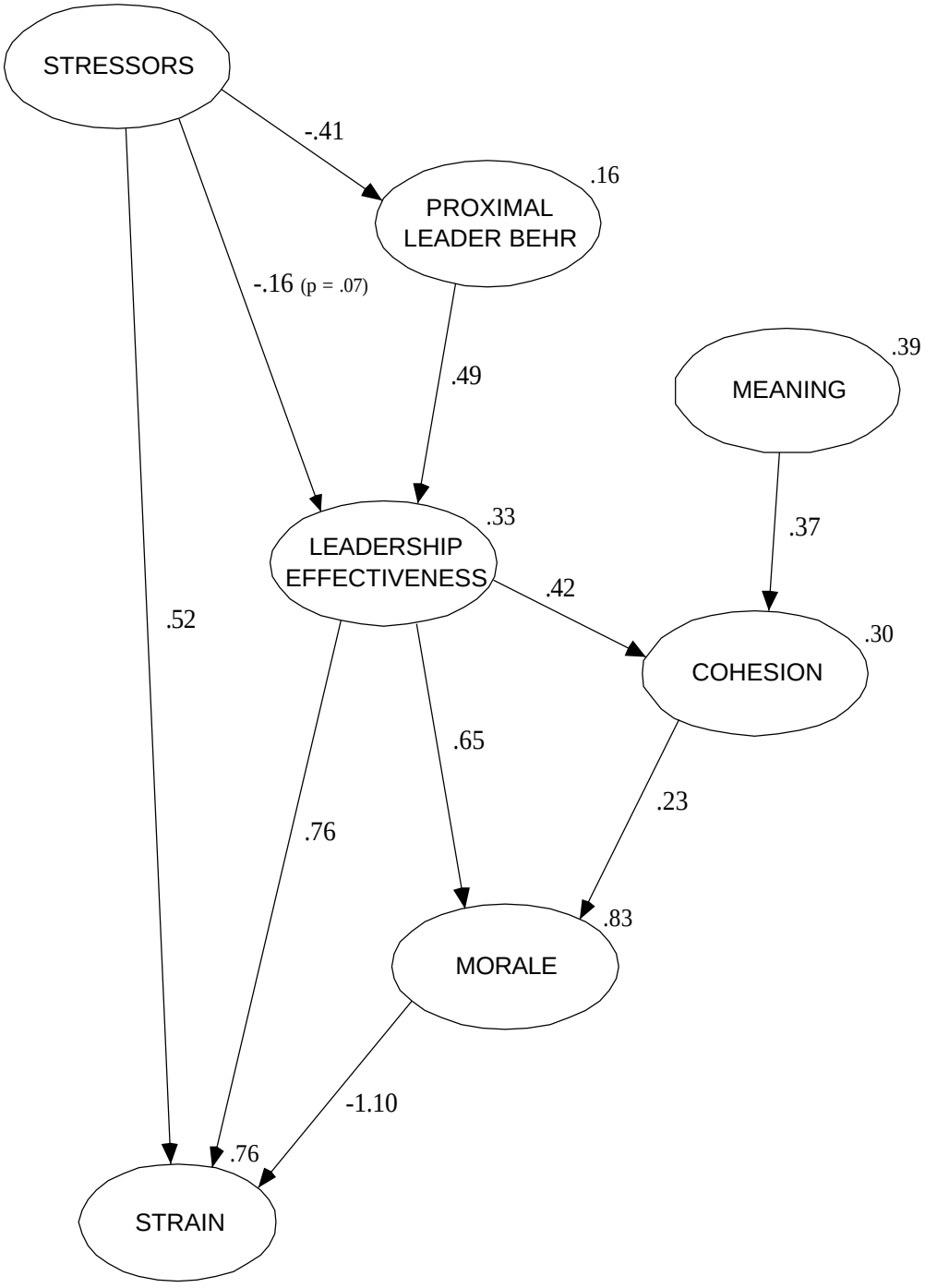

FIGURE 31 Significant pathways between latent variables in the re-specified model.

The model depicted in Figure 31 made conceptual sense. It showed that although stressors acted directly on strain (path coefficient .52), there was a mediating path through Leadership – to both Proximal Leader Behaviour (-.41) and Leadership Effectiveness (-.16) (the latter allowing for a coefficient that was trending towards significance ($p = .07$)) – that converged on Morale, before affecting Strain. A pathway from Meaning through Cohesion also influenced Morale, as did a pathway from Leadership Effectiveness to Cohesion (.42). The path coefficient for Morale to Strain was -1.10, which indicated that when the Morale latent variable score increased by 1 standard deviation, the Strain latent variable score decreased by 1.10 standard deviations. This was a powerful relationship.

Multi-group analysis. Measurement invariance was tested via multi-group analysis by comparing the two subsamples drawn from the deployment sample. A structural weights model was used. Fit indices were mixed, with the chi-square statistic ($\chi^2 = 1148.134$, $df = 804$, $p < .000$) and GFI (.856) and AGFI (.833), falling outside acceptable levels. The six other fit indices, including the Bollen-Stine bootstrap, were within acceptable / desirable levels (bootstrap $p = .058$, $\chi^2/df = 1.428$, RMSEA = .032, SRMR = .057, TLI = 9.29, CFI = .934). Overall, it was concluded that the structural model held across the two samples. Of course, both subsamples were drawn from the same dataset of a formed contingent deployed on a peacekeeping mission, so that a degree of consistency was expected.

Hypothesis 3 discussion. The results of structural modelling supported the hypothesis, albeit in a more complex manner than postulated in Figure 30. All of the postulated human factors contributed in some way to a mediating effect on the relationship between stressors and strain. Proximal Leader Behaviour appeared to moderate the impact of stressors, and influenced the effectiveness of the wider leadership in the unit. (The Leadership Effectiveness variable was derived from items with a focus on more senior levels, and perhaps more formal types of leadership in the unit,

as distinct from the behaviour of the immediate leader.) Leadership Effectiveness proved to be an important mediating factor, not so much in directly reducing the influence of stressors, but by fostering Morale directly – as well as indirectly – through the bolstering of Cohesion. A separate pathway indicated that a sense of meaning also fostered Cohesion, which in turn fostered Morale. Morale was a strong mediator of Strain.

Results in Chapter 4 suggested that Proximal Leadership was relatively more important than senior leadership during the predeployment stage, but that during deployment, the influence of more senior levels of leadership increased. The results in this section are consistent with these earlier findings. The increased importance of senior levels of leadership during deployment may be related to the increased transparency of command decision-making and the importance of such decisions to operational success (and therefore the safety and well-being of their subordinates).

In addition, it is plausible that the proximal leader – in most cases a junior NCO – may not have the skills or authority to influence the impact of stressors. Proximal leaders may be close to the source of many stressors, particularly workplace and operational stressors, so that their responses are focussed on immediate action, as opposed to moderating the longer-term stress responses characterised by most strain variables.

The literature review and the findings in Chapter 4 regarding psychological readiness highlighted the importance of cohesion in the military. From a multi-level perspective, the Leadership Effectiveness latent variable represented the organisational level in the broad Human Dimensions of Operations Model, while Morale and Meaning reflected the individual level. The construct of Cohesion was postulated to fill the gap between the individual level and the higher organisational level by representing social support at the level of the work group. For this

deployment sample, the Cohesion variable did play such a role between leadership and morale. Cohesion was the only variable influenced by the Meaning variable. This result may be explained by a sense of meaning being constructed at the level of the team and therefore having a strong social component. The finding that Cohesion was significantly influenced by both Leadership Effectiveness and Meaning is consistent with theories of cohesion that have suggested this construct has dual social- and task-related facets. Leadership is likely to foster task-related aspects of teamwork, whereas a sense of personal meaning may be rooted in the social interactions of the deployed work team.

The complex yet meaningful relationships among the human dimensions variables that influenced the relationship between stressors and strain were noteworthy. The resultant model confirmed the importance of leadership, cohesion, and morale in buffering the impact of stressors. The results also showed that the concept of Meaning, as measured by the positive aspects of deployment, can contribute to the stress-buffering impact of human dimensions constructs, albeit indirectly, by promoting cohesiveness.

The often-confused role of Morale has been given some clarity in this model. It would appear that Morale is a very important variable in terms of moderating the stressor-strain pathway. The model has suggested that morale is the result of the integration or synergy of several other human dimensions constructs, notably leadership and cohesion. Morale appears to function as a discrete, subsequent step in the mediatory pathway of human dimensions factors. This may explain why there is so much confusion in the literature about how to define and measure morale (Liefooghe et al., 2003). This finding has practical significance for military psychologists because it suggests that morale could be useful when a single, global measure of unit climate is required or preferred by commanders.

Chapter Summary and Conclusions

The three hypotheses were confirmed, although only partially supported in the case of Hypothesis 2. Complementary analytical approaches revealed strong dose-response relationships between the stressors of military service and strain during peacekeeping deployment. This finding affirmed the need, when feasible, to foster preventive strategies to avoid and reduce the impact of stressors during deployment.

With respect to the second hypothesis, the pattern of results showed that different stressor domains affected different human dimensions variables in distinct ways. There was a strong trend for workplace stressors and concerns about organisational support to rank as the most influential stressor domains. The practical significance of this finding for commanders and military psychologists is that tailored interventions can be implemented in response to known stressors affecting units, subunits, and individuals.

The third hypothesis was supported by the existence of a synergistic mediatory pathway among the human dimensions latent variables of Proximal Leader Behaviour, Leadership Effectiveness, Cohesion, Meaning, and Morale. This constellation of variables buffered the impact of stressors on strain. Leadership is generally presumed to play a critical role in the prevention and management of stress on operations. This research supported this notion, and more specifically, revealed that leadership both buffers the immediate impact of stressors, and also fosters cohesion and morale, thereby reducing strain.

The management of personal meaning for deployed personnel is increasingly recognised as an important leadership task, although there was not a direct, significant pathway between Meaning and either leadership variable in the structural model. The finding in this chapter that positive aspects of deployment and the personal meaning assumed to be derived from these experiences significantly bolsters cohesion will give some

scientific credibility to the assertion that a meaningful deployment experience can foster resilience.

Of course, the lack of a relationship between meaning and leadership behaviour in this study may simply reflect that at the time this data was gathered, there was no conscious or subconscious linkage between these two factors in the unit under study. Commanders may not have considered that one of their roles during deployment was to formally foster a sense of meaning in their troops. Certainly the concept of the 'management of meaning' is a relatively recent addition to the scientific literature, represented largely in the work of Bartone (2004a; 2004b; 2006). Future research on the concept of meaning should consider additional measures of meaning, and revisit the relationship between leadership and meaning in units where leaders are consciously attempting to nurture a sense of meaning within their command.

Collectively, the results in this chapter suggested that important ingredients of psychological resilience during operational deployment are effective leadership at all levels in the military unit, a sense of purpose or meaning, and strong cohesion and morale. Perceptions of effective leadership can be the result of a range of activities, in addition to fostering morale and the meaning of the mission, such as inspiring confidence in the competence of leaders, ensuring effective communication, conducting realistic training, fostering cohesion, applying sleep and fatigue management principles, promoting mutual support, resolving the personal problems of subordinates in a timely manner, making appropriate rotation decisions, promoting improvisation in the face of novel challenges, and, of course, achieving the mission. Future research should endeavour to distinguish the relative influence of such activities in the amelioration of stress.

The items of the Positive Aspects of Deployment Scale provide a blueprint for commanders with respect to promoting a belief in the mission

and promoting opportunities for meaningful experience. For example, giving significant, constructive work tasks to personnel can foster a sense of meaning. Interaction with the local populace can contribute to this sense of meaning. De Soir (1997) advocated "social patrols" to foster meaningful contact between peacekeepers and local residents – a 'peace building' approach. It is plausible that these factors – purpose and identification – may serve to inoculate personnel against stress reactions after the mission. Adler, Dolan, Castro, Bienvenu, and Huffman (2000) found that U.S. Army soldiers in Kosovo who encountered grateful civilians were more involved in their work and had greater job satisfaction than those who did not encounter grateful civilians. Evidence from the ADF experience in Somalia (Breen, 1998), compared with East Timor (Michalski, 2000), appeared to confirm the importance of the nature and quality of the relationship between peacekeeping troops and local people on outcomes such as morale and level of satisfaction with the mission.

The construct of morale continues to be elusive and surprising. Nevertheless, it appears to play an important role in perceptions of psychological climate and in buffering the impact of stressors. There is evidence that morale constitutes a 'meta-climate' factor that serves as a perceptual summation of the motivational and relational dynamics in the group in its current situation. It remains conjectural whether morale is fundamentally an individual- or group-level construct, an intrapersonal or a social construct, or in some way bridges the boundaries of such constructs.

The results presented in this chapter are encouraging. They support the military organisation's fundamental belief in the importance of leadership to operational effectiveness, particularly the role of leaders to foster and safeguard the well-being of their personnel. According to these findings, leaders in military units can promote psychological resilience through effective leadership behaviours, including the management of meaning. Leadership appears pivotal to positive morale and cohesion, and

in turn, morale is an antidote to the impact of the stressors of operational deployment.

Chapter 6

READJUSTMENT AFTER DEPLOYMENT

Introduction

> *The tempo we have here (in East Timor) is expensive in terms of energy, in terms of the claim on your personal reservoir of fortitude … so when you go home you have to sit and think. And you have to receive guidance and encouragement to adapt back to a different way of life. They are all ordinary Australians who do extraordinary things. They have to be put back into being ordinary Australians doing more ordinary things. Otherwise, you just can't keep living at that pace.*
>
> Major General Peter Cosgrove
> Quoted in P. Toohey, Major-General Achiever,
> The Australian Magazine, 5-6 February 2000

As a group, veterans of war have long been known to be at considerable risk of adjustment problems. There has been growing evidence that veterans of peacekeeping are not immune to adverse psychosocial outcomes. Studies of Australian, Canadian, European, and United States veterans of peace support operations in the former Yugoslavia (Baggaley, Piper, Cumming, & Murphy, 1999; Dirkzwager, Bramsen, & van der Ploeg, 2005; Passey, 1993; Solberg, 1997), Somalia (Bolton, Glenn, Orsillo, Roemer, & Litz, 2003; Orsillo, Roemer, Litz, Ehlich, & Friedman, 1998; W. Ward, 1997), and Rwanda (Dallaire, 2003; Hodson, Ward, & Rapee, 2003; D. J. Ward, 1997) have confirmed cases of serious, chronic postdeployment stress symptomatology. It often has been assumed that the experience of operational military service is the root cause of such long-term problems. This, however, may have been an attribution error.

As noted in previous chapters, several studies have found that the deployment stage of the deployment cycle, as compared to predeployment and postdeployment, often has the lowest reported levels of stress in

peacekeeping personnel. For example, MacDonald, Chamberlain, Long, and Mirfin (1996) found that the most stressful phase of the deployment cycle, and the phase with the most impact on overall health and well-being, was predeployment, followed by postdeployment. For both these stages, a predominance of work-related stressors and workload pressures was reported. The authors noted that "the months following the return to New Zealand is a stressful time in which assistance may be required to minimise the stressors encountered in the resumption of 'normal' duties" (p. vi).

Maguen, Litz, Wang, and Cook (2004) used a prospective design to evaluate the prevalence, severity, and predictors of several mental health outcomes among U.S. personnel who had served as peacekeepers in Kosovo. Whereas these personnel frequently had been exposed to potentially traumatising and other stressful events while in Kosovo, on average, their appraisal of those events was moderate. Postdeployment psychopathology was also low. Indeed, soldiers endorsed more severe mental health difficulties at predeployment, suggesting that non-operational stressors associated with the anticipation of deployment generally were more troublesome to soldiers than operational stressors experienced during deployment.

Michel, Lundin, and Larsson (2003) conducted a longitudinal study of Swedish peacekeepers deployed to Bosnia. There was no significant change in mental health over four assessment stages: before deployment, immediately after deployment, 6 months after deployment, and 1 year after deployment. Individuals who had experienced traumatic events in Bosnia, as well as stressful life events postdeployment, reported the poorest mental health. However, regression analysis showed that postdeployment stressors made the strongest contribution to adverse mental health after one year.

In light of such findings, it is not surprising that some researchers (e.g., Norris, Maguen, Litz, Adler, & Britt, 2005) have questioned whether

the impact of deployment stress in peacekeepers has been generally overrated in research efforts. Using a prospective design, Norris et al. (2005) examined physical health symptoms in a sample of U.S. peacekeepers. At pre-deployment, general life stressors and pre-deployment stress symptoms were significant predictors of physical health symptoms. At post-deployment, physical health symptoms were predicted by pre-existing physical health symptoms and stress symptoms reported before and after the mission. It was an intriguing finding that mission-related stressors were not associated with postdeployment physical health symptoms.

These studies suggested that it was plausible that factors intrinsic to the homecoming/reintegration phase of deployment may contribute substantially, perhaps even predominantly, to postdeployment adjustment. Such factors could include speed of return, the nature of the public welcome home, if and how memories of the operation are worked through, how meaning is derived after the usually profound experience of deployment, and how one's social relationships are reconstructed. While there has been growing acceptance within many Western military organisations of the need to prevent or remedy the detrimental impacts of operational service, often the emphasis on the provision of support has been during deployment in the operational theatre. Typically, this effort has been in the form of stress management interventions such as critical incident stress interventions, debriefings, clinical and counselling services, and the formal management of 'stress casualties'. Parallel with such in-theatre services for military members were support programs for families in the home nation. In contrast, there often has been limited support available specifically designed to address issues of postdeployment transition and adjustment. Furthermore, often there has been limited planning for long-term readjustment following homecoming, and limited effort to determine and monitor the psychological status of peacekeeping veterans.

The purpose of this chapter was to examine aspects of the postdeployment adjustment of peacekeepers. The relationship between select characteristics of the homecoming experience and self-reported strain were explored. Similar to the approach in Chapter 5, the influence of a number of human dimensions variables on the stressor-strain relationship were studied. In addition, the impact of potentially traumatic stressors experienced during deployment on postdeployment psychological status was investigated. These analyses aimed to clarify if the stressors of deployment are the key ingredients in the development of postdeployment difficulties, as was often assumed, or whether aspects of the postdeployment phase itself were more germane. Initially, a review of several relevant issues will be presented. These were psychological trauma in military populations, a review of research findings in relation to postdeployment adjustment in veterans of both war and peacekeeping, stressors of homecoming, and the construct of social support.

Psychological Trauma

It has become clear that serious threat and traumatic experience can lead to adverse psychological sequelae (Raphael, 1986). These problems can impact on the individual, his or her family, wider social relations, and performance and commitment at work. In the military, this impact has been illustrated by combat stress casualties and other stress syndromes during all major conflicts of the twentieth century (Craig, 1990; Gabriel, 1987) and in the adjustment problems of veterans after their return home (see Stretch, 1995, for a review). However, the acceptance of traumatic stress reactions as genuine continues to be challenged for social and political reasons (van der Kolk, McFarlane, & Weisaeth, 1996). It is both ironic and poignant that the military has often been reluctant to accept the effects of trauma as authentic, because it is an occupation routinely exposed to traumatic experience, and has been the largest source of subjects for traumatic stress research studies.

The issue of support for veterans was fixed in the public eye by the politicisation of the post-war difficulties of American veterans of the Vietnam War. Formal recognition of 'Posttraumatic Stress Disorder' (PTSD) as a distinct clinical syndrome occurred in 1980 with the inclusion of PTSD in the Diagnostic Statistical Manual of Mental Disorders, 3rd Edition (DSM-III) (American Psychiatric Association, 1980). This recognition ensured that a degree of legitimacy was accorded the problems experienced by veterans. It also triggered extensive research into the psychological status of veterans. The study of traumatic stress thereafter became a credible and viable field of research that, as discussed in Chapter 5, has come to dominate human science research in military populations.

The diagnostic criteria for PTSD are a complex constellation of re-experience, avoidance, numbing and arousal symptoms, which must persist for at least a month and cause significant distress or marked impairment in important areas of functioning such as social and occupational behaviour. Another component of the diagnostic criteria is the occurrence of an event – witnessed or experienced – that involves serious threat and which elicits an intense emotional response. More recently, there has been speculation in the literature that a distinct traumatic event may not be the only catalyst for PTSD. It has been suggested by Scott and Stradling (1994) and Friedman (2000) that chronic stress may cause the stress reactions normally associated with traumatic experience. This is relevant to the military because, as Dobson and Marshall (1997) suggested, an operational deployment could be considered a chronic stressor itself. This may explain instances of veterans who were not involved in combat or specific traumatic experience while serving in an operational theatre, yet have been diagnosed subsequently with PTSD (e.g., Southward, 1992). Indeed, research with Vietnam veterans in the United States by King, King, Gudanowski, and Vreven (1995) concluded that lower magnitude stressors of the operational environment may contribute more to serious stress disorders such as PTSD than critical incidents such as exposure to combat.

Another issue that is often overlooked by experts and novices alike in the field of psychotraumatology is that PTSD is not necessarily the most common or the most conspicuous long-term reaction to debilitating stress. PTSD, however, has tended to become a 'catch-all' for the range of adjustment difficulties that some veterans of war and peace support operations experience. This prominence has been in some respects unfortunate, because it may have deflected attention from the many other serious disturbances associated with extreme stress. These other reactions have included acute stress reaction, depression, hostility, substance abuse, family violence, anxiety disorders, antisocial behaviour and adjustment disorder (see Rundell & Ursano, 1996, for a review).

At the other end of the symptom spectrum are numerous 'subclinical' reactions that have been widespread among returned soldiers. These symptoms generally have been considered normal reactions to the stressors of deployment and have tended to characterise the 'adjustment difficulties' of the transition phase. Typical subclinical reactions have included difficulty sleeping, vivid dreams, tiredness, irritability, lack of impulse control (particularly anger), mild physical complaints, preoccupation with certain thoughts and memories, and a tendency to need time alone. It was often the duration of these symptoms, which distinguished whether they were considered normal or abnormal reactions. Hence subclinical reactions to the stress of deployment warrant attention; not only are they disruptive to well-being, but they can also crystallise into chronic stress reactions.

Perhaps the most potentially useful finding from the substantial literature on traumatic stress studies was that the behavioural and psychological responses to disaster and other traumatic experiences frequently have predictable features that take a typical course. For most individuals, posttraumatic symptoms were transitory; however for some the impact of such experience persisted and developed into a debilitating

disorder (Ursano, Grieger, & McCarroll, 1996). It would appear that the degree of human cruelty involved in a stressful incident might be the central determinant in the development of serious disorders such as PTSD (Grady, Woolfolk, & Budney, 1989; Truscott, 1997). Due to the nature of war and peace support operations – where abusive violence is commonly witnessed – it was assumed that service personnel were likely to be prone to postdeployment problems of adjustment. The ADF experience with the postdeployment adjustment problems of personnel who served in Rwanda provided strong evidence of the hypothesised link between the witnessing of human maliciousness and subsequent stress reactions (Hodson et al., 2003).

Adjustment Lessons from Veterans of War

Historically, there has been a great deal of denial within the military – and wider society – about the psychological impact of war on military personnel. Commanders and medical officers, who take primary roles in the management of stress casualties, have often promoted expectations that military personnel are immune to the impact of exposure to traumatic experience and label those who experience significant stress reactions as weak, cowardly or malingerers (Ireland & Bostwick, 1997; Moore, 1974). Because of these prevailing attitudes, lessons in the management of both the psychological casualties of combat and returning veterans have had to be repeatedly relearned, at great personal cost to service personnel affected by the stress of war.

The symptoms associated with traumatic stress reactions have been observed for centuries in veterans of war. For example, in Shakespeare's *King Henry IV*, the character Lady Percy describes – with uncanny accuracy – numerous symptoms consistent with PTSD in her husband Hotspur after his return from battle (see Shay, 1994). During the 20th century, names for the post-war adjustment problems of veterans included 'war neurosis', 'war sailor syndrome', 'survivor syndrome', and 'concentration camp syndrome.'

Current diagnostic nomenclature now identifies many of these disorders as chronic PTSD (Rundell & Ursano, 1996).

Symptoms of traumatic stress have been identified in veterans from the Second World War (e.g., White, 1983), the Korean War (Thienes-Hontos, 1982), the conflicts in the Middle East (Solomon, 1993), the conflict in the Falklands (Jones & Lovett, 1987), and the Gulf War (Vaitkus & Martin, 1991). In a sweeping review of the post-service adjustment of veterans from the two World Wars and the conflicts in Korea and Vietnam, Stretch (1995) demonstrated that war service could cause serious problems in subsequent adjustment in the areas of work, marital relations, family, the community and general social involvement. War service was also associated with increased mortality and psychiatric disability in veterans. Released prisoners of war were particularly at risk for such problems (Garton, 1996; Page, Engdahl, & Eberly, 1997; Tennant, Goulston, & Dent, 1986).

In what was probably the most comprehensive epidemiological investigation into the mental health of veterans, the National Vietnam Veterans Readjustment Study (NVVRS) (Kulka et al., 1990) found that 15% of all male veterans who were involved in active operations had current symptomatology consistent with PTSD, and a further 11% displayed partial symptoms. These symptoms were present 19 years after the war. A more recent study of American veterans from the Gulf conflict showed that, 18 months after the war, 11% of male respondents in a sample of 1,700 had psychometric symptom scores indicative of PTSD (Wolfe, Keane, & Young, 1996). Several variables significantly predicted the emergence of PTSD, including higher war-zone exposure, avoidant coping behaviours, less social support, and poorer family cohesion. King, King, Foy, Keane, and Fairbank (1999) analysed data from the NVVRS for pre-trauma risk factors, war-zone stressors, and post-trauma resilience-recovery variables associated with PTSD. Direct links were found between PTSD and all three predictive categories, with post-war variables accounting for a relatively high

proportion of influence on the posited structural model. Perhaps the most striking finding in terms of the focus of this research was that post-war variables were most salient in accounting for PTSD symptomatology in female veterans.

Epidemiological studies have demonstrated clearly that serious adjustment problems exist in veterans from all major conflicts this century. Rates of PTSD appear to be substantial, though it is emphasised that such severe morbidity has tended to be the exception rather than the rule (McFarlane & de Girolamo, 1996). What epidemiological research generally has not reported are the range of subclinical symptoms and adjustment problems that veterans experience and how long these symptoms persist. A clear shortcoming of much of the epidemiological research was that most studies have been conducted years or even decades after the cessation of hostilities. Furthermore, despite the evidence of a link between exposure to warfare and subsequent adjustment problems, surprisingly little was known about the causal mechanisms of PTSD, the postdeployment phase of readjustment and individual differences in the course of serious stress reactions and syndromes (Wolfe et al., 1996).

Postdeployment Adjustment in Peacekeepers

With the dramatic expansion and evolving nature of peacekeeping missions in the 1990s, a surge of relevant research began to emerge by the mid-1990s (e.g., Bartone, 1995; Bartone, Vaitkus, & Adler, 1994; Britt, 1998; Cerdeira, 1997; Farley, 1995; Flach, 1997; Hall, Bicknell, & Cipriano, 1997; Johansson, 1997; Lamerson & Kelloway, 1996; Segal, 1994; Wenek, 1993). In July 1997, a NATO Partnership for Peace workshop entitled "Psychological readiness for multinational operations: Directions for the 21st century" had its major focus on the psychological aspects of peace support operations (see Mangelsdorff & Bartone, 1997).

Conventional wisdom generally has suggested that conventional war imposes a greater impact on Service personnel than Peace Support Operations. As noted in the introductory chapter, this notion is beginning to be challenged. There has been growing evidence that the stress of peace support operations can be as psychologically damaging as conventional warfare (Bartone et al., 1994; Laffittan & Biville, 1997; Litz, 1996; Mylle, 1997; Richardson, Naifeh, & Elhai, 2007; Schade, 1997). However, the complex, dynamic and often ambiguous nature of peace support operations has made comparisons difficult to draw. Nevertheless, while many peace support operations may be qualitatively different from warfare, the end result – in terms of psychological impact – may be similar. Many stressors for military personnel are present in any operational deployment; for example, separation from family, harsh environmental conditions and organisational tensions. Research with New Zealand peacekeeping personnel led Pugsley (cited in Phare, 1994) to suggest that peace support operations may result in even more stress and frustration than conventional combat. For instance, there was often ambiguity about the role of military personnel on peace support missions, which was usually absent in conventional military operations. Other unique stressors of peace support operations included constraints on the use of force (even when confronted with threats), constraints on active involvement (even when witnessing atrocities), and taskings that military personnel may not be trained or adequately prepared for (such as tactical negotiation in threatening situations) (Orsillo et al., 1998).

A study of Australian soldiers deployed to Somalia in 1992/93 (W. Ward, 1997) concluded that nearly a fifth had "significant levels of psychiatric morbidity" 15 months after return from the mission. However, like much of the survey research with deployed military personnel, this research was open to methodological criticism, particularly how 'psychiatric morbidity' had been defined. Perhaps the most robust finding of the study was that most types of stress reactions declined significantly between the

first survey, conducted three months following return from Somalia, and the follow-up survey assessment 12 months later (for example, sleeping problems declined from 23.9% of respondents to 13.7%). Results also supported the contention that subclinical concerns are common among returned personnel from peace support operations (for example, three months after return, 23% of respondents (n = 482) reported lacking initiative, 28% were restless, 18% had concentration difficulties, and 20% felt their work performance had decreased). The study noted that, in spite of these problems, most soldiers were reluctant to seek any form of assistance. Such unwillingness to admit psychological difficulties seems a universal trait in Western military forces. Perhaps this recognition has spurred the numerous studies in Australia, Canada, the United Kingdom, and the United States that have focussed on issues of stigma and barriers to care in the military (Elhai, Richardson, & Pedlar, 2007; Fikretoglu, Brunet, Guay, & Pedlar, 2007; Gall, 2006; Hoge, Auchterlonie, & Milliken, 2006; Hoge et al., 2004; Maguen & Litz, 2006; Manning & Fullerton, 1988; Pincus & Benedek, 1998).

Studies from the Netherlands (Flach & Zijlmanna, 1997; Willigenburg & Alkemade, 1996) have demonstrated significant problems among returned peacekeepers. Nine months after returning from a mission, 4.7% of personnel were diagnosed with full PTSD. Up to 35% were classified as having partial PTSD, while a further 16% had sleep problems and 12% had general somatic complaints. Passey (1993) and Passey and Crockett (1997) reported on a study of Canadian military personnel deployed to the former Yugoslavia during 1992-93. Comparing predeployment and multiple postdeployment survey measures, it was concluded that the prevalence of PTSD following deployment was around 15% of the respondent sample. Several of their reported findings should be cause for concern for those responsible for the wellbeing of deployed troops, notably the high percentage of personnel exposed to serious and multiple stressors (for example, 80% were subjected to direct fire); the

proportion of personnel with symptoms of depression prior to deployment (about 10%), and the claim that 12-15% of personnel developed chronic PTSD after the deployment. Indeed the initial report by Passey appeared to prompt the establishment of PTSD treatment clinics in Canada specifically for CF personnel (Bialik, Langlois, Boddam, & Zimmerman, 1997).

Other studies of Canadian personnel on peace support operations have found evidence of serious, widespread stress reactions. Lamerson and Kelloway (1996) extended the analysis of Passey's (1993) data set and found that both traumatic and contextual stressors (role stress, family stress) contributed to the individual's reaction to stress. Stress reactions on operations were predictive of subsequent symptoms of PTSD and poor physical health. In one sample of personnel, stress reactions also predicted subsequent intentions to leave the Canadian Forces. The study provided evidence that cumulative and chronic stress can lead to stress outcomes that impact directly on the organisation – in this case in the form of lowered retention of experienced personnel.

Farley (1995) studied the prevalence and nature of stressors on Canadian peacekeeping operations. He found significant relationships between exposure to stressors and symptoms of stress, as well as time in theatre and symptoms of stress. The more stressors that soldiers were exposed to, and the longer they were deployed, the more severe were stress reactions. According to Sallot (1996), a study of suicide among Canadian Forces personnel (Sakinofsky et al., 1996) was prompted by speculation by that deployment was the main factor for an apparent rise in the suicide rate among veterans of peace support operations. The study found few direct links between peacekeeping duties and suicides by Canadian Forces personnel since 1990, but noted that domestic problems, which could be partly attributed to separation caused by deployments, were involved in a disturbingly high proportion of cases.

Richardson et al. (2007) studied the risk factors for PTSD in a random, national, Canadian sample of peacekeeping veterans with health-related disabilities. Rates and severity of PTSD were associated with younger age, single marital status, and greater deployment frequency. Rates of probable PTSD were 11% for veterans deployed once and 15% for those deployed more than once. Rates of probable clinical depression were considerably higher: 30% for veterans deployed once and 33% for those deployed more than once.

The Homecoming as a Stressor

> *It is well known that personnel returning from the theatre are irritable and tense for two weeks or more after arrival in Australia.*
>
> Major Rodgers, RMO, 1 RAR, Vietnam, 1966
> Cited in B. G. O'Keefe, *Medicine at War*, 1994

It has been postulated that factors associated with the homecoming may be related to the development of posttraumatic stress symptoms and other stress reactions. In their studies with veterans of the Second World War, Grinker & Spiegel (1945) categorised returning Service personnel with emotional difficulties into four types: 1) those who had problems overseas but who were gradually resolving these issues upon return, 2) those with problems originating overseas but which had not abated – or had worsened – upon return, 3) those who redevelop problems that existed prior to service, and 4) those who develop new problems due to failure to adapt to the home environment, perhaps because of changes in personality as a result of overseas experiences. The last category foreshadowed the results of research with Vietnam veterans, which showed that characteristics of the homecoming experience may be the most important contributors to postdeployment adjustment difficulties (Fontana & Rosenheck, 1994; Johnson et al., 1997; McNally, 1994; Wilson & Krauss, 1985). Johnson et al. (1997) found that homecoming stress was the most significant predictor of current posttraumatic stress symptomatology among U.S. Vietnam veterans.

They noted that "veterans of that conflict typically returned home after the most powerful emotional experience of their lives to find little acknowledgment and much misunderstanding by their families and society at large" (p. 261).

Another perspective was that homecoming adjustment was strongly related to the concept of transition stress. Adler, Litz, and Bartone (2003) suggested that a frequently overlooked issue associated with the deployment cycle was the distress associated with transitions. For example, pre-deployment could be difficult because of the uncertainty and the amount of work typically involved. During deployment, there was stress associated with adjustment to the job, to the living environment, to the local culture, to isolation, and the work itself. Transition home also presented a series of stressors, including packing up, possibly receiving a new posting order, and preparation for reintegration with family. These stressors could be both positive and negative, but during the frantic pace that often accompanies these transition periods, the awareness of transition as a special period of stress can be overlooked.

Negative events and stressors identified with transition after homecoming have been numerous. Such stressors included hostile or indifferent public attitudes to the returned veteran, reactions to inappropriate coping behaviours learned during deployment, delayed stress reactions, adjustment to non-operational Service life, changing work roles, reworking group and unit affiliations at work, dissatisfaction with nonoperational tasks and duties, yearning for the closeness of the working group during deployment, lack of confidence in garrison leadership, various issues of family adjustment, mismatch between expectations and fantasies about the homecoming, changes in emotional temperament, and guilt issues associated with one's actions, role or absence from family during deployment (Borus, 1976; Bourke, 1999; Hawkes, 1987; Matyschock & Uhlmann, 1997). A factor analysis of a homecoming stress scale developed

by Johnson et al. (1997) revealed four stressor domains that were labelled: Shame, Negative Interpersonal Interaction, Social Withdrawal, and Resentment. Negative Interpersonal Interaction was most strongly associated with PTSD symptoms. There was evidence in their data that suggested some specificity of the six-month period after return from deployment in predicting serious stress symptoms.

Postdeployment Adjustment

Research has shown that successful postdeployment adjustment was associated with the nature of the appraisal made concerning the deployment and one's role in it. Aldwin, Levenson, and Spiro (1994) found a decreased relation between combat stress and PTSD among personnel who were able to recount positive effects of the military service. Positive personal outcomes that have been identified in the literature included recognising one's ability to cope with adversity, increased self-discipline, resilience, reassessing or deepening key life values, a deeper appreciation of peace, and the development of a clearer direction and sense of purpose in life. Deployment-specific positive outcomes have included belief in the worth of the deployment, feelings of having contributed to humanitarian causes, and appreciation of the value of cross-cultural contact (Garland, 1993; Hall & Jansen, 1995; Tedeschi & Calhoun, 1996; Ursano, Wheatley, Sledge, Rahe, & Carlson, 1986).

The experience of formal ceremonies to recognise the sacrifice of deployment has been associated with successful adjustment during postdeployment transition. Studies of Vietnam veterans (Figley & Leventman, 1980) have shown the importance of homecoming ceremonies and other sources of recognition in facilitating the reintegration of veterans into society. Most cultures provide rituals for the returning warrior; however, many modern Western societies have tended to neglect these formalities – and the meaning that accompanies them – since the Vietnam War (Moremon, 2006). Hawkes (1987) postulated that traditional rituals of

returning allow warriors to cleanse themselves of their experience by receiving the formal sanction of social authority for their martial activities. Without such recognition and support, veterans may question their behaviours and be faced with issues of guilt and lack of meaning. The high level of participation of Australia's Vietnam veterans in the belated welcome-home activities of 1992 supported the notion that formal reception and ceremonies could be of vital importance to the process of veteran readjustment.

Family support has been recognised as an important contributor to positive transition. The security and psychological health of military personnel often rested on the immediate family (Hunter, Gelb, & Hickman, 1981). It has been postulated that the extent to which the returning serviceperson's experiences were validated by their family was perhaps the most important factor in promoting prompt and proper readjustment following homecoming (Flannery, 1990). The mechanism by which this social support promoted adjustment is not well understood, but has been postulated to include confrontation of problems, practical advice, detection of symptoms, sharing of emotions, fostering feelings of acceptance and a sense of belonging, and other coping assistance (Figley, 1986). Studies of Israeli veterans and American Vietnam veterans provided evidence of the healing role of social support in terms of reduced PTSD symptomatology (Solomon & Oppenheimer, 1986; Stretch, 1986).

Commanders can also contribute directly to the prevention of postdeployment maladjustment by ensuring that returning personnel have meaningful nonoperational roles. Murphy (1990) detailed how many Australian peacekeepers who served in Namibia perceived differences in task intensity, task variety, sense of responsibility, and feelings of autonomy between operational and nonoperational work environments. Not surprisingly, operational roles tended to generate greater meaning and satisfaction. Upon return to nonoperational roles, dissatisfaction and

frustration were common. A challenge for commanders was to ensure satisfying work roles in order to prevent performance decrements, retention problems, and lowered wellbeing in their personnel.

Social Support

There has been a widespread assumption in the literature that social support will modulate and even compensate for the effects of stress. Unfortunately, however, the construct of social support has been encumbered with a great deal of controversy. It has garnered the usual criticisms of vague definition, lack of conceptual consensus among researchers, great diversity in measurement approaches and tools, and a lack of consistent research findings (Barrera, 1986; Veiel & Baumann, 1992b). Nevertheless, according to Veiel and Baumann (1992a), social support "has joined stress and coping as one of the three most important constructs in current mental health research" (p. 1).

Research in the military has shown that social support can have a moderating effect on occupational stressors (see Bliese & Castro, 2000). In several studies, social support has been identified as the most important factor in reducing the effects of combat stressors (Glass, 1973; Grinker & Spiegel, 1945; Milgram, Orenstein, & Zafrir, 1989). Exploring the mechanisms of the positive influence of social support, Milgram et al. (1989) found that comradeship nurtured emotional support, the passage of information, and practical cooperation, each of which made appraisal of the situation by the individual more likely to be realistic and optimistic. It was concluded that military units with strong cohesion were characterised by confidence, trust, and respect between both soldiers and officers, which resulted in effective group functioning during times of crisis (Milgram et al., 1989). Close social relationships in groups have been found crucial for resisting the stressors of war (Hobfoll et al., 1991).

Similar findings have been found for peace support operations. In a study of Norwegian peacekeepers deployed to the Lebanon, Weisaeth and Sund (1982) found that good leadership, strong group feelings, and high motivation increased soldier tolerance of stress.

The preceding studies confined social support to social resources and interactions within the deployed unit. This research has defined in-unit social support as cohesion – and perhaps leadership. Very little attention has been paid to the influence of social support for deployed personnel from outside the military unit from agents such as family members, friends, and the broader society. Military studies that have examined 'family support' either referred to deployed Service members' concerns about the support being provided to their family by the organisation during their absence (i.e., family support as a stressor) (e.g., Bartone & Adler, 1999), or have focussed on the difficulties of accessing family support via different means of communication while on deployment (e.g., Ender, 1995).

One exception where family support was actually examined as a source of social support was in a study of Swedish peacekeepers in Bosnia and Herzegovina. However, in this case, family support was limited to the family's support of the member volunteering to undertake the peace support operation. The degree of perceived family support co-varied strongly with the family's service experiences (Johansson & Larsson, 2001). Another study of peacekeeping personnel examined wider social support, including the homecoming reception of U.S. Somalia veterans (Bolton, Litz, Glenn, Orsillo, & Roemer, 2002). Postdeployment adjustment was positively related to homecoming reception. A study of unaccompanied British military personnel deployed to the Falklands Islands used a measure of social support with items that canvassed social resources both inside and outside the deployed unit. The results suggested that perceptions of social support were associated with both psychological well-being and work satisfaction (Limbert, 2004).

Definition. Social support has been broadly defined as the resources and interactions provided by others that may be useful for helping a person cope with a problem (Wills & Fegan, 2001). In this chapter, social support will refer to perceived social support from agents (individuals, social groups, and organisations) outside the military unit. This was consistent with Barrera's (1986) call for more precision in defining social support and his category of social support called perceived social support, which was complemented by the categories social embeddedness and enacted support. Previous chapters have discussed how cohesion and leadership within the military unit can be considered forms of social support. The constructs of cohesion and leadership will again be utilised in this chapter, and will retain their distinctiveness with respect to the broad concept of social support.

Hypotheses

Drawing from the preceding review, and findings from previous chapters, three hypotheses were proposed.

1. *Social support and homecoming stressors will predict levels of postdeployment strain.*
2. *The experience of serious stressors on deployment will predict postdeployment psychological status.*
3. *Leadership effectiveness, proximal leader behaviour, cohesion, morale, and social support will mediate the postdeployment stress-strain relationship.*

Method

Procedural matters such as sampling, participation rate, survey administration, and initial data screening (deletion of univariate and multivariate outliers) were consistent with the generic methodology described in Chapter 2. Additional data screening to meet the requirement of AMOS statistical software was conducted in accordance with the procedure described in Chapter 4.

The measures utilised in analyses for this chapter were:

a. the Demands of Military Service Scale (Chapter 2, pp. 59-70) as a measure of stressors,

b. the Symptoms Checklist (Modified) (Chapter 2, pp. 71-76) as a measure of strain,

c. the Experience of Major Stressors Scale (Chapter 2, pp. 75-78) as a measure of potentially traumatic event exposures during deployment, and of the acute and chronic impact of these exposures,

d. the Service Experiences Scale (Chapter 2, pp. 79-83), as a measure of stress symptoms consistent with PTSD,

e. the Homecoming Issues Scale (Chapter 2, pp. 82-86), as a measure of the stressors and issues associated with the transition phase following homecoming, and

f. select variables from the Unit Climate Profile (Chapter 3).

Two social support latent variables were utilised. The first reflected social support during the deployment, and its indicator variables were the four components derived from PCA of Item 26 of the deployment support section of the Homecoming Issues Scale (see Appendix P). This item asked respondents to rate how supportive each of 13 given sources of support had been during their previous deployment. The response scale options were: 'Unsupportive (made things worse)', 'Of no support', 'Of some support', 'Of considerable support', and 'Of great support.' The rotated component matrix (orthogonal rotation) and subscale reliabilities (n = 820) are presented in Table 55. The four resulting components were labelled Organisational Support, Extended Family Support, Support from

Friends, and Immediate Family Support. The latent variable was labelled 'Deployment Social Support.'

TABLE 55
Rotated Component Matrix of Sources of Deployment Support

Item	Component			
	1	2	3	4
The Australian Government	.885			
ADF agencies outside unit	.787			
Unit	.750			
Australian society	.629			
Mother		.884		
Siblings		.757		
Father		.727		
Other family		.577		
Friends			.779	
Deployed mates			.719	
Nondeployed mates			.691	
Partner				.894
Children		.493		.552
Cronbach's alpha	.84	.88	.72	.58

Notes: [a] Loadings above .39 are shown
[b] Component labels:
C_1 Organisational Support
C_2 Extended Family Support
C_3 Support from Friends
C_4 Immediate Family Support

The second social support latent variable reflected perceived sources of social support since return from deployment. The indicator variables for the 'Postdeployment Social Support' latent variable were derived from four items of the Homecoming Issues Scale and two items of the Services Experiences Scale. The items utilised were:

- You spoke in a public setting (eg. a school, an RSL club) about your experiences of the deployment,
- You tried to tell someone about experiences on your deployment but the person was not interested in listening,
- Family put on a party or a celebration for your return from deployment,

- Level of enjoyment of leave after returning from deployment,
- I seem to prefer to be on my own these days, and
- I enjoy the company of others.

Four latent variables were derived from the PCA of the Homecoming Issues Scale (see Table 8, p. 86). The resulting components had been labelled: 'Work-related Readjustment Difficulties', 'Social Readjustment Difficulties', 'Alienation and Anger', and 'Positive Adjustment.' Items that had multiple loadings above .4 across the PCA components were not utilised as indicator variables. These latent variables were intended to reflect issues of concern specific to the homecoming phase of deployment.

A latent variable labelled 'Traumatic Stress Symptoms' was also developed. The indicator variables for this latent variable were derived from the four components of the Service Experiences Scale (see Table 7, p. 83). These components had been labelled 'Disruptive Impact of Traumatic Memories', 'Social and Emotional Impairment', 'Functional Impairment', and 'Normal Adjustment.' Items that had multiple loadings above .4 across the PCA components were not utilised as indicator variables. To limit the item-level complexity of structural models, a maximum of four indicator items were utilised for each predictor latent variable.

In order to examine the influence of traumatic stress on postdeployment psychological status, three variables were derived from the Experience of Major Stressors Scale (see Appendix M). The first variable, labelled 'PTEs Exposure', was the number of separate types of potentially traumatic events (PTE) that had been encountered during the previous deployment. This variable was considered to represent a measure of traumatic experience and was therefore categorised as a stressor variable. The second variable was an impact score for PTE exposures that used the responses to the question: 'How did the event affect you at the time?' The

third variable reflected a chronicity score that measured the responses to the question: 'How does the event affect you now?' The second and third variables represented measures of strain related to traumatic exposure.

A potential traumatic stressor variable that attempted to take into account the frequency of exposure to the 24 listed items by using the scale scores for that item ('Never' = 0, 'Once' = 1, 'A few times' = 2, 'Regularly' = 3) was not adopted because it proved to be almost identical to the 'PTEs Exposure' variable (r = .96 and r = .97 for postdeployment samples 1 and 2 respectively).

As in preceding chapters, a latent variable labelled 'Strain' was used to represent the constellation of stress symptoms that can occur. The six components of the Symptoms Checklist (modified) (see Table 6, p. 76) were used as indicators of the Strain latent variable. These components had been labelled: Depression/Withdrawal, Behavioural/Mental Anxiety, Physiological Anxiety, Somatic Complaints, Hyper-arousal, and Emotional Lability.

Two postdeployment samples were used for analysis. Table 56 provides select demographic characteristics for the samples, which contained 269 and 230 participants respectively following data cleaning. Collectively, Sample 2 had slightly better rank representation, was somewhat older, and had more military experience. Sample 1 had more participants with experience of multiple deployments. The two samples were closely matched for highest level of education and marital status. Females had very low representation in Sample 1 and were absent from Sample 2.

TABLE 56
Select Demographics for Two Postdeployment Samples

Demographic	**Sample**	
Rank	**1** (n = 269)	**2** (n = 230)
Private (equivalent)	67.2%	64.2%
Junior NCO	23.8	20.5
Senior NCO	5.3	11.8
Commissioned Officer	3.8	3.5
Age group		
18-21 years	22.2%	33.3%
22-26 years	41.7	25.9
27-31 years	27.4	19.3
32-36 years	6.0	13.2
37+ years	2.6	8.3
Marital Status		
Married	42.1%	39.7%
Single	53.4	53.7
Separated	3.4	4.4
Other	1.1	2.2
Years of Service		
0-4 years	56.3%	58.6%
5-9 years	33.2	15.0
10-14 years	6.3	14.5
15+ years	4.1	11.9
Previous tours		
None	0%	0%
One	49.3	80.8
Two	46.3	11.8
Three or more	4.5	7.4
Highest Education		
Some High School	25.4%	31.9%
Completed High School	55.2	45.0
Some University/College	14.9	16.2
University/College degree	4.5	7.0
Gender		
Male	99.6%	100%
Female	0.4	0.0

Results and Discussion

Hypothesis 1.

Social support and homecoming stressors and will predict levels of postdeployment strain.

Analysis overview. To test Hypothesis 1, three separate structural models were developed, tested, and re-specified as appropriate. Each model used Postdeployment Support, Deployment Social Support, or Homecoming Issues to predict a Strain latent variable. A combined structural model was then tested in order to understand better the relative influence of the variables in the preceding structural models.

Model 1. This model was designed to examine the influence of social support during the readjustment phase after deployment on strain. Six independent variables assumed to reflect aspects of perceived social support – or its absence – from various agents (individuals, social groups, and organisations) outside the military unit were used. Descriptive statistics and intercorrelations for the observed variables in the model are provided in Tables 57 and 58 respectively. The hypothesised structural model is shown in Appendix AJ.

There were strong positive correlations among the strain indicator variables, and lower and less consistent correlations among the social support variables. Two support items – 'Prefer to be alone these days' and 'Others disinterested in listening about the deployment' – were significantly correlated with the Strain variables. Assessment of model fit revealed that the initial model did not fit the data well (two acceptable fit indices) (χ^2 (39, N = 269) = 137.639, $p < .000$, bootstrap $p = .005$, $\chi^2/df = 3.529$, RMSEA = .097, SRMR = .0454, GFI = .926, AGFI = .852, TLI = .856, CFI = .915).

TABLE 57
Descriptive Statistics for Model 1 Observed Variables (Sample 1, n=269)

Variable	Mean	Standard deviation
d33: Seem to prefer to be on my own these days	1.84	1.030
d20: Enjoy the company of others (reverse coded)	2.38	1.046
kh24: Family celebrated your return	.35	.476
kh18: Others don't listen about the deployment	.54	.928
kh17: Public speaking about the deployment	.17	.528
kh32: Enjoyment of leave	3.12	1.120
bfc1: Depression/withdrawal	6.93	6.464
bfc2: Behavioural/mental anxiety	2.17	3.362
bfc3: Physiological anxiety	1.74	2.251
bfc4: Somatic complaints	4.08	3.164
bfc5: Hyper-arousal	1.07	1.685
bfc6: Emotional lability	.36	1.015

TABLE 58
Correlations for Model 1 Observed Variables (Sample 1, n=269)

	d33	d20	kh24	kh18	kh17	kh32	bfc6	bfc1	bfc2	bfc3	bfc4	bfc5
d33	1.00											
d20	-.240	1.00										
kh24	-.047	.137	1.00									
kh18	.294	-.145	-.021	1.00								
kh17	.120	-.008	.115	.232	1.00							
kh32	-.123	.230	.097	-.145	.009	1.00						
bfc6	.223	-.110	-.035	.195	.046	-.070	1.00					
bfc1	.462	-.229	-.072	.403	.096	-.145	.432	1.00				
bfc2	.401	-.199	-.062	.350	.084	-.126	.527	.777	1.00			
bfc3	.401	-.199	-.062	.350	.084	-.126	.375	.683	.675	1.00		
bfc4	.366	-.181	-.057	.319	.076	-.115	.342	.708	.615	.658	1.00	
bfc5	.351	-.174	-.054	.307	.073	-.110	.243	.680	.591	.591	.538	1.00

Notes:

1. Variable labels: d33 = Prefer to be alone these days, d20 = Enjoy the company of others, kh24 = Family celebrated my return, kh18 = Others disinterested in listening about the deployment, kh17 = You have spoken publicly about the deployment, kh32 = I enjoyed my leave after return from the deployment, bfc6 = emotional lability, bfc1 = depression/withdrawal, bfc2 = behavioural/mental anxiety, bfc3 = physiological anxiety, bfc4 = somatic complaints, bfc5 = hyper-arousal

2. Correlations above .12 were significant at the 0.05 level (2-tailed)
   Correlations above .16 were significant at the 0.01 level (2-tailed)

Consistent with previous analyses involving the Strain latent variable, modification indices suggested that covariance pathways be fitted among several of the error terms for the indicator variables for this latent variable. The model was re-specified with these error covariances as free parameters. The results of the fitted model with standardised estimates are schematically presented in Figure 32.

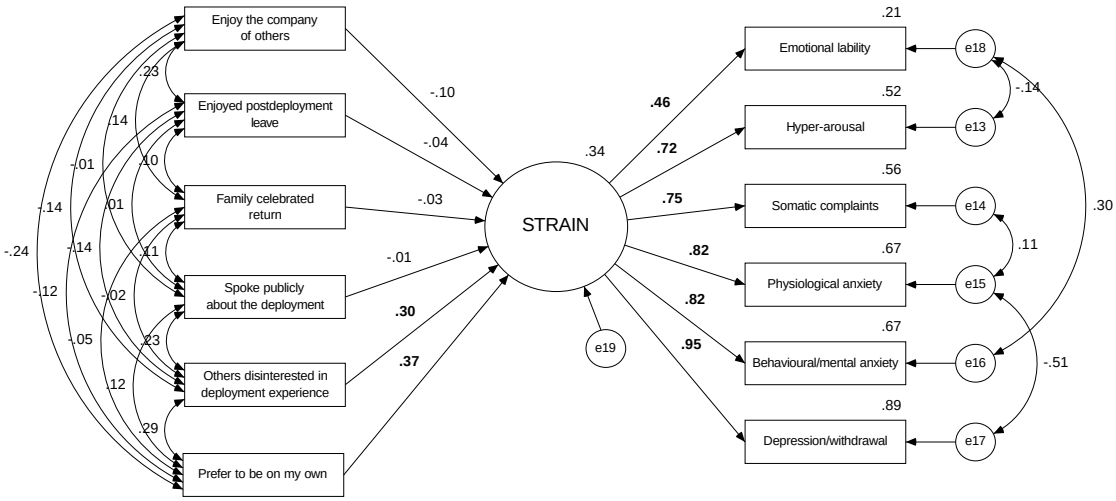

FIGURE 32 Fitted structural model predicting Strain from Postdeployment Social Support (Sample 1, n = 269).

The re-specified model achieved acceptable fit overall, with one desirable and five acceptable indices including the bootstrap p (χ^2 (35, N = 269) = 93.661, p < .000, bootstrap p = .025, χ^2/df = 2.676, RMSEA = .079, SRMR = .042, GFI = .949, AGFI = .886, TLI = .905, CFI = .949). Consistent with the patterns evident in the correlation matrix, parameter estimates were significant for two social support variables: the item from the Homecoming Issues Scale that asked if respondents had found people were disinterested in hearing about the deployment, and the item from the Service Experiences Scale (reverse coded) that suggested social isolation was

predictive of higher levels of strain. The model accounted for 34.0% of the variance in Strain.

Multi-group analysis. Measurement invariance was tested via multi-group analysis by comparing the two postdeployment samples. A structural weights model was used. With two exceptions, fit indices were acceptable or better (including the bootstrap *p*) (χ^2 (81, N = 269/230) = 181.826, $p < .000$, bootstrap $p = .25$, $\chi^2/df = 2.245$, RMSEA = .050, SRMR = .053, GFI = .945, AGFI = .895, TLI = .909, CFI = .948). Therefore, it was concluded that the structural model held across the two samples. A similar amount of variance in Strain was explained by the Sample 2 data (36.4% compared to 34.0% for Sample 1).

Model 2. This model was designed to examine the influence of perceptions of social support during the preceding deployment on postdeployment strain. The variables used to measure sources of social support during deployment were drawn from the one scale: Item 26 of the Sources of Deployment Support section of the Homecoming Issues Scale (see pp. 312-314). Three components that were drawn from the Sources of Deployment Support PCA (see Table 55) were utilised as latent variables labelled Organisational Support, Support from Friends, and Extended Family Support. The use of latent variables was considered appropriate here because, unlike the Postdeployment Support variables utilised in Model 1, the Deployment Support items were drawn from the one scale that had been subject to factor analysis.

A fourth component of the Sources of Deployment Support PCA – Immediate Family Support – was not utilised because one of the two items which loaded on this component – support provided by the respondent's child(ren) – cross-loaded above .40 on another component. Furthermore, this item was relevant to only the 22.2% of respondents who had children, so that the skewed response distribution was likely to cause

problems with the generation of variance estimates for this item during SEM. Instead of using a latent variable indicated by the two items that loaded on the Immediate Family Support component from the Sources of Deployment Support PCA, only the Partner Support item was utilised – as an independent observed variable. Descriptive statistics for the variables in Model 2 are provided in Table 59. A correlation matrix for the observed variables in the model is provided in Table 60. The hypothesised model is depicted in Figure 33.

TABLE 59
Descriptive Statistics for Model 2 Observed Variables (Sample 1, n=269)

Variable	Mean	Standard Deviation
spt3: Partner	1.38	1.370
spt13: Australian society	1.06	1.015
spt9: Nondeployed mates	.88	1.156
spt8: Deployed mates	1.99	.868
spt7: Friends	1.57	1.004
spt6: Other family	1.23	1.191
spt4: Siblings	1.59	1.125
spt2: Father	1.67	1.212
spt1: Mother	1.89	1.052
spt10: Unit	1.34	1.023
spt11: ADF agencies outside unit	.78	1.037
spt12: Government	.82	1.058
bfc1: Depression/withdrawal	.36	1.015
bfc2: Behavioural/mental anxiety	6.93	6.464
bfc3: Physiological anxiety	2.17	3.362
bfc4: Somatic complaints	1.74	2.251
bfc5: Hyper-arousal	4.08	3.164
bfc6: Emotional lability	1.07	1.685

TABLE 60
Correlations for Model 2 Observed Variables (Sample 1, n=269)

Variable	spt3	spt13	spt9	spt8	spt7	spt6	spt4	spt2	spt1	spt10	spt11	spt12	bfc6	bfc1	bfc2	bfc3	bfc4	bfc5
spt3	1.00																	
spt13	.085	1.00																
spt9	-.021	.290	1.00															
spt8	.080	.382	.307	1.00														
spt7	.038	.382	.374	.494	1.00													
spt6	.023	.408	.429	.314	.472	1.00												
spt4	.000	.353	.332	.326	.473	.574	1.00											
spt2	.060	.226	.196	.297	.361	.442	.573	1.00										
spt1	-.020	.290	.170	.251	.421	.450	.569	.635	1.00									
spt10	-.034	.374	.350	.459	.348	.301	.327	.299	.212	1.00								
spt11	.109	.467	.364	.332	.292	.323	.280	.203	.258	.535	1.00							
spt12	.017	.584	.327	.346	.319	.377	.360	.285	.303	.571	.613	1.00						
bfc6	.029	.021	-.065	-.066	.019	.000	.011	-.041	.024	-.181	-.108	-.094	1.00					
bfc1	-.035	-.188	-.076	-.146	-.119	-.064	-.145	-.059	-.080	-.274	-.192	-.247	.432	1.00				
bfc2	.014	-.138	-.161	-.181	-.096	-.084	-.086	-.076	-.068	-.286	-.218	-.227	.526	.759	1.00			
bfc3	-.010	-.122	-.078	-.078	-.046	-.059	-.087	-.003	-.042	-.157	-.116	-.196	.374	.683	.706	1.00		
bfc4	.053	-.113	-.108	-.087	-.022	-.015	.010	.031	-.007	-.209	-.146	-.225	.372	.709	.622	.657	1.00	
bfc5	.028	-.105	-.103	-.081	-.012	.000	-.111	-.084	-.069	-.171	-.122	-.190	.250	.672	.604	.609	.576	1.00

Notes:

1. Variable labels: spt3 = Partner, spt13 = Australian society, spt9 = Nondeployed mates, spt8 = Deployed mates, spt7 = Friends, spt6 =Other family, spt4 = Siblings, spt2 = Father, spt1 = Mother, spt10 = Unit, spt11 = ADF agencies outside unit, spt12 = Government, bfc6 = emotional lability, bfc1 = depression/withdrawal, bfc2 = behavioural/mental anxiety, bfc3 = physiological anxiety, bfc4 = somatic complaints, bfc5 = hyper-arousal

2. Correlations above .12 were significant at the 0.05 level (2-tailed)
   Correlations above .16 were significant at the 0.01 level (2-tailed)

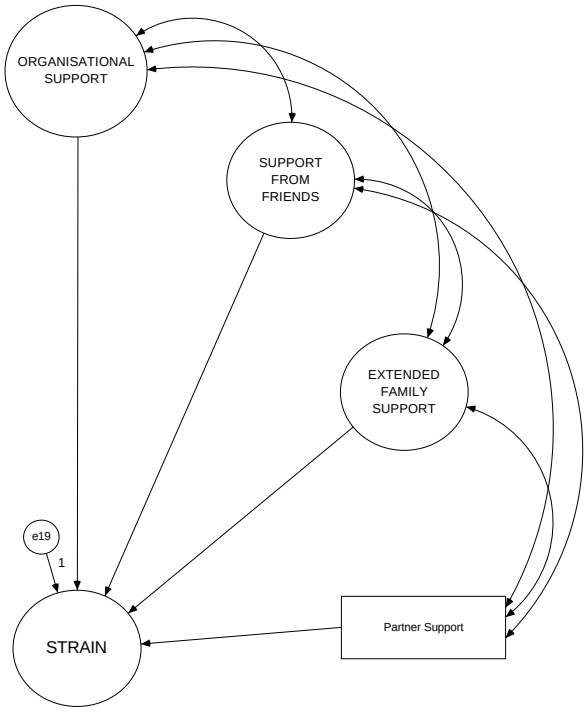

FIGURE 33 Simplified, hypothesised structural model predicting Strain from Deployment Social Support. (indicator variables not shown)

There were several strong positive correlations among the social support variables. Correlations between the social support and strain indicator variables were generally nonsignificant, with the exception of the 'Support from Australian Society' and 'Support from Deployed Mates' social support items. Assessment of model fit revealed that the initial model had mixed fit indices, including unacceptable chi-square and bootstrap *p* (χ^2 (126, N = 269) = 253.829, $p < .000$, bootstrap $p = .005$, $\chi^2/df = 2.015$, RMSEA = .062, SRMR = .050, GFI = .906, AGFI = .873, TLI = .926, CFI = .939). Modification indices suggested that model fit would be improved by fitting covariance pathways among several of the error terms for the indicator variables for the Strain latent variable, as well as between 'Mother' and Father' support items. The rationale for fitting error covariances to Strain indicator has been discussed previously. The fitting of an error covariance between the 'Mother' and Father' support items seemed reasonable as this probably reflected a broader perception of parental support among survey respondents. The results of the fitted model with standardised estimates are presented in Figure 34.

The re-specified model achieved improved fit, including an acceptable bootstrap *p* (χ^2 (121, N = 269) = 197.695, $p < .000$, bootstrap $p = .060$, $\chi^2/df = 1.634$, RMSEA = .049, SRMR = .045, GFI = .926, AGFI = .895, TLI = .954, CFI = .963). Only one pathway from the social support variables to Strain achieved a significant parameter estimate, that for Organisational Support. This indicated that higher levels of perceived organisational support were predictive of lower levels of postdeployment strain. All four indicator variables for Organisational Support (Unit, ADF agencies outside the unit, Government, and the Australian Society) achieved significant parameter estimates. The model accounted for 11.0% of the variance in Strain.

Multi-group analysis. Measurement invariance was tested via multi-group analysis by comparing the two postdeployment samples. A structural weights model was used. With two exceptions, fit indices were acceptable or better. It was notable that the bootstrap *p*, normed chi-square and RMSEA were each at desirable levels (χ^2 (259, N = 269/230) = 406.847, $p < .000$, bootstrap $p = .030$, $\chi^2/df = 1.571$, RMSEA = .034, SRMR = .050, GFI = .919, AGFI = .893, TLI = .950, CFI = .957). Therefore, it was concluded that the structural model held across the two samples. The amount of variance in Strain explained by the Sample 2 data for the unconstrained model decreased to 7.5% (from 11.0% for Sample 1).

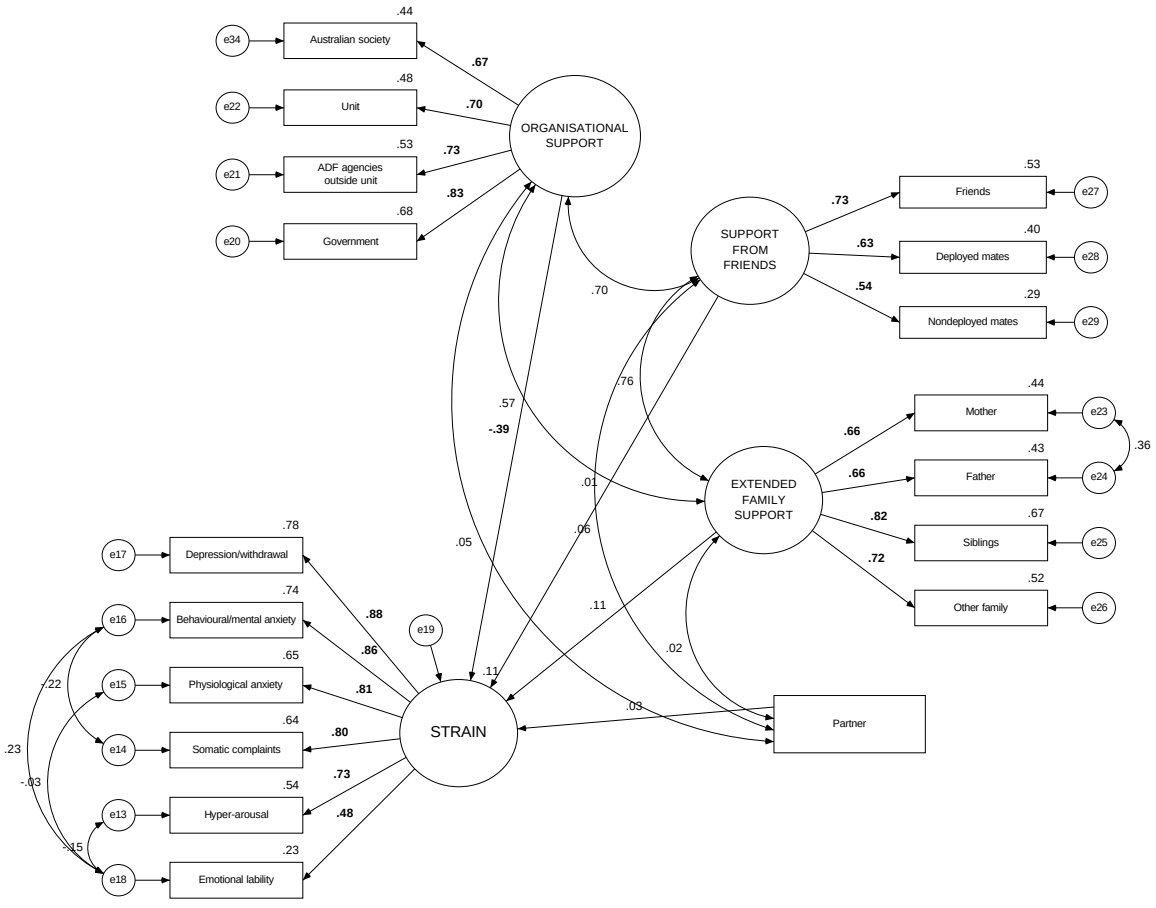

FIGURE 34 Fitted structural model predicting Strain from Deployment Social Support (Sample 1, n = 269).

The possibility of a higher order Social Support latent variable that bound the Social Support variables together was examined. Unlike the Unit Climate higher order factor in Chapter 4, various model re-specifications with the social support variables provided inadmissible solutions. These models are not reported here.

Model 3. The third structural model used to test Hypothesis 1 adopted the four components of the Homecoming Issues Scale as correlated exogenous latent variables to examine whether the experience of stressors following return from deployment predicted psychological distress as measured by the Strain latent variable. The simplified hypothesised model is depicted in Figure 35.

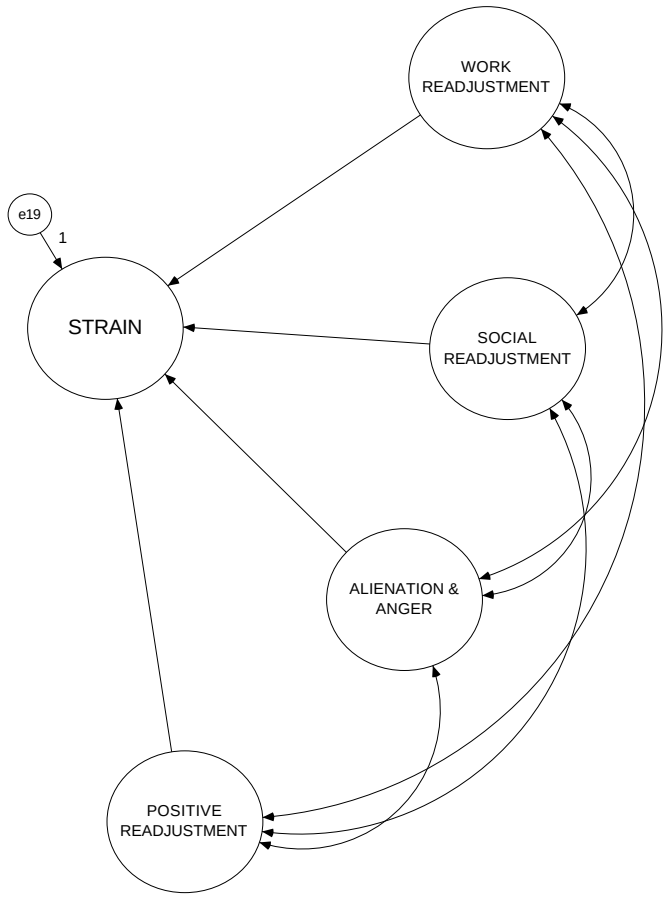

FIGURE 35 Simplified, hypothesised model predicting Strain from homecoming stressors. (indicator variables not shown)

Descriptive statistics for the observed variables in the model for Postdeployment Sample 1 are provided in Table 61. Intercorrelations for the model variables are provided in Table 62. Correlations between the items used as indicators of the three 'clinical' latent variables derived from the Homecoming Issues Scale ('Work Readjustment', 'Social Adjustment', and 'Alienation and Anger') were consistently high and positive, as were the correlations between these items and the Strain indicator variables. As expected, the indicator items for the 'Positive Adjustment' latent variable correlated generally negatively with variables from the other latent variables, although only a few of these correlations reached statistical significance.

TABLE 61
Descriptive Statistics for Model 3 Observed Variables (Sample 1, n=269)

Variable	Mean	Standard Deviation
bfc6 = Emotional lability	.36	1.015
bfc1 = Depression/withdrawal	6.93	6.464
bfc2 = Behavioural/mental anxiety	2.17	3.362
bfc3 = Physiological anxiety	1.74	2.251
bfc4 = Somatic complaints	4.08	3.164
bfc5 = Hyper-arousal	1.07	1.685
kh22 = Difficulties maintaining your usual work standards	1.00	1.121
kh3 = Difficulties maintaining interest at work	2.01	1.217
kh19 = Had a period of adjustment getting back into work	1.48	1.170
kh21 = Felt like dropping out of family life	.48	1.017
kh35 = Had serious arguments/conflicts with family/friends	.71	1.033
kh7 = Experienced marital or relationship problems	1.15	1.333
kh15 = Felt resentment over your treatment by others	.95	1.155
kh6 = Regretted having deployed	.51	.853
kh8 = Felt anger at the government	.49	.884
kh11 = Thought seriously of discharge to return to country of service	.39	.942
kh5 = Became interested in politics of the deployment	1.52	1.202
kh23 = Felt you changed for the better due to the deployment	1.67	1.203
kh4 = Felt family was proud of your service on deployment	2.87	.889

Assessment of model fit revealed that the initial model had mixed fit indices with four unacceptable indices and the bootstrap *p* barely acceptable (χ^2 (142, N = 269) = 342.130, $p < .000$, bootstrap $p = .010$, $\chi^2/df = 2.409$, RMSEA = .073, SRMR = .059, GFI = .884, AGFI = .845, TLI = .891, CFI = .909). Modification indices suggested that model fit would be improved by fitting covariance pathways among several of the error terms for the indicator variables for the Strain latent variable, as well as between items of the Social Readjustment latent variable. The rationale for fitting error covariances to Strain indicator has been discussed previously. The fitting of an error covariance between the Social Readjustment items seemed reasonable because the items appeared to reflect perceptions of interpersonal conflict. The results of the fitted model with standardised estimates are presented in Figure 36.

TABLE 62
Correlations for Model 3 Observed Variables (Sample 1, n=269)

Variable	kh23	kh4	kh5	kh7	kh35	kh21	kh11	kh8	kh6	kh15	kh19	kh3	kh22	bfc6	bfc1	bfc2	bfc3	bfc4	bfc5
kh23	1.0																		
kh4	.29	1.0																	
kh5	.25	.22	1.0																
kh7	-.05	-.08	.02	1.0															
kh35	-.06	-.06	-.03	.64	1.0														
kh21	-.01	-.19	-.01	.39	.64	1.0													
kh11	-.13	.00	-.01	.17	.31	.29	1.0												
kh8	-.11	-.04	-.05	.27	.31	.23	.26	1.0											
kh6	-.20	-.11	-.17	.38	.37	.30	.24	.29	1.0										
kh15	-.06	-.02	.00	.39	.39	.40	.36	.29	.37	1.0									
kh19	.14	.02	.04	.24	.33	.40	.21	.18	.24	.39	1.0								
kh3	-.01	-.02	.04	.23	.34	.37	.22	.26	.32	.45	.60	1.0							
kh22	-.08	-.08	-.04	.24	.36	.41	.24	.29	.33	.44	.63	.59	1.0						
bfc6	.00	-.01	-.15	.10	.29	.36	.25	.21	.23	.39	.22	.30	.30	1.0					
bfc1	-.13	-.11	-.09	.28	.47	.57	.31	.35	.26	.47	.60	.55	.61	.43	1.0				
bfc2	-.11	-.11	-.11	.23	.43	.56	.41	.34	.36	.48	.48	.39	.52	.53	.76	1.0			
bfc3	-.06	-.05	.02	.23	.36	.47	.29	.30	.21	.35	.43	.39	.41	.37	.68	.71	1.0		
bfc4	-.02	.00	-.06	.18	.33	.38	.23	.38	.18	.34	.41	.40	.43	.37	.71	.62	.66	1.0	
bfc5	-.12	-.10	-.07	.23	.34	.42	.27	.29	.19	.27	.40	.33	.40	.25	.67	.60	.61	.58	1.0

Notes:

1. Variable labels: kh23 = Felt you changed for the better due to the deployment, kh4 = Felt family was proud of your service on deployment, kh5 = Became interested in politics of the deployment, kh7 = Experienced marital or relationship problems, kh35 = Had serious arguments/conflicts with family/friends, kh21 = Felt like dropping out of family life, kh11 = Thought seriously of discharging to return to country of service, kh8 = Felt anger at the government, kh6 = Regretted having deployed, kh15 = Felt resentment over your treatment by others, kh19 = Had a period of adjustment getting back into work, kh3 = Difficulties maintaining interest at work, kh22 = Difficulties maintaining your usual work standards, bfc6 = Emotional lability, bfc1 = Depression/withdrawal, bfc2 = Behavioural/mental anxiety, bfc3 = Physiological anxiety, bfc4 = Somatic complaints, bfc5 = Hyper-arousal
2. Correlations above .12 significant at .05 level; above .16 significant at .01 level (2-tailed)

The re-specified model also achieved mixed but generally improved and acceptable fit indices (only two were unacceptable) (χ^2 (136, N = 269) = 270.781, p < .000, bootstrap p = .020, χ^2/df = 1.991, RMSEA = .061, SRMR = .052, GFI = .910, AGFI = .874, TLI = .923, CFI = .939). Three pathways from the homecoming stressor variables to Strain achieved significant parameter estimates, those from Work Readjustment (p < .001), Social Readjustment (p = .004), and Positive Adjustment (p = .05). The model accounted for an impressive 66.3% of the variance in Strain.

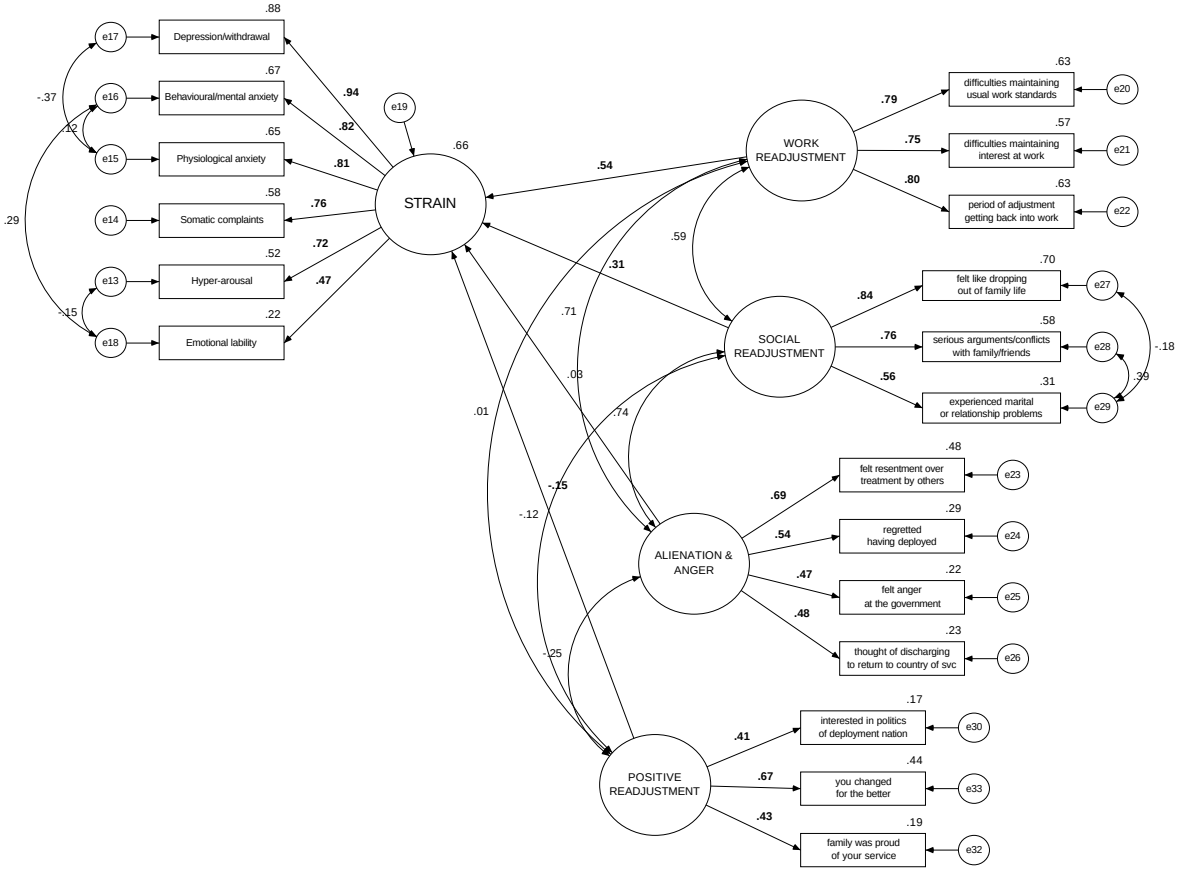

FIGURE 36 Fitted structural model predicting Strain from homecoming stressors. (Sample 1, n = 269)

Multi-group analysis. Measurement invariance was tested via multi-group analysis by comparing the two postdeployment samples. A structural weights model was used. Fit indices were again mixed, with four

indices in unacceptable ranges (including bootstrap *p*). On balance, this result was cautiously accepted. (χ^2 (290, N = 269/230) = 570.460, $p < .000$, bootstrap $p = .005$, $\chi^2/df = 1.967$, RMSEA = .044, SRMR = .057, GFI = .896, AGFI = .864, TLI = .907, CFI = .921). Therefore, it was concluded that the structural model held adequately across the two samples. The amount of variance in Strain explained by the Sample 2 data for the unconstrained model decreased to 51.5% (from 66.3% for Sample 1).

Combined structural model. In order to understand better the relative influence of the variables in the preceding structural models, the models examining Deployment Support and Homecoming Stressors were combined. The Postdeployment Social Support model was not included because four of the six items used in that model had been incorporated into the third structural model examining the stressors of postdeployment. Due to the preceding difficulties with the Immediate Family Support component variable used as one indicator of Deployment Support, it was deleted from this model. Instead, the Partner Support item was added to the Extended Family Support component variable, which was renamed 'Family Support.' The Child(ren) Support item was discarded from the model. An additional modification was to refer to the factors related to Homecoming Stressors in this model as 'Homecoming Adjustment' factors to better reflect the meaning inherent in the component variables. The simplified, hypothesised model is shown in Appendix AK. Postdeployment Sample 1 descriptive statistics for the observed variables in this model can be found in Tables 59 and 61. Intercorrelations for the observed variables in the model are provided as Table 63.

Assessment of model fit revealed that the initial model had six of nine inadequate fit indices ($\chi^2 = 798.386$, df = 406, $p < .000$, bootstrap $p = .005$, $\chi^2/df = 1.966$, RMSEA = .060, SRMR = .058, GFI = .842, AGFI = .808, TLI = .872, CFI = .889). Modification indices suggested that model fit would be improved by fitting covariance pathways among several of the

TABLE 63
Correlations for the Observed Variables in the Combined Structural Model (Sample 1, n=269)

	spt13	spt10	spt11	spt12	spt7	spt8	spt9	spt3	spt1	spt2	spt4	spt6	kh23	kh4	kh5	kh7	kh35	kh21	kh11	kh8	kh6	kh15	kh19	kh3	kh22	bfc6	bfc1	bfc2	bfc3	bfc4	bfc5
spt13	1.0																														
spt10	.37	1.0																													
spt11	.47	.54	1.0																												
spt12	.58	.57	.61	1.0																											
spt7	.38	.35	.29	.32	1.0																										
spt8	.38	.46	.33	.35	.49	1.0																									
spt9	.29	.35	.36	.33	.37	.31	1.0																								
spt3	.09	-.03	.11	.02	.04	.08	-.02	1.0																							
spt1	.29	.21	.26	.30	.42	.25	.17	-.02	1.0																						
spt2	.23	.30	.20	.29	.36	.30	.20	.06	.64	1.0																					
spt4	.35	.33	.28	.36	.47	.33	.33	.00	.57	.57	1.0																				
spt6	.41	.30	.32	.38	.47	.31	.43	.02	.45	.44	.57	1.0																			
kh23	.13	.16	.05	.15	.14	.19	.04	-.07	.15	.06	.12	.08	1.0																		
kh4	.38	.25	.29	.25	.31	.22	.20	.02	.32	.24	.38	.38	.29	1.0																	
kh5	.09	.13	.10	.15	.14	.17	.13	-.02	.15	.09	.15	.12	.25	.22	1.0																
kh7	-.05	-.16	.01	-.06	-.08	-.13	-.06	.16	-.14	-.08	-.19	-.03	-.05	-.08	.02	1.0															
kh35	-.13	-.22	-.06	-.16	-.14	-.17	-.11	.01	-.11	-.10	-.17	-.09	-.06	-.06	-.03	.64	1.0														
kh21	-.22	-.17	-.14	-.22	-.17	-.14	-.06	-.04	-.19	-.21	-.22	-.16	-.01	-.19	-.01	.39	.64	1.0													
kh11	-.07	-.17	-.11	-.09	.03	-.14	-.02	.06	.04	.07	.05	.06	-.13	.00	-.01	.17	.31	.29	1.0												
kh8	-.05	-.14	.04	-.16	.04	.06	.01	.04	-.02	-.04	-.05	.01	-.11	-.04	-.05	.27	.31	.23	.26	1.0											
kh6	-.10	-.26	-.15	-.22	-.17	-.20	-.12	.14	.02	-.02	-.09	-.11	-.20	-.11	-.17	.38	.37	.30	.24	.29	1.0										
kh15	-.07	-.28	-.16	-.08	-.13	-.21	-.17	.08	-.02	-.02	-.05	-.05	-.06	-.02	.00	.39	.39	.40	.36	.29	.37	1.0									
kh19	-.10	-.25	-.18	-.20	-.09	-.09	-.10	.04	.06	.07	-.08	.02	.14	.02	.04	.24	.33	.40	.21	.18	.24	.39	1.0								
kh3	-.15	-.26	-.18	-.25	-.01	-.12	-.08	-.02	.03	.06	-.01	-.03	-.01	-.02	.04	.23	.34	.37	.22	.26	.32	.45	.60	1.0							
kh22	-.13	-.24	-.13	-.18	-.06	-.17	-.08	.04	-.05	-.08	-.09	.00	-.08	-.08	-.04	.24	.36	.41	.24	.29	.33	.44	.63	.59	1.0						
bfc6	.02	-.18	-.11	-.09	.02	-.07	-.07	.03	.02	-.04	.01	.00	.00	-.01	-.15	.10	.29	.36	.25	.21	.23	.39	.22	.30	.30	1.0					
bfc1	-.19	-.27	-.19	-.25	-.12	-.15	-.08	-.04	-.08	-.06	-.15	-.06	-.13	-.11	-.09	.28	.47	.57	.31	.35	.26	.47	.60	.55	.61	.43	1.0				
bfc2	-.14	-.29	-.22	-.23	-.10	-.18	-.16	.01	-.07	-.08	-.09	-.08	-.11	-.11	-.11	.23	.43	.56	.41	.34	.36	.48	.48	.39	.52	.53	.76	1.0			
bfc3	-.12	-.16	-.12	-.20	-.05	-.08	-.08	-.01	-.04	.00	-.09	-.06	-.06	-.05	.02	.23	.36	.47	.29	.30	.21	.35	.43	.39	.41	.37	.68	.71	1.0		
bfc4	-.11	-.21	-.15	-.23	-.02	-.09	-.11	.05	-.01	.03	.01	-.02	-.02	.00	-.06	.18	.33	.38	.23	.38	.18	.34	.41	.40	.43	.37	.71	.62	.66	1.0	
bfc5	-.11	-.17	-.12	-.19	-.01	-.08	-.10	.03	-.07	-.08	-.11	.00	-.12	-.10	-.07	.23	.34	.42	.27	.29	.19	.27	.40	.33	.40	.25	.67	.60	.61	.58	1.0

Notes: 1. Variable labels can be found at Tables 59 and 61.
2. Correlations above .12 were significant at the 0.05 level (2-tailed); Correlations above .16 were significant at the 0.01 level (2-tailed)

error terms for the indicator variables for the Strain latent variable, as well as between items of the Social Readjustment, Positive Readjustment, Organisational Support and Family Support latent variables. The rationale for fitting error covariances to these variables has been discussed previously. The fitted model with standardised estimates is presented in Figure 38.

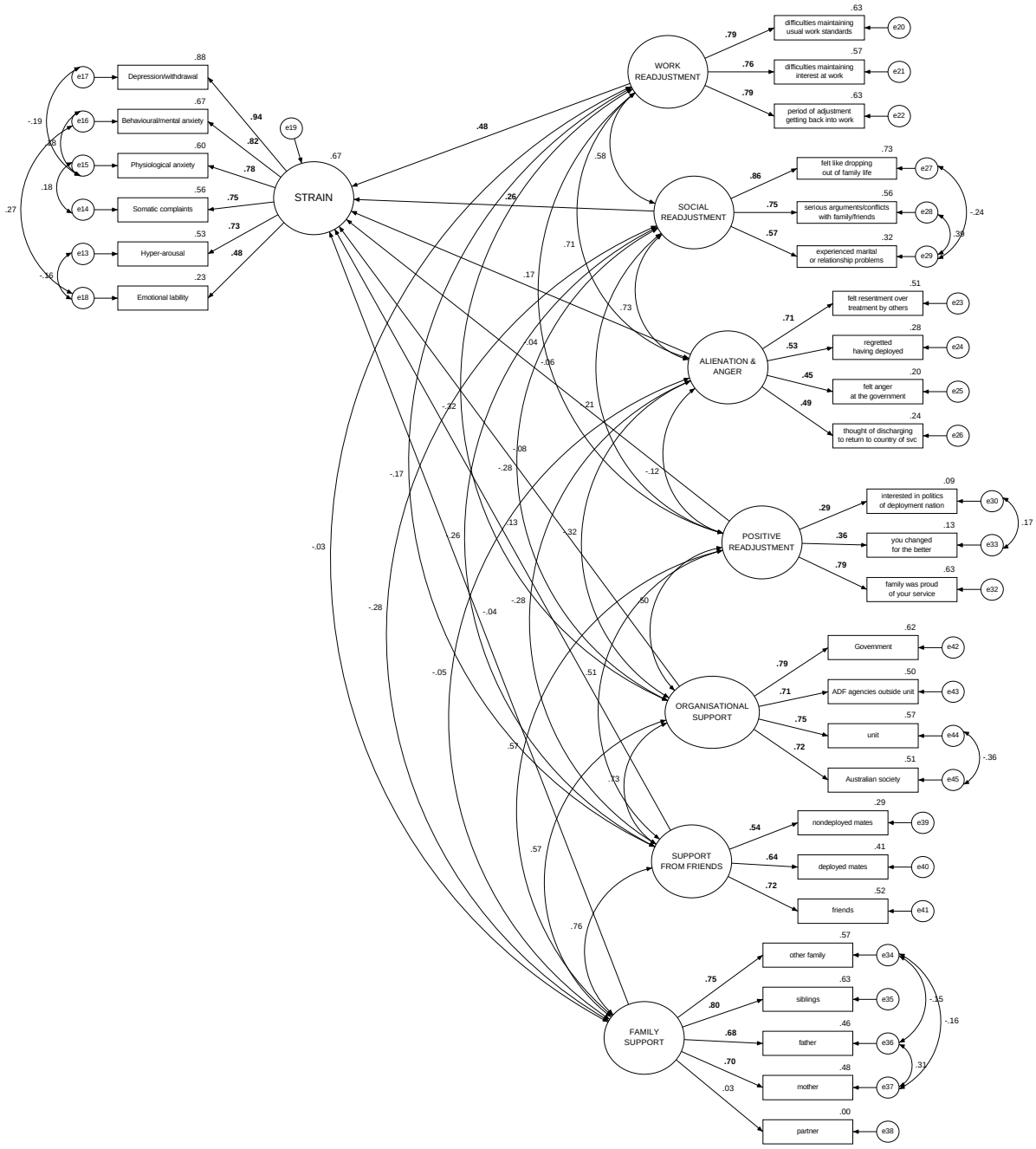

FIGURE 38 Fitted, re-specified structural model displaying standardised parameter estimates for the prediction of postdeployment strain from three deployment social support and four homecoming adjustment latent variables.

The re-specified model achieved improved and generally acceptable fit indices (chi-square, GFI and AGFI being the exceptions) (χ^2 = 665.138, df = 394, $p < .000$, bootstrap $p = .015$, $\chi^2/df = 1.688$, RMSEA = .051, SRMR = .052, GFI = .869, AGFI = .835, TLI = .909, CFI = .923). Two pathways from latent variables to Strain achieved significant parameter estimates, those from Work Readjustment ($p < .001$) and Social Readjustment ($p = .034$). The model accounted for an impressive 67.0% of the variance in Strain.

Multi-group analysis. Measurement invariance was tested via multi-group analysis by comparing the two postdeployment samples. A structural weights model was used. Fit indices were mixed (five in the acceptable or better ranges) but, in light of strong normed chi-square and RMSEA indices, were tentatively accepted (χ^2 = 1336.521, df = 818, $p < .001$, bootstrap $p = .005$, $\chi^2/df = 1.634$, RMSEA = .036, SRMR = .055, GFI = .857, AGFI = .827, TLI = .900, CFI = .912). Therefore, it was concluded that the structural model held adequately across the two samples. The amount of variance in Strain explained by the Sample 2 data for the unconstrained model decreased to 51.5% (from 66.3% for Sample 1).

Hypothesis 1 discussion. Hypothesis 1 was supported. The three structural models showed the significant influence of social support variables or homecoming adjustment issues on postdeployment strain. Two structural models, those examining postdeployment social support and social adjustment during the homecoming phase, accounted for substantial amounts of strain at postdeployment. With respect to Postdeployment Social Support, two social support variables – the level of interest in others in hearing about the deployment and a tendency towards social isolation – were predictive of higher levels of strain.

With respect to Deployment Social Support, only one latent variable, Organisational Support, had a significant relationship with postdeployment Strain. The indicator items contributing to the Organisational Support variable – the member's unit, ADF agencies outside the unit, the Australian government, and Australian society in general – might blur the distinction between two of Barrera's (1986) categories of social support, namely *perceived social support* and *enacted support.* Further, it could be argued that these forms of support are likely to be more material than social. However, in the context of the Homecoming Issues scale from which these items were drawn (see Appendix P, item 26), the respondent is asked to delineate level of perceived support. Although these sources of support are unlikely to reflect social support at the interpersonal level, they are plausible examples of social support at the organisational and wider societal levels.

Issues surrounding adjustment following return from deployment were the strongest predictors of postdeployment Strain. Three of the four Homecoming Stressors latent variables, namely Work Readjustment, Social Readjustment, and Positive Adjustment, were significant predictors of Strain in Postdeployment Sample 1 (although Positive Adjustment was not predictive in the second sample), accounting for 66.3% of explained variance in Strain in Sample 1 and 51.5% in Sample 2.

In the combined structural model, factors related to homecoming adjustment continued to predict significantly postdeployment psychological status with respect to strain. However, the role of social support was less clear. When Deployment Social Support and Homecoming Adjustment latent variables were integrated into this single structural model, the influence of Deployment Social Support on postdeployment Strain was negligible. It should be noted that items singled out in Model 1 to indicate the influence of Postdeployment Social Support were part of the Homecoming Adjustment latent variables. For example, the Social

Readjustment latent variable, which significantly contributed to the prediction of Strain, is essentially a measure of level of social support from family and friends.

The strongest predictor of Strain in the combined model was Workplace Adjustment. This result suggests that commanders potentially have an important role to play in postdeployment adjustment by monitoring and actively enhancing the well-being of returned Service personnel in the workplace. How long this period remains linked to the process of psychological readjustment is not apparent from these results, but is certainly worthy of further research.

A number of additional structural models that included combinations of higher order factors were tested but each failed to achieve acceptable model fit. The models included a higher order 'Homecoming Readjustment' factor that was indicated by the four latent variables derived from the Homecoming Issues Scale, and/or a higher order 'Deployment Social Support' factor that was indicated by the three social support latent variables. The detail of this modelling is not reported here.

Hypothesis 2.

The experience of serious stressors on deployment will predict postdeployment psychological status.

Analysis overview. To test Hypothesis 2, two separate structural models will be developed, tested, and re-specified as appropriate. The first model will examine the influence of the experience and impact of major stressors encountered during deployment on the Strain latent variable used in previous analyses. The second model will examine the influence of major stressors during deployment on a Traumatic Stress Symptoms latent variable.

Model 1. The three variables derived from the Experience of Major Stressors Scale (as detailed in the Method section) were used as correlated exogenous variables in this model. The same endogenous 'Strain' variable was used as a measure of postdeployment psychological status. The hypothesized model is illustrated in Appendix AL. Descriptive statistics for the observed variables in the model are provided in Table 64.

Correlations between the three independent variables, which measured frequency of exposure, immediate impact, and chronic impact of PTEs, were each significant at the $p<.01$ level and ranged between .55 and .80 (see Table 65). Correlations between the three independent variables and the indicator variables of the Strain latent variable were low but significant (ranging up to .248), with the exception of correlations with Emotional Lability and Somatic Complaints, which did not reach significance.

TABLE 64
Descriptive Statistics for Hypothesis 2 Model 1 Observed Variables (Sample 1)

Variable	Mean	Standard Deviation
PTEChr (Chronic Impact of PTEs)	2.29	5.343
PTEImp (Total Impact of PTEs)	5.41	7.520
PTEFre (Total Frequency of PTEs)	10.99	8.851

Note: Strain variable descriptives are available in Table 61

TABLE 65
Correlations for Hypothesis 2 Model 1 Observed Variables (Sample 1)

Variable	PTEChr	PTEImp	PTEFre	bfc6	bfc1	bfc2	bfc3	bfc4	bfc5
PTEChr	1.0								
PTEImp	.798	1.0							
PTEFre	.551	.700	1.0						
bfc6	.075	.056	.056	1.0					
bfc1	.248	.223	.210	.432	1.0				
bfc2	.160	.159	.104	.526	.759	1.0			
bfc3	.167	.141	.132	.374	.683	.706	1.0		
bfc4	.087	.104	.091	.372	.709	.622	.657	1.0	
bfc5	.242	.219	.154	.250	.672	.604	.609	.576	1.0

Notes: 1. Strain variable labels can be found in Table 59; PTE variable labels in Table 64.
2. Correlations above .13 were significant at the 0.05 level (2-tailed); Correlations above .16 were significant at the 0.01 level (2-tailed)

Assessment of model fit revealed that the initial model had adequate fit indices if bootstrap *p* was taken into consideration (χ^2 (24, N = 269) = 62.107, $p < .000$, bootstrap $p = .015$, $\chi^2/df = 2.588$, RMSEA = .077, SRMR = .039, GFI = .953, AGFI = .912, TLI = .959, CFI = .973). Once again, however, modification indices suggested that model fit would be improved by fitting covariance pathways among several of the error terms for the indicator variables for the Strain latent variable. These were fitted and the model retested. The fit indices were much improved, including a desirable chi-square (χ^2 (20, N = 269) = 21.712, $p = .356$, $\chi^2/df = 1.086$, RMSEA = .018, SRMR = .030, GFI = .983, AGFI = .961, TLI = .998, CFI = .999). It was apparent that while the model fitted the data from Postdeployment Sample 1, the amount of variance explained in Strain was small (5.8%) and none of the pathways from the Traumatic Stress variables had estimates that reached statistical significance (see Figure 39). The

pathway from the PTEs Chronic Impact variable had a regression coefficient that was approaching significance (p = .08).

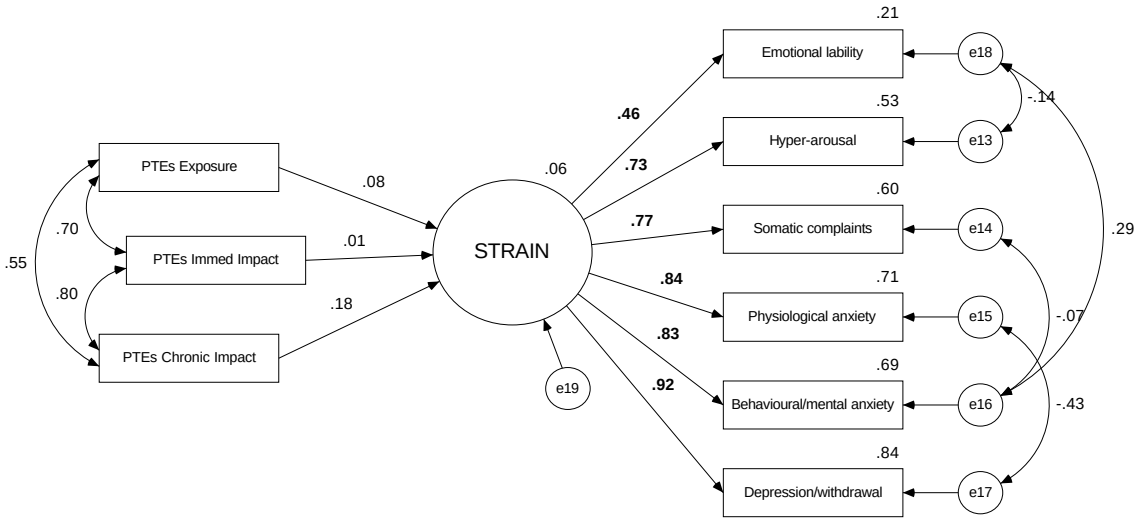

FIGURE 39 Re-specified and fitted structural model predicting postdeployment Strain from three traumatic stress variables (Sample 1, n = 269).

Multi-group analysis. A test of measurement invariance via multi-group analysis (structural weights model) using the two post-deployment samples resulted in very satisfactory fit indices (χ^2 = 74.260, df = 48, *p* = .009, bootstrap *p* = .368, χ^2/df = 1.547, RMSEA = .033, SRMR = .035, GFI = .968, AGFI = .940, TLI = .982, CFI = .988). It was concluded that the model fitted the data across both samples. The amount of variance in Strain explained by the Sample 2 data for the unconstrained model increased slightly to 7.5%. In addition, the path from the PTEs Chronic Impact variable to Strain was significant for the Sample 2 data (*p* < .001). Overall, the variables associated with traumatic stress did not predict or explain postdeployment Strain to any meaningful degree.

Model 2. In this model, the three variables derived from the Experience of Major Stressors Scale were retained as independent variables. The Strain latent variable was replaced by another measure of

postdeployment psychological status – Traumatic Stress Symptoms derived from the Service Experiences Scale. The Traumatic Stress Symptoms latent variable was intended to represent more serious symptoms associated with posttraumatic stress. The Traumatic Stress Symptoms latent variable had four indicator variables: Disruptive Impact of Traumatic Memories, Social and Emotional Impairment, Functional Impairment, and Normal Adjustment. The hypothesised model is shown as Figure 40.

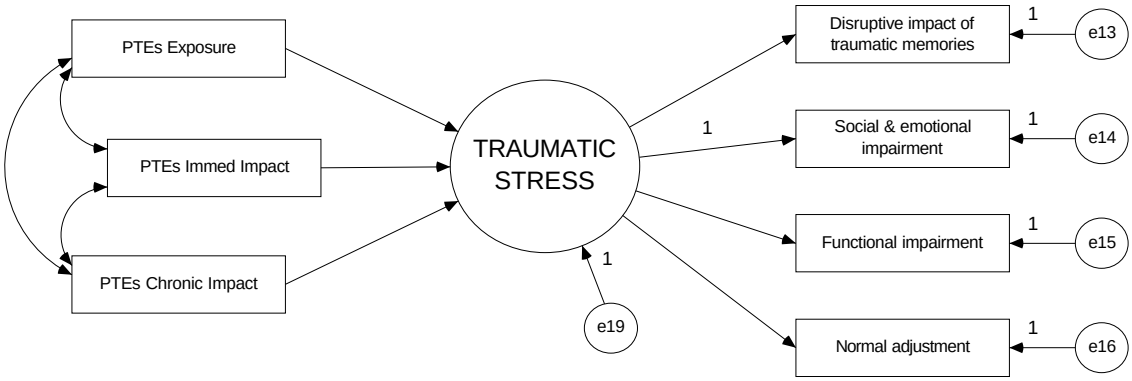

FIGURE 40 Hypothesised structural model predicting postdeployment Traumatic Stress Symptoms from three traumatic stress variables.

Descriptive statistics and correlations for the model variables are provided in Tables 66 and 67 respectively. The correlation matrix shows that the Functional Impairment and Normal Adjustment variables did not correlate with the traumatic stressor variables, although they did correlate significantly with each other and, in all but one instance, with the other two traumatic stress symptom variables, Disruptive Impact of Traumatic Memories and Social and Emotional Impairment.

TABLE 66
Descriptive Statistics for Hypothesis 2 Model 2 Observed Variables (Sample 1)

Variable	Mean	Standard Deviation
PTEChron: Chronic Impact of PTEs	2.29	5.343
PTEImp: Total Impact of PTEs	5.41	7.520
PTEFreq: Total Frequency of PTEs	10.99	8.851
sesf1a: Disruptive Impact of Traumatic Memories	7.24	3.509
sesf2a: Social & Emotional Impairment	9.18	4.114
ses3a: Functional Impairment	5.53	2.656
ses4a: Normal Adjustment	11.21	2.970

TABLE 67
Correlations for Hypothesis 2 Model 2 Observed Variables (Sample 1)

Variable	PTEChron	PTEImp	PTEFreq	sesf1a	sesf2a	sesf3a	sesf4a
PTEChron	1.0						
PTEImp	.798**	1.0					
PTEFreq	.551**	.700**	1.0				
sesf1a	.663**	.544**	.488**	1.0			
sesf2a	.281**	.228**	.244**	.551**	1.0		
sesf3a	.073	.063	.044	.319**	.629**	1.0	
sesf4a	.071	-.013	-.031	.100	.150*	.140*	1.0

Notes: 1. Variable labels are described in Table 66
2. * denotes significance at .05 level; ** denotes significance at .01 level (2-tailed)

The fit indices for the model using Postdeployment Sample 1 data were very poor (χ^2 (11, N = 269) = 157.221, $p < .000$, bootstrap $p = .005$, $\chi^2/df = 14.293$, RMSEA = .223, SRMR = .136, GFI = .870, AGFI = .669, TLI = .674, CFI = .829). Stepwise implementation of modification indices that indicated the fitting of covariance pathways among several error terms

of the Traumatic Stress indicator variables resulted in either negative variance occurring or a covariance matrix that was not positive definite.

Despite reluctance on the part of the researcher to delete variables from structural models, the only way to achieve an admissible outcome was to omit the Disruptive Impact of Traumatic Memories variable, which was indicated by the regression weights modification indices section of the AMOS output. A covariance pathway was also fitted between the error terms for the Social and Emotional Impairment and the Functional Impairment variables. This resulted in a strongly fitting model (χ^2 (5, N = 269) = 8.716, p = .121, χ^2/df = 1.743, RMSEA = .053, SRMR = .034, GFI = .989, AGFI = .955, TLI = .982, CFI = .994) that accounted for 15.6% of the variance in Traumatic Stress. However, the deletion of the variable (sesf1a) that had by far the strongest correlations with the independent variables in the model (see Table 67) was considered unsatisfactory and prompted a reformulation of the structural model.

In the re-designed model, latent indicator variables were developed to replace the composite component variables that had been derived from the Service Experiences Scale. The simplified model without indicator variables is shown as Figure 41. Sample 2 data were utilised to test the model. Descriptive statistics and correlations for the variables in the model are provided in Tables 68 and 69 respectively. One pattern evident among the intercorrelations was that the PTEChron variable had the strongest and largest number of significant correlations with the Traumatic Stress indicator variables.

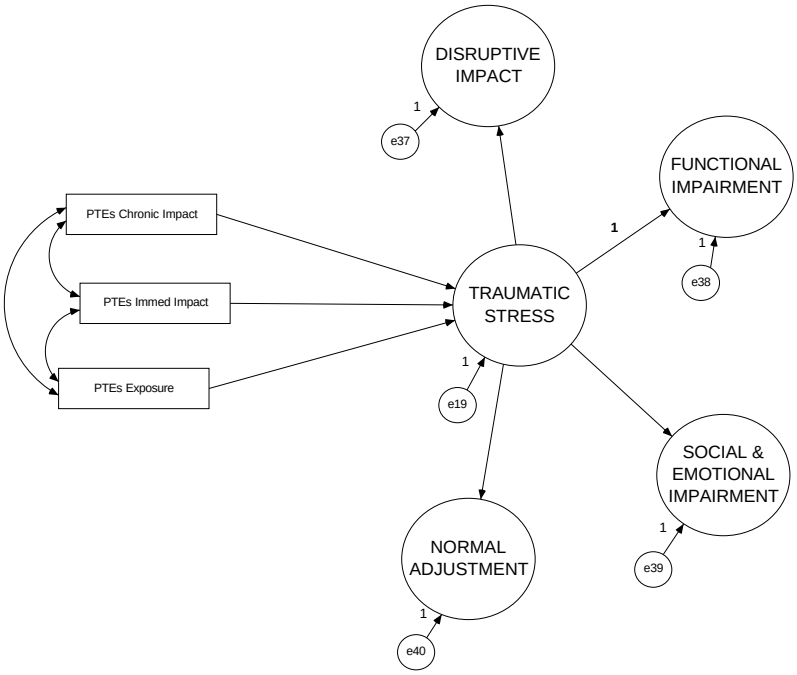

FIGURE 41 Simplified, re-designed structural model predicting postdeployment Traumatic Stress Symptoms. (indicator variables not shown)

TABLE 68
Descriptive Statistics for Redesigned Structural Model Variables (Sample 2)

Variable	Mean	Std. Deviation
Find myself thinking about negative or disturbing events	1.42	.730
Seem to prefer to be on my own these days	1.80	.936
Have a hard time expressing my feelings	1.88	1.044
Think positively ref another operational deployment	3.70	1.245
Lose my cool and explode over minor things	1.51	.824
Still enjoy things that I used to enjoy	3.74	1.254
Seem to have lost my feelings	1.57	.872
Sometimes things remind me of a disturbing experience	1.48	.845
Enjoy the company of others	3.86	.930
My performance at work is not what it used to be	1.67	.973
Many of my friendships have lost their meaning	1.53	.839
Find it hard to motivate myself to do my work	1.87	1.018
Things have happened that I would rather not talk about with anyone	1.53	.895
Have trouble concentrating on tasks	1.47	.786
Find myself trying not to think of upsetting things	1.44	.795
PTEs Total Frequency	11.07	9.826
PTEs Total Impact	4.96	7.089
PTEs Total Chronicity	1.67	3.574

TABLE 69
Model Variable Correlations (Postdeployment Sample 2)

	PTE Chron	PTE Impact	PTE Freq	d19	d15	d32	d18	d3	d22	d20	d13	d21	d33	d29	d6	d34	d14	d5
PTEChron	1.0																	
PTEImpact	.642	1.0																
PTEFreq	.465	.707	1.0															
d19	.181	.085	.111	1.0														
d15	.362	.196	.105	.510	1.0													
d32	.249	.099	.017	.374	.526	1.0												
d18	.183	.058	.025	.306	.523	.495	1.0											
d3	-.015	.097	.098	-.163	-.175	-.228	-.094	1.0										
d22	-.123	.034	.076	-.159	-.205	-.260	-.141	.276	1.0									
d20	-.137	-.035	-.024	-.280	-.277	-.212	-.217	.353	.286	1.0								
d13	.210	.075	.136	.315	.474	.389	.308	-.114	-.088	-.216	1.0							
d21	.170	.044	-.005	.309	.372	.424	.416	-.179	-.188	-.254	.388	1.0						
d33	.210	.129	.165	.364	.355	.363	.335	-.130	-.079	-.459	.376	.480	1.0					
d29	.202	.121	.086	.389	.441	.327	.442	-.090	-.125	-.296	.405	.455	.485	1.0				
d6	.423	.260	.195	.287	.438	.331	.247	-.076	-.194	-.126	.293	.268	.172	.294	1.0			
d34	.458	.357	.309	.299	.420	.356	.322	-.044	-.197	-.140	.328	.301	.324	.347	.518	1.0		
d14	.371	.239	.210	.397	.434	.387	.324	-.118	-.151	-.155	.311	.346	.290	.306	.602	.535	1.0	
d5	.370	.302	.250	.421	.348	.220	.182	-.038	-.056	-.151	.242	.220	.259	.277	.606	.463	.578	1.0

Notes:

1. Variable descriptions: d19 - Lose my cool and explode over minor things; d15 - Have trouble concentrating on tasks; d32 - My performance at work is not what it used to be; d18 - Find it hard to motivate myself to do my work; d3 - Still enjoy things that I used to enjoy; d22 - Think positively ref another operational deployment; d20 - Enjoy the company of others; d13 - Seem to have lost my feelings; d21 - Many of my friendships have lost their meaning; d33 - Seem to prefer to be on my own these days; d29 - have a hard time expressing my feelings; d6 - Find myself trying not to think of upsetting things; d34 - Things have happened that I would rather not talk about with anyone; d14 – I find myself thinking about negative or disturbing events; d5 - Sometimes things remind me of a disturbing experience.
2. Correlations above .12 were significant at the 0.05 level (2-tailed); Correlations above .16 were significant at the 0.01 level (2-tailed)

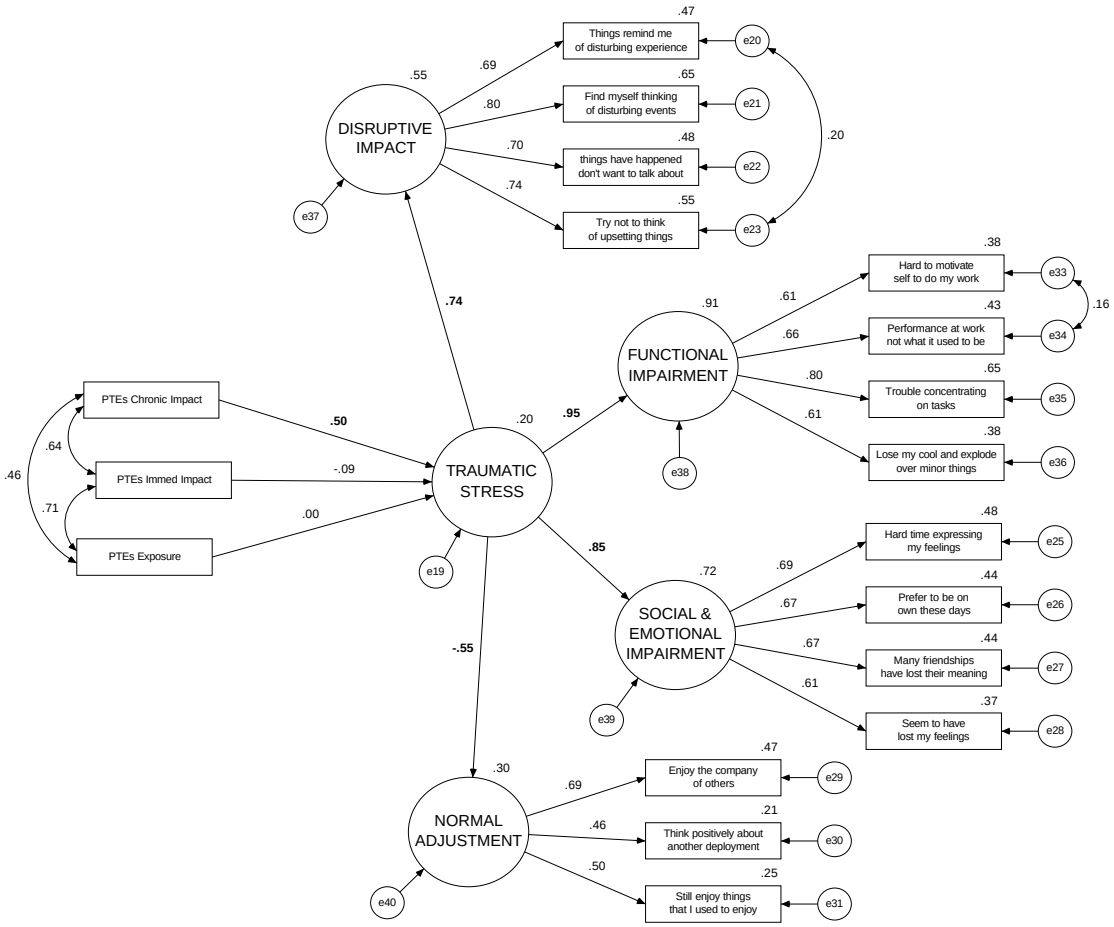

FIGURE 42 Re-specified and fitted structural model predicting postdeployment Traumatic Stress Symptoms (Sample 2).

The model was re-specified slightly to improve fit after initial testing. Re-specification entailed the fitting of two error term covariances, one between two indicator variables of the Disruptive Impact latent variable, and one between two variables of the Functional Impairment latent variable (see Figure 41). The fit indices for this model were generally satisfactory (with one exception if the acceptable bootstrap *p* is considered to over-ride chi-square) (χ^2 (126, N = 230) = 218.487, $p < .000$, bootstrap $p = .034$, $\chi^2/df = 1.734$, RMSEA = .057, SRMR = .069, GFI = .903, AGFI = .868, TLI = .924, CFI = .937). Explained variance in Traumatic Stress Symptoms was 20.4%. All pathways between the Traumatic Stress

Symptoms latent variable and the four indicator latent variables had significant regression weights, which was consistent with the patterns evident in the bivariate correlations. The Chronic Impact of PTEs was the only independent variable to predict significantly Traumatic Stress Symptoms. Once again, this result was consistent with the pattern of bivariate correlations. The fact that the Chronic Impact of PTEs predicted Traumatic Stress Symptoms is not surprising because both are measures of current psychological status. What is surprising is that the variables that measured exposure to and immediate impact of potentially traumatic stressors during deployment did not predict postdeployment psychological status.

Multi-group analysis. Measurement invariance was tested via multi-group analysis by comparing the two postdeployment samples. A structural weights model was used. Fit indices were mixed, with five unacceptable (χ^2 (269, N = 230/269) = 589.952, $p < .000$, bootstrap p = .002, χ^2/df = 2.193, RMSEA = .049, SRMR = .078, GFI = .882, AGFI = .849, TLI = .899, CFI = .911). Therefore, it could not be concluded with confidence that the redesigned structural model held across the two samples. Half the amount of variance in Traumatic Stress Symptoms was explained by the Sample 1 data (9.5% compared to 20.4% for Sample 2).

Hypothesis 2 discussion. The hypothesis that the experience of serious stressors on deployment will predict postdeployment psychological status was only partially supported. Testing of Model 1 revealed that the experience of serious (potentially traumatic events) stressors during deployment did significantly predict postdeployment Strain but not to a meaningful level (5 and 7.5% in the two samples). Testing of Model 2 showed that the experience of serious stressors during deployment predicted postdeployment Traumatic Stress Symptoms, but only in one sample, and only after the deletion of a variable to achieve model fit, which is likely to change the nature of the latent trait. Further, the only variable that was

significantly predictive of Traumatic Stress Symptoms was Chronic Impact of PTEs, which is essentially a measure of strain, rather than a stressor variable.

The difficulties in achieving adequate fit for Model 2 led to a revised structural model using four latent variables to measure a higher order Traumatic Stress Symptoms factor. Results with this model for one sample were reassuring. All four indicator latent variables contributed significantly to the Traumatic Stress Symptoms factor in this model in a manner consistent with the pattern of bivariate correlations. In addition, 20% of variance in this factor was accounted for by the predictor variables. Unfortunately, once again, only the Chronic Impact of PTEs variable was significantly predictive of Traumatic Stress Symptoms. Level of exposure to PTEs during deployment and the immediate psychological impact of these exposures did not predict postdeployment adjustment.

These results raise serious questions about the construct validity of the Experience of Major Stressors Scale. In addition, the measure of serious stress symptoms used in the HDO project, the Service Experiences Scale, warrants further psychometric scrutiny to confirm its intended utility.

These inconsistent outcomes suggested that there are other factors at play that moderate or mediate the stressor-strain relationship. It is these postulated factors that are the focus of the third hypothesis in this chapter.

Hypothesis 3.

Leadership effectiveness, proximal leader behaviour, cohesion, morale, and social support will mediate the postdeployment stress-strain relationship.

This hypothesis was tested using one structural model. The simplified structural model is shown in Figure 43. A depiction of the hypothesised model containing all indicator variables is provided in Appendix AM. The model contains seven latent variables, all of which have been used in previous analyses in this or earlier chapters. The Stressors latent variable was derived from the five component variables of the Demands of Service Scale (nonoperational version). Leadership Effectiveness, Proximal Leader Behaviour, Cohesion, and Morale were derived from the individual-level-of-analysis outcomes from the Unit Climate Profile PCA (see Table 16 in Chapter 3, p. 144). The Social Support latent variable adopted five indicator variables used in Hypothesis 1 of this chapter to measure aspects of perceived social support – or its absence – during the homecoming period. A Strain latent variable was used to measure postdeployment psychological status. Strain was derived from the six component variables from the Symptoms Checklist (Modified). Due to the inconclusive outcomes in Hypothesis 2, a traumatic stress symptoms variable was not included in the model.

Not all possible pathways were included in the model between the starting point of the model – the Stressors latent variable – and the main outcome latent variable that measured psychological status (Strain). Pathways between Social Support and the three unit climate factors of Cohesion, Leadership Effectiveness, and Proximal Leader Behaviour were omitted because Social Support was considered to represent external-to-the-unit sources of support, whereas Cohesion, Leadership Effectiveness, and Proximal Leader Behaviour were considered internal sources of social support. Sample 2 data initially were used to test model fit.

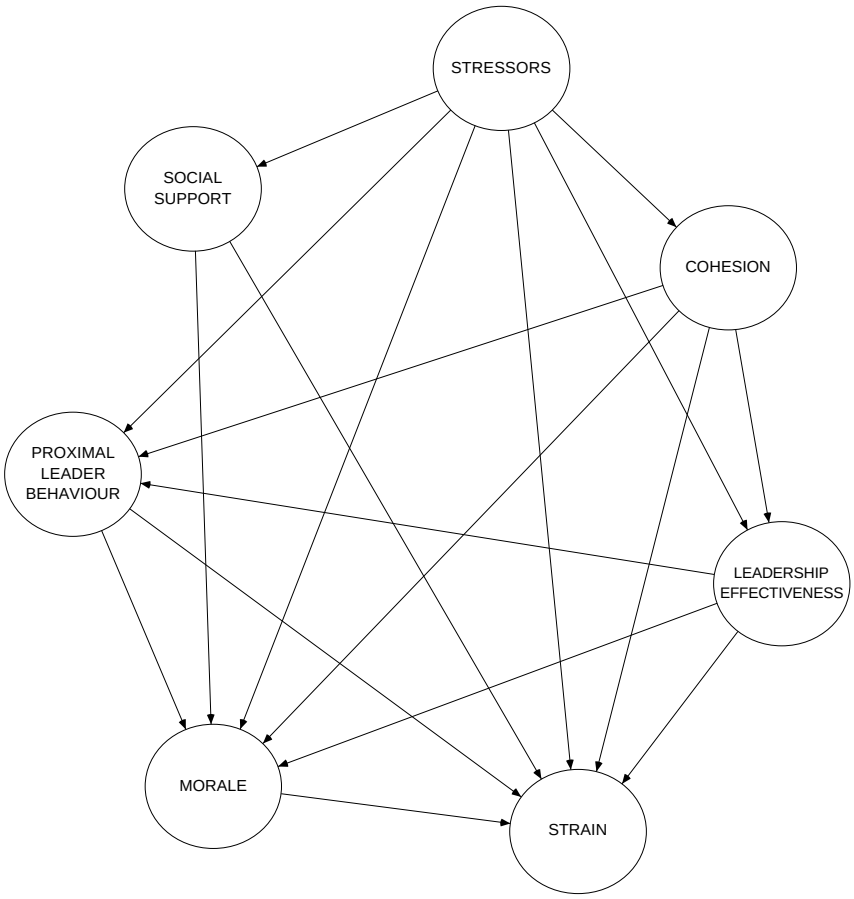

FIGURE 43 Simplified structural model examining potential buffering factors in the stress-strain relationship during the postdeployment phase. (indicator items omitted)

Initial fit indices for the model were largely unsatisfactory (χ^2 (269, N = 230) = 914.275, $p < .000$, bootstrap $p = .005$, $\chi^2/df = 2.182$, RMSEA = .072, SRMR = .086, GFI = .796, AGFI = .758, TLI = .833, CFI = .850). A process of re-specification was conducted as previously described. With one exception, the process entailed fitting covariance paths between error terms of indicator variables belonging to the same latent variable. The exception to this process was the deletion of the 'Operational Stressors' variable from the Stressors latent variable, in response to the AMOS regression weights modification indices. Removal of this item made conceptual sense because the items making up this composite variable were related to environmental stressors of the field training environment that

were not likely to have been encountered by survey respondents early in the postdeployment period when the HDO postdeployment surveys are typically administered.

Fit indices for the re-specified model were largely acceptable (six of nine acceptable indices, including the bootstrap *p*) (χ^2 (374, N = 230) = 597.605, $p < .000$, bootstrap $p = .015$, $\chi^2/df = 1.598$, RMSEA = .051, SRMR = .062, GFI = .854, AGFI = .818, TLI = .915, CFI = .927). Eleven of the 18 pathways in the model had significant regression coefficients. These are displayed in Figure 44. Explained variance in Strain was 60.1%.

The model revealed highly significant pathways from Stressors to Leadership Effectiveness and Social Support. Less significant pathways led from Stressors to Proximal Leader Behaviour and Cohesion. Interestingly, there was no direct path between Stressors and Strain for this sample. Leadership Effectiveness appears to be a hub variable, because it has highly significant paths to the other three unit climate variables: Proximal Leader Behaviour, Cohesion, and Morale. There is also a highly significant path from Proximal Leader Behaviour to Cohesion, indicating that all levels of unit leadership contribute to cohesiveness among unit personnel. There was a path from Proximal Leader Behaviour to Morale that was approaching significance ($p = .071$). A highly significant path led from Cohesion to Morale. Cohesion also had a significant effect on Strain. The path relationship between Morale and Strain was only trending towards significance ($p = .062$). Interestingly, Social Support had the strongest direct impact on Strain ($p < .001$). A figure with the model outcomes in detail is provided in Appendix AN. It was encouraging that all variables in the model played a role in buffering the relationship between Stressors and Strain. Social Support and Leadership (represented by two latent variables) appeared to be the most influential variables. The wording of the social support items meant that lower levels of social support fostered adverse psychological status.

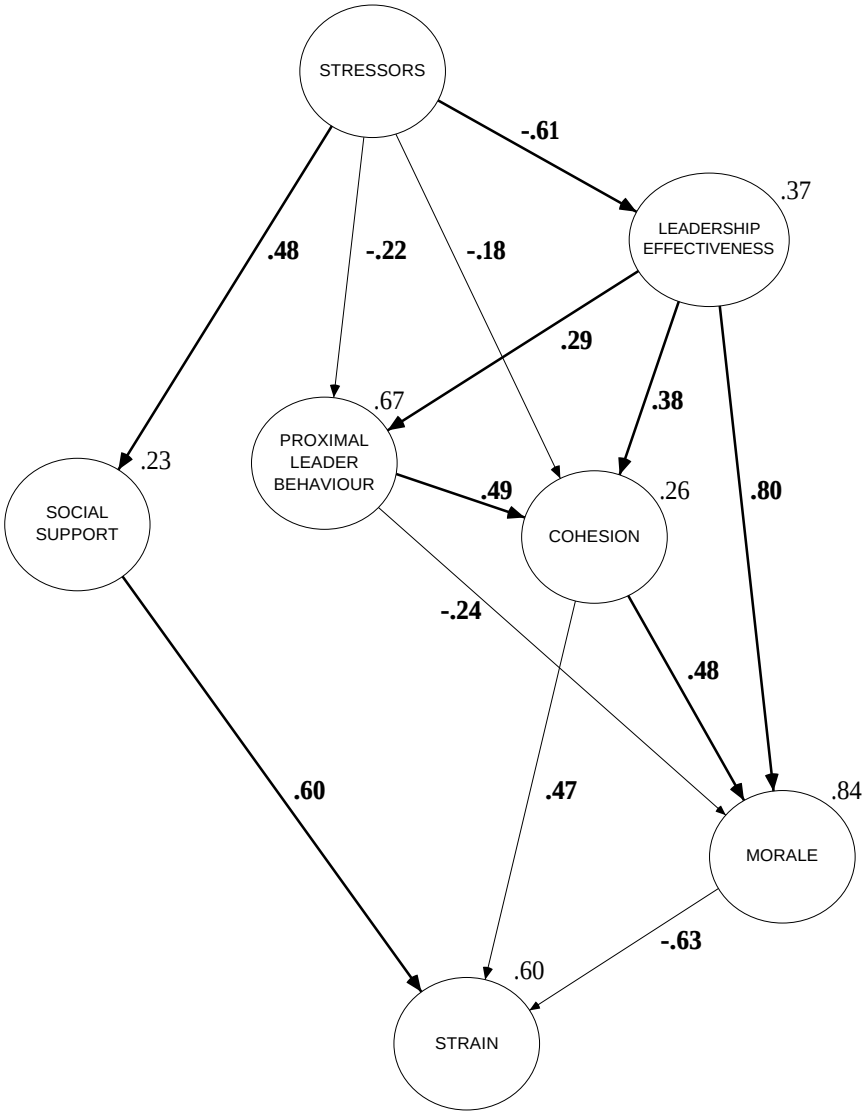

FIGURE 44 Re-specified structural model displaying significant pathways.(Postdeployment Sample 2).

Note: The thickest paths have regression coefficients significant at the $p < .01$ level; middle thickness indicates regression coefficients significant at $p < .05$ level; thin paths indicate regression coefficients trending towards significance ($p < .08$)

Multi-group analysis. Measurement invariance was tested using the two postdeployment samples. Six fit indices for the structural weights model were in the acceptable ranges, including bootstrap p (χ^2 (789, N = 230/269) = 1373.001, $p < .000$, bootstrap $p = .010$, $\chi^2/df = 1.740$, RMSEA = .039, SRMR = .067, GFI = .850, AGFI = .818, TLI = .905, CFI = .914).

Therefore, it was concluded that the structural model held adequately across the two samples. A similar amount of variance in Strain was explained by the Sample 1 data (69.3% compared to 60.1% for Sample 2).

Hypothesis 3 discussion. The hypothesis that the unit climate factors of Leadership Effectiveness, Proximal Leader Behaviour, Cohesion, and Morale) would mediate the postdeployment stress-strain relationship was strongly supported. Social support also had a strong buffering effect on strain in that higher levels of social support fostered better psychological status.

Chapter Summary and Conclusions

The findings in this chapter have confirmed that there are compelling reasons why the ADF must maintain and enhance its postdeployment support programs. The level of stressors encountered during the homecoming phase predicted levels of postdeployment strain. Further, social support was perhaps the strongest buffering factor of strain. By encouraging supportive social environments and providing adequate social support resources, the ADF is likely to benefit from reduced strain in members during postdeployment transition. Reduced strain is likely to have associated benefits such as happier families, quicker readjustment to garrison duties, and higher retention (Bolton et al., 2002; Deans, 2001; Figley, 1993; Mateczun & Holmes, 1996; Peebles-Kleiger & Kleiger, 1994; Wisecarver, Cracraft, & Heffner, 2006).

Another finding, that potentially traumatic exposures and serious stress symptomatology did not feature in models of the stressor-strain relationship during postdeployment is consistent with observations by Bliese and Castro (2003) that traumatic stress did not feature as an important issue for the majority of peacekeeping veterans (in their case, those from the United States). This finding has important implications. It suggests that there should be a balance between programs designed for serious

maladjustment and those designed for the 'normal' challenges of the transition phase following return from deployment (Murphy, 2000). Most members will not experience serious stress reactions in relation to the types of peacekeeping duties that HDO respondents have encountered, but they are likely, nonetheless, to benefit from appropriate forms of support. This outcome appears to support Stressor Transition Theory (see Rothberg, Harris, Jellen, & Pickle, 1985). This theory has posited that when people move or transition to a new physical environment, their health and wellbeing is adversely affected. According to this theory, neither location nor duration is important, just the transition process itself is sufficient to generate stress. For the postdeployment samples in this research, self-reported strain did not feature the more clinical symptoms or potentially traumatic event exposures; rather, more mundane concerns and physical symptoms were paramount.

Of course, if the nature of the deployment experience changes, these results may not generalise to more recent operations. There are cogent indications that the nature of current operations in the Middle East Area of Operations (Iraq, Afghanistan) are intrinsically different from the Peace Support Operations that are represented in the HDO data used for this dissertation (Di Nicola et al., 2007; Engelhard, Huijding, van den Hout, & de Jong, 2007; Engelhard & van den Hout, 2007; Hoge et al., 2004; Hotopf et al., 2006; Hughes et al., 2005; Kolkow, Spira, Morse, & Grieger, 2007). Further HDO research with ADF personnel deployed to these contemporary operations would appear to be an imperative if we are to better understand the human dimensions and psychological impacts of these more intense and dangerous operations.

Social support external to the unit is known to be important to postdeployment readjustment. Moljord, Fossum and Holen (2003) have postulated that the quality of the social infrastructure available to military personnel during deployment will determine the strength of the buffer

capacity ascribed to social networks. This suggests that commanders in peacekeeping contingents (and presumably any deployment context) specifically need to develop supportive social environments during deployment. The results of the Hypothesis 1 analyses showed that, of the four domains of perceived social support during deployment, the source labelled 'organisational support' was the strongest predictor of strain (increasing levels of perceived support were associated with lower strain). Considerable research has demonstrated significant links between perceived organisational support and positive behavioural outcomes such as attendance, work performance, organisational citizenship behaviours, commitment, and role ambiguity (Thomas & Castro, 2003). The items reflecting organisational sources of support this chapter were the member's military unit (presumably including nondeployed personnel back in Australia providing support to families), wider ADF support agencies, the Australian government and Australia society in general. This finding has identified the need to increase the scope of the Human Dimensions of Operations model, in that individual, team, and unit levels should be examined, but also higher organisational levels, both internal and external to Defence.

The moderating effects on strain of unit climate factors, notably (senior) leadership effectiveness, proximal leadership behaviour, cohesion, and morale were found. That team cohesion can serve as a moderating effect similar to social support is not surprising, and adds further impetus to the need to design and foster the implementation of practical, feasible and culturally appropriate interventions to nurture horizontal cohesion. Strong cohesion is likely to protect soldiers further from adverse reactions to the stressors of deployment. The pivotal role of leadership to positive unit climate and the psychological well-being of personnel was a welcome finding, and one that provides empirical evidence for what is generally considered a military axiom.

The results also support Murphy's (2001) call for interventions designed to enhance postdeployment transition to be integrated into a model of support that encompasses the entire deployment cycle. Strong cohesion, effective leadership, and a positive social climate should be germane to all occupational environments, not just in the military during particular phases of the deployment cycle. The evidence that social support and a positive psychological climate in the military unit will moderate the impact of homecoming stressors, and perhaps the delayed impact of the stressful events encountered during deployment, reinforces the ADF's acknowledged duty of care to prevent or at least minimise the psychological ill-effects of the stress associated with deployment and homecoming.

These results confirm that commanders have an important role to play in the management and prevention of stress during homecoming. In particular, the behaviour of the proximal leader appears to have the most potential to ameliorate the adverse impacts on psychological status during the postdeployment phase. Of course, the behaviour of commanders at all levels will plainly demonstrate the level of genuine concern and support the organisation has for the well-being of its members. Research into organisations has consistently found that the employee's belief about the organisation's commitment to them is a key factor in moderating the effect of work-related stress (e.g., see Jones, Flynn, & Kelloway, 1995).

Command actions to foster adjustment during the transition phase following deployment could include (a) attempting to allow a gradual transition from the operational environment and/or the tempo of operations, (b) regular reminders of what the previous deployment accomplished (i.e., fostering a sense of meaning regarding the mission), (c) giving priority upon return to Australia to member/family reintegration, (d) continued encouragement of formal ceremonies and other forms of recognition, and (e) the provision of meaningful nonoperational roles (Murphy, 2003). Special attention should be given to the needs and

adjustment of members who are likely to have limited postdeployment sources of support. This often applies to Reserve members who typically do not have regular contact with their military units following return from deployment (Orme, 2008). Discharge surveys should be routinely administered and analysed to capture the reasons why many service personnel elect to leave the Services shortly after returning from operational deployment.

Once again, the research has demonstrated that an understanding of stressors, strain, and the human factors within units can provide potentially useful information to commanders and policy makers who want to enhance the well-being, and presumably the performance and commitment, of Service members. The findings suggest that stressors related to the postdeployment transition phase, rather than stressors encountered during deployment, have the strongest impact on the adjustment of peacekeeping veterans. Future research, incorporating a longitudinal design, is needed to confirm such a thesis.

Chapter 7

CONCLUSION

The Human Challenges of Peace Support Operations

> *I thought I'd prepared myself for seeing dead people - being in the military and going on a mission that was purely to support a hospital. You ask yourself shed-loads of questions about how this could happen. I just went numb. I didn't get angry until later.*
>
> Australian Army Senior Non-commissioned Officer,
> Reflecting on his reactions to witnessing the Kibeho massacre, Rwanda

The numerous human challenges of peace support operations provide extraordinary opportunities for researchers to apply psychological principles to an important, real-world domain. In particular, the study of military personnel on peacekeeping operations allows the profession of psychology to demonstrate the value of applied human science in responding to issues of capability, functioning, and mental health in complex, demanding, and potentially hazardous operational settings. As Adler and Britt (2003) noted in the concluding chapter to their edited book, *The Psychology of the Peacekeeper*:

> Whether viewed at the individual, small group, or organizational level, the issue of peacekeeper motivation, health, and performance sets the stage for psychologists to ask key questions: What is it we already know about psychology that can provide us insight? What is it we still need to know? What new methodological or interdisciplinary techniques do we need to consider in order to address issues unique to peacekeepers? (p. 313).

The complexity of peace support operations has allowed numerous constructs and theories from a broad range of fields within the behavioural sciences to be applied to these 'natural laboratories'. This thesis has examined measures and models of psychological climate and human factors in relation to occupational stressors and strain using transactional stress theory to underpin a macro-theoretical framework called the Human Dimensions of Operations model. In doing so, the research has addressed issues typically associated with several major fields within psychology, notably social, organisational, health, and clinical psychology. The thesis has also demonstrated the practical value of incorporating multiple levels of analysis in organisational settings. The importance of understanding both the organisational and situational contexts of research has been highlighted.

The purpose of this concluding chapter is to briefly review the findings of the dissertation's component studies, to integrate these outcomes into overall conclusions, to provide recommendations regarding the application and dissemination of the results, to discuss the limitations of the research, and to propose areas and topics for future research.

Chapter Summaries

Chapter 2 – The development of suitable measures. In addition to detailing the methodology underpinning this research, the chapter showed the psychometric development of several instruments used in the Human Dimensions of Operations project. Most of these scales began development during the author's tenure as a research psychologist in the Operational Effectiveness Section of the Canadian Forces' Personnel Research Team. While it was recognised that the creation of new scales is not normally advisable when relevant scales exist, it became apparent that, at that time, there were few available instruments that were suitably tailored to explore the issues and stressors that characterised peace support operations. Castro (2003) reported that the same dilemma arose when studying U.S. peacekeepers deployed to Kosovo in the late 1990s –

appropriate scales simply did not exist, so his research team developed scales to examine the unique experience of peacekeeping in that country.[1]

A major focus of this dissertation therefore was the validation of these new measures and the demonstration of their utility in predictive models that examined stress and performance issues related to peacekeeping operations. The specific scales introduced in Chapter 2 were (1) the Demands of Military Service Scale, which was intended to measure an expansive domain of the stressors associated with the military occupation (with separate versions for deployed and non-deployed situations), (2) the Symptoms Checklist (Modified), a measure of the frequency of psychological, physical, and behavioural indices of distress, (3) the Experience of Major Stressors Scale, which was designed to explore the frequency and psychological impact of serious (potentially traumatic) events associated with peacekeeping, (4) the Service Experiences Scale, which was intended to capture more serious stress outcomes and issues of functional impairment associated with potentially traumatic experience, (5) the Homecoming Issues Scale, which explores the stressors of the homecoming period and a number of important issues of reintegration for service personnel returning from deployment, and (6) the Positive Aspects of Deployment Scale, which was designed to measure experiences postulated to foster personal meaning during deployment and promote successful adaptation following deployment. Each scale proved to have a meaningful component structure and adequate subscale reliabilities. The cornerstone measure of the Human Dimensions of Operations project, the Unit Climate Profile (UCP), was the focus of the third chapter.

Chapter 3 – Developing a measure of psychological climate.

The UCP was designed as a multi-dimensional measure of psychological

[1] Since that time, psychologists from many Western nations have collaborated in the development of common measures relevant to human dimensions research in military contexts (e.g., Castro, 2000) in order to reduce duplication of effort, allow the comparison of findings across nations, and foster the potential for collaborative research in coalition operations.

climate in military units. Its conceptual development and psychometric validation was reported. In many respects, the UCP is the central measure of the Human Dimensions of Operations project because it spans all components of the conceptual model underlying this research. For example, certain dimensions of unit climate, such as morale, conceivably could act in multiple roles such as being a stressor (low morale), a moderator (medium to high morale), and an outcome (low, medium, or high morale) of the transactional stress process. Furthermore, the UCP was designed to provide certain measures at three levels of the organisation: the individual, the work team, and the unit.[2] It was concluded that the UCP has a robust, multi-dimensional structure that is conceptually concordant with its theoretical development and design. In addition, the component structure of the UCP changed in meaningful ways according to its level of analysis: individual or group.

Chapter 4 – Psychological readiness for operations.

Traditionally, the military has rarely attempted to measure the human dimensions of operational readiness. This chapter provided evidence for two dimensions of psychological readiness, namely individual readiness and collective readiness at the level of the military unit. Theoretically derived psychological readiness models for both dimensions were tested. Regression models showed that human dimensions constructs were the most powerful predictors of readiness when compared to biographical and health-related variables. In particular, regression analyses examining the associations between human dimensions constructs and psychological readiness at the collective level showed strong relationships.

[2] From a pragmatic perspective, the Unit Climate Profile has proven to be effective in providing commanders with an objective understanding of the human factors within their unit across the stages of deployment. This information has been utilised to design a range of management interventions in response to the impact of operational stressors on the psychological and functional status of deployed personnel. The Unit Climate Profile is, in essence, a new tool in the commander's decision-making toolkit.

Structural Equation Modelling (SEM) also resulted in meaningful models with adequate statistical fit for both individual and collective readiness. Military experience, health-related behaviours, and the latent climate constructs of Proximal Leader Behaviour and Cohesion had significant influence in models predicting individual psychological readiness. The latent climate constructs of Proximal Leader Behaviour, Cohesion, and Morale had significant influence in models predicting collective readiness. Models with a higher order factor that bound the human dimensions latent variables were tested for both individual and collective readiness. In each case, the higher order factor proved to have strong explanatory power and the resultant pathways reflected more closely the associations between variables that were evident in bivariate correlations. However, the most compelling structural model examining collective psychological readiness suggested that perceptions of readiness at the group level, along with horizontal cohesion (Team Climate) and vertical cohesion (Ethos), were antecedent to morale.

Broadly, the SEM results showed that psychological readiness can be modelled meaningfully using latent constructs, particularly the climate constructs measured by the Unit Climate Profile. Explained variance for collective readiness was consistently greater than for individual readiness. These outcomes added credence to the postulation that a distinction between self-efficacy and psychological readiness can be drawn, in that readiness for deployment has multiple levels (individual, team, and unit), reflecting the importance of individual and group performance in the military.

Although multi-group analyses generally showed that structural models were consistent across samples, it was evident that distinctive patterns existed between groups for several variables. The examination of group differences was not the aim of this dissertation. It is intended that future research into the human dimensions of operations will examine to

what degree situational differences (e.g., deployment status; stressors encountered), respondent characteristics (individual differences), and unit differences (particularly in unit climate factors) explain the relationships within the HDO data. A practical recommendation arising from these apparent group differences is that each unit would benefit from a unit climate assessment prior to – and during – deployment so that the unique constellation of human factors in that unit, at that time, could be assessed in order to provide advice to command.

The results regarding psychological readiness also raised questions about the interrelationships among stressors, psychological climate factors such as cohesion, morale, and leadership, and strain. These interrelationships during deployment were the focus of the fifth chapter.

Chapter 5 - Psychological resilience during deployment. This chapter examined factors that may account for resilience during deployment, in particular, the psychological climate variables postulated to buffer the effects of deployment stressors on strain. Complementary analytical approaches revealed strong dose-response relationships between the stressors of military service and strain during deployment on peace support operations. Different stressor domains affected different human dimensions variables in distinct ways. Most notably, there was a strong trend for workplace stressors and concerns about organisational support to rank as the most influential stressor domains.

A structural model showed a synergistic mediatory pathway among the human dimensions latent variables of Proximal Leader Behaviour, Leadership Effectiveness, Cohesion, Meaning, and Morale that buffered the impact of stressors on psychological status. Senior leadership appeared to be pivotal to this resilience pathway. Collectively, the results of this chapter suggested that the important ingredients of psychological resilience during

operational deployment are effective leadership (at all levels), a sense of purpose or personal meaning, work team cohesiveness, and strong morale.

Chapter 6 - Psychological readjustment following deployment. The results of this chapter suggested that the stressors specific to the postdeployment transition phase, rather than stressors encountered during deployment, have the strongest impact on the postdeployment adjustment of the majority of peacekeeping veterans. The level of stressors encountered during the homecoming phase predicted levels of postdeployment strain whereas potentially traumatic stressors encountered during deployment did not.

There was strong evidence that, during the postdeployment transition phase, sources of social support and a positive psychological climate in the unit will moderate the impact of homecoming stressors. Once again, Senior Leadership appeared to be pivotal to this resilience pathway and Morale had a powerful moderating effect on Strain. All latent variables played a moderating role in the Stress-Strain relationship.

Collectively, the findings in this chapter indicated that military commanders have an important role to play in the management and prevention of stress during homecoming. Of the homecoming issues latent variables, Workplace Adjustment was the strongest predictor of postdeployment psychological status. Presumably commanders have an important role in fostering adjustment in the workplace. Furthermore, the behaviour of the proximal leader appears to influence cohesion and morale, which both have direct effects on Strain.

Potentially traumatic exposures and serious stress symptomatology did not feature in models of the stressor-strain relationship during postdeployment, suggesting that there should be a balance between the delivery of programs designed for serious maladjustment and those designed for the 'normal' challenges of the transition phase following return from

deployment. Most members do not experience serious stress reactions, but they are likely, nonetheless, to benefit from appropriate forms of support, particularly the strengthening of social supports.

Overall Conclusions

First and foremost, the outcomes of this research have demonstrated that an understanding of the human factors within military units within the context of the stressors-strain relationship can provide potentially useful information to commanders and policy makers who want to enhance the well-being, performance, and commitment of Service members involved in the cycle of deployment for peace support operations.

This research has represented the initial steps of an evolutionary process. Relevant and reliable measures have been developed and tested with a number of samples of Australian military personnel deployed as peacekeepers. A critical first step, the ability to identify the range of unique and general stressors associated with peacekeeping, has been achieved. The Demands of Service Scale and the Experience of Major Stressors Scale appear to offer satisfactory domain coverage. The two measures of strain, the Symptoms Checklist (Modified) and the Service Experiences Scale, achieved psychometric outcomes that were conceptually concordant and they contributed to meaningful statistical outcomes. The Unit Climate Profile was especially useful, contributing numerous military climate constructs for analysis.

Another evolutionary step has been to test several micro-theoretical models within the context of the broader Human Dimensions of Operations model. In particular, the delineation of moderators of adjustment and performance during peacekeeping operations has been achieved, consistent with Britt and Adler's (2003) call for specific research on this topic. Over time, as more data are collected, as measures are refined, and as the interrelationships between constructs, situations, and

events are clarified, more and more elements of the macro-theoretical model underpinning this research can be examined.

Consistent with the positivistic philosophy of the researcher, findings in this research have suggested that potentially traumatic stressors tend to be relatively inconsequential to psychological status compared to more mundane stressors such as issues of organisational support and workplace demands. This finding, that ordinary stressors commonly examined in the occupational stress literature are most important, is not new (see Halverson, Bliese, Moore, & Castro, 1995). Dobson and Marshall (1997) emphasised that stress management programs must target both the occupational and/or traumatic stressors of the operational theatre as well as any subsequent postdeployment stress reactions. Yet there is a continuing tendency for human research in the military to focus on issues of trauma and pathology. Perhaps the findings in this dissertation, its interest in positive coping (resilience), and its emphasis on teams and larger organisational groups (in addition to individuals), will help to redress the imbalance of attention between exotic, traumatic stressors and the everyday hassles and challenges that military personnel encounter in garrison and during deployment.

A positivistic approach seems more important than ever, given the increasing recognition that post-event psychological interventions such as critical incident stress debriefing (Everly & Mitchell, 1997) are frequently ineffective and may even increase the incidence of subsequent psychological problems (Deahl, 2000; Piercy, 1997; Rose, Bisson, & Wessely, 2003). Therefore, proactive efforts to enhance resilience within a positive psychology framework may represent more effective expenditure of command and support resources (Bartone, 2006). The advantages of prevention over cure do not need elaboration here. In addition, it is noted that preventative approaches to stress management tend to be compatible with military culture (Murphy, 2003).

Fortunately, there is growing acceptance within many Western military organisations of the need to actively prevent the detrimental impacts of operational service. This interest in preventing serious stress reactions stems from a number of concerns: operational effectiveness, humane regard for the wellbeing of personnel, retention, and legal considerations such as compensation. Much of this preventive effort is delivered in the form of stress inoculation or stress exposure activities (Driskell & Johnston, 1998; Driskell, Salas, Johnston, & Wollert, 2008; Wilson, Braithwaite, & Murphy, 2003), resilience training (Cohn & Pakenham, in press), support programs for families, and a variety of reactive interventions such as critical incident mental health support that contain preventive elements. These efforts strive to enhance the abilities of personnel and their families to manage the various stressors of deployment by fostering intrinsic coping skills and providing external support resources. However, to be maximally effective, these preventive programs and strategies must be based on an awareness of the variety of stressors inherent in operational service.

Two relatively novel research questions explored in this thesis were the potential buffering role of personal meaning (or sensemaking) and perceived social support from agents external to the workteam (as distinct from workteam cohesion) in the stressor-strain relationship. Both variables were shown to have important buffering effects – personal meaning during deployment, and perceived social support from external sources following the return home. These promising results suggest that each of these constructs warrants further research in its own right in order to refine tools for their measurement and to define further their influence as moderating agents.

The broad support for the various hypotheses in Chapters 4 through 6 has lent support to the value of the transactional stress model chosen as the bedrock theory of this research. Various moderators have been identified to support the concept of an intervening component of

subjective appraisal that encompasses evaluations of the extent of a perceived threat in light of the resources available to meet associated demands. These moderators are consistent with reigning military doctrine and fundamental principles that presume human factors such as morale, cohesion, and leadership are fundamental to the effectiveness of military units.

The construct of morale and its role in the transactional process proved to be particularly intriguing. Morale was the most inconstant factor in the analyses conducted. It satisfactorily fitted models where it was either antecedent or superordinate to psychological readiness. Yet it did not contribute to models where several other climate constructs proved to be influential. These inconsistent results mirror the frustrations expressed in a recent review of the construct (Liefooghe, Jonsson, Conway, Morgan, & Dewe, 2003), which concluded that the definition and measurement of morale remained problematic. Nevertheless, there is widespread acknowledgment in military circles that morale is a key ingredient in military performance, is relevant to all military members, and is positively associated with other highly desirable climate factors such as cohesion and esprit de corps. It is not yet the time to abandon the construct of morale.

The adoption of a higher order 'Unit Climate' factor postulated to bind several human dimensions variables drawn from the UCP-A generated pathways among these latent variables that reflected well the associations evident in bivariate correlations. Future research should examine further the efficacy of such higher order climate factors in the prediction of other dependent variables.

Application and Dissemination of Results

The results have affirmed that leaders have an important role to play in the management and prevention of stress during all stages of the deployment cycle. Therefore, select findings need to be promulgated widely

to reach leaders across the ADF. One opportunity to achieve wide distribution is a forthcoming publication entitled *FOCUS on Human Performance in Land Operations.* Like a sister publication, *FOCUS on Human Factors in Aviation* (Murphy, 2005), this publication will eschew an academic style in order to be engaging and culturally appropriate to its intended audience. The military is renowned for its professional development activities and resources, and a number of in-house publications would be suitable for appropriately tailored papers on select findings from this thesis and the broader Human Dimensions of Operations project.

The value to commanders of the information afforded by Human Dimensions surveys needs to be given a higher profile. The potential role for psychologists as command consultants in nurturing effective psychological climates within units appears to be feasible if the Human Dimensions project is widely implemented. However, to ensure that the promise of this command support can be delivered, adequate resources need to be obtained, in order to streamline data collection, analysis, and reporting. Many military psychologists would benefit from specific guidance with respect to the delivery of Human Dimensions reports to commanders (Castro, 2007). At the risk of making psychologists 'invisible agents' in the process (Koocher, 2007), the provision of an automated system of psychological climate appraisals would offer efficient use of psychology resources and encourage commanders to be more autonomous agents in the management of human resources in their units.

In terms of the practical application of specific findings from this research, four recommendations are evident. These recommended actions are intended to optimise peacekeeper adjustment and performance through leadership at all levels, including operational commanders, trainers, policy makers, and planners.

Firstly, foster meaning throughout the deployment cycle. Consistent with previous studies (Bartone, Adler, & Vaitkus, 1998; Britt, Adler, & Bartone, 2001) this thesis found that belief in the mission can act as a stress buffer. Placing the operation in a meaningful context, for example, by letting peacekeepers know how their participation will lead to desirable consequences can foster positive attitudes toward peace support operations. Therefore, it is important to communicate to personnel the indicators of mission success (Adler & Britt, 2003).

Secondly, foster psychological preparedness. Ensure adequate predeployment training for the challenging situations that peacekeepers are likely to encounter. Other factors that appeared to foster a sense of individual efficacy for peacekeepers were level of general military experience, self-care behaviours, and the human factors of morale and horizontal cohesion. Factors found in this research to foster a sense of collective efficacy were a cohesive team climate, a strong sense of identification with the unit, the effectiveness of the senior leadership in the unit, and the behaviour of the proximal leader.

Thirdly, provide leaders with the knowledge and skills to moderate the impact of various stressors. Although many deployment stressors cannot be avoided, there appear to be factors that promote psychological resilience in the face of adversity and challenge. Commanders should be made aware of the factors, situations, and leadership tasks that have the greatest potential to generate or alleviate particular concerns. For example, the impact of senior leadership compared to the proximal leader appears to increase during deployment relative to the predeployment stage. However, Dallaire (2000) has lamented that, increasingly, senior leaders are drawn into their offices in response to deployment crises, presumably to "answer phone calls from higher headquarters or to write reports to 'cover all the bases' " (p. 46). As discussed above, a sense of meaning – the fostering of which is another function of leadership - was found to contribute to resilience during

deployment. To encourage such leadership behaviours, commanders should be made aware that these presumed relationships have empirical support.

Fourthly, encourage social support from outside the military unit during deployment. The attention of commanders during deployment is often focussed on operational exigencies so that other matters may be neglected. The findings herein have suggested that perceptions of support from external sources such as the Australian society, the Australian government, and ADF support agencies act collectively as stress moderators during and after deployment. Commanders should be reminded routinely of the potential positive influence of such sources and hence the importance of fostering their support. Other such sources presumably could include the media and non-government agencies. In this light, it is noteworthy that the U.S. has recently suspended its longstanding program of encouraging children to write letters to a 'G.I.'[3] on active duty. The program was suspended due to concerns about terrorists utilising the program to target military personnel with contaminants such as anthrax via these letters.

Limitations of the Research

For as long as surveys have been used in research, survey research methodology has been subjected to psychometric criticism about issues of response biases, sampling errors, the role of memory in survey response, context and experience effects, comprehension, response scales, and the cognitive models underpinning survey response processes (e.g., Babbie, 1990; Tourangeau, Rips, & Rasinski, 2000). Survey research has also been described as impersonal, static (although computer-based surveys are increasingly adaptive), and tending to oversimplify the complexities of human thought, emotion, opinion, and attitude. Nevertheless, survey research

[3] G.I. refers to the term 'General Issue' soldier in the U.S.. Initially a label of endearment for the basic infantry soldier in the World Wars, it has come to encapsulate the U.S. Serviceperson generally, in much the same way that the collective label 'Digger' refers affectionately to the Australian Serviceperson.

continues to prosper, not least because it is easily administered, relatively inexpensive, prompt, and has wide user acceptance.

Moreover, Krosnick (1999) has argued the merits of survey research, and suggested that recent findings have challenged long-standing prejudice against survey studies with low response rates, demonstrated that innovative techniques for pre-testing questionnaires have improved measurement validity, suggested there are optimal approaches to scale labelling, and postulated that measurement error attributed to social desirability response bias may have been exaggerated. Survey research appears to be technically resurgent. Nevertheless, it is recommended that future Human Dimensions research adopt a more balanced mix of research methods: surveys, interviews, focus groups, supervisor ratings, archival information, and field observations.

A shortcoming in data collection for the Human Dimensions of Operations project has been the lack of consistent sampling across the deployment cycle within units. It had been expected that the use of a self-generated participant identification code would have ensured a sufficient proportion of identified respondents across survey administrations to enable longitudinal analyses. However, predeployment samples were in most cases the smallest achieved, limiting the ability to capture adequate numbers of personnel at every deployment stage. Further, there appear to have been challenges for a proportion of respondents in consistently completing the identification code, as well as difficulties in achieving accurate electronic scanning of the response boxes for this item. The impact of this limitation has been most evident in the inability to use the measure of coping behaviour obtained at predeployment in subsequent analyses of deployment and postdeployment outcomes.

A limitation in the research design has been the perennial challenge of capturing measures of performance in real-life military settings, particularly

when deployed overseas. Performance did not emerge as a distinct climate factor from the individual or collective-level principal component analyses of the Unit Climate Profile. This was despite an intended dimension of performance reflected by three items tapping perceptions of performance at individual, workteam, and unit levels. The potential for integrating performance measures other than those gained through self-report was considered during the design of the Human Dimensions Project. However, the ability to quantify the individual and collective performance of peacekeepers during an operation is difficult because indicators of mission success are often dynamic, arbitrary, or infused with political and cultural elements. Further, traditional archival indicators that could be used as proxies of performance are often security-classified, so that access for research purposes is difficult to obtain. As Segal, Furukawa, and Lindh (1990) pointed out, peacekeeping operations are often considered successful when nothing happens (e.g., stabilisation missions such as Cyprus), which makes performance assessment abstruse. There is also confusion in the literature about whether performance is an outcome in its own right, or should be considered a category of strain. One potential way ahead, suggested by Adler and Britt (2003), is to develop generic task criteria that are relevant to peacekeeping and then utilise supervisor ratings with respect to these criteria.

The thesis could be criticised with respect to a number of psychometric issues, for example, the use of principal components analysis versus other data reduction techniques to derive scale factors, computing factor scores by summing raw data rather than using variables derived from factor analysis, and the choice of fit indices to test model fit in structural equation modelling. Debate in the psychometric literature continues on such matters. The approach adopted here was one of consistency, unless there were specific reasons to diverge from a standard procedure. Nevertheless, advice from Woodman and King (1978) that "demonstrating factor stabilities and high correlations between factors and items or scales is not in itself sufficient to establish the validity of measurement tools" (p. 824) has been

heeded. Future Australian studies of the human dimensions of operations will endeavour to conduct convergent and discriminant validity studies of the various measures where feasible. For example, convergent validity could be achieved by using self-report and more objective measures of psychological climate together. Further, relatively unsophisticated measures, such as that used for perceived social support, are in need of refinement.

Further Research

The preceding discussion has made evident several directions for future research effort in the realm of the human dimensions of military operations:

- There is need to clarify the current enigma surrounding morale by revisiting underlying theory and how the construct is measured, and then conducting further modelling to explore how it interacts with other human climate factors.

- There is need to add a coping measure in such a way that it can be examined at each stage of the deployment cycle.

- There is need to acknowledge the complexity of social support theory and its measurement (Barrera, 1986; Sarason, Sarason, & Shearin, 1986; Turner, 1992; Veiel & Baumann, 1992a, 1992b; Wills & Fegan, 2001) and to construct more sophisticated social support variables.

- There is a lack of real-world studies of the impact of stress on performance in the peacekeeping context; hence there is need to develop complex, reliable, and valid measures of performance for peacekeeping operations.

- There is need to ensure outcome measures are practical and meaningful to commanders.

- There is scope to explore a plethora of intermediate variables that may affect the stress-strain relationship among peacekeepers. These variables could include age, gender, employment status (full time versus part time military), employment specialisation, operational tempo, perceptions of family well-being, time spent in the operational theatre, group coping behaviours, and prior psychological trauma.

- There is a requirement to prepare military psychologists for the role of command consultant with respect to the conduct, analysis, and reporting of Human Dimensions surveys.

- The feasibility of developing a fully automated system of psychological climate appraisals should be examined.

- There also is need to determine whether multidimensional models of cohesion, as championed by Siebold (Siebold, 1990, 1999, 2006), would provide a better conceptual fit and pragmatic framework for a number of the psychological climate variables derived from the Unit Climate Profile.

This study has supported the hypothesised role of personal meaning, as measured by the positive aspects of deployment, as an important moderator of psychological status during deployment. The demonstrated value of the Positive Aspects of Deployment variable should stimulate further discussion and research into the positive experiences and effects of peacekeeping deployments. Approaches stemming from a positivistic psychology perspective (e.g., Matthews, 2008) should encourage a balanced understanding of both the difficulties and opportunities inherent

in the experience of peacekeeping and other exceptional circumstances. There is need to examine how a sense of meaning among military personnel undertaking peace support operations may be undermined, for example, by unrealised pre-departure expectations, the nature of contact with locals during deployment, the perceived importance of deployment roles and tasks, and leadership effectiveness.

In particular, the need to foster a sense of meaning may be undermined by the increasing focus of peacekeeping personnel on the financial incentives received for undertaking such duties. This seems to be especially the case in some European nations where peacekeepers may be drawn from the civilian population specifically for a UN tour on a contractual basis. Cerdeira (1997) found that 85% of Portuguese peacekeeping personnel were strongly motivated by financial considerations. However, even Regular force personnel appear to be increasingly motivated by financial considerations rather than any altruistic reasons or a sense of duty. Murphy, Farley, Dobreva-Martinova, and Gingras (1998) found that among Canadian Forces personnel on peace support operations, 'allowances received' featured prominently in response to a list of factors contributing to general satisfaction. Financial incentives also appeared in the top 10 positive aspects of deployment for Australian troops in East Timor (Michalski, 2000).

In contrast, factors associated with meaning such as 'doing something positive for the country here' and 'expressions of thanks and gratitude from the locals' were rated amongst the lowest sources of satisfaction among Canadian peacekeepers in Haiti (Murphy et al., 1998). Ironically, financial incentives for peacekeeping service may actually reduce the satisfaction military personnel derive from their experience. As dissonance theory has shown, when individuals are given only marginal external rewards, they tend to derive more meaning from their actions than those who receive generous incentives (Festinger, 1957; Festinger &

Carlsmith, 1959). This issue may warrant further research in the realm of peace support operations.

The results have highlighted the important role of leadership as a moderator of deployment stress. Both the behaviour of the proximal leader and the effectiveness of the unit's senior leadership consistently influenced psychological outcomes. Proximal leaders were especially important during predeployment and postdeployment phases, while senior leaders appeared to become central to resilience processes during the deployment, and to maintain an important stress moderating role after the deployment by fostering positive unit climate. There is need to understand the actual mechanisms of this influence and to provide clear advice to command about effective leadership roles and tasks. For example, commanders should actively and persistently communicate to their troops the value of the mission and its achievements (Gifford, Ritzer, Britt, & Valentine, 1997).

Several other leadership issues warrant further examination. Consensus about leadership among unit members (Bliese & Britt, 2001; Bliese & Halverson, 1998) offers promise as another useful moderating variable. The fostering of a sense of inclusiveness or belonging within work teams has been recognised as a critical component of safe and effective operational performance (Cheng & Daly, 2008). The concept of trust is gaining prominence as an important component of organisational climate, particularly within high-reliability occupations such as the military (Murphy & Jones, 2005; Smith, 2008). Dallaire (2000) stressed the importance of trust to effective performance in peace support operations (what he referred to as 'conflict resolution operations') and how leaders were instrumental in building this trust:

> Senior officers must create an atmosphere that clearly demonstrates their confidence that their subordinates will undertake the proper and competent actions. Until officers can project this confidence – a cornerstone of effective

> leadership – personnel at all levels will be looking over their shoulders during conflict resolution operations and lapsing into inaction (p. 46).

A measure of trust should be added to future Human Dimensions surveys.

There is need to institute longitudinal analysis of Human Dimensions data. Advantages of longitudinal design include the ability to describe patterns of change, develop predictive models, and determine the direction and magnitude of causal relationships. With adequate sampling, and some procedural house cleaning, the Human Dimensions project is amenable to longitudinal research.

Concluding Comment

The focus of this dissertation has been to establish the HDO measures and models. This study has examined the interrelationships of several human factors and their role in the transactional process as buffers of stress. One aim, to clarify the stressors of peacekeeping deployment, and the interrelationships among unit climate factors that foster or hinder operational effectiveness, has been achieved. A parallel aim, to develop the capability to provide commanders with timely and constructive feedback regarding the psychological status and readiness of their troops, which would support informed psychological climate interventions across the deployment cycle, has also been achieved.

The Human Dimensions project clearly has significant potential, and it has already paid dividends. The project represents a rare research opportunity: to measure the impact of stress on performance in authentic military environments. Each survey administration adds to the collective understanding of the human aspects of operational service. Briefings to commanders have proven useful in aiding command decisions. Component instruments are being employed in other research projects. The growing

database has been used to respond to various questions about the human aspects of deployment posed by sections of the Defence organisation and to develop normative information. Comparative norms are being developed gradually by seeking opportunities to survey those who have not been operationally deployed, along with those who have been deployed on operations other than peace support operations.

Further exploration of the interrelationships among stressors, and the moderators and outcomes of stress within an empirical model of stress and performance will help to determine the design and implementation of new interventions and support programs. Because many moderators are essentially resources, these interventions and programs would be aimed at providing or replenishing individuals and groups with the resources proven to buffer the stress of operational service. The findings of the Human Dimensions project to date indicate that the most salient stressors in military service are organisational stressors. Yet most stress management initiatives and support programs are aimed at the individual Service member. With adequate promulgation of these findings, the Human Dimensions project may remedy this discrepancy. In time, the research within the Human Dimensions project has the potential to lead to new and precisely tailored interventions to address better the issues of operational readiness, resilience, and readjustment that underpin the operational effectiveness of the ADF.

Current operational priorities within the ADF indicate there is need for a degree of transformation of the Human Dimensions project to reflect the characteristics of these missions. The shift to peace support operations in the early 1990s has since shifted to a new mode of conflict related to the 'war on terror.' While peacekeeping operations continue around the globe, they are generally small-scale and no longer attract the research attention they once did. Nevertheless, operations since the demise of the Cold War – whether humanitarian, peace support, or the war against

terrorism – share many similarities. They are complex, often ambiguous, culturally diverse, and increasingly open to public scrutiny with respect to their ethical and financial dimensions. One striking lesson learned from the analyses to date is that there is meaningful variability at the sub-unit level in almost all components of the human dimensions of operations model. This suggests that situational variables should be a focus of future research and that sub-units and units should be a main level of analysis.

The Human Dimensions of Operations project shows considerable promise in becoming an important avenue for psychology to enhance the capability, operational effectiveness, and force preservation of the ADF in this era of high operational tempo.

P o s t s c r i p t

Homecoming

Joseph T. Cox

Walking with my son on the sandy hook, we stare at a full moon
that he finds hard to believe polishes the rough desert he just left.
We gaze across at the lights of a great city and the dark spaces.
The spirit of atrocity fades in soft rhythms of Jersey beach.

The more we talk, the more we realize we are cowards, retreating
into a common bond of camaraderie, medicating ourselves with myths
of old soldiers. On his left wrist he wears his best friend's name,
tangible reminder of a man disintegrated by a suicide bomber.

In this sweet air, it is hard to recall the daily dragon's breath
that claimed a family's only son. My son has difficulty talking.
He made this pilgrimage to explain love in a time of fear,
but it's easier to trade clichés and swap sanitized sound bites.

On the drive back, my son mentally walks a soldier's stations of the cross:
go to war, glimpse the darkness in your soul, try to find your way home.
Haunted by survivor guilt, he will learn that even those who lived are lost.
After war the homes we try to come home to are no more.

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APPENDICES

Appendix A

Human Dimension of Operations Project
Survey Component - Example Cover Sheet

THE HUMAN DIMENSION OF OPERATIONS: DEPLOYMENT

Purpose

Your CO has requested this research. We have made a commitment to brief your CO on findings within 3 weeks of surveys returning. This survey examines 'people' issues of military service. It can be used by commanders as another means to check on issues such as morale, cohesion and work satisfaction. Your responses will be added to grouped information, and may be used in making decisions to enhance unit effectiveness and to respond to matters that are raised. With your support, this survey can make a difference. Your honest and thoughtful responses are requested.

Participation is voluntary; Your responses are treated confidentially

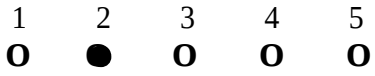
Your participation in this research is entirely voluntary and you are free to withdraw at any time. **Participation will not effect your deployability or career in any way.** Filling out this survey will be regarded as an indication that you consent to your answers being used by the professional staff conducting the study.

Individuals should not be identifiable from their responses. However, if you feel one of the items will identify you, and you are uncomfortable about this, then please omit that response. However, please complete the rest of the survey. No individual surveys will be made available to anyone except research personnel conducting the study. Only grouped results will be reported. You are invited to make comments at the end of the survey. All comments will be summarised and presented (anonymously) to your CO. A number of comments are also used - as written - in the research brief to illustrate issues. We have found that your own words often make the strongest impact.

General Instructions - *Please read carefully before filling out the survey*

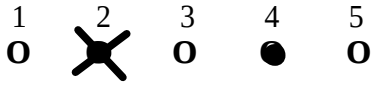
- Completion of this survey should take most people between 25 and 40 minutes.
- There are eight sections. Please read the brief instructions in each section.
- It is best to use a soft, dark pencil, a black/blue ink pen, or a texter pen (if it doesn't 'bleed' onto the next page).

- In most cases, simply fill in the bubble that indicates the most appropriate response for you. For example:



And: O married O single O other

- If you change your mind, please cross through the incorrect bubble and fill in the correct answer as shown:



- In some cases, you are asked to fill in answer boxes. For best accuracy, please use capital letters, and avoid contact with the edges of each box. For example:

2	**5**		**C**	**O**	**N**	**S**	**T**		**S**	**Q**	**N**

Available Support Services

You may wish to discuss this survey or any concerns that it may raise with someone. Points of contact are the administrator(s) of the survey, Defence Force psychology officers, or the officers listed below. You may remove this cover page and retain it for future reference if you wish.

Principal contacts

- Commanding Officer, 1 Psych Unit, Randwick Barracks Ph: 02 9349xxxx
- Staff Officer Human Performance, Land Operations Division, DSTO-S Ph: 08 8259xxxx

Appendix B

Human Dimension of Operations Project
Survey Component - Participant Code Section

Research Participant Code

Why a code? This research is ongoing so you may find yourself completing a related survey and some stage in the future. To make this research more valuable, we would like to be able to 'marry up' your responses at different times. Somehow, we must also meet our promise to keep your responses confidential. This can be achieved by asking you to generate your own unique research participant code. To make sure you don't forget your participation code number, you will generate it according to certain guidelines. The resulting code will allow us to determine if you have previously completed similar surveys, but will assure your answers are confidential, as we won't know your name.

How to make your code. Create the code as follows:

1. Right the first two letters of your mother's maiden name (her surname at birth) in the first two boxes below (eg., if your mother's maiden name was Smith, you would put **S M**).

2. Write the day date on which your birthday falls in the next two boxes (if your birthday is on the fourth of the month, you would put **0 4**).

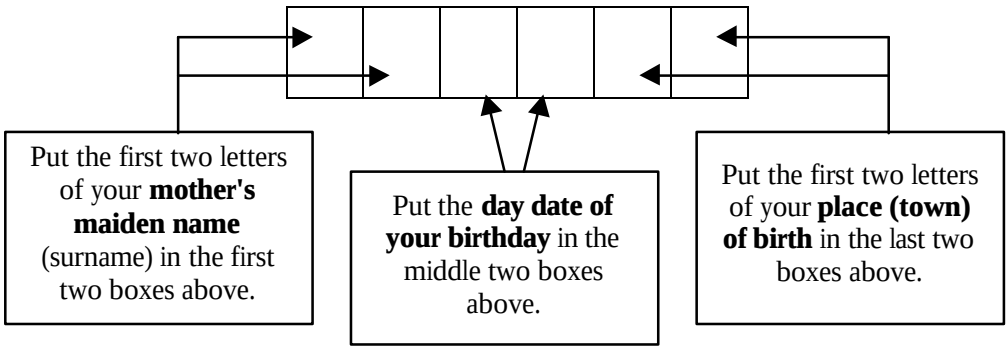
3. Write the first two letters of your place of birth (town or nearest town) in the final two boxes (eg. if you were born in Geelong, you would put **G E**).

In this example, the unique ID number would be:

S	**M**	**0**	**4**	**G**	**E**

PLEASE ADD YOUR UNIQUE PARTICIPATION CODE NUMBER BELOW:

Adding your identification code is optional.



Appendix C

Human Dimension of Operations Project
Example HDO Project Brief for Stakeholders

The Human Dimension of Operations Project

Brief for Commanders

Introduction

1. The Defence Science & Technology Organisation (DSTO) is eager to achieve engagement in matters arising from the recent White Paper (WP) and to align its efforts with the emergent issues. Clearly, one of these issues is Operations other than war (OOTW). The WP notes that "in general, the capabilities we develop in the Australian Defence Force (ADF) for defending Australia provide forces appropriate for these tasks, *but some important enhancements might be needed to meet unique demands*" (p. 10, italics added). Furthermore, "the Government believes that this is an important and lasting trend, with significant implications for our Defence Force. Over the next 10 years, the ADF will continue to undertake a range of operations other than conventional war, both in our own region and beyond. *Preparing the ADF for such operations will therefore take a more prominent place in our defence planning than it has in the past*" (p. 10, italics added). The White Paper also places an emphasis on the 'Human Dimensions' of operations (section 10.17): "Wherever technology developments lead us, in the final analysis, people carry out military tasks so it is important that we continue to attach top priority to the human aspects... Nowhere is this more evident than in the land environment where the individual will continue to be the primary warfighting 'platform'" (p.111). Such statements appear to endorse a need for research that is focussed on both the human aspects of operational service and the distinctiveness of OOTW.

2. The recent and continuing high operational tempo of the ADF provides a valuable opportunity to conduct operational research into the human dimension of peace support operations. Such research can support command decision-making, inform training, and underpin policy development. The ultimate research aim is to contribute to the goal of optimising readiness and operational effectiveness.

3. In recent years, many military forces have increased their commitment to research into the human dimension of operational performance. This effort has been fostered by both recognition that the human components of military performance are crucial to effectiveness, and acceptance of responsibility for the psychological welfare of military personnel and their families.

Aim

4. The aim of this brief is to detail the Human Dimension of Operations (HDO) research project in order to inform you of its potential so that you may consider its tailored implementation in your unit.

Research Design

5. The HDO project normally examines the three main phases of the deployment cycle: pre-, during, and postdeployment. It may, however, be used in units that are not scheduled to deploy on operations. By selective use of HDO measures, commanders can efficiently and effectively gather systematic information on various human issues within their unit (eg., individual morale, work satisfaction, career intentions, health status). The HDO mainly uses self-report measures (surveys), but it can supplement its data gathering through focus groups and interviews, and unit outcome measures that are routinely collected (eg., range scores, accident rates, repatriation rates from theatre, discharge applications). The project is based on models of readiness and op tempo & stress and performance drawn from research into the Western military experience of recent peace operations. The performance model is presented in brief form as Annex C1. ADMEC approval for HDO survey protocols was gained in December 1999.

6. **Survey questionnaires.** These are intended to be administered before deployment, during deployment (at least once), and after deployment (at least once), although operational and resource constraints may lead to modifications to this proposed design. Increasingly, commanders are asking for surveys into the human dimension of their unit for reasons not directly related to deployment. The proportion of personnel and/or sub-units to be involved surveys is determined through consultation with unit commanders. In addition, some component measures from these surveys may be administered to non-deployed or 'sister' units in order to have 'comparison group' information. Surveys are administered by professional researchers. The pre- and post-deployment surveys are completed in barracks, while deployment instruments are administered on bases or in the field by deployed DSTO and Australian Army Psychology Corps (AAPsych) personnel. Surveys are completed anonymously but a unique case number generated by the respondent will allow some matching of responses over time. Surveys are designed to take 90% of respondents between 25 and 40 minutes to complete. While it is preferable for deployed personnel to complete a survey at each deployment phase so that trends across the cycle can be explored, valuable information can be derived from a single 'snapshot' administration at any one stage.

7. **Measures.** Various measures are contained within the surveys.

Some measures such as major incidents during the tour are taken only once, while some are repeated at different stages. Other measures include: unit climate (eg., morale, cohesion, commitment), workload and sleep patterns, career intentions, health and well-being indicators, coping techniques, family issues, post-deployment adjustment, and positive aspects of deployment. Most of these measures have been developed specifically for military personnel on peace support operations. *There is potential for commanders to add items to the surveys in order to capture topical matters of concern.* Further information about survey measures is contained in Annex C2.

8. **Timeliness of feedback.** Land Operations Division (LOD) within DSTO has recently obtained a technical capability to scan surveys. This will enable timely response. It is anticipated that a commander would receive a detailed brief on the outcomes from a survey within two weeks of the surveys arriving at LOD. Response time is likely to be faster. In one recent case, a short survey was analysed and a brief report dispatched within 24 hours. If scanning technology is eventually made available to deployed research teams, commanders could expect results within hours of survey administration. There is an option to administer just one or two survey measures in response to critical incidents. For example, a commander may wish to assess the impact on individual and group morale of a line-of-duty death.

Potential Information

9. The HDO design and its survey measures allow numerous issues to be explored. Much of the resulting information can inform command decision-making by allowing commanders to confirm their judgements about various aspects of unit climate and soldier psychological status. Examples of the types of information that can be provided include:

a. trends in human dimension information (eg., readiness) across the stages of deployment;

b. comparative information for different groups such as sub-units, rank levels, regular and reserve members, and gender;

c. major issues of concern to soldiers at different stages of deployment;

d. changes in unit climate factors (such as individual and group morale) following critical incidents;

e. the proportion of personnel who appear at risk of developing serious deployment or postdeployment adjustment difficulties; and

f. evaluations of unit fatigue levels and predisposition towards

inappropriate behaviours.

10. It is anticipated that the HDO project will eventually capture sufficient information to enable an understanding of patterns of attitudes, behaviours and performance that occur across the deployment cycle in different unit types and different mission types. Such information will allow commanders to better anticipate changes in their unit and to conduct proactive interventions to maintain performance and morale. The HDO project has already captured information from several units during and after deployment to East Timor. However, there remain many gaps in the information record. It is noteworthy that at this stage, the HDO project is largely focussed on providing direct feedback to commanders on various human aspects. While research personnel can provide advice relating to the results of survey data, commanders would normally decide how the information from the HDO pertaining to their command is used and disseminated. A major report is gradually being developed on the broader human aspects of the deployment to East Timor.

Potential Outcomes

11. The following potential outcomes of the HDO project are anticipated:

a. contributions to readiness evaluations;

b. information for use in doctrine development;

c. refinement of predeployment training requirements;

d. refined guidelines for the psychological management of deployed personnel;

e. the ability to answer specific questions regarding the human dimension of operations in a timely, objective manner;

f. clarification of the psychological impact of high readiness and high operational tempo; and

g. determination of how OOTW are different to conventional operations in the human dimension.

Who gets the information?

12. Clearly, there are sensitivities involved in some components of the HDO project, in particular the dimensions of the Unit Climate Profile. In recognition of these sensitivities, no attributable results are provided outside

each unit. That is, any information on identifiable individual units is only offered to the relevant unit commander. Unit commanders may use any supplied information as they see fit. Briefings on survey findings can be provided either by deployed military psychologists/research staff in person, or by phone by the senior researcher involved in the project. It is recommended that higher commanders should not receive attributable data from subordinate units, as there is no intention to use the HDO project as a means of performance appraisal. Reports on research findings will be provided to sponsors (when formalised) and appropriate agencies within the ADF, and possibly for military/academic journals, but this is done with an awareness of the sensitivities that even non-attributable data can entail.

Resource Requirements

13. Anticipated resource requirements to conduct the HDO project are as follows.

a. **Time.** The main resource requirement of the HDO is the time required of personnel to complete surveys. The research design process has been driven by an awareness of the need to minimise this time requirement, hence group administration, use of short forms of several measures, and the unique identifier code, which reduces the need to repeat measures.

b. **Administration.** AAPsych or DSTO scientific personnel will administer the surveys and conduct limited focus groups and interviews. There is scope to integrate these activities with existing psychological briefing and debriefing activities.

c. **Design and Analysis.** Most measures are already developed. Staff time at LOD will be required to analyse data, generate reports and conduct routine test evaluation.

d. **Printing, hardware and software.** The major tangible cost of the project is the printing costs associated with questionnaire reproduction. There may be a need for additional scanning hardware and questionnaire design software. The timeliness of questionnaire analysis in the field is likely to be significantly enhanced by providing portable technologies to generate rapid reports.

Conclusion

14. The bottom line of the HDO project is the capture of information that can contribute to command decision-making, policy development and longer-term interventions at individual, group and organisational levels in order to enhance operational readiness and effectiveness, and the well-being

of service personnel and their families. The information gleaned from similar HDO projects within the US and Canadian Forces has been reported to be a valuable aid to Commanding Officers in peace support operations, remote locality service (eg., the Canadian Forces Station Alert in the Arctic circle), and on naval ships. When used in conjunction with other existing unit indicators, information from the HDO project can enhance decision-making by commanders and guide the monitoring of critical human dimensions of combat readiness within units before, during and after operations. Overseas, interest in similar projects has been fostered by issues of duty of care for deployed personnel and the need for various investigators to be able to determine the impact of the conditions of operational deployments on serving personnel.

15. There currently exists great potential to increase the level of operational research within the ADF. Liaison is ongoing with both United States and Canadian Force agencies responsible for human dimension research. Experience from these forces suggests that once commanders are exposed to the benefits of properly conducted and timely research into the human dimension of operations, it is highly regarded.

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Annexes:

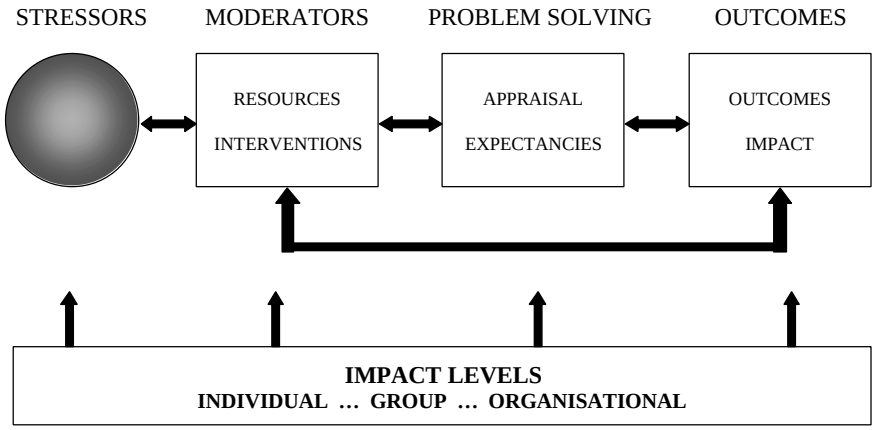
C1. HDO conceptual model – components of operational effectiveness

C2. HDO survey measures

Annex C1 to HDO Project Brief

Human Dimension of Operations Conceptual Model

OPERATIONAL EFFECTIVENESS: RESEARCH MODEL



Annex C2 to HDO Project Brief

HDO Questionnaire Measures

Predeployment:

Background information / demographics / participant code
Military Service (Unit Climate Profile)
Family Matters
Health (Health status)
Demands of Service (Organisational, environmental and personal stressors)
Dealing with problems (coping behaviours)
General comments

During deployment:

Background information / demographics / participant code
Military Service (Unit Climate Profile)
Health (Health status)
Dealing with problems (coping behaviours) (once only)
Demands of peace operations (Organisational, environmental and personal stressors)
Family issues (once only)
Positive aspects of the tour (once only)
The tour in perspective (topical issues)
Experience of major incidents during deployment (once only)
General comments

Postdeployment:

Background information / demographics / participant code
Military Service (Unit Climate Profile)
Health (Health status)
Homecoming issues
Family issues
Demands of Service (Organisational, environmental and personal stressors)
Perceived organisational support
Service experience scale (serious stress reactions)
Topical issues
General comments

Appendix D

Human Dimension of Operations Project

Survey Administrator's Brief

Human Dimension of Operations Project

Survey Administrator's Brief

Purpose

To briefly explain the purpose of the survey, cover key ethical issues, and generate interest in, and commitment to completing the survey. Try to arrange for the unit to demonstrate the commander's commitment to this research, eg., by having a unit representative provide some opening remarks at each group administration.

Notes for Administrator(s)

- Modify the following to suit your style and the context.

- The version below should take about 2 and a half minutes to deliver.

- You should acquaint yourself with the detailed brief on the Human Dimensions of Operations Project in order to facilitate your ability to answer questions posed by respondents during the administration of the survey.

Example Brief

"Just a few key point before you start the survey."

"This research has been requested by your CO/OC for use in this unit. This research – entitled the Human Dimension of Operations Project - is currently being conducted in a number of ADF units. Similar research is also conducted in several overseas militaries, such as the US Army, and the Canadian Forces."

"The project is focussed on the human aspects of operations, issues like morale, cohesion, readiness to deploy, and day-to-day frustrations that may affect individual and team performance. The research aims to provide another source of information to your commander about the human factors in the unit – it is another tool in the commander's decision-making toolkit - so to speak."

"The researchers conducting the study will attempt to provide detailed results to your CO/OC within three weeks after receiving the completed surveys. If you provide comments – and we hope you do – these will be summarised and

presented in the brief on the survey findings. Some comments will be used 'verbatim' to highlight issues – we find that often your own words are much better than figures and tables of statistics. You may comment on any issue you think is relevant."

"The survey is designed to ensure your responses are anonymous. Individuals will not be identified. We have an ethical obligation to do this. That is why completing the survey cannot affect your career or your deployability in any way."

"The two most common complaints about the survey are the amount of time that it can take, and the fact that some items appear to be repetitive. Please understand that the researchers constantly try to minimise the time requirement. In some cases, the survey asks questions that the CO/OC has specifically asked for, but mostly it includes questionnaires specifically designed for the military. Several 'Diggers' have actually commented that they enjoy completing the survey."

"With respect to the issue of repetition: Just as a weapon cannot be zeroed with one round, some concepts in the survey cannot be properly assessed with just one item. Thus some items may appear similar, and you may think you are wasting time, but it is the way proper surveys try to 'zero' their concepts. Certainly there is no intention to trick you or check up on you as some respondents seem to think."

"Participation is voluntary. However, we – and your CO/OC - are very eager to hear your views and better understand your experience. We hope your sense of professionalism includes providing feedback in this way. Your responses may make a difference – at the individual, team, unit and even ADF level."

"Finally, you may be asked to complete another, similar survey again in a few months as part of this project. This is because some of the most useful information for commanders is how things change over time."

"Now please read through the cover page of the survey and note the directions for filling out your responses. It is important that you completely fill in the response circles if your responses are to be recorded accurately."

"We/I thank you for your cooperation."

Issues for administrator(s)

Usual test administration procedures apply; eg., foster compliance through appropriate interpersonal manner; be prepared to provide writing implements

(texters that don't bleed onto the next page; or fairly blunt & dark pencils; or pens); monitor group throughout; answer queries that arise; check surveys for completion as they are returned– *especially* the **subunit** response in the background info section. Try to identify any that were not completed conscientiously – a likely sign of this is if completion takes under 30 minutes. Mark such surveys for my subsequent inspection.

Prepared by LTCOL P. J. Murphy
Staff Officer Human Performance and Military Psychology
Land Operations Division, DSTO
[Contact details and date added]

Appendix E

Human Dimension of Operations Project

Component Measures by Nation, Unit/Contingent, and Deployment Status

Canadian Forces Data Collection Overview

Table 1. Sample Size, Deployment Stage and Psychometric Measures of Canadian Forces Personnel Sampled in the Human Dimensions of Operations Project

Unit / Contingent (coded)	Sample size	Deployment Status	Measures[1]
1	381	Deployment	1,2,4,5,8
2	348	Deployment	1,2,4,5,8
3	417	Deployment	1,2,3,4,5,6,7,8,9
4	202	Postdeployment	1,2,3,4,5,6,7,10,11,15
5	736	Predeployment	1,2,4,5,8
6	398	Deployment	1,2,4,5,8
7	467	Deployment	1,2,3,4,5,9,15
8	512	Deployment	1,2,4,5,6,7,11,14,15
9	324	Predeployment	1,2,3,4,5,6,7,14,15
10	168	Deployment	1,2,3,4,5,15
11	550	Deployment	1,4
12	20	Postdeployment	1,2,3,4,5,6,10,14,15
13	307	Predeployment	1,2,4,5,8
14	334	Deployment	1,2,4,5,8
15	293	Deployment	1,2,3,4,5,8,9
16	241	Deployment	1,2,4,5,6,7,9,11,14

[1] Codes for the HDO Measures used with CF samples are explained in Table 2 of Appendix E

Canadian Forces Data Collection Overview (contd)

Table 1 (contd). Sample Size, Deployment Stage and Psychometric Measures of Canadian Forces Personnel Sampled in the Human Dimensions of Operations Project

Unit / Contingent (coded)	Sample size	Deployment Status	Measures
17	60	Deployment	1,2,3,4,5,8,9,15
18	620	Non-deployed	1,2,5,6,7,8
19	465	Non-deployed	1,4,6
20	448	Non-deployed	1,2,5,6,7,8
21	807	Non-deployed Reserve members	1,2,6,7,10

Table 2. Codes for Canadian HDO Measures
in the Data Collection Overview

Code	Measure
1	Demographics
2	Strain
3	Stressors of Military Service
4	Unit Climate Profile
5	Coping Scale
6	Exposure to Potentially Traumatic Events
7	Posttraumatic Stress Scale
8	Perceived Organisational Support
9	Positive Aspects of Deployment
10	Homecoming Issues
11	The Tour in Perspective
12	Topical Issues
13	Psychological Hardiness
14	Family and Support Issues
15	Comments

Australian Defence Force Data Collection Overview

Table 3. Sample Size, Deployment Stage and Psychometric Measures of Australian Defence Force Personnel Sampled in the Human Dimensions of Operations Project

Unit/ Contingent (coded)	Sample size	Deployment Status	Measures[2]
1	285	Retrospective	1,2,3,4,5,15
2	225	Postdeployment	1,2,3,4,6,7,10,11,15
3	72	Postdeployment	1,2,3,4,6,7,10,11,15
4	126	Readiness	1,2,3,4,5,6,14,15
5	168	Readiness	1,2,3,4,6,7,12,14,15
6	31	Non-deployed	1,2,3,4,5,6,7,15
7	83	Non-deployed	1,4,15
8	83	Non-deployed	1,4,15
9	97	Non-deployed	1,4,15
10	181	Predeployment	1,2,3,4,5,8,13,14,15
11	561	Perideployment	1,2,3,4,9,12,15
12	251	Postdeployment	1,2,3,4,6,7,10,13,15
13	246	Readiness	1,2,3,4,5,6,7,15
14	56	Predeployment	1,2,3,4,5,6,7,8,12,13,15
15	74	Postdeployment	1,2,3,4,6,7,8,9,10,12,14,15
16	165	Postdeployment	1,2,3,4,6,7,9,10,12,14,15

[2] Codes for the HDO Measures used with ADF samples are explained in Table 4 of Appendix E

Australian Defence Force Data Collection Overview (contd)

Table 3 (contd). Sample Size, Deployment Stage and Psychometric Measures of Australian Defence Force Personnel Sampled in the Human Dimensions of Operations Project

Unit / Contingent (coded)	Sample size	Deployment Status	Measures
17	81	Predeployment	1,2,3,4,5,8,13,14,15
18	100	Postdeployment	1,2,3,4,7,9,10,12,14,15
19	124	Readiness	1,2,3,4,5,15
20	411	Predeployment	1,2,3,4,5,6,14,15
21	476	Deployment	1,2,4,15
22	151	Deployment	1,2,3,4,9,12,15
23	334	Postdeployment	1,2,3,4,6,7,10,14,15
24	67	Postdeployment	1,2,3,4,12,15
25	264	Deployment	1,4
26	62	Non-deployed	1,2
27	52	Postdeployment	1,2,3,4,6,7,10,14,15

Table 4. Codes for Australian HDO Measures
in the Data Collection Overview

Code	Measure
1	Demographics
2	Strain
3	Stressors of Military Service
4	Unit Climate Profile
5	Coping Scale
6	Exposure to Potentially Traumatic Events
7	Posttraumatic Stress Scale
8	Psychological Hardiness – Version 1
9	Positive Aspects of Deployment
10	Homecoming Issues
11	The Tour in Perspective
12	Topical Issues
13	Psychological Hardiness – Version 2
14	Family and Support Issues
15	Comments

Appendix F

Human Dimension of Operations Project

Survey Component – Demographics Section

"General Information" (A selection of typical items)

General Information

Instructions. Please provide the information below by adding a response or filling in the appropriate response bubble.

Your unit (eg., 1 RAR).
[response added to boxes provided]

Your subunit (eg., 1 PL C COY or 3 TP C SQN).
[response added to boxes provided]

Your Corps.

RAAC	RACT
RAA	AACC
RAE	RAAMC
RASIGS	RAAOC
RAINF	RAEME
AAAVN	RACMP
AUSTINT	Other (please specify)

Rank.

PTE (equivalent)
JNCO (LCPL/CPL)
SNCO/WO
Officer

Gender. Male Female

Marital Status.

Married/partner	Single
Separated/divorced	Other

Dependents (indicate the number of dependents (excluding spouse) normally living with you at home.
Nil 1 2 3 4 5 6 or more

Years of Service. How many years of service have you completed?
0-4 yrs 5-9 yrs 10-14 yrs 15+ yrs

Operational experience. How many operational tours of duty of more than 30 days have you been on (including the current tour)?
Nil 1 2 3 4 5 6 7 8 or more

Age group.

18-21 yrs	22-26 yrs
27-31 yrs	32-36 yrs
37+ yrs	

Education. What best describes your highest level of education?

Some high school	Some university/College
Completed high school	University/College degree

Medical (a). Other than regular or routine check-ups and inoculations, how many times have you sought medical advice or treatment during the last six months?

None	Once or twice
Three or four times	Five or more times

Medical (b). How many days of work have you missed due to illness over the last 30 days?

[response added to boxes provided]

Work (a). On how many days did you work (military duty) for at least an hour during the previous seven days?

Nil 1 2 3 4 5 6 7

Work (b). For the days that you did military work over the previous seven days, what was the average number of hours per day that you worked? Answer to the nearest full hour.

[response added to boxes provided]

Time in the field. How many days have you been in the field or doing training away from your unit in the past six months?

[response added to boxes provided]

Leave. How many days of recreation and short leave have you taken in the past 12 months?

[response added to boxes provided]

Sleep. Over the previous seven days, what was the average number of hours per day of sleep that you had? Answer to the nearest full hour.

[response added to boxes provided]

Exercise. During the past seven days, on how many days did you do physical fitness for 30 minutes or more?

Nil 1 2 3 4 5 6 7

Alcohol (a). On how many days have you consumed some alcohol over the past week?

Nil 1 2 3 4 5 6 7

Alcohol (b). About how many standard alcoholic drinks have you had over the past week? (1 standard drink = 1 beer; 1 glass of wine; 1 shot of spirits)

None	1-7 drinks
8-14 drinks	15-21 drinks
22-28 drinks	more than 28 drinks

Caffeine. During the past week, what is the average amount of coffee, tea or Pepsi/Coke drinks that you have had per day?

[response added to boxes provided]

Tobacco. During the past week, what is the average number of times per day that you used tobacco? (Average smokes per day)

[response added to boxes provided]

Pace of deployments. Ideally, how much time (in months) would you prefer between operational deployments?

[response added to boxes provided]

Status with your deployed unit on operations. While deployed, you will be:

With your normal posted unit
Attached to a contingent/another unit as an individual
Attached to a contingent/another unit as part of my section/platoon/troop
A Reservist on full-time service
A Reservist on part-time service

Career plans. My current military career intentions are to:

Take discharge as soon as possible
Leave in the next year or two
Stay in for several years yet
Stay in as long as I can
I am undecided

Additional General Information items used in Canadian Forces survey:

MOC (Military Occupational Category). What is you MOC? (e.g. 0/3/1)

[response added to boxes provided]

Language. What is your first official language?

English French Other

Conduct. Number of convictions under the National Defence Act during the last six months?

None One Two or more

Modified General Information items used in Canadian Forces survey:

Education. What level of education have you completed?

Grade at High School: 8 9 10 11 12 13

Years of post-High School: 1 2 3 4 5 or more

(e.g. technical college, university)

Appendix G

Stressors of Military Service Scale Development

Human Dimension of Operations Project

Stressors of Military Service Scale Development

The HDO research model established a requirement to determine the sources of stress for military personnel during the three phases of deployment. These sources of stress were not limited to characteristics of the operating environment such as dust and weapons fire, because it was widely known that several stressor domains impact on deployed personnel (Bartone, Adler, & Vaitkus, 1998). One of these domains comprised occupational stressors, including characteristics of the workplace, policies of the wider organisation, and interactions with agencies external to the organisation. Another familiar domain involved personal stressors such as health, career progression, and work satisfaction. A third important stressor domain was the interface between work and personal domains, such as family issues, which often becomes particularly salient during deployment. At the commencement of the HDO project, no known psychometric measure could adequately address this broad requirement. Therefore, a specific tool was developed in the early stages of the project. Since that time, several stressor scales related to peace support operations have been reported in the literature (e.g., Moldjord, Fossum, & Holen, 2001).

In order to develop a measure of the stressors associated with military service across the deployment cycle, the author's experience of briefing and debriefing Australian operational personnel (e.g., Murphy, 1990) was combined with a review of the literature relating to the stress of military service. This list was subsequently refined during a number of focus groups with Canadian military personnel. These activities led to a list of 105 stressors relating to military service generally, and operational deployment more specifically. This extensive list of stressors, contained in Annex G1, was included in three early surveys of Canadian Forces peacekeepers deployed in Bosnia and Haiti. This initial instrument was intended to achieve domain coverage of the stressors associated with military deployment. When adequate data from this instrument were available, the intention was to

develop, through psychometric analysis, a refined measure of the stressors of peace support operations.

The initial version of the scale was called "Stress in Peace Support Operations." Respondents were asked to indicate to what extent each item on the given "list of issues, situations and threats" had caused them "trouble or concern at any time during the course of this deployment." The measure used a 6-point response scale reflecting different levels of concern.

Responses to this scale were received from 1177 respondents from the three deployments (n_1=417; n_2=467; n_3=293). Data screening as previously described was conducted for each item. Descriptive Statistics (means, standard deviations, skewness and kurtosis) of the Stress in Peace Support Operations Scale are provided in Annex G2. Skewness and kurtosis values for each item were within prescribed ranges. Due to the low likelihood or potentially traumatic nature of several items in the Stress in Peace Support Operations Scale, response distributions suggestive of univariate outliers were expected. These items (e.g., being taken hostage/held captive; exposure to mass graves) were likely to have been experienced by relatively few respondents, and those who had experienced them were likely to rate the psychological impact as high. For this reason, items with standardised scores greater than threshold (there were 30 such items) were retained in the psychometric analysis of the scale.

Data reduction was conducted to reduce the number of items on the 105-item scale and to determine an initial factor structure that adequately explained the patterns of correlations among the variables. Not only did the exigencies of operational service demand a parsimonious approach to survey design; it was recognised that the items needed to be refined into a meaningful conceptual structure, rather than simply provide domain coverage. Factor analysis was utilised to support these dual goals of data reduction and designation of scale dimensions.

Coakes and Steed (1999) outlined the testing assumptions of factor analysis. Although these techniques are robust to assumptions of normality, linearity is important because the techniques are based on correlation. Factor analysis relies on several sizeable correlations in the data correlation matrix so visual inspection for correlations in excess of .3 is recommended. Measures of Sampling Adequacy (MSA) contained in the diagonal of the anti-image correlation matrix should be above .5. Other common tests of sampling adequacy are Bartlett's test of sphericity (a significant value suggests factorability) and the Kaiser-Meyer-Olkin measure (with a value above .6 recommended).

The three samples were pooled. Although Tabachnik and Fidell (2001) warned against pooling the results of several samples for factor analytic purposes because different samples may have quite dissimilar characteristics, in this case the samples were from the same demographic group of Canadian serving soldiers undertaking peacekeeping duties. Visual inspection of the total sample correlation matrix found between 2 and 22 correlations above .3 for each item. Multicollinearity is not a concern in Principal Component Analysis (PCA) because there is no need to invert a correlation matrix (Tabachnik & Fidell, 2001). The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was .945, well above the recommended .6. Bartlett's Test of Sphericity was significant (approximate χ^2 of 62913.76; df 5460; $p < .000$). However Tabachnik and Fidell (2001) have noted that this was a notoriously sensitive test that was likely to be significant when sample sizes were 'substantial' even if correlations were low. All MSAs in the diagonal of the anti-image correlation matrix were .87 and above (well above the recommended .5). Together, these tests strongly suggested factorability of the matrix. Frequency distributions of standardised scores were examined. Thirty-one percent of cases (381) included at least one item with a standardised score above 3.29. As noted above, univariate outliers were expected due to the low incidence and potentially traumatic nature of several

scale items. Furthermore, there was little doubt that such items would contribute to overall stress levels for participants who were exposed to them. For these reasons, all cases were retained in subsequent analyses.

The merged sample was divided into two random samples each of nearly 600 cases (n_1=593; n_2=584). Comrey and Lee (1992) described samples above 500 cases as a "very good" sample size for factor analysis. The two samples also met the subjects-to-variable ratio of 5 or greater advocated by Bryant and Yarnold (2000) and Tabachnik and Fidell (2001). PCA using SPSS software was undertaken. PCA analyses the variance in the data, compared to factor analysis, which analyses covariance. PCA has been used quite commonly as a preliminary extraction technique and has been recommended when a large number of variables needs to be reduced to a smaller number of components (Tabachnik & Fidell, 1989). The goal of PCA is to extract maximum variance from the data using a reasonable number of readily interpretable components. Hence PCA provides a useful empirical summary of a data set.

PCA was applied to both samples. Confirmatory Factor Analysis (CFA) often has been utilised with a second (holdback) sample in psychometric scale development procedures. CFA is a sophisticated technique used in advanced stages of research in order to confirm theoretically-derived latent or underlying processes (Tabachnik & Fidell, 2001). However, there were two reasons why CFA was not used at this stage in this study. Firstly, the large number of items in the Stress in Peace Support Operations scale, as well as the large number of expected factors, was unlikely to lead to an adequate fit of the model when using confirmatory factor analytic techniques. Tabachnik and Fidell (1989) suggested that the number of extracted components with eigenvalues greater than 1 is usually between the total number of variables divided by 3 and the number of variables divided by 5. For a scale of 105 items, that would amount to between 21 and

34 components. CFA is not suitable for such a complex model. Secondly, as noted above, CFA is normally used in the advanced stages of research. At this early stage of psychometric development, the component structure of the Stress in Peace Support Operations Scale was both too large and unspecified for such sophisticated analysis.

The components extracted by PCA were rotated to improve interpretability. Based on advice from Bobko (1990), varimax rotation was applied. Varimax is an orthogonal rotation procedure that maximises the variance of loadings on each factor. It therefore minimises the complexity amongst components or factors, providing ease of interpretation, description and reporting. Orthogonal rotation produces factors that are uncorrelated, which is useful if these resulting factors are to be used in subsequent correlational analysis with other variables. The extraction option utilised was Eigenvalues over 1.0. Kaiser normalisation was adopted. An item-component correlation cut-off of .4 was utilised, which represents 15% overlapping variance. Cut-offs are often set at .3 or .4 (and occasionally higher), depending on the preference and goals of the researcher. Comrey and Lee (1992) regarded loadings of .32 (10% overlapping variance) as poor indicators of a factor. For this reason, this study generally adopted a .4 cut-off criterion.

Both analyses resulted in the extraction of 23 components, accounting for 67.2 and 66.2 percent respectively of the variance observed in the two samples. The final extracted component from each sample's PCA did not appear interpretable. Four other components from each analysis had unique loadings (an item that loaded above cut-off only on this component) made up of less than three items. Nevertheless, each of these components was conceptually meaningful and therefore retained. One component was poorly defined in the sense that it had only one unique variable loading on it and this component was discarded. The 22 meaningful components for each

sample are listed in Table 2. Item loadings for each component are contained in Annex G3. 'Complex' items that loaded above .4 on more than one component were the exception. For sample 1, seven items loaded above .4 on two components. Four of these same items, and two additional items, were complex items in the PCA outcomes for the second sample.

A limitation of both factor analysis and PCA is that there is no criterion variable against which to test the solution. Nevertheless, an important test of these analyses is interpretability (Tabachnik & Fidell, 1989). Examination of Table 2 revealed remarkable consistency in the outcomes of the two PCAs. Thus, 20 of the 22 meaningful components were identified in both analyses. Furthermore, 10 of these components were made up of identical items in both PCA outputs (see Annex G3).

Although the initial version of the Stress in Peace Support Operations scale showed promising psychometric properties and conceptual structure, there was need to significantly reduce the number of items and factors in the scale. A conceptual structure for the scale, formulated on the basis of professional experience and a review of the literature, suggested between five and seven dimensions were likely, including stressors specific to the operational theatre, workplace stressors, organisational stressors beyond the immediate workplace, family concerns, and sources of stress external to the military organisation. The requisite item reduction was achieved using a number of criteria. It was intended that most of the 22 meaningful components extracted by the two, random-sample PCAs would be represented in the short version. Components were excluded if other scales used in the HDO project measured a similar construct. Item loadings (correlation coefficients) were considered when determining the item or items to represent each component, with stronger loadings normally given precedence. Factors that accounted for more of the variance and which were constituted by more items were considered for multiple items in the short version. However, because domain

coverage was an important goal in the development of this instrument, even marginal components were considered for retention. As Tabachnik and Fidell (2001) noted, the last few factors extracted from factor analysis may "represent the most interesting and unexpected findings in a research area" (p. 622).

TABLE G1
'Stress in Peace Support Operations' Scale: PCA Component Labels and Item Loadings for Two Samples

	Sample 1 Component Labels (Number of items loading)	**Sample 2 Component Labels** (Number of items loading)
1	Unit management practices (10)	Unit management practices (9)
2	'Culture shock' (10)	'Culture shock' (10)
3	Personal security – Operational threats (8)	Personal security – Operational threats (7)
4	Family matters (8)	Exposure to trauma (5)
5	Work demands (8)	Family matters (8)
6	Exposure to trauma (5)	Tensions with external agents (5)
7	Support external to the organisation (4)	Work demands (7)
8	Interpersonal frustration (5) [a]	Perceived inequities (4)
9	Training and preparation issues (4)	Training and preparation issues (4)
10	Perceived inequities (4)	Support external to the organisation (4)
11	Tensions with external agencies (4)	Inadequacies in surrounding agencies (5) [a]
12	Personal and job security (3)	Personal Security – Non-military hazards (4)
13	Restrictions on leisure activities (3)	Personal and job security (4)
14	Restrictions of social relations (2)	Isolation / Alienation (4)
15	Impediments to social contact with locals (3)	Restrictions on leisure activities (4)
16	Isolation / Alienation (4)	Lack of workplace cohesion (3)
17	Personal Security – Non-military hazards (3)	Lack of organisational support (3) [a]
18	Lack of contact with home (5) [a]	Impediments to social contact with locals (3)
19	Lack of workplace cohesion (2)	Restrictions of social relations (2)
20	Uncertain / unfamiliar stressors (2)	Uncertain operational requirements (1)
21	Uncertain operational requirements (3)	Uncertain / unfamiliar stressors (2)
22	Lack of work satisfaction (2)	Lack of work satisfaction (2)

Note: [a] Denotes a factor common to only one sample's PCA outcomes.

Hence, there were sound reasons for retaining weaker components of marginal reliability. In several cases, new items were developed to reflect the quintessence of a multiple-item component. Conceptual and pragmatic issues also influenced item and component selection. One important practical concern was the need to develop a stressor scale that was applicable to the three stages of deployment, not just the in-theatre deployment stage. Finally, feedback from survey respondents and a reappraisal of focus group research pointed to several important stressors that were not addressed by the 105-item 'Stress in Peace Support Operations' scale.

As a result of these deliberations, two new versions of the stressors scale were constructed: 'Demands of Military Service (Non-operational)' (30 items) and 'Demands of Military Service (Operational)' (35 items). The non-operational version was for use in the predeployment and postdeployment phases. The operational version was for use with deployed samples. As a result of respondent and focus group feedback, five stressor items that had not been included in the antecedent Stress in Peace Support Operations scale were included in both versions of the new scale. These items were: conditions of Service matters, administrative support, degree of control over work tasks, quality of personal military clothing and equipment, and organisational policies that impact on work. The two versions of the new scale shared 29 items. The non-operational version had one unique item regarding career uncertainty. The operational version included six items that dealt with stressors considered to be unique to the deployment phase. These items canvassed exposure to traumatic stressors (three items), experience of 'culture clash' (one item), an aspect of personal security - non-military threat (one item), and uncertainty about end-of-mission date (one item). Four components that were extracted from the PCA of the 105-item scale were not included in the short versions. These components had been labelled 'interpersonal frustration', 'impediments to social relations with the local populace', 'work satisfaction', and 'restrictions on social relations'. These

issues were considered to lack universality across all deployment stages, and/or were to be more appropriately addressed by other HDO survey measures.

Annex G1 to Stressors of Military Service Scale Development

Stress in Peace Support Operations (105)

Instructions: Below is a list of issues, situations, events and threats that have caused stress for personnel serving in previous peace operations. Please indicate to what extent these stressors have caused you trouble or concern at any time during the course of this deployment.

Rating Scale:

0 not applicable
1 no trouble
2 a little trouble or concern
3 some trouble or concern
4 much trouble or concern
5 very much trouble or concern

1	Pre-deployment training that proved irrelevant to our actual role in theatre
2	Pre-deployment training that did not prepare me well enough for my role in theatre
3	Misleading / inaccurate pre-deployment briefings on the situation here
4	Too much time spent in pre-deployment training
5	Poorly thought out policies and regulations
6	Restrictions on travel/movement outside the camp/base (eg. 'walking out' policy)
7	The alcohol policy
8	Policies concerning relationships between men and women
9	A poorly defined mission statement
10	Poorly defined Rules of Engagement (ROEs)
11	The system / plan of UN leave and R&R
12	Lack of a regular work day routine
13	Unnecessary tasks being undertaken just to keep busy
14	Not being given enough credit for previous military experience or qualifications

15	Feeling inexperienced / untrained for the tasks at hand
16	Excessively physically demanding work or training
17	Long hours of work
18	Insufficient personnel to complete the tasks assigned
19	An excessive level of responsibility
20	Lack of responsibility
21	Mental fatigue
22	Feeling isolated or trapped in one location
23	Lack of privacy
24	Boredom
25	Delays or problems in the mail service
26	Loneliness
27	The way the media presents the situation back home
28	The amount of media coverage at home
29	The system for phoning home
30	Lack of contact with family back home
31	The reactions of your family to the situation here
32	Concern for the welfare of your family
33	Being unable to assist with problems or decisions back home
34	Separation at special occasions, eg Christmas; birthdays; graduations, anniversaries
35	Rumours and inaccurate information circulating at home
36	Lack of official support by the Defence organization for your family at home
37	A feeling of lack of support or interest by the Canadian public
38	Level of support shown by the Canadian government for members on this mission

39	Unequal treatment of new unit members (augmentees and reserves)
40	Poor communication / slow passage of information through the chain of command
41	Superiors overreacting to situations or events
42	Superiors looking over your shoulder ("micro-managing")
43	Lack of clear direction or orders needed to carry out tasks
44	Lack of trust from superiors
45	Personnel in the unit being treated like "kids"
46	Lack of trust or confidence in your superiors
47	Lack of recognition for your efforts and / or achievements
48	Extreme or unusual environmental factors (eg. heat, cold, noise)
49	Poor relations with local police / military / paramilitary forces
50	Unpredictable behaviour or intent of local forces
51	Lack of evidence that the UN/NATO has a positive effect on the situation here
52	Trying to deal with local factions / forces in an impartial manner
53	Dealing with personnel from other UN/NATO military contingents
54	Dealing with UN or NGO civilian officials
55	Perceptions of incompetence within the UN
56	The risk of traffic accidents
57	Having to sort out problems caused by others
58	Poor coping by others in the contingent
59	Incompetence by others in the contingent
60	Poor relations with work colleagues
61	Intolerance among work colleagues
62	The possibility of subordinates or colleagues being wounded or killed

63	Inadequate or insufficient equipment
64	"Double standards" among *units* in the distribution of supplies and equipment
65	"Double standards" among *ranks* when it comes to applying rules and regulations
66	"Double standards" among *ranks* in your contingent with respect to privileges
67	"Double standards" among *units* in your contingent with respect to privileges
68	Feeling unwelcome or unappreciated by those you are trying to help
69	Language barriers with the locals
70	Misunderstandings relating to the local culture and customs
71	The role of religion in the society here
72	Local attitudes towards children
73	Local attitudes towards women
74	Local attitudes towards death
75	Poverty and / or begging
76	The local system of justice
77	Feeling economically exploited by the locals
78	Substandard living conditions for contingent personnel
79	Lack of time off
80	The quality / appeal of the food provided
81	Lack of facilities for recreation
82	Lack of social contact with opposite sex from own culture
83	Lack of opportunities to engage in sexual activity
84	Lack of a clearly defined end-of-mission date
85	Viewing widespread destruction of property
86	Witnessing widespread or unusual human suffering eg. starvation, mutilation

87	Viewing the corpses of adult civilians
88	Exposure to the corpses of children
89	Viewing scenes where atrocities or massacres took place
90	Handling / burying / disinterring bodies
91	Exposure to mass graves
92	Seeing children who are victims of war, oppression or serious neglect
93	The possibility of being killed or seriously wounded
94	The danger posed by undetected, unexploded ordnance (eg, anti-personnel mines)
95	The possibility of being taken hostage / held captive
96	The threat posed by sniper fire
97	Danger posed by indirect involvement in major hostilities between local factions
98	The potential danger posed by direct involvement in major hostilities
99	The risk of contracting AIDS
100	The risk of contracting a non-fatal disease
101	The risk of assault whilst on local leave
102	An insecure living / sleeping environment
103	Apprehension about returning home
104	Possible adverse effects of the deployment on *posting* opportunities
105	Possible adverse effects of the deployment on *promotion* opportunities

Annex G2 to Stressors of Military Service Scale Development

Descriptive Statistics of the Stress in Peace Support Operations Scale

(N = 1,232)

	Item	Mean	Standard Deviation	Skewness	Kurtosis
1	Predeploy training irrelevant	2.61	1.525	.085	-1.082
2	Predeploy training inadequate	2.00	1.412	.690	-.447
3	Predeploy training misleading	2.18	1.388	.521	-.699
4	Too much predeployment training	3.03	1.572	-.151	-1.325
5	Policies & regulations poorly thought out	3.15	1.471	-.275	-1.042
6	Restrictions on travel	3.14	1.555	-.220	-1.285
7	Alcohol policy	2.98	1.686	-.082	-1.484
8	Policies about male-female relationships	2.30	1.597	.488	-1.121
9	Poorly defined mission statement	2.17	1.406	.664	-.604
10	Poorly defined ROEs	1.79	1.302	1.215	.568
11	System of UN leave and R&R	2.10	1.397	.786	-.551
12	Lack of regular daily work routine	1.75	1.214	1.164	.610
13	Unnecessary tasks to keep busy	3.03	1.632	-.171	-1.380
14	Lack of credit for prior experience and qualifications	2.41	1.560	.369	-1.138
15	Feeling inexperienced / untrained for the tasks at hand	1.41	.990	1.656	3.069
16	Excessively physically demanding work or training	1.32	.908	1.836	4.084
17	Long hours of work	1.63	1.133	1.322	1.123
18	Insufficient personnel to complete the tasks assigned	2.12	1.388	.726	-.556
19	An excessive level of responsibility	1.32	.861	1.757	4.049
20	Lack of responsibility	1.84	1.307	1.006	.076
21	Mental fatigue	1.52	1.037	1.501	2.041
22	Feeling isolated or trapped in one location	2.00	1.412	.925	-.326
23	Lack of privacy	2.15	1.357	.691	-.568
24	Boredom	2.53	1.413	.370	-.960
25	Delays or problems in the mail service	2.48	1.489	.413	-1.057
26	Loneliness	1.94	1.199	.910	.126

	Item	Mean	Standard Deviation	Skewness	Kurtosis
27	The way the media presents the situation back home	1.91	1.340	.769	-.173
28	The amount of media coverage at home	1.89	1.357	.810	-.173
29	The system for phoning home	1.88	1.326	1.208	.278
30	Lack of contact with family back home	1.80	1.232	1.191	.523
31	The reactions of your family to the situation here	1.67	1.121	1.404	1.425
32	Concern for the welfare of your family	2.20	1.403	.675	-.692
33	Being unable to assist with problems or decisions back home	2.33	1.452	.510	-.928
34	Separation at special occasions	2.39	1.434	.493	-.928
35	Rumours and inaccurate information at home	2.35	1.517	.511	-1.024
36	Lack of official support by the Defence organisation for family	1.97	1.406	.837	-.375
37	A feeling of lack of support or interest by the Canadian public	2.36	1.462	.466	-.978
38	Level of support shown by government for members on this mission	2.52	1.479	.343	-1.115
39	Unequal treatment of new unit members	1.64	1.263	1.390	1.152
40	Poor communication / slow passage through chain of command	2.68	1.461	.192	-1.174
41	Superiors overreacting to situations or events	3.05	1.478	-.097	-1.259
42	Superiors looking over your shoulder ("micro-managing")	3.07	1.577	-.140	-1.387
43	Lack of clear direction or orders needed to carry out tasks	2.24	1.358	.703	-.602
44	Lack of trust from superiors	2.80	1.578	.122	-1.411
45	Personnel in the unit being treated like "kids"	3.51	1.522	-.556	-1.075
46	Lack of trust or confidence in your superiors	2.92	1.521	.031	-1.330
47	Lack of recognition for your efforts/achievements	2.38	1.389	.494	-.885
48	Extreme or unusual environmental factors	1.87	1.231	1.067	.282

	Item	Mean	Standard Deviation	Skewness	Kurtosis
49	Poor relations with local police / military / paramilitary	1.56	1.156	1.389	1.552
50	Unpredictable behaviour or intent of local forces	1.60	1.151	1.226	1.010
51	Lack of evidence the UN/NATO has a positive effect here	2.11	1.377	.764	-.468
52	Trying to deal with local factions / forces impartially	1.39	1.055	1.330	2.057
53	Dealing with personnel from other UN/NATO contingents	1.22	.800	1.720	4.676
54	Dealing with UN or NGO civilian officials	1.23	.923	1.606	3.784
55	Perceptions of incompetence within the UN	1.75	1.297	.975	.267
56	The risk of traffic accidents	2.52	1.478	.315	-1.074
57	Having to sort out problems caused by others	2.01	1.230	.776	-.089
58	Poor coping by others in the contingent	1.70	1.091	1.146	1.130
59	Incompetence by others in the contingent	2.22	1.344	.580	-.562
60	Poor relations with work colleagues	1.56	1.028	1.483	2.112
61	Intolerance among work colleagues	1.65	1.066	1.324	1.460
62	Possibility of subordinates/ colleagues wounded or killed	1.53	1.038	1.401	1.924
63	Inadequate or insufficient equipment	2.73	1.518	.159	-1.260
64	"Double standards" among units in the distribution of supplies and equipment	3.04	1.587	-.156	-1.342
65	"Double standards" among ranks when it comes to applying rules and regulations	3.25	1.554	-.287	-1.306
66	"Double standards" among ranks in your contingent with respect to privileges	3.08	1.603	-.113	-1.448
67	"Double standards" among units in your contingent with respect to privileges	3.00	1.604	-.051	-1.436
68	Feeling unwelcome or unappreciated by those you are trying to help	2.12	1.338	.759	-.410
69	Language barriers with the locals	2.19	1.369	.675	-.541

	Item	Mean	Standard Deviation	Skewness	Kurtosis
70	Misunderstandings relating to the local culture and customs	1.70	1.142	1.229	1.101
71	The role of religion in the society here	1.53	1.109	1.453	1.869
72	Local attitudes towards children	1.67	1.193	1.241	.915
73	Local attitudes towards women	1.68	1.177	1.216	.940
74	Local attitudes towards death	1.64	1.198	1.338	1.199
75	Poverty and / or begging	1.89	1.337	.961	-.006
76	The local system of justice	2.10	1.527	.685	-.754
77	Feeling economically exploited by the locals	1.74	1.262	1.104	.498
78	Substandard living conditions for contingent personnel	1.78	1.205	1.198	.756
79	Lack of time off	1.96	1.311	1.002	.011
80	The quality / appeal of the food provided	2.41	1.481	.515	-1.064
81	Lack of facilities for recreation	2.00	1.296	.936	-.091
82	Lack of social contact with opposite sex from own culture	2.35	1.547	.531	-1.067
83	Lack of opportunities to engage in sexual activity	2.49	1.703	.345	-1.400
84	Lack of a clearly defined end-of-mission date	2.72	1.664	.209	-1.498
85	Viewing widespread destruction of property	1.63	1.086	1.250	1.269
86	Witnessing widespread or unusual human suffering eg. starvation, mutilation	1.50	1.152	1.155	1.165
87	Viewing the corpses of adult civilians	1.00	1.009	1.507	2.919
88	Exposure to the corpses of children	1.17	1.342	1.340	1.087
89	Viewing scenes where atrocities or massacres took place	1.15	1.141	1.374	1.954
90	Handling / burying / disinterring bodies	.85	1.096	1.706	2.935
91	Exposure to mass graves	.98	1.100	1.522	2.437
92	Seeing children who are victims of war, oppression or serious neglect	1.66	1.365	.816	-.122
93	The possibility of being killed or seriously wounded	1.56	1.047	1.278	1.597

	Item	Mean	Standard Deviation	Skewness	Kurtosis
94	The danger posed by undetected, unexploded ordnance (eg, anti-personnel mines)	1.74	1.264	.868	.174
96	The threat posed by sniper fire	1.27	.971	1.524	3.229
97	Danger posed by indirect involvement in major hostilities between local factions	1.34	.912	1.375	2.654
98	The potential danger posed by direct involvement in major hostilities	1.36	.928	1.272	2.195
99	The risk of contracting AIDS	1.61	1.451	1.206	.436
100	The risk of contracting a non-fatal disease	1.78	1.325	1.064	.268
101	The risk of assault whilst on local leave	1.52	1.056	1.438	2.075
102	An insecure living / sleeping environment	1.36	.949	1.834	3.802
103	Apprehension about returning home	1.52	1.093	1.555	1.994
104	Possible adverse effects of the deployment on posting opportunities	1.41	1.099	1.725	2.731
105	Possible adverse effects of the deployment on promotion opportunities	1.46	1.168	1.637	2.232

Note. Each item was marked as an answer to the question: 'Please indicate to what extent these stressors have caused you trouble or concern at any time during the course of this deployment, on the following scale:

0 not applicable
1 no trouble
2 a little trouble or concern
3 some trouble or concern
4 much trouble or concern
5 very much trouble or concern

Annex G3 to Stressors of Military Service Scale Development

Stressors of Military Service Scale

Component Loadings for Sample 1 and Sample 2

	Sample 1		Sample 2	
Item	**Component**	**Ld**	**Component**	**Ld**
Component 1/1 Unit management practices	7.5% Var		6.5% Var	
Lack of trust from superiors	C1	.814	C1	.819
Superiors looking over your shoulder ("micro-managing")	C1	.775	C1	.804
Lack of trust or confidence in your superiors	C1	.771	C1	.772
Superiors overreacting to situations or events	C1	.749	C1	.700
Personnel in the unit being treated like "kids"	C1	.742	C1	.708
Lack of recognition for your efforts/achievements	C1	.664	C1	.499
Lack of clear direction or orders needed to carry out tasks	C1	.639	C1	.683
Poor communication/slow passage through chain of command	C1	.585	C1	.510
Unnecessary tasks just to keep busy	C1	.501	C1	.528
Incompetence by others in the contingent	C1	.485	C1	(.324)
Component 2/2 'Culture shock'	6.3% Var		6.0% Var	
Local attitudes towards women	C2	.798	C2	.766
Local attitudes towards children	C2	.783	C2	.714
The local system of justice	C2	.780	C2	.758
Poverty and/or begging	C2	.756	C2	.769
Local attitudes towards death	C2	.716	C2	.719
Feeling economically exploited by the locals	C2	.539	C2	.445
Witnessing widespread or unusual human suffering eg. starvation	C2	.513	C2	.594
The role of religion in the society here	C2	.501	C2	.420
Seeing children who are victims of war/oppression/serious neglect	C2	.492	C2	.510
Viewing widespread destruction of property	C2	.437	C2	.477
Component 3/3 Personal security - Operational threats	4.9% Var		4.2% Var	
The possibility of being taken hostage/held captive	C3	.831	C3	.757
The threat posed by sniper fire	C3	.817	C3	.799
Danger of indirect involvement in major hostilities by local factions	C3	.774	C3	.656
The possibility of being killed or seriously wounded	C3	.764	C3	.740
Potential danger posed by direct involvement in major hostilities	C3	.743	C3	.580
The danger posed by undetected, unexploded ordnance, eg, mines	C3	.670	C3	.739
The risk of assault whilst on local leave	C3	.474	C3	.443
Possibility of subordinates/colleagues wounded or killed	C3	.457	C3	(.348)

Component Loadings for Sample 1 and Sample 2 (contd)

	Sample 1		Sample 2	
Item	**Component**	**Ld**	**Component**	**Ld**
Component 4/5 **Family matters**	4.3% Var		4.0% Var	
Being unable to assist with problems or decisions back home	C4	.812	C5	.714
Concern for the welfare of your family	C4	.794	C5	.775
Separation at special occasions	C4	.719	C5	.627
Lack of official support by the Defence organisation for family	C4	.574	C5	.426
The reactions of your family to the situation here	C4	.491	C5	.673
Loneliness	C4	.474	C5	(.354)
Rumours and inaccurate information at home	C4	.431	C5	.437
Lack of contact with family back home	C4	.476	C5	.676
The system for phoning home	C18	.737	C5	.405
Component 5/7 **Work demands**	4.1% Var		3.6% Var	
Long hours of work	C5	.758	C7	.715
Excessively physically demanding work or training	C5	.709	C7	.703
An excessive level of responsibility	C5	.657	C7	.663
Mental fatigue	C5	.632	C7	.692
Feeling inexperienced / untrained for the tasks at hand	C5	.569	C7	.557
Insufficient personnel to complete the tasks assigned	C5	.545	C7	.433
Lack of time off	C5	.469	C7	(.323)
Lack of regular daily work routine	C5	.429	C7	.452
Component 6/4 **Exposure to trauma**	4.0% Var		4.1% Var	
Handling / burying / disinterring bodies	C6	.805	C4	.796
Exposure to mass graves	C6	.771	C4	.791
Viewing scenes where atrocities or massacres took place	C6	.768	C4	.784
Viewing the corpses of adult civilians	C6	.758	C4	.771
Exposure to the corpses of children	C6	.750	C4	.752
Component 7/10 **Support external to the organisation**	3.0% Var		2.8% Var	
The way the media presents the situation back home	C7	.766	C10	.761
The amount of media coverage at home	C7	.735	C10	.758
A feeling of lack of support or interest by the Canadian public	C7	.599	C10	.618
Level of government support for members on this mission	C7	.598	C10	.580
Component 8/(6&11) **Interpersonal frustration**	2.8% Var		-	
Dealing with UN or NGO civilian officials	C4	.756	C6	.752
Dealing with personnel from other UN/NATO contingents	C4	.687	C6	.732
Perceptions of incompetence within the UN	C4	.643	C11	.440
Poor coping by others in the contingent	C4	.468	C11	.555
Having to sort out problems caused by others	C4	.412	C11	.613

Component Loadings for Sample 1 and Sample 2 (contd)

	Sample 1		Sample 2	
Item	**Component**	**Ld**	**Component**	**Ld**
Component 9/9 **Training & preparation issues**	2.8% Var		2.8% Var	
Predeployment training irrelevant	C9	.751	C9	.756
Predeployment training inadequate	C9	.724	C9	.716
Predeployment training misleading	C9	.698	C9	.639
Too much predeployment training	C9	.561	C9	.541
Component 10/8 **Perceived inequities**	2.8% Var		2.8% Var	
'Double standards' in contingent units with respect to privileges	C10	.719	C8	.804
'Double standards' among ranks in applying rules and regulations	C10	.697	C8	.741
'Double standards' in units in distribution of supplies/equipment	C10	.696	C8	.721
'Double standards' among ranks in contingent in privileges	C10	.678	C8	.786
Component 11/8 **Tensions with external agents**	2.4% Var		3.7% Var	
Poor relations with local police / military / paramilitary	C11	.683	C8	.491
Unpredictable behaviour or intent of local forces	C11	.670	C8	.559
Lack of evidence the UN/NATO has a positive effect here	C11	.503	C6	(.375)
Trying to deal with local factions / forces impartially	C11	.467	C8	.727
Component 12/13 **Personal and job security**	2.3% Var		2.3% Var	
Possible adverse effects of the deployment on postings	C12	.732	C13	.815
Possible adverse effects of the deployment on promotion	C12	.720	C13	.731
An insecure living / sleeping environment	C12	.452	C13	(.374)
Substandard living conditions for contingent personnel	C12	(.346)	C17	.433
Apprehension about returning home	C12	(.312)	C13	.613
Component 13/15 **Restrictions on leisure activities**	2.3% Var		2.3% Var	
The alcohol policy	C13	.703	C15	.730
Restrictions on travel	C13	.670	C15	.657
Policies about male-female relationships	C13	.524	C15	.630
Policies and regulations poorly thought out	C13	(.31)	C15	.449
Component 14/19 **Restrictions on social relations**	2.1% Var		1.8% Var	
Lack of social contact with opposite sex from own culture	C14	.814	C19	.759
Lack of opportunities to engage in sexual activity	C14	.799	C19	.809
Component 15/18 **Impediments to social contact with locals**	2.1% Var		1.8% Var	
Language barriers with the locals	C15	.709	C18	.499
Misunderstandings relating to the local culture and customs	C15	.693	C18	.646
The role of religion in the society here	C15	.455	C18	.604

Component Loadings for Sample 1 and Sample 2 (contd)

	Sample 1		Sample 2	
Item	**Component**	**Ld**	**Component**	**Ld**
Component 16/14 **Isolation & Alienation**	2.0% Var		2.3% Var	
Feeling isolated or trapped in one location	C16	.624	C14	.598
Lack of privacy	C16	.621	C14	.479
Boredom	C16	.538	C14	.758
Loneliness	C16	.470	C14	.534
Component 17/12 **Non-military hazards**	2.0% Var		2.3% Var	
The risk of contracting AIDS	C17	.647	C12	.777
The risk of contracting a non-fatal disease	C17	.639	C12	.747
Apprehension about returning home	C17	(.323)	C13	.613
The risk of assault whilst on local leave	C17	.453	C12	.455
Component 18/- **Lack of contact with home**	1.9% Var		-	
The system for phoning home	C18	.737	C5	.405
Lack of contact with family back home	C18	.577	C5	.676
Delays or problems in the mail service	C18	.431	C23	.432
System of UN leave and R&R	C18	.425	C20	.727
Lack of facilities for recreation	C18	.401	C17	.646
Component 19/16 **Lack of workplace cohesion**	1.9% Var		2.1% Var	
Intolerance among work colleagues	C19	.812	C16	.738
Poor relations with work colleagues	C19	.806	C16	.733
Unequal treatment of new unit members	DNL	-	C16	.499
Component 20/- **Uncertain/unfamiliar stressors**	1.8% Var		-	
Lack of a clearly defined end-of-mission date	C20	.650	C2	(.338)
Extreme or unusual environmental factors	C20	.516	C21	.495
Component 21/20 **Uncertainty in operational requirements**	1.6% Var		1.6% Var	
Poorly defined Rules of Engagement	C21	.743	C20	(.389)
Poorly defined mission statement	C21	.537	C20	(.397)
System of UN leave and R&R	C18	.425	C20	.727
Component 22/22 **Lack of work satisfaction**	1.3% Var		1.3% Var	
Lack of responsibility	C22	.565	C22	.603
Lack of credit for prior experience and qualifications	C22	.484	C22	.494
Component 23/23 **(Not interpretable)**	1.2% Var		1.2% Var	
Having to sort out problems caused by others	C23	(.356)	DNL	-
Viewing widespread destruction of property	C23	(-.38)	DNL	-
Delays or problems in the mail service	DNL	-	C23	.432

Appendix H

Human Dimension of Operations Project

Survey Component – Stressors of Military Service [30]

"Demands of Military Service" (30 item non-operational version)

(Used in pre- and post-deployment surveys)

Demands of Military Service [30]

Instructions: Below is a list of issues, situations and threats that have caused stress for personnel serving in the military. Using the scale provided, please indicate to what extent each issue below has caused you trouble or concern **during the last month**.

Rating Scale:

0 no trouble/not applicable
1 a little trouble or concern
2 some trouble or concern
3 much trouble or concern
4 very much trouble or concern

1 Conditions of service matters (eg. pay, allowances).

2 Administrative support.

3 Career issues (eg. promotion, postings).

4 Training issues (eg. relevance, repetition, amount).

5 The amount of work you were expected to undertake or achieve.

6 Boredom while at work.

7 Degree of control over your work tasks.

8 Uncertainty about what your work role is or will be (eg. tasks, projects).

9 Uncertainty about your own competence to do your job.

10 Uncertainty about the competence of others you rely on to do their job.

11 The quality of your personal clothing and equipment.

12 The feedback you receive about your work.

13 Leadership concerns.

14 ADF policies that impact on your work.

15 Policies and regulations in your unit (eg. short leave, duties).

16 Lack of cohesion among your workmates.

17 Time spent away from your family due to service.

18 Problems with or in your family.

19 Communication with your family.

20 Concern about the impact of deployment on your relationship with your family.

21 Level of support shown by those outside the ADF (eg. the Australian public, the government).

22 Lack of privacy.

23 Dealing with people external to the ADF in your work (eg., local police and officials).

24 Mental or physical fatigue.

25 Harsh environmental conditions (eg. heat, cold, dust, noise, humidity).

26 Threat of serious injury.

27 Double standards (eg. in applying rules, receiving privileges).

28 Standard of living conditions when in the field (eg. food, amenities).

29 Lack of recreation opportunities.

30 Uncertainty about your future in the ADF.

Appendix I

Human Dimension of Operations Project

Survey Component – Stressors of Military Service [35]

"Demands of Military Service" (35 item operational version)

(Used in deployment surveys)

Demands of Military Service [35]

Instructions: Below is a list of issues, situations and threats that have caused stress for personnel serving in the military. Using the scale provided, please indicate to what extent each issue below has caused you trouble or concern **during the last month**.

Rating Scale:

0 no trouble/not applicable
1 a little trouble or concern
2 some trouble or concern
3 much trouble or concern
5 very much trouble or concern

1 Conditions of service matters (eg. pay, allowances).

2 Administrative support.

3 Career issues (eg. promotion, postings).

4 Training issues (eg. relevance, repetition, amount).

5 The amount of work you were expected to undertake or achieve.

6 Boredom while at work.

7 Degree of control over your work tasks.

8 Uncertainty about what your work role is or will be (eg. mission, Rules of Engagement).

9 Uncertainty about your own competence to do your job.

10 Uncertainty about the competence of others you rely on to do their job.

11 The quality of your personal clothing and equipment.

12 The feedback you receive about your work.

13 Leadership concerns.

14 ADF policies that impact on your work.

15 Policies and regulations in your unit (eg. leave plan, alcohol consumption).

16 Lack of cohesion among your workmates.

17 Time spent away from your family due to service.

18 Problems with or in your family.

19 Communication with your family.

20 Concern about the impact of deployment on your relationship with your family.

21 Level of support shown by those outside the ADF (eg. the Australian public, the Government).

22 Lack of privacy.

23 Dealing with people external to the ADF (eg. UN or aid officials, local police, militia).

24 Mental or physical fatigue.

25 Harsh environmental conditions (eg. heat, cold, dust, noise, humidity).

26 Threat of serious injury.

27 Double standards (eg. in supplies, applying rules, receiving privileges).

28 Standard of living conditions in the field / on deployment (eg. food, sleeping quarters).

29 Lack of recreation opportunities.

30 Uncertainty about end-of-mission date.

31 Seeing widespread suffering (eg. starvation, forced migration, property destruction).

32 Seeing instances of inhumanity (eg. mass graves, neglected children, signs of torture).

33 The impact of a different culture (eg. attitudes towards women, death and time).

34 Experience with death (eg. seeing someone die, handling corpses).

35 Risk of contracting a serious disease.

Appendix J

Human Dimension of Operations Project

Descriptive Statistics – Stressors of Military Service

"Demands of Military Service Scale"

(For pre-, during and post-deployment samples)

Descriptive statistics of the Stressors of Military Service Scale
Predeployment sample
(N = 411)

	Item	Mean	Standard deviation	Skewness	Kurtosis
1	Conditions of service matters (eg. pay, allowances).	2.22	1.30	.81	-.43
2	Administrative support.	2.04	1.11	.90	.12
3	Career issues (eg. promotion, postings).	2.27	1.35	.69	-.74
4	Training issues (eg. relevance, repetition, amount).	2.43	1.26	.43	-.86
5	The amount of work you were expected to undertake or achieve.	2.08	1.17	.85	-.20
6	Boredom while at work.	2.15	1.34	.89	-.47
7	Degree of control over your work tasks.	1.98	1.11	1.07	.46
8	Uncertainty about what your work role is or will be (eg. tasks, projects).	1.82	1.07	1.30	1.02
9	Uncertainty about your own competence to do your job.	1.42	.77	1.99	3.84
10	Uncertainty about the competence of others you rely on to do their job.	2.14	1.11	.82	.04
11	The quality of your personal clothing and equipment.	2.21	1.25	.75	-.48
12	The feedback you receive about your work.	1.85	1.06	1.38	1.47
13	Leadership concerns.	1.96	1.16	1.11	.38
14	ADF policies that impact on your work.	2.09	1.17	.92	.04
15	Policies and regulations in your unit (eg. short leave, duties).	2.06	1.17	.93	-.00
16	Lack of cohesion among your workmates.	1.81	1.02	1.31	1.29
17	Time spent away from your family due to service.	2.37	1.30	.63	-.73

	Item	Mean	Standard deviation	Skewness	Kurtosis
18	Problems with or in your family.	1.72	1.09	1.57	1.74
19	Communication with your family.	1.78	1.12	1.51	1.54
20	Concern about the impact of deployment on your relationship with your family.	1.98	1.22	1.19	.41
21	Level of support shown by those outside the ADF (eg. the Australian public, the government).	1.86	1.12	1.26	.82
22	Lack of privacy.	1.74	1.04	1.52	1.73
23	Dealing with people external to the ADF in your work (eg., local police and officials).	1.46	.86	2.13	4.39
24	Mental or physical fatigue.	1.91	1.10	1.14	.49
25	Harsh environmental conditions (eg. heat, cold, dust, noise, humidity).	1.70	.96	1.41	1.65
26	Threat of serious injury.	1.81	1.04	1.29	1.06
27	Double standards (eg. in applying rules, receiving privileges).	2.71	1.47	.35	-1.25
28	Standard of living conditions when in the field (eg. food, amenities).	1.70	1.01	1.63	2.20
29	Lack of recreation opportunities.	1.98	1.17	1.11	.39
30	Uncertainty about your future in the ADF.	1.96	1.22	1.20	.47

Descriptive statistics of the Stressors of Military Service Scale
Deployment sample
(N = 560)

	Item	Mean	Standard deviation	Skewness	Kurtosis
1	Conditions of service matters (eg. pay, allowances).	2.41	1.39	.61	-.89
2	Administrative support.	2.52	1.26	.41	-.82
3	Career issues (eg. promotion, postings).	2.84	1.40	.15	-1.20
4	Training issues (eg. relevance, repetition, amount).	2.66	1.29	.34	-.88
5	The amount of work you were expected to undertake or achieve.	2.27	1.25	.65	-.67
6	Boredom while at work.	2.24	1.24	.78	-.35
7	Degree of control over your work tasks.	2.22	1.19	.73	-.30
8	Uncertainty about what your work role is or will be (eg. tasks, projects).	1.95	1.16	1.12	.31
9	Uncertainty about your own competence to do your job.	1.34	.66	2.12	4.56
10	Uncertainty about the competence of others you rely on to do their job.	2.28	1.14	.72	-.21
11	The quality of your personal clothing and equipment.	2.03	1.25	1.01	-.08
12	The feedback you receive about your work.	2.17	1.24	.86	-.26
13	Leadership concerns.	2.39	1.31	.60	-.78
14	ADF policies that impact on your work.	2.37	1.24	.60	-.58
15	Policies and regulations in your unit (eg. short leave, duties).	2.37	1.30	.59	-.78
16	Lack of cohesion among your workmates.	2.01	1.08	1.05	.54
17	Time spent away from your family due to service.	2.74	1.36	.31	-1.08

	Item	Mean	Standard deviation	Skewness	Kurtosis
18	Problems with or in your family.	1.82	1.11	1.36	1.07
19	Communication with your family.	1.99	1.24	1.14	.26
20	Concern about the impact of deployment on your relationship with your family.	2.40	1.40	.64	-.86
21	Level of support shown by those outside the ADF	2.15	1.25	.86	-.29
22	Lack of privacy.	2.19	1.29	.87	-.38
23	Dealing with people external to the ADF in your work (eg., local police and officials).	1.51	.87	2.00	4.06
24	Mental or physical fatigue.	2.17	1.17	.82	-.22
25	Harsh environmental conditions (eg. heat, cold, dust, noise, humidity).	1.89	1.02	1.17	.96
26	Threat of serious injury.	1.93	1.05	1.14	.75
27	Double standards (eg. in applying rules, receiving privileges).	3.40	1.40	-.30	-1.21
28	Standard of living conditions when in the field (eg. food, amenities).	1.96	1.19	1.18	.46
29	Lack of recreation opportunities.	2.38	1.28	.61	-.72
30	Uncertainty about end-of-mission date.	1.85	1.18	1.41	1.06
31	Seeing widespread suffering (eg. starvation, forced migration, property destruction).	1.50	.79	1.66	2.59
32	Seeing instances of inhumanity (eg. mass graves, neglected children, signs of torture).	1.68	.90	1.40	1.75
33	The impact of a different culture (eg. attitudes towards women, death and time).	1.50	.78	1.68	2.75
34	Experience with death (eg. seeing someone die, handling corpses).	1.36	.70	2.21	5.43
35	Risk of contracting a serious disease.	2.04	1.12	1.08	.530

Descriptive statistics of the Stressors of Military Service Scale
Postdeployment sample
(N = 334)

	Item	Mean	Standard deviation	Skewness	Kurtosis
1	Conditions of service matters (eg. pay, allowances).	2.57	1.296	.360	-.89
2	Administrative support.	2.50	1.270	.325	-.94
3	Career issues (eg. promotion, postings).	2.44	1.361	.498	-.99
4	Training issues (eg. relevance, repetition, amount).	2.83	1.303	.111	-1.08
5	The amount of work you were expected to undertake or achieve.	2.28	1.200	.610	-.55
6	Boredom while at work.	2.79	1.434	.196	-1.28
7	Degree of control over your work tasks.	2.13	1.175	.863	-.12
8	Uncertainty about what your work role is or will be (eg. tasks, projects).	2.08	1.233	.913	-.23
9	Uncertainty about your own competence to do your job.	1.55	.912	1.822	3.05
10	Uncertainty about the competence of others you rely on to do their job.	2.22	1.182	.720	-.36
11	The quality of your personal clothing and equipment.	2.44	1.394	.524	-1.02
12	The feedback you receive about your work.	2.02	1.181	.971	.01
13	Leadership concerns.	2.22	1.248	.785	-.38
14	ADF policies that impact on your work.	2.45	1.305	.528	-.83
15	Policies and regulations in your unit (eg. short leave, duties).	2.51	1.331	.485	-.91
16	Lack of cohesion among your workmates.	1.90	1.066	1.140	.68

	Item	Mean	Standard deviation	Skewness	Kurtosis
17	Time spent away from your family due to service.	2.42	1.32	.56	-.82
18	Problems with or in your family.	1.92	1.25	1.17	.21
19	Communication with your family.	1.87	1.16	1.18	.37
20	Concern about the impact of deployment on your relationship with your family.	2.15	1.34	.87	-.54
21	Level of support shown by those outside the ADF (eg. the Australian public, the government).	2.00	1.21	1.02	.06
22	Lack of privacy.	1.93	1.16	1.16	.44
23	Dealing with people external to the ADF in your work (eg., local police and officials).	1.81	1.12	1.27	.71
24	Mental or physical fatigue.	2.11	1.24	.87	-.30
25	Harsh environmental conditions (eg. heat, cold, dust, noise, humidity).	1.95	1.13	1.14	.54
26	Threat of serious injury.	1.85	1.13	1.24	.67
27	Double standards (eg. in applying rules, receiving privileges).	2.98	1.49	.04	-1.39
28	Standard of living conditions when in the field (eg. food, amenities).	1.75	1.08	1.40	1.22
29	Lack of recreation opportunities.	2.11	1.24	.90	-.27
30	Uncertainty about your future in the ADF.	2.21	1.31	.84	-.47

Appendix K

Human Dimension of Operations Project

Survey Component - Strain Scale - Symptoms Checklist (Modified)

"Health" (36 item version)

Health

Instructions: Below is a list of troubles or complaints that people sometimes have. Using the given scale, please indicate how often you have experienced each of these over the last month.

Rating Scale:

0 Never
1 Sometimes
2 Often
3 Very often

1 Common cold or flu

2 Dizziness or faintness

3 General aches or pains

4 Sweaty / wet / clammy hands or body

5 Headaches

6 Muscle twitching or trembling

7 Nervousness or tenseness

8 Rapid heartbeat (while not exercising or working hard)

9 Shortness of breath (while not exercising or working hard)

10 Skin rashes or itching

11 Upset stomach

12 Trouble sleeping

13 Feeling down or 'blue' or depressed

14 Difficulty concentrating

15 Crying

16 Lack of appetite

17 Loss of weight

18 Taking medication to sleep or calm down

19 Overly tired / lack of energy

20 Loss of interest in things, such as TV, news and friends

21 Feeling life is pointless

22 Feeling bored

23 Minor accidents

24 Increased smoking

25 Thoughts of ending your life

26 Wanting to be alone

27 Mental confusion

28 Being jumpy / easily startled

29 Being cranky / easily annoyed

30 Bad dreams / nightmares

31 Difficulty relating to others

32 Loss of self-confidence

33 Difficulty making decisions

34 Feeling anxious or worried

35 Pains in the heart or chest

36 Feeling trapped or confined

Appendix L

Human Dimension of Operations Project

Descriptive Statistics - Strain Scale - Symptoms Checklist (Modified)

"Health" (36 item version)

(Postdeployment sample)

Descriptive statistics of the Strain Scale – Postdeployment sample
(N = 334)

	Item	Mean	Standard deviation	Skewness	Kurtosis
1	Common cold or flu	.67	.64	.77	1.08
2	Dizziness or faintness	.34	.60	1.87	3.44
3	General aches or pains	1.14	.90	.44	-.55
4	Sweaty / wet / clammy hands or body	.72	.96	1.20	.35
5	Headaches	.71	.79	1.08	.86
6	Muscle twitching or trembling	.57	.76	1.27	1.20
7	Nervousness or tenseness	.42	.69	1.76	2.94
8	Rapid heartbeat (while not exercising or working hard)	.23	.58	2.87	8.48
9	Shortness of breath (while not exercising or working hard)	.19	.50	2.90	8.89
10	Skin rashes or itching	.40	.70	1.90	3.36
11	Upset stomach	.50	.72	1.37	1.35
12	Trouble sleeping	.93	1.01	.76	-.60
13	Feeling down or 'blue' or depressed	.69	.84	1.13	.64
14	Difficulty concentrating	.60	.82	1.30	1.01
15	Crying	.10	.39	4.69	25.10
16	Lack of appetite	.43	.71	1.64	2.13
17	Loss of weight	.56	.79	1.39	1.36
18	Taking medication to sleep or calm down	.15	.55	3.99	15.74
19	Overly tired / lack of energy	.88	.92	.82	-.10

	Item	Mean	Standard deviation	Skewness	Kurtosis
20	Loss of interest in things, such as TV, news and friends	.52	.81	1.50	1.47
21	Feeling life is pointless	.21	.58	3.04	9.17
22	Feeling bored	.86	.93	.84	-.24
23	Minor accidents	.20	.49	2.86	9.88
24	Increased smoking	.35	.74	1.97	2.77
25	Thoughts of ending your life	.08	.39	6.08	39.12
26	Wanting to be alone	.57	.79	1.45	1.69
27	Mental confusion	.26	.63	2.77	7.73
28	Being jumpy / easily startled	.25	.62	2.83	7.95
29	Being cranky / easily annoyed	.86	.90	.87	-.01
30	Bad dreams / nightmares	.30	.66	2.32	4.94
31	Difficulty relating to others	.38	.71	2.09	4.22
32	Loss of self-confidence	.30	.61	2.31	5.65
33	Difficulty making decisions	.26	.56	2.49	6.93
34	Feeling anxious or worried	.34	.65	2.11	4.37
35	Pains in the heart or chest	.14	.46	4.04	18.68
36	Feeling trapped or confined	.23	.59	2.83	8.12
37	Increased alcohol consumption	.62	.89	1.27	.56
38	Diarrhoea or constipation	.40	.71	1.90	3.35
39	Back problems	.79	.99	1.02	-.13
40	Menstrual changes or difficulties (women only)	-	-	-	-

Note: Items 37-40 were introduced into the HDO project from 2000 in research with Australian deployed personnel.

Appendix M

Human Dimension of Operations Project

Survey Component - Critical Incident Exposure

Experience of Major Stressors Scale

"Serious Events During Service"

Serious Events During Service

Instructions: Please indicate if you have been involved in any of the incidents listed below during Service, and if so, how each incident affected you at the time (response column 2) and how it affects you now (response column 3).what you generally have done or how you have generally responded when faced with difficult or trying events during the last month. Use the following scale to make your responses. If you answer 'never' in the first response column to having experienced a given event, then ignore the second and third response columns for that item and simply go down to the next item in the 'event' list.

Response Scales:

How often did you experience this event?
0 Never
1 Once
2 A few times
3 Regularly

How did the event affect you at the time?
0 Not at all
1 A little
2 A moderate amount
3 A great deal

How does the event affect you now?
0 Not at all
1 A little
2 A moderate amount
3 A great deal

Event list

1 Seeing widespread destruction

2 Seeing widespread suffering

3 Dangerous traffic incidents / road conditions

4 Dangerous training conditions / incidents

5 Seeing abusive violence

Event list (contd)

6 Crowd control tasks in conditions of disorder

7 Dealing with serious injuries in others

8 You having to harm a person

9 Seeing dead bodies

10 Seeing a person die

11 Handling/recovering bodies or body parts

12 Being threatened with assault

13 Being threatened with death

14 Being physically assaulted

15 Being sexually assaulted

16 Being seriously injured or seriously ill

17 Being held hostage/captive

18 A workmate dying on training/operations

19 Possible exposure to toxic substances (eg. chemicals)

20 Removing unexploded ordnance

21 Being subject to direct fire (eg. Sniper fire)

22 Being subject to indirect fire (eg. Mortars, shelling)

23 Threat of mines

24 Armed combat

25 Other: (please specify) ……

Appendix N

Human Dimension of Operations Project

Descriptive Statistics – Serious Stress Reactions

PTSD Scale

"Service Experiences Scale"

Descriptive Statistics of the Service Experiences Scale – Postdeployment sample
(N = 321)

Item	Mean	SD	Skewness	Kurtosis
I still enjoy doing many things that I used to enjoy.	3.37	1.30	-.55	-.75
I seem to have lost my feelings.	1.72	1.05	1.33	.90
Find myself trying not to think of upsetting things.	1.39	.76	2.01	3.38
Enjoy my work.	3.25	1.01	-.34	-.10
Sometimes things remind me of a disturbing experience.	1.42	.81	1.84	2.22
Having difficulties with sleep.	2.05	1.21	.84	-.41
Enjoy the company of others.	3.65	1.04	-.91	.66
Do not laugh or cry at the same things other people do.	1.95	1.13	1.04	.21
Used alcohol (or other drugs) to help me sleep or forget.	1.53	1.00	1.86	2.54
My performance at work is not what it used to be.	1.77	1.12	1.27	.51
Fall asleep, stay asleep, only awaken... (normal sleep).	2.29	1.30	.61	-.81
More tense than usual these days.	1.76	1.09	1.30	.78
No-one seems to understand me anymore.	1.45	.82	1.99	3.98
Many of my friendships have lost their meaning.	1.53	.87	1.73	2.73
Think positively about going on another operational deployment.	3.52	1.27	-.62	-.60
Find it hard to motivate myself to do my work.	2.04	1.09	.76	-.22
Find myself thinking about negative or disturbing events.	1.35	.72	2.38	6.23

Item	Mean	SD	Skewness	Kurtosis
Lose my cool and explode over minor things.	1.64	.94	1.53	1.91
Seem to prefer to be on my own these days.	1.79	1.01	1.03	.13
Have a hard time expressing my feelings.	1.93	1.18	1.06	.10
Things have happened that I would rather not talk about with anyone.	1.47	.93	2.11	3.91
Have trouble concentrating on tasks.	1.55	.90	1.75	2.79
Have disturbing dreams of experiences that have really happened.	1.30	.72	2.71	7.41
Unexpected noises startle me or make me jump.	1.46	.87	2.17	4.73
My life has been threatened while on military service.	1.67	.82	.77	-.75
Scenes/experiences really disturbed me during service.	1.53	.81	1.46	1.52

Appendix O

Human Dimension of Operations Project

Survey Component – Serious Stress Reactions

PTSD Scale

"Service Experiences Scale"

Service Experiences Scale

Instructions: Experiences during service can change military personnel in many ways. Please circle the number from the given scale that best describes how each statement below applies to you.

Rating Scale:

1 Never
2 Rarely
3 Sometimes
4 Frequently
5 Very frequently

1 My life has been threatened while on military service.

2 I have seen or experienced things that really disturbed or upset me during service.

3 I still enjoy doing many things that I used to enjoy.

4 I seem to have lost my feelings.

5 I find myself *trying not to think about* certain upsetting things that have happened during service.

6 I enjoy my work.

7 I sometimes see, hear or smell things that remind me of a disturbing experience during service.

8 I am having difficulties with sleep.

9 I enjoy the company of others.

10 I do not laugh or cry at the same things other people do.

11 There have been times when I used alcohol (or other drugs) to help me sleep or to make me forget about things that have happened during my service.

12 My performance at work is not what it used to be.

13 I fall asleep, stay asleep and awaken only when the alarm goes off or when I've had a proper amount of sleep.

14 I am more tense than usual these days.

15 I find that no-one seems to understand me anymore.

16 I feel that many of my friendships have lost their meaning.

17 I think positively about going on another overseas operational deployment.

18 I find it hard to motivate myself to do my work.

19 I find myself *thinking about* negative or disturbing events that have occurred during service.

20 I lose my cool and explode over minor everyday things.

21 I seem to prefer to be on my own these days.

22 I have a hard time expressing my feelings, even to the people that I care about.

23 There are things that have happened during my service that I would rather not talk about with anyone.

24 I have trouble concentrating on tasks.

25 I have disturbing dreams of experiences in the military that have really happened.

26 Unexpected noises startle me or make me jump.

Appendix P

Human Dimension of Operations Project

Survey Component – Stressors of Homecoming

Homecoming Issues Scale

"Homecoming Issues"

Homecoming Issues

This section explores a variety of issues about the transition back into family, work and society after your deployment. Using the following scale, please indicate how often each of the following occurred **since your return from your deployment**?

Rating Scale:

1 Never
2 Rarely
3 Sometimes
4 Frequently
5 Very frequently

1 You felt proud about having served on the deployment.

2 You felt like a 'stranger in a strange land' after returning home.

3 You experienced difficulties maintaining your interest at work.

4 You felt your family was proud of you for serving on the operation.

5 You became interested in political discussions about the reasons you deployed or the country you deployed to.

6 You regretted having deployed.

7 You experienced marital or relationship problems.

8 You felt anger at the Australian government.

9 You felt like "dropping out" of society.

10 You had serious arguments or conflict(s) with family or friends.

11 You thought seriously about taking discharge in order to return to the area/people/country where you deployed.

12 You experienced a period of adjustment getting back to your usual self.

13 You felt like getting out of the military.

14 You felt resentment over the way you were treated by other people.

15 You experienced a period of adjustment settling back with your family.

16 You spoke in a public setting (eg. a school, an RSL club) about your experiences of the deployment.

17 You tried to tell someone about experiences on your deployment but the person was not interested in listening.

18 You experienced a period of adjustment getting back to your normal work routine.

19 You felt like "dropping out" of family life.

20 You experienced difficulties maintaining your usual standards at work.

21 You felt that you had changed for the better as a result of your deployment experience.

Additional instructions. Please answer the following questions in relation to the period since your return from deployment.

22. Did your family have a party or a celebration for your return? Y / N

23. Since returning, have you had any serious medical concerns or serious health problems? Y / N / not sure

24. Have you had a relationship breakup during or since your last deployment? Y / N

25. How did you enjoy your leave after returning from deployment?

1	2	3	4	5
Not at all	A little	Somewhat	Considerably	Greatly

26. During your last deployment, how supportive, overall, were the following to you? Please use the scale provided.

Rating Scale:
0 Unsupportive (made things worse)
1 Of no support
2 Of some support
3 Of considerable support
4 Of great support

a. Your Mother
b. Your Father
c. Your Spouse / Partner
d. Your Brothers / Sisters
e. Your children
f. Other family members
g. Friends
h. Work colleagues who deployed with you
i. Work colleagues who did not deploy with you
j. Your unit
k. ADF agencies outside your unit
l. The Government
m. Australian society in general

Appendix Q

Human Dimension of Operations Project

Descriptive Statistics – Homecoming Issues Scale (AS version)

(Section 1 of the Scale only)

Descriptive Statistics of the Homecoming Issues Scale

(N = 547)

	Item	Mean	Standard Deviation	Skewness	Kurtosis
1	Proud of your service on the deployment	2.38	.96	-.15	-.30
2	Felt like a stranger in a strange land after return	1.06	1.05	.74	-.10
3	Difficulties maintaining interest at work	1.73	1.17	.31	-.57
4	Felt family was proud of your service on deployment	2.83	.96	-.70	.34
5	Became interested in politics of the deployment	1.53	1.18	.30	-.78
6	Regretted having deployed	.51	.90	1.99	3.83
7	Experienced marital or relationship problems	1.01	1.21	.95	-.14
8	Felt anger at the government	.50	.85	1.94	3.70
9	Felt like dropping out of society	.30	.69	2.75	8.57
10	Had serious arguments/conflicts with family/friends	.58	.90	1.53	1.63
11	Thought seriously of discharging to return to country of svc	.37	.84	2.44	5.44
12	Had a period of adjustment to get back to normal self	1.19	1.07	.49	-.58
13	Felt like getting out of the military	1.27	1.25	.63	-.66
14	Felt resentment over your treatment by others	.84	1.04	1.11	.51
15	Had a period of adjustment to fit back into family	1.10	1.07	.66	-.31
16	When you speak about the deployment others don't listen	.49	.83	1.67	2.04
17	Had a period of adjustment getting back into work	1.24	1.07	.42	-.63
18	Felt like dropping out of family life	.29	.69	2.56	6.40
19	Difficulties maintaining your usual work standards	.79	.98	1.15	.74
20	Felt you changed for the better due to the deployment	1.72	1.14	.01	-.76

Appendix R

Human Dimension of Operations Project

Descriptive Statistics – Stress Buffering Factors

"Positive Aspects of Deployment Scale"

Descriptive statistics of the Positive Aspects of Deployment Scale

(N = 515)

	Item	Mean	Standard Deviation	Skewness	Kurtosis
1	Pride in being part of the ADF	2.68	1.00	-.36	-.54
2	Making new friendships	2.57	1.03	-.52	-.06
3	Knowing I have contributed something worthwhile to the country here	2.78	.99	-.56	-.25
4	The opportunity to see new sights in a different country	2.86	1.03	-.71	-.14
5	Putting our training into practice	2.79	1.06	-.63	-.23
6	The local climate	1.75	1.03	.25	-.41
7	Meeting / communicating with the local people	2.42	1.04	-.23	-.57
8	The extra responsibilities my role here entails	2.46	1.08	-.23	-.70
9	Communication with home	3.25	.96	-1.11	.56
10	Expressions of thanks and gratitude from the locals	2.71	1.09	-.57	-.39
11	Doing a real job as opposed to just training	3.04	1.10	-1.06	.39
12	Realising how well we are off in Australia	-	-	-	-
13	The opportunity / incentive to get fit	2.23	1.31	-.22	-1.08
14	Working with UN personnel / contingents from other countries	1.99	1.13	.08	-.75
15	Leave breaks / 'R&R'	2.87	1.47	-1.00	-.48
16	Getting mail from home	3.54	.82	-2.03	4.14
17	Contributing to projects that help the people	2.20	1.37	-.27	-1.12
18	Positive reports in the media back home about our work here	2.41	1.22	-.28	-.87
19	Doing something different	2.74	1.00	-.66	.21
20	Pride in my unit or work team	2.65	1.04	-.39	-.60

	Item	Mean	Standard Deviation	Skewness	Kurtosis
21	Strengthening existing friendships	2.57	1.07	-.53	-.22
22	The allowances received / financial incentives	3.47	.83	-1.55	1.95
23	Experiencing / learning the local culture	2.46	1.07	-.21	-.75
24	Thoughts of returning home to Australia	3.35	.94	-1.36	1.02
25	Support from Australia generally	2.58	1.14	-.43	-.65
26	Learning new skills	2.59	1.15	-.57	-.42
27	The sense of teamwork in my section or work group	2.59	1.03	-.27	-.65
28	Mixing with and / or helping the children here	2.58	1.16	-.47	-.62
29	The professional / operational experience	3.03	1.01	-.83	-.03
30	Growing as a person / learning more about myself	2.69	1.15	-.55	-.56

Appendix S

Human Dimension of Operations Project

Survey Component – Stress Buffering Factors

Positive Aspects of Deployment Scale

"Positive Aspects of Peace Operations"

The Positive Aspects of Peace Operations

Instructions. In this section please indicate how much each aspect given below contributed to your satisfaction and /or enjoyment of the tour. Some of them may compensate for, or counter, the negative aspects of the tour. Please use the scale provided. If appropriate, please add as the last item any positive factor that has been important to you.

Rating Scale:

0 Not applicable
1 Contributes nothing to my satisfaction/enjoyment
2 Contributes a little to my satisfaction/enjoyment
3 Contributes a moderate amount to my satisfaction/enjoyment
4 Contributes a great deal to my satisfaction/enjoyment

1 Pride in being part of the ADF
2 Making new friendships
3 Knowing I have contributed something worthwhile to the country here
4 The opportunity to see new sights in a different country
5 Putting our training into practice
6 The local climate
7 Meeting / communicating with the local people
8 The extra responsibilities my role here entails
9 Communication with home
10 Expressions of thanks and gratitude from the locals
11 Doing a real job as opposed to just training
12 Realising how well we are off in Australia
13 The opportunity / incentive to get fit
14 Working with UN personnel / contingents from other countries
15 Leave breaks / 'R&R'
16 Getting mail from home
17 Contributing to projects that help the people (eg. conducting language lessons, building facilities for schools, orphanages, local communities)

18 Positive reports in the media back home about our work here
19 Doing something different
20 Pride in my unit or work team
21 Strengthening existing friendships
22 The allowances received / financial incentives
23 Experiencing / learning the local culture
24 Thoughts of returning home to Australia
25 Support from Australia generally
26 Learning new skills
27 The sense of teamwork in my section or work group
28 Mixing with and / or helping the children here
29 The professional / operational experience
30 Growing as a person / learning more about myself
31 Other: please specify:

Appendix T

Human Dimension of Operations Project

Survey Component – Unit Climate Profile

Unit Climate Profile - Australian

"Military Service" (UCP-A 36, 40 and 43-item versions)

Military Service [36]

Instructions: The purpose of this section is to measure morale, cohesion and other aspects important to military performance. Using the given scale, please indicate the amount of agreement you have with each statement by filling in the appropriate bubble in the response column. Make your ratings on **how things are at present**.

Rating scale:

1 strongly disagree
2 disagree
3 slightly disagree
4 neither agree nor disagree/uncertain
5 slightly agree
6 agree
7 strongly agree

1 My unit is ready for its wartime role.

2 The members of my workteam/platoon/troop encourage each other to work together as a team.

3 I plan on making the military my career.

4 My immediate commander (next in the chain-of-command above you) is willing to listen to problems.

5 Overall, I am confident in the abilities of the Junior NCOs in my unit.

6 My closest friendships are with the people I work with.

7 I think the military has an important job to do in defending Australia.

8 I feel I am making a contribution to Australia by serving in the military.

9 My immediate commander blames the team for his/her own inadequacies.

10 My workteam/platoon/troop is effective in its normal duties.

11 I know what my unit is trying to accomplish.

12 I am prepared to risk my life for the members of my workteam/platoon/troop.

13 The members of my workteam/platoon/troop are ready to go to war, if it is necessary.

14 My workteam/platoon/troop is proud of its standards and achievements.

15 If the ADF were going to war, I would want to remain with my current workteam/platoon/troop.

16 My immediate commander puts suggestions by members of the platoon/troop into operation.

17 Overall, I am confident in the abilities of the Senior NCOs in my unit.

18 My job is important to the mission of the unit.

19 I feel proud to be a member of the Australian Defence Force.

20 It feels good to be part of my workteam/platoon/troop.

21 My immediate commander lets others interfere with my work.

22 I perform my routine duties to a high standard.

23 Officers almost always get willing and eager cooperation from members in my unit.

24 Being in the military is more than just a job.

25 I am ready to deal with any demand or situation that may arise during operational service.

26 The level of morale in my workteam/platoon/troop is high.

27 I want to stay in my current unit for as long as possible.

28 My immediate commander respects my military skills and experience.

29 Overall, I am confident in the abilities of the Officer(s) in my unit.

30 My own level of morale is high.

31 A career in the ADF is worthwhile.

32 I enjoy my job.

33 My immediate commander refuses to explain his/her actions.

34 Overall, my unit maintains high standards of performance.

35 Commanders in my unit are interested in my personal welfare.

36 The requirements of the mission should normally take priority over the needs of individuals.

Military Service [40]

Instructions: The purpose of this section is to measure morale, cohesion and other aspects important to military performance. Using the given scale, please indicate the amount of agreement you have with each statement by filling in the appropriate bubble in the response column. Make your ratings on **how things are at present**.

Rating scale:

1 strongly disagree
2 disagree
3 slightly disagree
4 neither agree nor disagree/uncertain
5 slightly agree
6 agree
7 strongly agree

1 My unit is ready for deployment on operations other than war.

2 The members of my workteam/platoon/troop encourage each other to work together as a team.

3 I plan on making the military my career.

4 My immediate commander (next in the chain-of-command above you) is willing to listen to problems.

5 I am usually confident in the abilities of the JNCOs (LCPL, CPL) in my unit.

6 My closest friendships are with the people I work with.

7 I am ready to perform effectively if sent to war.

8 The military has an important job to do in defending Australia.

9 I am making a contribution to Australia by serving in the military.

10 My immediate commander blames the team for his/her own inadequacies.

11 My workteam/platoon/troop is effective in its normal duties.

12 I know what my unit is trying to accomplish.

13 I am prepared to risk my life for the members of my workteam/platoon/troop.

14 The members of my workteam/platoon/troop are ready to deploy on operations other than war.

15 My workteam/platoon/troop is proud of its standards and achievements.

16 If the ADF were going to war, I would want to remain with my current workteam/platoon/troop.

17 My immediate commander puts suggestions by members of the platoon/troop into operation.

18 I am usually confident in the abilities of the Warrant Officers in my unit.

19 My job is important to the mission of the unit.

20 My unit is ready for its wartime role.

21 I feel proud to be a member of the Australian Defence Force.

22 It feels good to be part of my workteam/platoon/troop.

23 My immediate commander lets others interfere with my work.

24 I perform my routine duties to a high standard.

25 Officers almost always get willing and eager cooperation from members in my unit.

26 Being in the military is more than just a job.

27 I am ready to deal with any demand or situation that may arise during operational service.

28 The level of morale in my workteam/platoon/troop is high.

29 I want to stay in my current unit for as long as possible.

30 The members of my workteam/platoon/troop are ready to go to war.

31 My immediate commander respects my military skills and experience.

32 I am usually confident in the abilities of the Officer(s) in my unit.

33 My own level of morale is high.

34 A career in the ADF is worthwhile.

35 I enjoy my job.

36 My immediate commander refuses to explain his/her actions.

37 My unit generally maintains high standards of performance.

38 Commanders in my unit are interested in my personal welfare.

39 The requirements of the mission should normally take priority over the needs of individuals.

40 I am usually confident in the abilities of my unit SNCOs (SGT, SSGT).

Military Service [43]

Instructions: The purpose of this section is to measure morale, cohesion and other aspects important to military performance. Using the given scale, please indicate the amount of agreement you have with each statement by filling in the appropriate bubble in the response column. Make your ratings on **how things are at present**.

Rating scale:

1 strongly disagree
2 disagree
3 slightly disagree
4 neither agree nor disagree/uncertain
5 slightly agree
6 agree
7 strongly agree

1 My unit is ready for deployment on operations other than war.

2 The members of my workteam/platoon/troop encourage each other to work together as a team.

3 I plan on making the military my career.

4 My immediate commander (next in the chain-of-command above you) is willing to listen to problems.

5 I am usually confident in the abilities of the JNCOs (LCPL, CPL) in my unit.

6 My closest friendships are with the people I work with.

7 I am ready to perform effectively if sent to war.

8 The military has an important job to do in defending Australia.

9 I am making a contribution to Australia by serving in the military.

10 My immediate commander blames the team for his/her own inadequacies.

11 My workteam/platoon/troop is effective in its normal duties.

12 I know what my unit is trying to accomplish.

13 I am prepared to risk my life for the members of my workteam/platoon/troop.

14 The members of my workteam/platoon/troop are ready to deploy on operations other than war.

15 My workteam/platoon/troop is proud of its standards and achievements.

16 If the ADF were going to war, I would want to remain with my current workteam/platoon/troop.

17 My immediate commander puts suggestions by members of the platoon/troop into operation.

18 I am usually confident in the abilities of the Warrant Officers in my unit.

19 My job is important to the mission of the unit.

20 My unit is ready for its wartime role.

21 I feel proud to be a member of the Australian Defence Force.

22 It feels good to be part of my workteam/platoon/troop.

23 My immediate commander lets others interfere with my work.

24 I perform my routine duties to a high standard.

25 Officers almost always get willing and eager cooperation from members in my unit.

26 Being in the military is more than just a job.

27 I am ready to deal with any demand or situation that may arise during operational service.

28 The level of morale in my workteam/platoon/troop is high.

29 I want to stay in my current unit for as long as possible.

30 The members of my workteam/platoon/troop are ready to go to war.

31 My immediate commander respects my military skills and experience.

32 I am usually confident in the abilities of the Officer(s) in my unit.

33 My own level of morale is high.

34 A career in the ADF is worthwhile.

35 I enjoy my job.

36 My immediate commander refuses to explain his/her actions.

37 My unit generally maintains high standards of performance.

38 Commanders in my unit are interested in my personal welfare.

39 The requirements of the mission should normally take priority over the needs of individuals.

40 I am usually confident in the abilities of my unit SNCOs (SGT, SSGT).

41 Unit morale is high.

42 I am given meaningful tasks

43 Standards of discipline in my unit are high.

Appendix U

Human Dimension of Operations Project

Unit Climate Profile - Australian

UCP-A Items according to postulated factor structure

"Military Service"

UCP-A Items and Designated Construct Scales

Item	Construct Scale
I am ready to perform effectively if sent to war.	Readiness for War – individual
The members of my workteam/section/patrol are ready to go to war.	Readiness for War - team
My unit is ready for its wartime role.	Readiness for War - unit
I am ready to deal with any demand or situation that may arise during operational service.	Readiness for OOTW – individual
The members of my workteam/section/patrol are ready to deploy on operations other than war.	Readiness for OOTW - team
My unit is ready for deployment on operations other than war.	Readiness for OOTW - unit
If the ADF were going to war, I would want to remain with my current workteam/section/patrol.	Commitment – team
I want to stay in my current unit for as long as possible.	Commitment - unit
I plan on making the military my career.	Commitment – military
The members of my workteam/section/patrol encourage each other to work together as a team.	Cohesion 1
My workteam/section/patrol is proud of its standards and achievements.	Cohesion 2
The level of morale in my workteam/section/patrol is high.	Cohesion 3
My immediate commander (next in the chain-of-command above you) is willing to listen to problems.	Positive leadership climate 1
My immediate commander puts suggestions by soldiers of the workteam/section/patrol into operation.	Positive leadership climate 2
My immediate commander respects my military skills and experience.	Positive leadership climate 3
My immediate commander blames the team for his/her own inadequacies.	Negative leadership climate 1
My immediate commander lets others interfere with my work.	Negative leadership climate 2
My immediate commander refuses to explain his/her actions.	Negative leadership climate 3
Overall, I am confident in the abilities of the Junior NCOs in my unit.	Leadership confidence - Junior NCO
I am usually confident in the abilities of my unit SNCOs (SGT, SSGT).	Leadership confidence – Senior NCO

Item	Construct Scale
Overall, I am confident in the abilities of the Warrant Officers in my unit.	Leadership confidence – Warrant Officer
I am usually confident in the abilities of the Officer(s) in my unit.	Leadership confidence – Officer
I perform my routine duties to a high standard.	Performance – individual
My workteam/section/patrol is effective in its normal duties.	Performance - team
My unit generally maintains high standards of performance.	Performance - unit
Standards of discipline in my unit are high.	Exploratory item
My closest friendships are with the people I work with.	Individual morale 1
My job is important to the mission of the unit.	Individual morale 2
My own level of morale is high.	Individual morale 3
I am given meaningful tasks.	Exploratory item
Unit morale is high.	Exploratory item
The military has an important job to do in defending Australia.	Esprit 1
I feel proud to be a member of the Australian Defence Force.	Esprit 2
A career in the ADF is worthwhile.	Esprit 3
I am making a contribution to Australia by serving in the military.	Satisfaction 1
It feels good to be part of my workteam/section/patrol.	Satisfaction 2
I enjoy my job.	Satisfaction 3
I know what my unit is trying to accomplish.	Leadership behaviour 1
Officers almost always get willing and eager cooperation from members in my unit.	Leadership behaviour 2
Commanders in my unit are interested in my personal welfare.	Leadership behaviour 3
I am prepared to risk my life for the members of my workteam/section/patrol.	Values 1
Being in the military is more than just a job.	Values 2
The requirements of the mission should normally take priority over the needs of individuals.	Values 3

Appendix V

Human Dimension of Operations Project

Survey Component – Unit Climate Profile - Australian

Descriptive Statistics for Two Independent Samples

Descriptive Statistics of the Unit Climate Profile - Australia

Sample 1 (N = 460)

Item	Mean	Standard Deviation	Skewness	Kurtosis
Readiness for War – individual	6.13	.813	-.954	1.146
Readiness for War - team	5.96	.976	-1.075	1.249
Readiness for War - unit	5.57	1.449	-1.365	1.543
Readiness for OOTW – individual	6.36	.789	-1.404	2.363
Readiness for OOTW - team	5.54	1.282	-1.099	.991
Readiness for OOTW - unit	5.24	1.557	-1.006	.411
Commitment – team	5.50	1.622	-1.145	.522
Commitment - unit	4.12	2.107	-.116	-1.305
Commitment – military	4.61	1.952	-.520	-.862
Cohesion 1	5.67	1.196	-1.067	.909
Cohesion 2	5.86	.970	-.895	.849
Cohesion 3	5.00	1.682	-.821	-.142
Positive leadership climate 1	5.45	1.546	-1.130	.449
Positive leadership climate 2	5.17	1.407	-1.091	.843
Positive leadership climate 3	5.35	1.428	-1.101	.688
Negative leadership climate 1	2.97	1.776	.647	-.635
Negative leadership climate 2	3.39	1.717	.379	-.951
Negative leadership climate 3	3.17	1.614	.441	-.758
Leadership confidence - Junior NCO	5.57	1.162	-1.284	1.854
Leadership confidence – Senior NCO	5.10	1.475	-.901	.172
Leadership confidence – Warrant Officer	4.68	1.634	-.574	-.574
Leadership confidence – Officer	4.54	1.595	-.613	-.548
Performance – individual	6.05	.761	-.887	1.078
Performance - team	6.14	.695	-.831	1.659
Performance - unit	5.52	1.119	-1.152	1.762
Exploratory item	4.97	1.280	-.705	.289
Individual morale 1	4.61	1.759	-.492	-.793
Individual morale 2	6.00	.933	-.939	.526
Individual morale 3	5.29	1.458	-1.046	.440

Item	Mean	Standard Deviation	Skewness	Kurtosis
Exploratory item	4.75	1.438	-.606	-.147
Exploratory item	4.37	1.646	-.497	-.646
Esprit 1	6.41	.742	-1.220	1.210
Esprit 2	6.09	.920	-.852	.097
Esprit 3	5.31	1.362	-.914	.612
Satisfaction 1	6.08	.942	-.893	.093
Satisfaction 2	5.83	.961	-.847	.508
Satisfaction 3	5.60	1.217	-1.217	1.604
Leadership behaviour 1	5.61	1.317	-1.460	2.250
Leadership behaviour 2	4.74	1.403	-.674	-.124
Leadership behaviour 3	4.53	1.574	-.440	-.691
Values 1	6.00	1.026	-1.152	1.321
Values 2	5.58	1.327	-1.084	.905
Values 3	4.97	1.351	-.726	.212

Descriptive Statistics of the Unit Climate Profile - Australia

Sample 2 (N = 508)

Item	Mean	Standard Deviation	Skewness	Kurtosis
Readiness for War – individual	2.36	1.462	.466	-.978
Readiness for War - team	1.64	1.263	1.390	1.152
Readiness for War - unit	2.52	1.479	.343	-1.115
Readiness for OOTW – individual	2.48	1.489	.413	-1.057
Readiness for OOTW - team	3.03	1.632	-.171	-1.380
Readiness for OOTW - unit	2.61	1.525	.085	-1.082
Commitment – team	1.41	.990	1.656	3.069
Commitment - unit	1.91	1.340	.769	-.173
Commitment – military	2.18	1.388	.521	-.699
Cohesion 1	2.00	1.412	.690	-.447
Cohesion 2	2.41	1.560	.369	-1.138
Cohesion 3	1.94	1.199	.910	.126
Positive leadership climate 1	3.03	1.572	-.151	-1.325
Positive leadership climate 2	1.32	.908	1.836	4.084
Positive leadership climate 3	1.89	1.357	.810	-.173
Negative leadership climate 1	2.17	1.406	.664	-.604
Negative leadership climate 2	1.52	1.037	1.501	2.041
Negative leadership climate 3	2.33	1.452	.510	-.928
Leadership confidence - Junior NCO	3.15	1.471	-.275	-1.042
Leadership confidence – Senior NCO	1.63	1.133	1.322	1.123
Leadership confidence – Warrant Officer	2.68	1.461	.192	-1.174
Leadership confidence – Officer	1.88	1.326	1.208	.278
Performance – individual	2.00	1.412	.925	-.326
Performance - team	1.79	1.302	1.215	.568
Performance - unit	2.39	1.434	.493	-.928
Exploratory item	2.24	1.358	.703	-.602
Individual morale 1	3.14	1.555	-.220	-1.285
Individual morale 2	2.12	1.388	.726	-.556
Individual morale 3	1.80	1.232	1.191	.523

Item	Mean	Standard Deviation	Skewness	Kurtosis
Exploratory item	3.07	1.577	-.140	-1.387
Exploratory item	3.05	1.478	-.097	-1.259
Esprit 1	2.98	1.686	-.082	-1.484
Esprit 2	1.32	.861	1.757	4.049
Esprit 3	1.67	1.121	1.404	1.425
Satisfaction 1	2.30	1.597	.488	-1.121
Satisfaction 2	1.84	1.307	1.006	.076
Satisfaction 3	2.20	1.403	.675	-.692
Leadership behaviour 1	2.10	1.397	.786	-.551
Leadership behaviour 2	2.15	1.357	.691	-.568
Leadership behaviour 3	2.35	1.517	.511	-1.024
Values 1	1.75	1.214	1.164	.610
Values 2	2.53	1.413	.370	-.960
Values 3	1.97	1.406	.837	-.375

Appendix W

Human Dimension of Operations Project

Principal Components Analysis – Unit Climate Profile – Australia [43]

"Military Service"

(43-item version)

Component Loadings for UCP-A Sample 1 and Sample 2

	Sample 1		Sample 2	
Item	**Component**	**Ld**	**Component**	**Ld**
Component 1/6 Cohesion	α = .85		α = .84	
Cohesion 1: The members of my workteam encourage each other…	C1	.73	C6	.44
Cohesion 2: My workteam is proud of its standards and achievements.	C1	.68	C6	.52
Satisfaction 2: It feels good to be part of my workteam.	C1	.65	C6	.73
Performance 1 – Team: My workteam is effective in its regular duties	C1	.65	C6	.44
Commitment 2 – Team: If the ADF were going to war, I would want to remain…	C1	.57	C6	.47
Individual Morale 1: My closest friendships are with the people I…	C6	-.41	C6	.54
Ldr Confid 1 – JNCO: I am usually confident in the abilities of…	C3	-.41	C6	.48
Ready OOTW 2 – Team: The members of my workteam are ready…	C9	.52	C6	.41
Component 2/4 Proximal Leader Behaviour	α = .83		α = .83	
Negative Climate 1: My immediate commander blames the team…	C2	.84	C4	.81
Negative Climate 3: My immediate commander refuses to explain…	C2	.79	C4	.77
Negative Climate 2: My immediate commander lets others interfere…	C2	.77	C4	.71
Positive Climate 1: My immediate commander is willing…	C2	-.63	C4	-.72
Positive Climate 2: My immediate commander uses suggestions…	C2	-.58	C4	-.73
Positive Climate 3: My immediate commander respects my skills	C2	-.45	C4	-.49
Component 3/1 Leadership Effectiveness	α = .74		α = .81	
Ldr Confid 4 – WO: I am usually confident in the abilities of…	C3	-.68	C1	.42
Ldr Conf 2 – SNCOs: I am usually confident in the abilities of…	C3	-.65	C1	.52
Standards of discipline in my unit are high.	C3	-.54	C1	.39
Ldr Confid 1 – JNCO: I am usually confident in the abilities of…	C3	-.41	C6	.48
Performance 3 – Unit: My unit generally maintains high standards of performance.	C3	-.39	C9	-.56
Ldr Confid 3 - Offr: I am usually confident in the abilities of…	C6	.60	C1	.77
Ldr Beh 2: Officers almost always get willing cooperation…	C8	.63	C1	.75
Ldr Beh 3: Commanders in my unit are interested in my…	C8	.41	C1	.57
Component 4/2 Esprit de Corps	α = .8		α = .77	
Satisfaction 1: I am making a contribution to Australia by serving…	C4	-.73	C2	.84
Espirit 1: The military has an important job to do in defending…	C4	-.72	C2	.78
Espirit 2: I feel proud to be a member of the ADF	C4	-.63	C2	.57
Values 2: Being in the military is more than just a job	C4	-.47	C3	.42
Ldr Beh 1: I know what my unit is trying to accomplish.	C4	-.37	C9	-.32

Component Loadings for Sample 1 and Sample 2 (contd)

	Sample 1		Sample 2	
Item	**Component**	**Ld**	**Component**	**Ld**
Component 5/5 Morale	α = .83		α = .77	
Satisfaction 3: I enjoy my job.	C5	-.64	C7	-.52
Commitment 1 Military: I plan on making the military my career.	C5	-.64	C3	.64
Individual Morale 3: My own level of morale is high.	C5	-.64	C5	.67
Commitment 3 – Unit: I want to stay in my current unit…	C5	-.58	C5	.43
Espirit 3: A career in the ADF is worthwhile.	C5	-.53	C3	.58
Cohesion 3: The level of morale in my workteam…	C5	-.52	C5	.66
Unit morale is high.	C5	-.52	C5	.56
Component 6/7 Meaning (Work motivation)	α = .52		α = .72	
Performance 2 – Indiv: I perform my routine duties to a high standard.	C6	.60	C7	-.42
I am given meaningful tasks.	C6	.53	C7	-.65
Individual Morale 2: My job is important to the mission of the unit	C6	.46	C7	-.71
Individual Morale 1: My closest friendships are with the people I…	C6	-.41	C6	.73
Satisfaction 3: I enjoy my job.	C5	-.64	C7	-.52
Component 7/8 Individual Readiness	α = .72		α = .66	
Ready War 1 – Indiv: I am ready to perform effectively if sent to war.	C7	.75	C4	-.59
Ready OOTW 3 – Indiv: I am ready to deal with any demand or situation…	C7	.64	C4	-.60
Values1: I am prepared to risk my life for the members of my workteam.	C7	.39	C4	-.39
Values 3: The requirements of the mission should normally take priority…	C8	.45	C4	-.70
Component 8/1 Unit Leadership Effectiveness	α = .63		α = .81	
Ldr Beh 2: Officers almost always get willing cooperation…	C8	.63	C1	.75
Ldr Confid 3 - Offr: I am usually confident in the abilities of…	C8	.60	C1	.77
Values 3: The requirements of the mission should normally take priority…	C8	.45	C8	-.70
Ldr Beh 3: Commanders in my unit are interested in my…	C8	.41	C1	.57
Ldr Conf 2 – SNCOs: I am usually confident in the abilities of…	C3	-.65	C1	.52
Ldr Confid 4 – WO: I am usually confident in the abilities of…	C3	-.68	C1	.42
Standards of discipline in my unit are high.	C3	-.54	C1	.39

Component Loadings for Sample 1 and Sample 2 (contd)

	Sample 1		Sample 2	
Item	**Component**	**Ld**	**Component**	**Ld**
Component 9/9 Collective Readiness	α = .75		α = .78	
Ready War 2 – Unit: My unit is ready for its wartime role.	C9	.64	C9	-.76
Ready OOTW 1 – Unit: My unit is ready for deployment on operations…	C9	.60	C9	-.71
Ready War 3 – Team: The members of my workteam are ready to go to war.	C9	.53	C9	-.45
Ready OOTW 2 – Team: The members of my workteam are ready to…	C9	.52	C9	-.41
Performance 3 – Unit: My unit generally maintains high standards of performance.	C3	-.39	C9	-.56
Ldr Beh 1: I know what my unit is trying to accomplish.	C4	(-.37)	C9	(-.32)
Component -/3 Belonging	α = n/a		α = .78	
Commitment 1 Military: I plan on making the military my career.	C5	-.64	C3	.64
Espirit 3: A career in the ADF is worthwhile.	C5	-.53	C3	.58
Values 2: Being in the military is more than just a job	C4	-.47	C3	.42

Appendix X

Multiple regression model predicting individual readiness from rank, (less commissioned officers), operational experience, years of service, and age

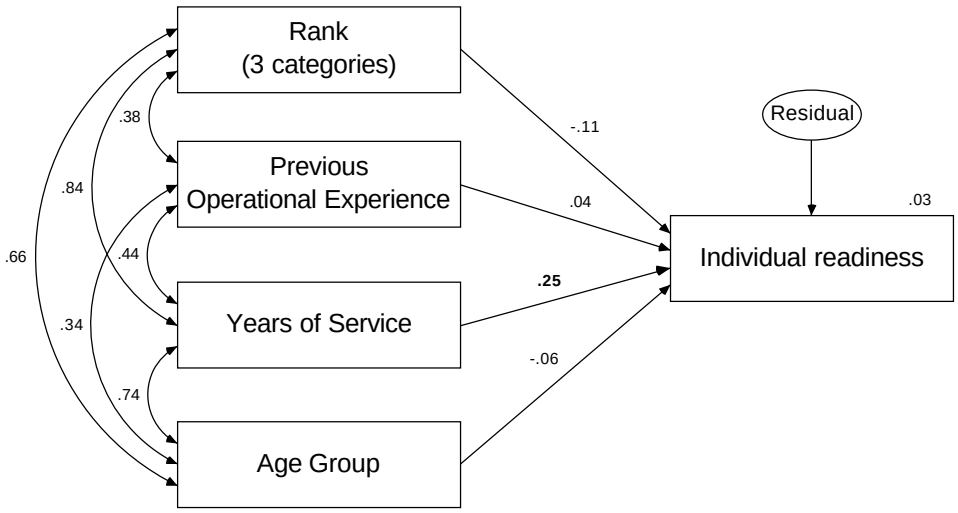


FIGURE X1 Multiple regression predicting individual readiness from rank (less commissioned officers), operational experience, years of service, and age. (Predeployment Sample 1, n=346)

Appendix Y

Select Goodness of Fit Indices for Structural Models

Select Goodness of Fit Indices for Structural Models

In structural equation modelling, goodness of fit tests are used to determine if the model being tested should be accepted or rejected. These fitness indices do not establish that particular paths within the model are significant. If the model is accepted, the researcher will then go on to interpret the path coefficients in the model ("significant" path coefficients in poorly fitted models are not considered meaningful). AMOS can print up to 25 different goodness-of-fit measures, however there is broad consensus that the researcher should avoid the 'shotgun approach' of reporting them all.

What indices should be used remains a matter of considerable dispute among SEM methodologists. If general guidance can be drawn from this ongoing debate, it is that at least one fit indicator from three categories should be used in order to reflect diverse criteria. These categories are absolute model fit, incremental fit, and model parsimony (a parallel schema has labelled the three categories as measures of baseline fit, information theory, and parsimony (the latter especially if there is model comparison) (Garson, 2008). The fit indices chosen for this dissertation were guided largely by advice from Cunningham (2007) and Fogarty (2004).

The most common statistic utilised in SEM analysis is chi-square (χ^2). Rather than the traditional test of the null hypothesis, in structural equation modelling, the hypothesis tested is the alternative hypothesis that there is a difference between the matrix of implied variances and covariances and the matrix of empirical sample variances and covariances. However, χ^2 is sensitive to sample size: the larger the sample, the more likely the *p*-value will indicate a significant difference between the model and

the data. Researchers therefore typically rely on a range of fit indices to determine whether SEM results are consistent with the proposed model.

One method to account for sample size, the normed chi-square (χ^2/df), provided a measure of absolute fit. Because the normed chi-square takes model complexity into account, it is also regarded as an index of model parsimony. If χ^2/df values are too small (< 1.0), the model probably contains too many parameters and is over-specified. There is reasonable consensus in the literature that a χ^2/df value > 3.0 represents poor fit (Fogarty, 2004).

Three measures of absolute fit of a model were utilised: the Root Mean-Square Error of Approximation (RMSEA), the Goodness-of-Fit Index (GFI), and the Adjusted Goodness-of-Fit Index (AGFI). The RMSEA has the advantage of being relatively independent of sample size and tends to favour parsimonious models. According to Fogarty (2004), RMSEA id increasing in popularity and is likely to become a standard for describing quality of fit. Large values (> .08) for another measure of absolute fit, the Standardised Root Mean-square Residual (SRMS), may indicate outliers in the raw data when all other fit indices suggest good fit.

Two measures of incremental fit were used: the Tucker–Lewis Index (TLI) and the Comparative Fit Index (CFI). The TLI is a nonnormed index so that its value can exceed 1.0 or be negative, but a value > .90 can be regarded as a good fit. The CFI is recommended when data are not multivariate normally distributed.

'Desirable' and 'acceptable' values for these fit indices were distinguished during SEM analyses; again these values were drawn from Cunningham (2007) and Fogarty (2004), based on their separate reviews of the literature. Both authors valued the advice provided by Hoyle (1995) on

the use of adjunct fit indices available in AMOS. The goodness-of-fit indices adopted in this dissertation are summarised in the table below.

TABLE AA1
Goodness-of-fit indices for structural models

Level of 'fitness'	χ^2 (*p* value)	χ^2/df	RMSEA; SRMR	GFI; AGFI	TLI; CFI
Desirable	p > .05	< 1.96	< 0.05	> 0.95	> 0.95
Acceptable	p > .01	< 3.0	< 0.08	> 0.90	> 0.90

Notes:

- χ^2 = chi-square (a measure of Absolute Fit)
- χ^2 / *df* represents the normed chi-square (a measure of Absolute Fit and Model Parsimony) – values less than 1.0 may indicate overfit of the model
- RMSEA = Root Mean-Square Error of Approximation (an Absolute Fit measure relatively independent of sample size)
- SRMR = Standardised Root Mean-square Residual (Absolute Fit)
- GFI = Goodness-of-Fit Index (Absolute Fit)
- AGFI = Adjusted Goodness-of-Fit Index (parsimony-adjusted Absolute Fit)
- TLI = Tucker–Lewis Index (Incremental fit)
- CFI = Comparative Fit Index (Incremental fit)

Appendix Z

Regression Model Predicting Individual Readiness from four Human Dimensions Variables

Regression Model Predicting Individual Readiness from four Human Dimensions Variables

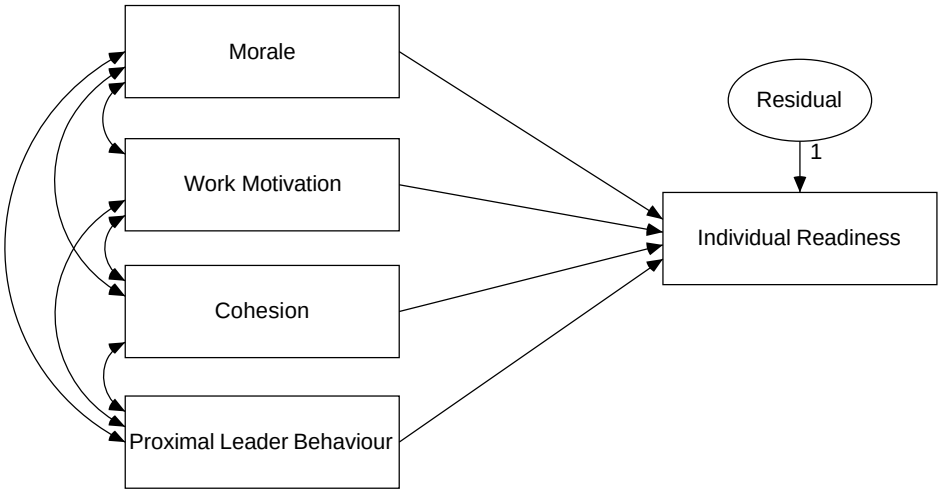


FIGURE Z1 Regression model predicting individual readiness from four human dimensions variables.

Appendix AA

Structural Model with Motivation as Mediator of the Influence of Morale and Cohesion on Individual Readiness

Structural Model with motivation as mediator of the influence of morale and cohesion on individual readiness

A model where Morale, Cohesion, Proximal Leader Behaviour, and Motivation were correlated exogenous variables predicting Individual Readiness did not fit the data. As a consequence of this finding, it was postulated that if psychological readiness is essentially a motivational factor resulting from a constellation of psychosocial influences, then the latent construct of motivation might play a mediating role between the climate constructs of Morale and Cohesion and Individual Readiness.

A number of models examining this assumption were established and tested. The only model that adequately fitted the data (χ^2 (23, N = 369) = 37.773, p = .027, bootstrap p = .306, χ^2/df = 1.642, RMSEA = .042, SRMR = .031, GFI = 0.977, AGFI = 0.956, TLI = 0.980, CFI = 0.987) resulted in Cohesion having separate directed paths to Morale and Motivation and with Motivation having a directed path to Individual Readiness (see Figure AA1 overleaf). However, comparison of AIC statistics for the two models suggested that the simpler, three-latent factor model (Morale and Cohesion predicting Individual Readiness) was more parsimonious (although explained variance was slightly less). This was not surprising, given the effect size (.97) between Morale and Motivation (with 99 percent of variance in Motivation accounted for) in Figure AA1. This suggested that the two variables were measuring the same construct in this sample. Furthermore, a cross validation (using multi-group analysis) of this more complex model did not fit the data.

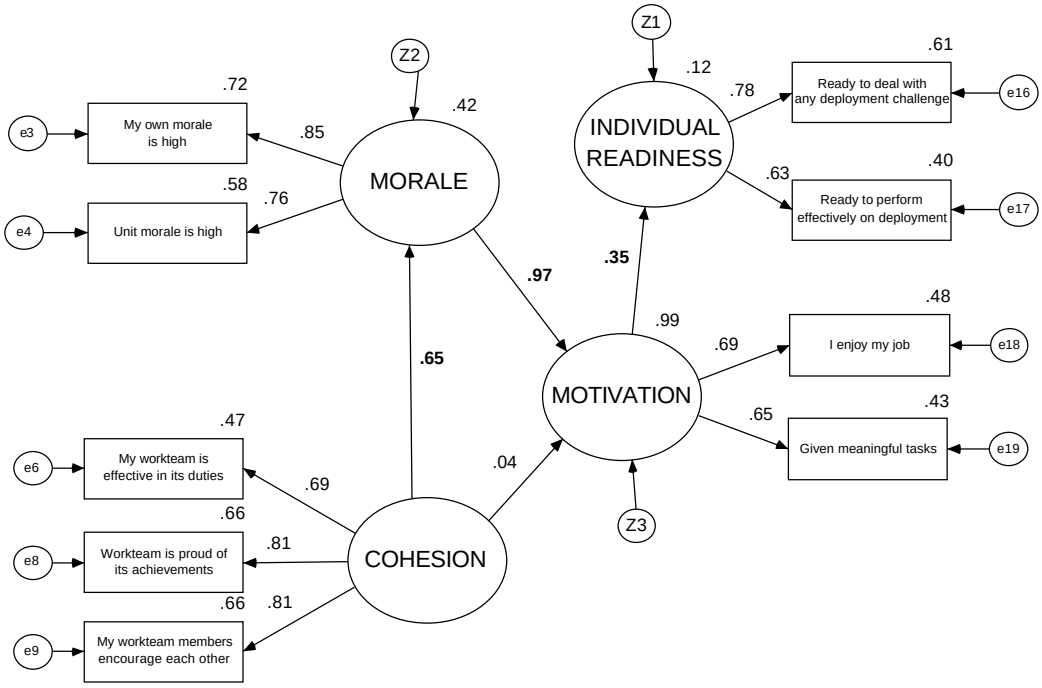


FIGURE AA1 Model with motivation as mediator of the influence of morale and cohesion on individual readiness (n=363).

Appendix AB

Simplified, hypothesised path diagram examining the influence of three human dimensions factors on Collective Readiness

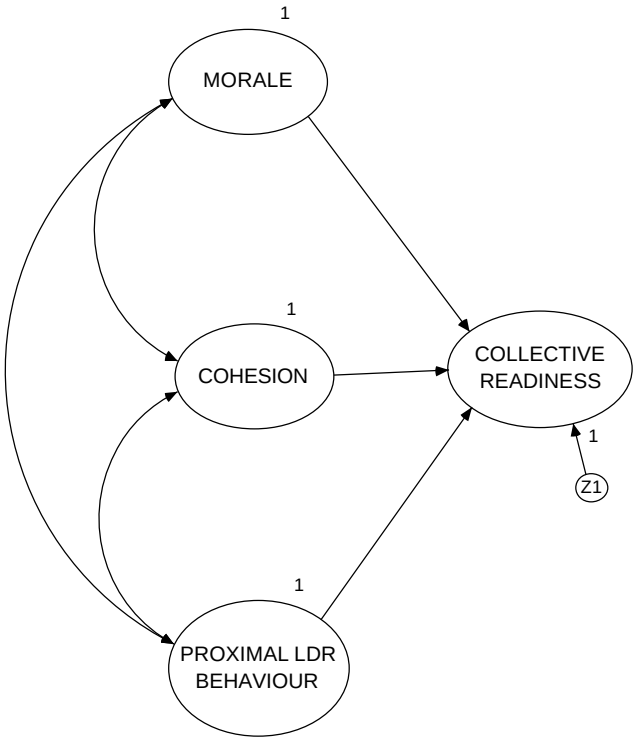


FIGURE AB1 Simplified, hypothesised path diagram examining the influence of three human dimensions factors on Collective Readiness.

(indicator variables omitted from illustrated model)

Appendix AC

Predicting Collective Readiness to Deploy: Re-specified Measurement Model 1 with a Predeployment Sample showing Detailed Outcomes

Predicting Collective Readiness to Deploy: Re-specified Measurement Model 1 with a Predeployment Sample

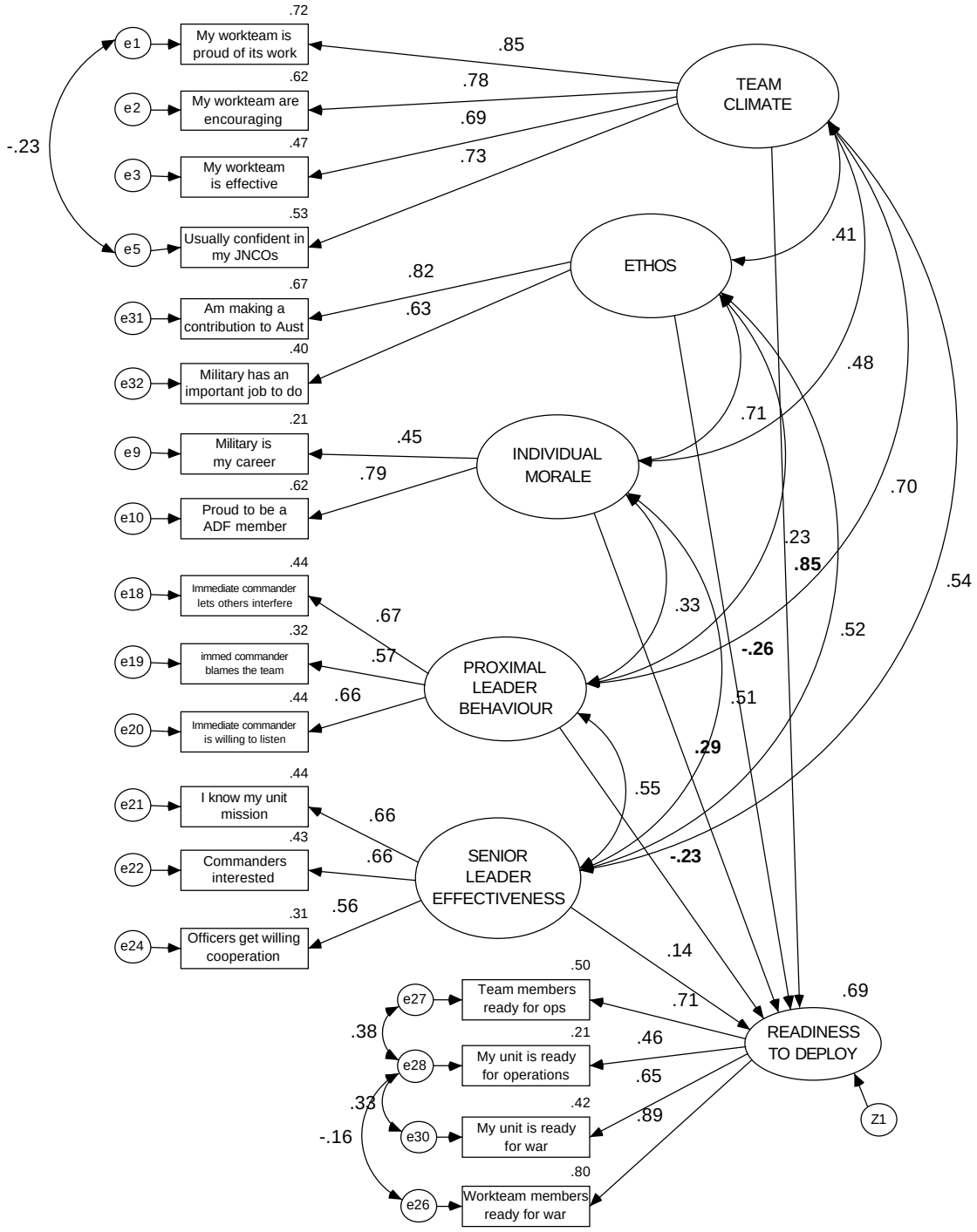


Figure AC1: Predicting collective readiness to deploy: Re-specified measurement model 1 with a predeployment sample (n=369).

Appendix AD

Results of One-Way Between-Groups ANOVA with Planned Comparisons – Stressor Component Variables and Strain

(Descriptives, Test of Homogeneity of Variances, Contrast Coefficients, Contrast Tests, Post Hoc Tests - Multiple Comparisons)

Descriptives

		N	Mean	Std. Dev	Std. Error	95% Confidence Interval for Mean		Min	Max
						Lower Bound	Upper Bound		
Workplace stressors	Low strain	136	14.23	4.947	.424	13.39	15.07	7	29
	Medium strain	148	17.13	5.611	.461	16.22	18.04	7	33
	High strain	144	20.02	6.056	.505	19.02	21.02	9	33
	Total	428	17.18	6.030	.291	16.61	17.75	7	33
Operational stressors	Low strain	136	11.46	4.598	.394	10.68	12.24	7	27
	Medium strain	148	14.24	4.952	.407	13.44	15.05	7	30
	High strain	144	18.13	5.792	.483	17.18	19.09	7	33
	Total	428	14.67	5.810	.281	14.11	15.22	7	33
Traumatic stressors	Low strain	136	6.99	2.632	.226	6.55	7.44	5	18
	Medium strain	148	7.64	2.897	.238	7.17	8.11	5	22
	High strain	144	9.24	3.715	.310	8.62	9.85	5	25
	Total	428	7.97	3.253	.157	7.66	8.28	5	25
Organisational support	Low strain	136	12.60	5.062	.434	11.74	13.46	6	30
	Medium strain	148	14.17	5.179	.426	13.33	15.01	6	28
	High strain	144	15.50	5.226	.436	14.64	16.36	6	29
	Total	428	14.12	5.278	.255	13.62	14.62	6	30
Family concerns	Low strain	136	7.25	3.483	.299	6.66	7.84	4	20
	Medium strain	148	8.24	3.682	.303	7.64	8.83	4	20
	High strain	144	10.87	4.279	.357	10.16	11.57	4	20
	Total	428	8.81	4.117	.199	8.42	9.20	4	20
Ambiguity/ Uncertainty	Low strain	136	6.35	2.408	.206	5.94	6.75	4	16
	Medium strain	148	7.41	2.869	.236	6.95	7.88	4	16
	High strain	144	8.95	3.387	.282	8.39	9.51	4	18
	Total	428	7.59	3.105	.150	7.30	7.89	4	18

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Workplace stressors	3.683	2	425	.026
Operational stressors	5.392	2	425	.005
Traumatic stressors	7.559	2	425	.001
Organisational support	.258	2	425	.773
Family concerns	4.572	2	425	.011
Ambiguity / Uncertainty	10.696	2	425	.000

Contrast Coefficients

	Health total scale		
Contrast	Low strain	Medium strain	High strain
1	-2	-1	3

Contrast Tests

		Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
Workplace stressors	Assume equal variances	14.48	1.749	8.278	425	.000
	Does not assume equal variances	14.48	1.796	8.062	254.32	.000
Operational stressors	Assume equal variances	17.24	1.617	10.666	425	.000
	Does not assume equal variances	17.24	1.698	10.153	246.17	.000
Traumatic stressors	Assume equal variances	6.08	.981	6.201	425	.000
	Does not assume equal variances	6.08	1.060	5.738	227.94	.000
Organisational support	Assume equal variances	7.13	1.620	4.398	425	.000
	Does not assume equal variances	7.13	1.625	4.384	281.32	.000
Family concerns	Assume equal variances	9.87	1.204	8.193	425	.000
	Does not assume equal variances	9.87	1.262	7.819	249.73	.000
Ambiguity / Uncertainty	Assume equal variances	6.75	.918	7.350	425	.000
	Does not assume equal variances	6.75	.971	6.951	232.15	.000

Post Hoc Tests - Multiple Comparisons - Dunnett T3

Dependent Variable	(I) Health total scale	(J) Health total scale	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
Workplace stressors	Low strain	Medium strain	-2.900(*)	.627	.000	-4.41	-1.40
		High strain	-5.793(*)	.659	.000	-7.38	-4.21
	Medium strain	Low strain	2.900(*)	.627	.000	1.40	4.41
		High strain	-2.892(*)	.684	.000	-4.53	-1.25
	High strain	Low strain	5.793(*)	.659	.000	4.21	7.38
		Medium strain	2.892(*)	.684	.000	1.25	4.53
Operational stressors	Low strain	Medium strain	-2.787(*)	.567	.000	-4.15	-1.43
		High strain	-6.676(*)	.623	.000	-8.17	-5.18
	Medium strain	Low strain	2.787(*)	.567	.000	1.43	4.15
		High strain	-3.889(*)	.631	.000	-5.41	-2.37
	High strain	Low strain	6.676(*)	.623	.000	5.18	8.17
		Medium strain	3.889(*)	.631	.000	2.37	5.41
Traumatic stressors	Low strain	Medium strain	-.649	.328	.139	-1.44	.14
		High strain	-2.243(*)	.383	.000	-3.16	-1.32
	Medium strain	Low strain	.649	.328	.139	-.14	1.44
		High strain	-1.594(*)	.391	.000	-2.53	-.66
	High strain	Low strain	2.243(*)	.383	.000	1.32	3.16
		Medium strain	1.594(*)	.391	.000	.66	2.53
Organisational support	Low strain	Medium strain	-1.566(*)	.608	.031	-3.03	-.11
		High strain	-2.897(*)	.615	.000	-4.37	-1.42
	Medium strain	Low strain	1.566(*)	.608	.031	.11	3.03
		High strain	-1.331	.609	.086	-2.79	.13
	High strain	Low strain	2.897(*)	.615	.000	1.42	4.37
		Medium strain	1.331	.609	.086	-.13	2.79
Family concerns	Low strain	Medium strain	-.986	.425	.062	-2.01	.03
		High strain	-3.618(*)	.465	.000	-4.74	-2.50
	Medium strain	Low strain	.986	.425	.062	-.03	2.01
		High strain	-2.632(*)	.468	.000	-3.75	-1.51
	High strain	Low strain	3.618(*)	.465	.000	2.50	4.74
		Medium strain	2.632(*)	.468	.000	1.51	3.75
Ambiguity/ Uncertainty	Low strain	Medium strain	-1.067(*)	.313	.002	-1.82	-.31
		High strain	-2.606(*)	.350	.000	-3.45	-1.77
	Medium strain	Low strain	1.067(*)	.313	.002	.31	1.82
		High strain	-1.539(*)	.368	.000	-2.42	-.66
	High strain	Low strain	2.606(*)	.350	.000	1.77	3.45
		Medium strain	1.539(*)	.368	.000	.66	2.42

* The mean difference is significant at the .05 level.

Appendix AE

Results of One-Way Between-Groups ANOVA with
Planned Comparisons – Individual Stressors and Strain

(Descriptives, Analysis of Variance, Contrast Coefficients, Contrast Tests, Post Hoc Tests - Multiple Comparisons)

Descriptives

		N	Mean	Std Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
						Lower Bound	Upper Bound		
conditions of service matters	Low strain	136	2.21	1.319	.113	1.99	2.44	1	5
	Medium strain	148	2.32	1.366	.112	2.10	2.55	1	5
	High strain	144	2.49	1.424	.119	2.25	2.72	1	5
	Total	428	2.34	1.373	.066	2.21	2.47	1	5
administrative support	Low strain	136	2.26	1.180	.101	2.06	2.46	1	5
	Medium strain	148	2.47	1.203	.099	2.28	2.67	1	5
	High strain	144	2.71	1.262	.105	2.50	2.92	1	5
	Total	428	2.48	1.227	.059	2.37	2.60	1	5
career issues	Low strain	136	2.47	1.288	.110	2.25	2.69	1	5
	Medium strain	148	2.97	1.382	.114	2.74	3.19	1	5
	High strain	144	3.08	1.366	.114	2.86	3.31	1	5
	Total	428	2.85	1.370	.066	2.72	2.98	1	5
training issues	Low strain	136	2.37	1.210	.104	2.16	2.57	1	5
	Medium strain	148	2.52	1.264	.104	2.31	2.73	1	5
	High strain	144	3.07	1.227	.102	2.87	3.27	1	5
	Total	428	2.66	1.268	.061	2.54	2.78	1	5
workload	Low strain	136	1.85	1.010	.087	1.67	2.02	1	5
	Medium strain	148	2.24	1.269	.104	2.03	2.44	1	5
	High strain	144	2.76	1.343	.112	2.54	2.99	1	5
	Total	428	2.29	1.273	.062	2.17	2.41	1	5
boredom at work	Low strain	136	1.76	.954	.082	1.60	1.92	1	5
	Medium strain	148	2.20	1.205	.099	2.00	2.39	1	5
	High strain	144	2.66	1.375	.115	2.43	2.89	1	5
	Total	428	2.21	1.247	.060	2.09	2.33	1	5
work control	Low strain	136	1.86	1.020	.087	1.69	2.03	1	5
	Medium strain	148	2.13	1.139	.094	1.94	2.31	1	5
	High strain	144	2.56	1.278	.106	2.35	2.77	1	5
	Total	428	2.19	1.185	.057	2.08	2.30	1	5
uncertainty over work role	Low strain	136	1.54	.739	.063	1.42	1.67	1	4
	Medium strain	148	1.84	1.067	.088	1.67	2.02	1	5
	High strain	144	2.24	1.348	.112	2.01	2.46	1	5
	Total	428	1.88	1.119	.054	1.77	1.99	1	5
uncertainty own competence	Low strain	136	1.18	.490	.042	1.10	1.27	1	4
	Medium strain	148	1.24	.530	.044	1.16	1.33	1	4
	High strain	144	1.49	.811	.068	1.36	1.63	1	5
	Total	428	1.31	.641	.031	1.25	1.37	1	5
uncertainty competence of others	Low strain	136	1.82	.888	.076	1.67	1.97	1	5
	Medium strain	148	2.34	1.054	.087	2.17	2.52	1	5
	High strain	144	2.59	1.214	.101	2.39	2.79	1	5
	Total	428	2.26	1.108	.054	2.15	2.36	1	5

Descriptives (contd)

		N	Mean	Std Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
quality of clothing & equipment	Low strain	136	1.81	1.119	.096	1.62	2.00	1	5
	Medium strain	148	1.91	1.225	.101	1.71	2.10	1	5
	High strain	144	2.20	1.304	.109	1.99	2.42	1	5
	Total	428	1.97	1.229	.059	1.86	2.09	1	5
feedback about your work	Low strain	136	1.65	.865	.074	1.50	1.79	1	5
	Medium strain	148	2.30	1.264	.104	2.09	2.50	1	5
	High strain	144	2.54	1.306	.109	2.33	2.76	1	5
	Total	428	2.17	1.224	.059	2.06	2.29	1	5
leadership concerns	Low strain	136	2.04	1.195	.102	1.83	2.24	1	5
	Medium strain	148	2.28	1.206	.099	2.08	2.47	1	5
	High strain	144	2.71	1.443	.120	2.47	2.95	1	5
	Total	428	2.35	1.314	.063	2.22	2.47	1	5
organisation policies that impact work	Low strain	136	2.03	1.088	.093	1.84	2.21	1	5
	Medium strain	148	2.41	1.250	.103	2.21	2.62	1	5
	High strain	144	2.58	1.249	.104	2.37	2.78	1	5
	Total	428	2.35	1.219	.059	2.23	2.46	1	5
unit policies and regulations	Low strain	136	1.99	1.132	.097	1.80	2.18	1	5
	Medium strain	148	2.30	1.254	.103	2.10	2.51	1	5
	High strain	144	2.81	1.381	.115	2.58	3.03	1	5
	Total	428	2.37	1.302	.063	2.25	2.50	1	5
lack of cohesion among coworkers	Low strain	136	1.59	.784	.067	1.46	1.72	1	5
	Medium strain	148	1.96	1.075	.088	1.78	2.13	1	5
	High strain	144	2.39	1.116	.093	2.20	2.57	1	5
	Total	428	1.99	1.056	.051	1.89	2.09	1	5
time away from family due to service	Low strain	136	2.23	1.259	.108	2.01	2.44	1	5
	Medium strain	148	2.66	1.313	.108	2.44	2.87	1	5
	High strain	144	3.29	1.279	.107	3.08	3.50	1	5
	Total	428	2.73	1.353	.065	2.61	2.86	1	5
problems with or in your family	Low strain	136	1.40	.764	.065	1.27	1.53	1	5
	Medium strain	148	1.60	.909	.075	1.45	1.75	1	5
	High strain	144	2.18	1.221	.102	1.98	2.38	1	5
	Total	428	1.73	1.038	.050	1.64	1.83	1	5
communication with your family	Low strain	136	1.54	.894	.077	1.39	1.69	1	5
	Medium strain	148	1.83	1.090	.090	1.65	2.01	1	5
	High strain	144	2.44	1.413	.118	2.21	2.68	1	5
	Total	428	1.94	1.213	.059	1.83	2.06	1	5
impact of deployment on family relations	Low strain	136	2.08	1.265	.108	1.87	2.30	1	5
	Medium strain	148	2.15	1.290	.106	1.94	2.36	1	5
	High strain	144	2.95	1.464	.122	2.71	3.19	1	5
	Total	428	2.40	1.398	.068	2.26	2.53	1	5

Descriptives (contd)

		N	Mean	Std Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
level of support from outside organisation	Low strain	136	1.82	1.010	.087	1.65	1.99	1	5
	Medium strain	148	2.09	1.212	.100	1.89	2.28	1	5
	High strain	144	2.44	1.347	.112	2.22	2.67	1	5
	Total	428	2.12	1.225	.059	2.01	2.24	1	5
lack of privacy	Low strain	136	1.62	.959	.082	1.46	1.78	1	5
	Medium strain	148	2.05	1.214	.100	1.85	2.24	1	5
	High strain	144	2.79	1.404	.117	2.56	3.02	1	5
	Total	428	2.16	1.300	.063	2.04	2.28	1	5
dealing with those external to organisation	Low strain	136	1.43	.832	.071	1.29	1.57	1	5
	Medium strain	148	1.30	.635	.052	1.20	1.41	1	5
	High strain	144	1.72	.973	.081	1.56	1.88	1	5
	Total	428	1.48	.839	.041	1.40	1.56	1	5
mental or physical fatigue	Low strain	136	1.62	.870	.075	1.47	1.77	1	5
	Medium strain	148	2.07	.994	.082	1.91	2.23	1	5
	High strain	144	2.83	1.218	.101	2.63	3.03	1	5
	Total	428	2.18	1.151	.056	2.07	2.29	1	5
harsh environmental conditions	Low strain	136	1.51	.852	.073	1.36	1.65	1	5
	Medium strain	148	1.75	.790	.065	1.62	1.88	1	5
	High strain	144	2.35	1.130	.094	2.16	2.53	1	5
	Total	428	1.87	.998	.048	1.78	1.97	1	5
threat of serious injury	Low strain	136	1.56	.814	.070	1.42	1.70	1	5
	Medium strain	148	1.78	.944	.078	1.63	1.94	1	5
	High strain	144	2.35	1.209	.101	2.16	2.55	1	5
	Total	428	1.90	1.057	.051	1.80	2.00	1	5
double standards	Low strain	136	2.78	1.275	.109	2.56	3.00	1	5
	Medium strain	148	3.43	1.424	.117	3.19	3.66	1	5
	High strain	144	3.92	1.220	.102	3.72	4.12	1	5
	Total	428	3.39	1.387	.067	3.25	3.52	1	5
standard of living conditions in field	Low strain	136	1.49	.843	.072	1.34	1.63	1	5
	Medium strain	148	1.93	1.190	.098	1.73	2.12	1	5
	High strain	144	2.29	1.251	.104	2.09	2.50	1	5
	Total	428	1.91	1.159	.056	1.80	2.02	1	5
lack of recreation opportunities	Low strain	136	1.82	1.010	.087	1.65	1.99	1	5
	Medium strain	148	2.43	1.320	.109	2.22	2.65	1	5
	High strain	144	2.75	1.271	.106	2.54	2.96	1	5
	Total	428	2.35	1.268	.061	2.23	2.47	1	5

Descriptives (contd)

		N	Mean	Std Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
uncertainty about end-of-mission date	Low strain	136	1.53	.886	.076	1.38	1.68	1	5
	Medium strain	148	1.70	1.181	.097	1.51	1.89	1	5
	High strain	144	2.14	1.272	.106	1.93	2.35	1	5
	Total	428	1.79	1.155	.056	1.68	1.90	1	5
see widespread suffering	Low strain	136	1.29	.657	.056	1.18	1.41	1	4
	Medium strain	148	1.41	.717	.059	1.29	1.52	1	4
	High strain	144	1.67	.828	.069	1.53	1.80	1	5
	Total	428	1.46	.753	.036	1.39	1.53	1	5
see instances of inhumanity	Low strain	136	1.44	.697	.060	1.32	1.56	1	4
	Medium strain	148	1.59	.807	.066	1.46	1.73	1	5
	High strain	144	1.92	1.034	.086	1.75	2.09	1	5
	Total	428	1.65	.880	.043	1.57	1.74	1	5
impact of a different culture	Low strain	136	1.29	.657	.056	1.18	1.41	1	4
	Medium strain	148	1.39	.646	.053	1.29	1.50	1	4
	High strain	144	1.78	.978	.082	1.62	1.94	1	5
	Total	428	1.49	.802	.039	1.41	1.57	1	5
experience with death	Low strain	136	1.21	.532	.046	1.12	1.30	1	4
	Medium strain	148	1.32	.650	.053	1.21	1.42	1	5
	High strain	144	1.50	.836	.070	1.36	1.64	1	5
	Total	428	1.34	.695	.034	1.28	1.41	1	5
risk of contracting serious disease	Low strain	136	1.76	1.000	.086	1.59	1.93	1	5
	Medium strain	148	1.93	.974	.080	1.77	2.09	1	5
	High strain	144	2.38	1.262	.105	2.17	2.58	1	5
	Total	428	2.03	1.115	.054	1.92	2.13	1	5

Analysis of Variance

		Sum of Squares	df	Mean Square	F	Sig
conditions of service matters	Between Groups	5.291	2	2.645	1.407	.246
	Within Groups	799.221	425	1.881		
	Total	804.512	427			
administrative support	Between Groups	14.251	2	7.125	4.817	.009
	Within Groups	628.635	425	1.479		
	Total	642.886	427			
career issues	Between Groups	29.415	2	14.708	8.100	.000
	Within Groups	771.713	425	1.816		
	Total	801.129	427			
training issues	Between Groups	38.649	2	19.325	12.677	.000
	Within Groups	647.862	425	1.524		
	Total	686.512	427			
workload	Between Groups	59.622	2	29.811	20.033	.000
	Within Groups	632.453	425	1.488		
	Total	692.075	427			
boredom at work	Between Groups	57.015	2	28.508	19.972	.000
	Within Groups	606.637	425	1.427		
	Total	663.652	427			
work control	Between Groups	35.327	2	17.663	13.302	.000
	Within Groups	564.344	425	1.328		
	Total	599.671	427			
uncertainty over work role	Between Groups	33.790	2	16.895	14.328	.000
	Within Groups	501.133	425	1.179		
	Total	534.923	427			
uncertainty own competence	Between Groups	7.649	2	3.825	9.696	.000
	Within Groups	167.641	425	.394		
	Total	175.290	427			
uncertainty competence of others	Between Groups	43.556	2	21.778	19.256	.000
	Within Groups	480.656	425	1.131		
	Total	524.213	427			
quality of clothing & equipment	Between Groups	11.852	2	5.926	3.980	.019
	Within Groups	632.865	425	1.489		
	Total	644.717	427			
feedback about your work	Between Groups	59.478	2	29.739	21.802	.000
	Within Groups	579.728	425	1.364		
	Total	639.206	427			

Analysis of Variance (contd)

		Sum of Squares	df	Mean Square	F	Sig
leadership concerns	Between Groups	32.614	2	16.307	9.842	.000
	Within Groups	704.208	425	1.657		
	Total	736.822	427			
organisation policies that impact work	Between Groups	21.922	2	10.961	7.601	.001
	Within Groups	612.900	425	1.442		
	Total	634.822	427			
unit policies and regulations	Between Groups	47.321	2	23.661	14.856	.000
	Within Groups	676.866	425	1.593		
	Total	724.187	427			
lack of cohesion among coworkers	Between Groups	44.996	2	22.498	22.189	.000
	Within Groups	430.920	425	1.014		
	Total	475.916	427			
time away from family due to service	Between Groups	80.526	2	40.263	24.407	.000
	Within Groups	701.109	425	1.650		
	Total	781.636	427			
problems with or in your family	Between Groups	46.093	2	23.046	23.685	.000
	Within Groups	413.543	425	.973		
	Total	459.636	427			
communication with your family	Between Groups	60.505	2	30.253	22.630	.000
	Within Groups	568.149	425	1.337		
	Total	628.654	427			
impact of deployment on family relations	Between Groups	66.977	2	33.488	18.544	.000
	Within Groups	767.500	425	1.806		
	Total	834.477	427			
level of support from outside organisation	Between Groups	27.259	2	13.629	9.447	.000
	Within Groups	613.178	425	1.443		
	Total	640.437	427			
lack of privacy	Between Groups	99.340	2	49.670	33.909	.000
	Within Groups	622.537	425	1.465		
	Total	721.876	427			
dealing with those external to organisation	Between Groups	12.837	2	6.419	9.470	.000
	Within Groups	288.048	425	.678		
	Total	300.886	427			

Analysis of Variance (contd)

		Sum of Squares	df	Mean Square	F	Sig
mental or physical fatigue	Between Groups	106.343	2	53.172	49.186	.000
	Within Groups	459.442	425	1.081		
	Total	565.785	427			
harsh environmental conditions	Between Groups	52.805	2	26.403	30.133	.000
	Within Groups	372.382	425	.876		
	Total	425.187	427			
threat of serious injury	Between Groups	47.524	2	23.762	23.511	.000
	Within Groups	429.548	425	1.011		
	Total	477.072	427			
double standards	Between Groups	90.825	2	45.413	26.418	.000
	Within Groups	730.565	425	1.719		
	Total	821.390	427			
standard of living conditions in field	Between Groups	45.543	2	22.772	18.333	.000
	Within Groups	527.903	425	1.242		
	Total	573.446	427			
lack of recreation opportunities	Between Groups	61.733	2	30.867	20.986	.000
	Within Groups	625.089	425	1.471		
	Total	686.822	427			
uncertainty about end-of-mission date	Between Groups	27.883	2	13.942	10.932	.000
	Within Groups	542.023	425	1.275		
	Total	569.907	427			
see widespread suffering	Between Groups	10.332	2	5.166	9.467	.000
	Within Groups	231.911	425	.546		
	Total	242.243	427			
see instances of inhumanity	Between Groups	16.617	2	8.309	11.238	.000
	Within Groups	314.205	425	.739		
	Total	330.822	427			
impact of a different culture	Between Groups	18.568	2	9.284	15.389	.000
	Within Groups	256.394	425	.603		
	Total	274.963	427			
experience with death	Between Groups	6.202	2	3.101	6.580	.002
	Within Groups	200.310	425	.471		
	Total	206.512	427			
risk of contracting serious disease	Between Groups	28.650	2	14.325	12.126	.000
	Within Groups	502.067	425	1.181		
	Total	530.717	427			

Contrast Coefficients

	Health total scale		
Contrast	Low strain	Medium strain	High strain
1	-2	-1	3

Contrast Tests

		Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
conditions of service matters	Assume equal variances	1	.71	.431	1.643	425	.101
	Does not assume equal variances	1	.71	.436	1.621	273.31	.106
administrative support	Assume equal variances	1	1.14	.382	2.977	425	.003
	Does not assume equal variances	1	1.14	.388	2.934	274.20	.004
career issues	Assume equal variances	1	1.34	.423	3.172	425	.002
	Does not assume equal variances	1	1.34	.422	3.179	279.15	.002
training issues	Assume equal variances	1	1.95	.388	5.035	425	.000
	Does not assume equal variances	1	1.95	.385	5.077	286.34	.000
workload	Assume equal variances	1	2.36	.383	6.169	425	.000
	Does not assume equal variances	1	2.36	.392	6.031	244.93	.000
boredom at work	Assume equal variances	1	2.27	.375	6.045	425	.000
	Does not assume equal variances	1	2.27	.393	5.767	231.17	.000
work control	Assume equal variances	1	1.84	.362	5.079	425	.000
	Does not assume equal variances	1	1.84	.376	4.890	249.04	.000
uncertainty over work role	Assume equal variances	1	1.78	.341	5.205	425	.000
	Does not assume equal variances	1	1.78	.371	4.790	203.83	.000
uncertainty own competence	Assume equal variances	1	.87	.197	4.401	425	.000
	Does not assume equal variances	1	.87	.224	3.882	205.29	.000
uncertainty competence of others	Assume equal variances	1	1.79	.334	5.370	425	.000
	Does not assume equal variances	1	1.79	.350	5.118	236.73	.000
quality of clothing & equipment	Assume equal variances	1	1.08	.383	2.820	425	.005
	Does not assume equal variances	1	1.08	.391	2.762	261.72	.006
feedback about your work	Assume equal variances	1	2.03	.367	5.543	425	.000
	Does not assume equal variances	1	2.03	.373	5.448	231.85	.000

Contrast Tests (contd)

		Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
leadership concerns	Assume equal variances	1	1.77	.404	4.389	425	.000
	Does not assume equal variances	1	1.77	.427	4.160	250.54	.000
organisation policies that impact work	Assume equal variances	1	1.26	.377	3.335	425	.001
	Does not assume equal variances	1	1.26	.378	3.328	267.85	.001
unit policies and regulations	Assume equal variances	1	2.13	.396	5.366	425	.000
	Does not assume equal variances	1	2.13	.409	5.199	253.67	.000
lack of cohesion among coworkers	Assume equal variances	1	2.03	.316	6.420	425	.000
	Does not assume equal variances	1	2.03	.322	6.304	237.88	.000
time away from family due to service	Assume equal variances	1	2.76	.403	6.850	425	.000
	Does not assume equal variances	1	2.76	.401	6.900	285.93	.000
problems with or in your family	Assume equal variances	1	2.13	.310	6.879	425	.000
	Does not assume equal variances	1	2.13	.341	6.259	212.89	.000
communication with your family	Assume equal variances	1	2.43	.363	6.687	425	.000
	Does not assume equal variances	1	2.43	.395	6.143	215.40	.000
impact of deployment on family relations	Assume equal variances	1	2.54	.422	6.026	425	.000
	Does not assume equal variances	1	2.54	.439	5.800	258.93	.000
level of support from outside organisation	Assume equal variances	1	1.60	.377	4.236	425	.000
	Does not assume equal variances	1	1.60	.392	4.081	241.68	.000
lack of privacy	Assume equal variances	1	3.09	.380	8.134	425	.000
	Does not assume equal variances	1	3.09	.400	7.728	228.70	.000
dealing with those external to organisation	Assume equal variances	1	.97	.259	3.767	425	.000
	Does not assume equal variances	1	.97	.287	3.397	245.11	.001
mental or physical fatigue	Assume equal variances	1	3.20	.327	9.789	425	.000
	Does not assume equal variances	1	3.20	.349	9.169	230.95	.000
harsh environmental conditions	Assume equal variances	1	2.28	.294	7.744	425	.000
	Does not assume equal variances	1	2.28	.325	7.014	231.13	.000
threat of serious injury	Assume equal variances	1	2.16	.316	6.843	425	.000
	Does not assume equal variances	1	2.16	.342	6.322	222.44	.000
double standards	Assume equal variances	1	2.77	.412	6.715	425	.000
	Does not assume equal variances	1	2.77	.393	7.034	303.27	.000
standard of living conditions in field	Assume equal variances	1	1.98	.350	5.652	425	.000
	Does not assume equal variances	1	1.98	.358	5.525	232.59	.000

Contrast Tests (contd)

		Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
lack of recreation opportunities	Assume equal variances	1	2.17	.381	5.698	425	.000
	Does not assume equal variances	1	2.17	.378	5.745	258.30	.000
uncertainty about end-of-mission date	Assume equal variances	1	1.66	.355	4.666	425	.000
	Does not assume equal variances	1	1.66	.365	4.529	234.77	.000
see widespread suffering	Assume equal variances	1	1.01	.232	4.337	425	.000
	Does not assume equal variances	1	1.01	.243	4.143	246.79	.000
see instances of inhumanity	Assume equal variances	1	1.27	.270	4.714	425	.000
	Does not assume equal variances	1	1.27	.292	4.353	222.34	.000
impact of a different culture	Assume equal variances	1	1.35	.244	5.546	425	.000
	Does not assume equal variances	1	1.35	.274	4.930	215.96	.000
experience with death	Assume equal variances	1	.77	.216	3.574	425	.000
	Does not assume equal variances	1	.77	.234	3.289	216.32	.001
risk of contracting serious disease	Assume equal variances	1	1.68	.341	4.915	425	.000
	Does not assume equal variances	1	1.68	.368	4.561	241.14	.000

Post Hoc Tests - Multiple Comparisons

Dependent Variable	Test	(I) Health total scale	(J) Health total scale	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
conditions of service matters	Tukey HSD	Low strain	Medium strain	-.111	.163	.774	-.49	.27
			High strain	-.273	.164	.220	-.66	.11
		Medium strain	Low strain	.111	.163	.774	-.27	.49
			High strain	-.162	.161	.572	-.54	.22
		High strain	Low strain	.273	.164	.220	-.11	.66
			Medium strain	.162	.161	.572	-.22	.54
administrative support	Tukey HSD	Low strain	Medium strain	-.216	.144	.296	-.56	.12
			High strain	-.451(*)	.145	.006	-.79	-.11
		Medium strain	Low strain	.216	.144	.296	-.12	.56
			High strain	-.235	.142	.225	-.57	.10
		High strain	Low strain	.451(*)	.145	.006	.11	.79
			Medium strain	.235	.142	.225	-.10	.57
career issues	Tukey HSD	Low strain	Medium strain	-.496(*)	.160	.006	-.87	-.12
			High strain	-.613(*)	.161	.000	-.99	-.23
		Medium strain	Low strain	.496(*)	.160	.006	.12	.87
			High strain	-.117	.158	.738	-.49	.25
		High strain	Low strain	.613(*)	.161	.000	.23	.99
			Medium strain	.117	.158	.738	-.25	.49
training issues	Tukey HSD	Low strain	Medium strain	-.153	.147	.552	-.50	.19
			High strain	-.702(*)	.148	.000	-1.05	-.35
		Medium strain	Low strain	.153	.147	.552	-.19	.50
			High strain	-.549(*)	.145	.000	-.89	-.21
		High strain	Low strain	.702(*)	.148	.000	.35	1.05
			Medium strain	.549(*)	.145	.000	.21	.89
workload	Tukey HSD	Low strain	Medium strain	-.391(*)	.145	.020	-.73	-.05
			High strain	-.918(*)	.146	.000	-1.26	-.58
		Medium strain	Low strain	.391(*)	.145	.020	.05	.73
			High strain	-.527(*)	.143	.001	-.86	-.19
		High strain	Low strain	.918(*)	.146	.000	.58	1.26
			Medium strain	.527(*)	.143	.001	.19	.86
boredom at work	Tukey HSD	Low strain	Medium strain	-.439(*)	.142	.006	-.77	-.10
			High strain	-.902(*)	.143	.000	-1.24	-.57
		Medium strain	Low strain	.439(*)	.142	.006	.10	.77
			High strain	-.464(*)	.140	.003	-.79	-.13
		High strain	Low strain	.902(*)	.143	.000	.57	1.24
			Medium strain	.464(*)	.140	.003	.13	.79

Post Hoc Tests - Multiple Comparisons (contd)

Dependent Variable	Test	(I) Health total scale	(J) Health total scale	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
work control	Tukey HSD	Low strain	Medium strain	-.268	.137	.124	-.59	.05
			High strain	-.702(*)	.138	.000	-1.03	-.38
		Medium strain	Low strain	.268	.137	.124	-.05	.59
			High strain	-.434(*)	.135	.004	-.75	-.12
		High strain	Low strain	.702(*)	.138	.000	.38	1.03
			Medium strain	.434(*)	.135	.004	.12	.75
uncertainty over work role	Tukey HSD	Low strain	Medium strain	-.300	.129	.053	-.60	.00
			High strain	-.692(*)	.130	.000	-1.00	-.39
		Medium strain	Low strain	.300	.129	.053	.00	.60
			High strain	-.392(*)	.127	.006	-.69	-.09
		High strain	Low strain	.692(*)	.130	.000	.39	1.00
			Medium strain	.392(*)	.127	.006	.09	.69
uncertainty own competence	Tukey HSD	Low strain	Medium strain	-.059	.075	.705	-.23	.12
			High strain	-.309(*)	.075	.000	-.49	-.13
		Medium strain	Low strain	.059	.075	.705	-.12	.23
			High strain	-.250(*)	.074	.002	-.42	-.08
		High strain	Low strain	.309(*)	.075	.000	.13	.49
			Medium strain	.250(*)	.074	.002	.08	.42
uncertainty competence of others	Tukey HSD	Low strain	Medium strain	-.528(*)	.126	.000	-.83	-.23
			High strain	-.774(*)	.127	.000	-1.07	-.48
		Medium strain	Low strain	.528(*)	.126	.000	.23	.83
			High strain	-.246	.124	.120	-.54	.05
		High strain	Low strain	.774(*)	.127	.000	.48	1.07
			Medium strain	.246	.124	.120	-.05	.54
quality of clothing & equipment	Tukey HSD	Low strain	Medium strain	-.097	.145	.783	-.44	.24
			High strain	-.393(*)	.146	.020	-.74	-.05
		Medium strain	Low strain	.097	.145	.783	-.24	.44
			High strain	-.296	.143	.097	-.63	.04
		High strain	Low strain	.393(*)	.146	.020	.05	.74
			Medium strain	.296	.143	.097	-.04	.63
feedback about your work	Tukey HSD	Low strain	Medium strain	-.650(*)	.139	.000	-.98	-.32
			High strain	-.895(*)	.140	.000	-1.22	-.57
		Medium strain	Low strain	.650(*)	.139	.000	.32	.98
			High strain	-.244	.137	.175	-.57	.08
		High strain	Low strain	.895(*)	.140	.000	.57	1.22
			Medium strain	.244	.137	.175	-.08	.57

Post Hoc Tests - Multiple Comparisons (contd)

Dependent Variable	Test	(I) Health total scale	(J) Health total scale	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
leadership concerns	Tukey HSD	Low strain	Medium strain	-.240	.153	.259	-.60	.12
			High strain	-.672(*)	.154	.000	-1.03	-.31
		Medium strain	Low strain	.240	.153	.259	-.12	.60
			High strain	-.431(*)	.151	.012	-.79	-.08
		High strain	Low strain	.672(*)	.154	.000	.31	1.03
			Medium strain	.431(*)	.151	.012	.08	.79
organisation policies that impact work	Tukey HSD	Low strain	Medium strain	-.383(*)	.143	.021	-.72	-.05
			High strain	-.547(*)	.144	.000	-.88	-.21
		Medium strain	Low strain	.383(*)	.143	.021	.05	.72
			High strain	-.164	.141	.473	-.49	.17
		High strain	Low strain	.547(*)	.144	.000	.21	.88
			Medium strain	.164	.141	.473	-.17	.49
unit policies and regulations	Tukey HSD	Low strain	Medium strain	-.311	.150	.096	-.66	.04
			High strain	-.813(*)	.151	.000	-1.17	-.46
		Medium strain	Low strain	.311	.150	.096	-.04	.66
			High strain	-.502(*)	.148	.002	-.85	-.15
		High strain	Low strain	.813(*)	.151	.000	.46	1.17
			Medium strain	.502(*)	.148	.002	.15	.85
lack of cohesion among coworkers	Tukey HSD	Low strain	Medium strain	-.371(*)	.120	.006	-.65	-.09
			High strain	-.801(*)	.120	.000	-1.08	-.52
		Medium strain	Low strain	.371(*)	.120	.006	.09	.65
			High strain	-.429(*)	.118	.001	-.71	-.15
		High strain	Low strain	.801(*)	.120	.000	.52	1.08
			Medium strain	.429(*)	.118	.001	.15	.71
time away from family due to service	Tukey HSD	Low strain	Medium strain	-.427(*)	.153	.015	-.79	-.07
			High strain	-1.064(*)	.154	.000	-1.42	-.70
		Medium strain	Low strain	.427(*)	.153	.015	.07	.79
			High strain	-.636(*)	.150	.000	-.99	-.28
		High strain	Low strain	1.064(*)	.154	.000	.70	1.42
			Medium strain	.636(*)	.150	.000	.28	.99
problems with or in your family	Tukey HSD	Low strain	Medium strain	-.197	.117	.214	-.47	.08
			High strain	-.776(*)	.118	.000	-1.05	-.50
		Medium strain	Low strain	.197	.117	.214	-.08	.47
			High strain	-.579(*)	.115	.000	-.85	-.31
		High strain	Low strain	.776(*)	.118	.000	.50	1.05
			Medium strain	.579(*)	.115	.000	.31	.85

Post Hoc Tests - Multiple Comparisons (contd)

Dependent Variable	Test	(I) Health total scale	(J) Health total scale	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
communication with your family	Tukey HSD	Low strain	Medium strain	-.294	.137	.083	-.62	.03
			High strain	-.908(*)	.138	.000	-1.23	-.58
		Medium strain	Low strain	.294	.137	.083	-.03	.62
			High strain	-.613(*)	.135	.000	-.93	-.30
		High strain	Low strain	.908(*)	.138	.000	.58	1.23
			Medium strain	.613(*)	.135	.000	.30	.93
impact of deployment on family relations	Tukey HSD	Low strain	Medium strain	-.068	.160	.905	-.44	.31
			High strain	-.871(*)	.161	.000	-1.25	-.49
		Medium strain	Low strain	.068	.160	.905	-.31	.44
			High strain	-.803(*)	.157	.000	-1.17	-.43
		High strain	Low strain	.871(*)	.161	.000	.49	1.25
			Medium strain	.803(*)	.157	.000	.43	1.17
level of support from outside organisation	Tukey HSD	Low strain	Medium strain	-.264	.143	.154	-.60	.07
			High strain	-.621(*)	.144	.000	-.96	-.28
		Medium strain	Low strain	.264	.143	.154	-.07	.60
			High strain	-.357(*)	.141	.031	-.69	-.03
		High strain	Low strain	.621(*)	.144	.000	.28	.96
			Medium strain	.357(*)	.141	.031	.03	.69
lack of privacy	Tukey HSD	Low strain	Medium strain	-.430(*)	.144	.008	-.77	-.09
			High strain	-1.174(*)	.145	.000	-1.51	-.83
		Medium strain	Low strain	.430(*)	.144	.008	.09	.77
			High strain	-.744(*)	.142	.000	-1.08	-.41
		High strain	Low strain	1.174(*)	.145	.000	.83	1.51
			Medium strain	.744(*)	.142	.000	.41	1.08
dealing with those external to organisation	Tukey HSD	Low strain	Medium strain	.130	.098	.381	-.10	.36
			High strain	-.281(*)	.098	.012	-.51	-.05
		Medium strain	Low strain	-.130	.098	.381	-.36	.10
			High strain	-.411(*)	.096	.000	-.64	-.18
		High strain	Low strain	.281(*)	.098	.012	.05	.51
			Medium strain	.411(*)	.096	.000	.18	.64
mental or physical fatigue	Tukey HSD	Low strain	Medium strain	-.450(*)	.124	.001	-.74	-.16
			High strain	-1.216(*)	.124	.000	-1.51	-.92
		Medium strain	Low strain	.450(*)	.124	.001	.16	.74
			High strain	-.766(*)	.122	.000	-1.05	-.48
		High strain	Low strain	1.216(*)	.124	.000	.92	1.51
			Medium strain	.766(*)	.122	.000	.48	1.05

Post Hoc Tests - Multiple Comparisons (contd)

Dependent Variable	Test	(I) Health total scale	(J) Health total scale	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
harsh environmental conditions	Tukey HSD	Low strain	Medium strain	-.243	.111	.075	-.50	.02
			High strain	-.840(*)	.112	.000	-1.10	-.58
		Medium strain	Low strain	.243	.111	.075	-.02	.50
			High strain	-.597(*)	.110	.000	-.85	-.34
		High strain	Low strain	.840(*)	.112	.000	.58	1.10
			Medium strain	.597(*)	.110	.000	.34	.85
threat of serious injury	Tukey HSD	Low strain	Medium strain	-.225	.119	.145	-.51	.06
			High strain	-.795(*)	.120	.000	-1.08	-.51
		Medium strain	Low strain	.225	.119	.145	-.06	.51
			High strain	-.570(*)	.118	.000	-.85	-.29
		High strain	Low strain	.795(*)	.120	.000	.51	1.08
			Medium strain	.570(*)	.118	.000	.29	.85
double standards	Tukey HSD	Low strain	Medium strain	-.646(*)	.156	.000	-1.01	-.28
			High strain	-1.137(*)	.157	.000	-1.51	-.77
		Medium strain	Low strain	.646(*)	.156	.000	.28	1.01
			High strain	-.491(*)	.153	.004	-.85	-.13
		High strain	Low strain	1.137(*)	.157	.000	.77	1.51
			Medium strain	.491(*)	.153	.004	.13	.85
standard of living conditions in field	Tukey HSD	Low strain	Medium strain	-.440(*)	.132	.003	-.75	-.13
			High strain	-.806(*)	.133	.000	-1.12	-.49
		Medium strain	Low strain	.440(*)	.132	.003	.13	.75
			High strain	-.366(*)	.130	.015	-.67	-.06
		High strain	Low strain	.806(*)	.133	.000	.49	1.12
			Medium strain	.366(*)	.130	.015	.06	.67
lack of recreation opportunities	Tukey HSD	Low strain	Medium strain	-.609(*)	.144	.000	-.95	-.27
			High strain	-.926(*)	.145	.000	-1.27	-.59
		Medium strain	Low strain	.609(*)	.144	.000	.27	.95
			High strain	-.318	.142	.066	-.65	.02
		High strain	Low strain	.926(*)	.145	.000	.59	1.27
			Medium strain	.318	.142	.066	-.02	.65
uncertainty about end-of-mission date	Tukey HSD	Low strain	Medium strain	-.173	.134	.401	-.49	.14
			High strain	-.609(*)	.135	.000	-.93	-.29
		Medium strain	Low strain	.173	.134	.401	-.14	.49
			High strain	-.436(*)	.132	.003	-.75	-.13
		High strain	Low strain	.609(*)	.135	.000	.29	.93
			Medium strain	.436(*)	.132	.003	.13	.75

Post Hoc Tests - Multiple Comparisons (contd)

Dependent Variable	Test	(I) Health total scale	(J) Health total scale	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
see widespread suffering	Tukey HSD	Low strain	Medium strain	-.111	.088	.414	-.32	.10
			High strain	-.373(*)	.088	.000	-.58	-.16
		Medium strain	Low strain	.111	.088	.414	-.10	.32
			High strain	-.261(*)	.086	.008	-.46	-.06
		High strain	Low strain	.373(*)	.088	.000	.16	.58
			Medium strain	.261(*)	.086	.008	.06	.46
see instances of inhumanity	Tukey HSD	Low strain	Medium strain	-.153	.102	.291	-.39	.09
			High strain	-.475(*)	.103	.000	-.72	-.23
		Medium strain	Low strain	.153	.102	.291	-.09	.39
			High strain	-.322(*)	.101	.004	-.56	-.09
		High strain	Low strain	.475(*)	.103	.000	.23	.72
			Medium strain	.322(*)	.101	.004	.09	.56
impact of a different culture	Tukey HSD	Low strain	Medium strain	-.098	.092	.540	-.31	.12
			High strain	-.484(*)	.093	.000	-.70	-.27
		Medium strain	Low strain	.098	.092	.540	-.12	.31
			High strain	-.386(*)	.091	.000	-.60	-.17
		High strain	Low strain	.484(*)	.093	.000	.27	.70
			Medium strain	.386(*)	.091	.000	.17	.60
experience with death	Tukey HSD	Low strain	Medium strain	-.112	.082	.358	-.30	.08
			High strain	-.294(*)	.082	.001	-.49	-.10
		Medium strain	Low strain	.112	.082	.358	-.08	.30
			High strain	-.182	.080	.061	-.37	.01
		High strain	Low strain	.294(*)	.082	.001	.10	.49
			Medium strain	.182	.080	.061	-.01	.37
risk of contracting serious disease		Low strain	Medium strain	-.175	.129	.365	-.48	.13
			High strain	-.618(*)	.130	.000	-.92	-.31
		Medium strain	Low strain	.175	.129	.365	-.13	.48
			High strain	-.443(*)	.127	.002	-.74	-.14
		High strain	Low strain	.618(*)	.130	.000	.31	.92
			Medium strain	.443(*)	.127	.002	.14	.74

* The mean difference is significant at the .05 level.

Appendix AF

Hypothesised Model of Stressors Predicting Strain

Hypothesised Model of Stressors Predicting Strain

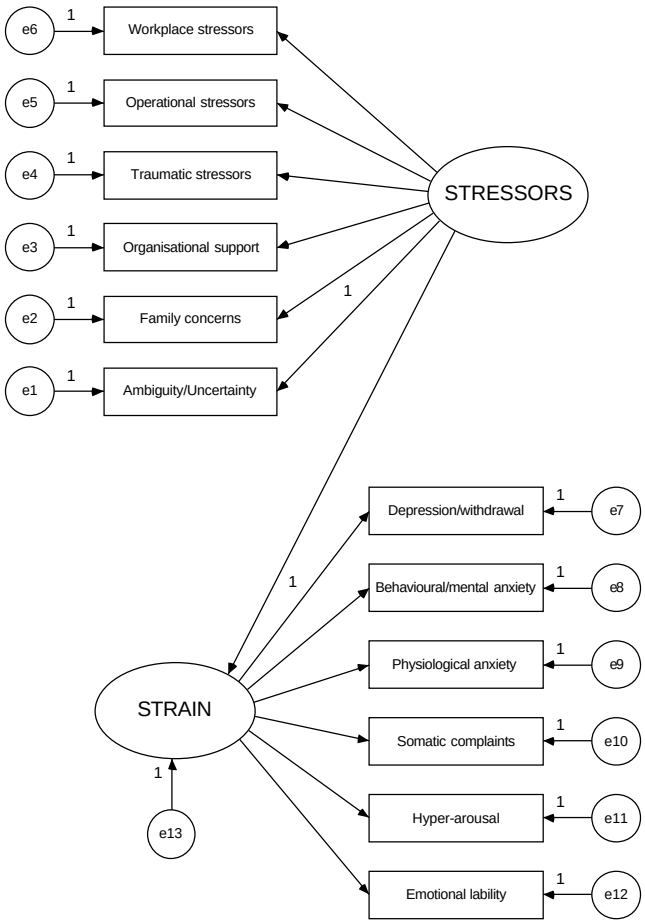


FIGURE AF1 Hypothesised model of stressors predicting strain.

Appendix AG

Full Structural Model Postulating the Mediating Effects of the Human Factors of Leadership, Cohesion, Sense of Meaning, and Morale between Stressors and Strain

Full Structural Model Postulating the Mediating Effects of the Human Factors of Leadership, Cohesion, Sense of Meaning, and Morale between Stressors and Strain

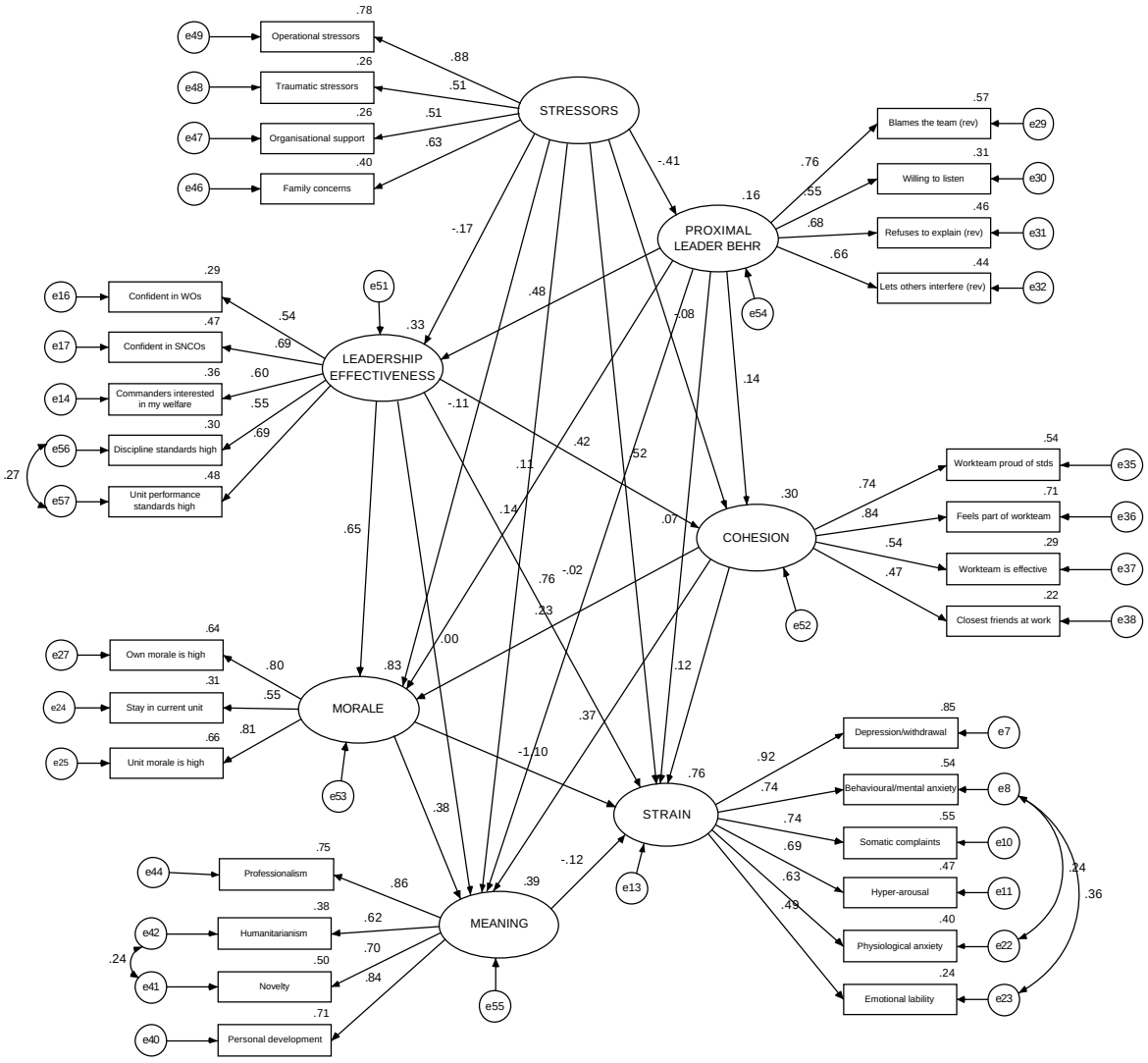


Figure AG1 Full latent structural model examining the mediating effects of the human factors of leadership, cohesion, sense of meaning, and morale between stressors and strain.

Appendix AH

Subsample Intercorrelations Among Observed Variables
for the Structural Model

TABLE AH1
Subsample Intercorrelations among Observed Variables for the Structural Model
(Subsample 1, n = 223)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1.00																			
2	0.62	1.00																		
3	0.42	0.44	1.00																	
4	0.62	0.49	0.32	1.00																
5	0.36	0.54	0.31	0.30	1.00															
6	0.59	0.47	0.32	0.39	0.31	1.00														
7	-0.22	-0.23	-0.01	-0.05	-0.19	-0.19	1.00													
8	-0.24	-0.19	-0.04	-0.08	-0.12	-0.10	0.44	1.00												
9	-0.10	-0.14	-0.06	-0.06	-0.18	-0.02	0.41	0.24	1.00											
10	-0.22	-0.19	-0.08	-0.02	-0.13	-0.18	0.61	0.46	0.32	1.00										
11	-0.30	-0.22	-0.13	-0.02	-0.20	-0.21	0.49	0.49	0.26	0.46	1.00									
12	-0.36	-0.24	-0.09	-0.08	-0.23	-0.28	0.55	0.40	0.25	0.46	0.43	1.00								
13	-0.46	-0.30	-0.13	-0.25	-0.17	-0.20	0.36	0.48	0.27	0.41	0.48	0.36	1.00							
14	-0.41	-0.31	-0.13	-0.13	-0.08	-0.34	0.29	0.24	0.07	0.30	0.23	0.26	0.28	1.00						
15	-0.35	-0.23	-0.14	-0.24	-0.12	-0.24	0.14	0.22	0.16	0.19	0.13	0.20	0.35	0.42	1.00					
16	-0.55	-0.40	-0.23	-0.23	-0.20	-0.33	0.19	0.11	0.12	0.16	0.22	0.20	0.35	0.57	0.43	1.00				
17	-0.44	-0.23	-0.09	-0.22	-0.13	-0.25	0.21	0.08	0.12	0.25	0.19	0.19	0.27	0.41	0.32	0.51	1.00			
18	-0.35	-0.17	-0.12	-0.14	-0.05	-0.32	0.29	0.16	0.13	0.35	0.27	0.34	0.28	0.33	0.35	0.34	0.30	1.00		
19	-0.37	-0.12	-0.04	-0.10	0.00	-0.25	0.31	0.23	0.13	0.38	0.22	0.42	0.34	0.44	0.36	0.41	0.46	0.54	1.00	
20	-0.46	-0.36	-0.24	-0.18	-0.20	-0.31	0.32	0.16	0.27	0.29	0.25	0.30	0.29	0.45	0.36	0.64	0.37	0.39	0.39	1.00

Notes:

Strain: 1 = Workplace Stressors; 2 = Operational Stressors; 3 = Traumatic Stressors; 4 = Organisational Support; 5 = Family Concerns; 6 = Ambiguity/Uncertainty
Cohesion: 7 = It feels good to be part of my workteam; 8 = My workteam is effective in its duties; 9 = My closest friendships are with my workmates; 10 = My workteam is proud of its standards and achievements; 11 = Members of my workteam encourage each other; 12 = Stay with current team if ADF were going to war
Leadership Effectiveness: 13 = Usually confident in JNCO abilities; 14 = Usually confident in SNCO abilities; 15 = Usually confident in WO abilities; 16 = Usually confident in Officer abilities; 17 = Commanders interested in my welfare; 18 = Discipline standards in unit are high; 19 = Unit generally maintains high standards; 20 = Officers almost always get willing cooperation

Correlations above .13 are significant at the $p < .05$ level (2-tailed); correlations above .18 are significant at the $p < .01$ level (2-tailed)

TABLE AH1 (contd)
Subsample Intercorrelations among Observed Variables for the Structural Model

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	-0.38	-0.35	-0.12	-0.11	-0.25	-0.37	0.51	0.27	0.24	0.47	0.38	0.45	0.34	0.47	0.28	0.36	0.33	0.38	0.46	0.41
22	-0.40	-0.33	-0.10	-0.12	-0.17	-0.32	0.54	0.29	0.24	0.42	0.44	0.52	0.36	0.46	0.27	0.42	0.37	0.38	0.51	0.49
23	-0.51	-0.35	-0.12	-0.15	-0.16	-0.30	0.38	0.17	0.25	0.31	0.32	0.42	0.37	0.53	0.41	0.56	0.42	0.46	0.57	0.52
24	-0.36	-0.23	-0.10	-0.08	-0.13	-0.33	0.33	0.23	0.16	0.27	0.22	0.47	0.20	0.26	0.17	0.30	0.32	0.24	0.38	0.28
25	-0.36	-0.29	-0.20	-0.09	-0.16	-0.31	0.23	0.10	0.16	0.10	0.26	0.35	0.24	0.31	0.20	0.38	0.25	0.26	0.23	0.29
26	-0.37	-0.26	-0.06	-0.17	-0.18	-0.25	0.29	0.26	0.22	0.26	0.47	0.22	0.40	0.19	0.12	0.33	0.39	0.22	0.24	0.26
27	-0.27	-0.16	-0.18	-0.05	-0.12	-0.19	0.26	0.24	0.14	0.18	0.36	0.38	0.25	0.24	0.18	0.33	0.30	0.16	0.17	0.25
28	-0.41	-0.29	-0.23	-0.14	-0.13	-0.34	0.22	0.19	0.14	0.14	0.29	0.35	0.28	0.30	0.20	0.32	0.23	0.25	0.21	0.21
29	-0.29	-0.13	-0.07	0.00	-0.17	-0.32	0.46	0.33	0.30	0.42	0.45	0.43	0.37	0.32	0.13	0.26	0.28	0.23	0.28	0.27
30	-0.42	-0.32	-0.07	-0.19	-0.17	-0.25	0.39	0.36	0.19	0.34	0.41	0.48	0.38	0.29	0.30	0.30	0.32	0.33	0.31	0.27
31	-0.18	-0.07	0.01	-0.09	-0.10	-0.22	0.44	0.13	0.20	0.35	0.19	0.33	0.15	0.21	0.17	0.21	0.24	0.28	0.34	0.25
32	0.00	0.11	0.07	-0.02	0.27	-0.03	-0.01	0.01	-0.03	0.09	-0.02	-0.08	0.06	0.05	0.07	0.02	0.08	0.03	0.07	-0.07
33	-0.13	-0.01	0.08	-0.07	-0.06	-0.04	0.24	0.15	0.19	0.21	0.13	0.13	0.18	0.11	0.07	0.15	0.21	0.12	0.19	0.14
34	-0.18	-0.11	0.06	-0.07	-0.17	-0.11	0.31	0.16	0.27	0.30	0.12	0.19	0.19	0.23	0.16	0.26	0.29	0.24	0.21	0.19
35	-0.23	-0.14	0.09	-0.10	-0.12	-0.19	0.45	0.20	0.23	0.36	0.25	0.32	0.18	0.17	0.21	0.22	0.28	0.29	0.29	0.27
36	0.48	0.56	0.30	0.23	0.51	0.44	-0.33	-0.19	-0.21	-0.30	-0.31	-0.37	-0.21	-0.20	-0.14	-0.27	-0.24	-0.27	-0.24	-0.30
37	0.38	0.50	0.29	0.16	0.50	0.43	-0.19	-0.16	-0.24	-0.21	-0.24	-0.31	-0.21	-0.10	0.00	-0.16	-0.06	-0.13	-0.10	-0.23
38	0.31	0.43	0.25	0.14	0.30	0.29	-0.11	-0.02	-0.09	-0.08	-0.20	-0.15	-0.13	-0.08	-0.04	-0.19	-0.18	-0.11	-0.15	-0.20
39	0.33	0.40	0.24	0.17	0.33	0.20	-0.24	-0.13	-0.13	-0.16	-0.21	-0.29	-0.22	-0.20	-0.10	-0.25	-0.16	-0.25	-0.19	-0.23
40	0.35	0.44	0.28	0.18	0.40	0.29	-0.16	-0.19	-0.17	-0.19	-0.14	-0.31	-0.15	-0.22	-0.07	-0.23	-0.12	-0.19	-0.19	-0.24
41	0.25	0.28	0.25	0.08	0.30	0.24	-0.10	-0.11	-0.13	-0.17	-0.19	-0.12	-0.15	-0.08	-0.02	-0.20	-0.10	-0.07	-0.07	-0.21

Notes:

Strain: 1 = Workplace Stressors; 2 = Operational Stressors; 3 = Traumatic Stressors; 4 = Organisational Support; 5 = Family Concerns; 6 = Ambiguity/Uncertainty
Cohesion: 7 = It feels good to be part of my workteam; 8 = My workteam is effective in its duties; 9 = My closest friendships are with my workmates; 10 = My workteam is proud of its standards and achievements; 11 = Members of my workteam encourage each other; 12 = Stay with current team if ADF were going to war
Leadership Effectiveness: 13 = Usually confident in JNCO abilities; 14 = Usually confident in SNCO abilities; 15 = Usually confident in WO abilities; 16 = Usually confident in Officer abilities; 17 = Commanders interested in my welfare; 18 = Discipline standards in unit are high; 19 = Unit generally maintains high standards; 20 = Officers almost always get willing cooperation
Morale: 21 = Own level of morale is high; 22 = Level of morale in my workteam is high; 23 = Unit morale is high; 24 = Want to stay in my current unit
Proximal Leader Behaviour: 25 = My immediate commander blames the team; 26 = Immed comd is willing to listen; 27 = Immed comd refuses to explain; 28 = Immed comd lets others interfere; 29 = Immed comd respects my skills; 30 = Immed comd uses suggestions
Meaning: 31 = Professionalism; 32 = Home Support; 33 = Humanitarianism; 34 = Novelty; 35 = Personal Development
Strain: 36 = Depression/Withdrawal; 37 = Behavioural/Mental Anxiety; 38 = Physiological Anxiety; 39 = Somatic Complaints; 40 = Hyper-arousal; 41 = Emotional Lability

Correlations above .13 are significant at the $p < .05$ level (2-tailed); correlations above .18 are significant at the $p < .01$ level (2-tailed)

TABLE AH1 (contd)
Subsample Intercorrelations among Observed Variables for the Structural Model (contd)

	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
21	1.00																				
22	0.76	1.00																			
23	0.65	0.75	1.00																		
24	0.41	0.40	0.49	1.00																	
25	0.30	0.42	0.35	0.26	1.00																
26	0.32	0.37	0.32	0.23	0.39	1.00															
27	0.32	0.37	0.30	0.27	0.55	0.38	1.00														
28	0.30	0.39	0.38	0.36	0.51	0.35	0.43	1.00													
29	0.44	0.42	0.37	0.32	0.34	0.55	0.40	0.35	1.00												
30	0.41	0.50	0.41	0.28	0.41	0.54	0.47	0.33	0.47	1.00											
31	0.48	0.39	0.37	0.30	0.19	0.20	0.19	0.13	0.32	0.30	1.00										
32	0.01	-0.05	-0.02	-0.10	-0.05	-0.01	0.01	0.02	0.02	0.02	0.25	1.00									
33	0.14	0.14	0.16	0.11	0.12	0.23	0.11	0.06	0.26	0.23	0.52	0.32	1.00								
34	0.34	0.22	0.26	0.22	0.10	0.23	0.19	0.10	0.30	0.25	0.62	0.23	0.57	1.00							
35	0.39	0.35	0.30	0.21	0.15	0.19	0.19	0.17	0.28	0.29	0.72	0.31	0.56	0.59	1.00						
36	-0.55	-0.47	-0.44	-0.34	-0.25	-0.24	-0.19	-0.30	-0.33	-0.30	-0.33	0.16	-0.13	-0.24	-0.31	1.00					
37	-0.37	-0.19	-0.23	-0.21	-0.19	-0.22	-0.16	-0.20	-0.34	-0.20	-0.20	0.15	-0.06	-0.19	-0.17	0.68	1.00				
38	-0.31	-0.22	-0.22	-0.15	-0.15	-0.19	-0.14	-0.16	-0.21	-0.24	-0.14	0.06	-0.07	-0.11	-0.18	0.56	0.60	1.00			
39	-0.41	-0.33	-0.36	-0.20	-0.27	-0.23	-0.16	-0.20	-0.28	-0.31	-0.24	0.12	-0.09	-0.20	-0.20	0.69	0.49	0.56	1.00		
40	-0.35	-0.28	-0.30	-0.26	-0.17	-0.13	-0.03	-0.20	-0.25	-0.16	-0.13	0.22	-0.06	-0.13	-0.11	0.62	0.53	0.48	0.55	1.00	
41	-0.26	-0.14	-0.15	-0.18	-0.13	-0.18	-0.10	-0.17	-0.15	-0.12	-0.12	0.01	0.01	-0.11	-0.02	0.46	0.58	0.33	0.31	0.36	1.00

Notes:

Morale: 21 = Own level of morale is high; 22 = Level of morale in my workteam is high; 23 = Unit morale is high; 24 = Want to stay in my current unit
Proximal Leader Behaviour: 25 = My immediate commander blames the team; 26 = Immed comd is willing to listen; 27 = Immed comd refuses to explain; 28 = Immed comd lets others interfere; 29 = Immed comd respects my skills; 30 = Immed comd uses suggestions
Meaning: 31 = Professionalism; 32 = Home Support; 33 = Humanitarianism; 34 = Novelty; 35 = Personal Development
Strain: 36 = Depression/Withdrawal; 37 = Behavioural/Mental Anxiety; 38 = Physiological Anxiety; 39 = Somatic Complaints; 40 = Hyper-arousal; 41 = Emotional Lability

Correlations above .13 are significant at the $p < .05$ level (2-tailed); correlations above .18 are significant at the $p < .01$ level (2-tailed)

Appendix AI

Fitted Structural Model Examining the Mediating Effects of the Human Factors of Leadership, Cohesion, Sense of Meaning, and Morale between Stressors and Strain

Fitted Structural Model Examining the Mediating Effects of the Human Factors of Leadership, Cohesion, Sense of Meaning, and Morale between Stressors and Strain

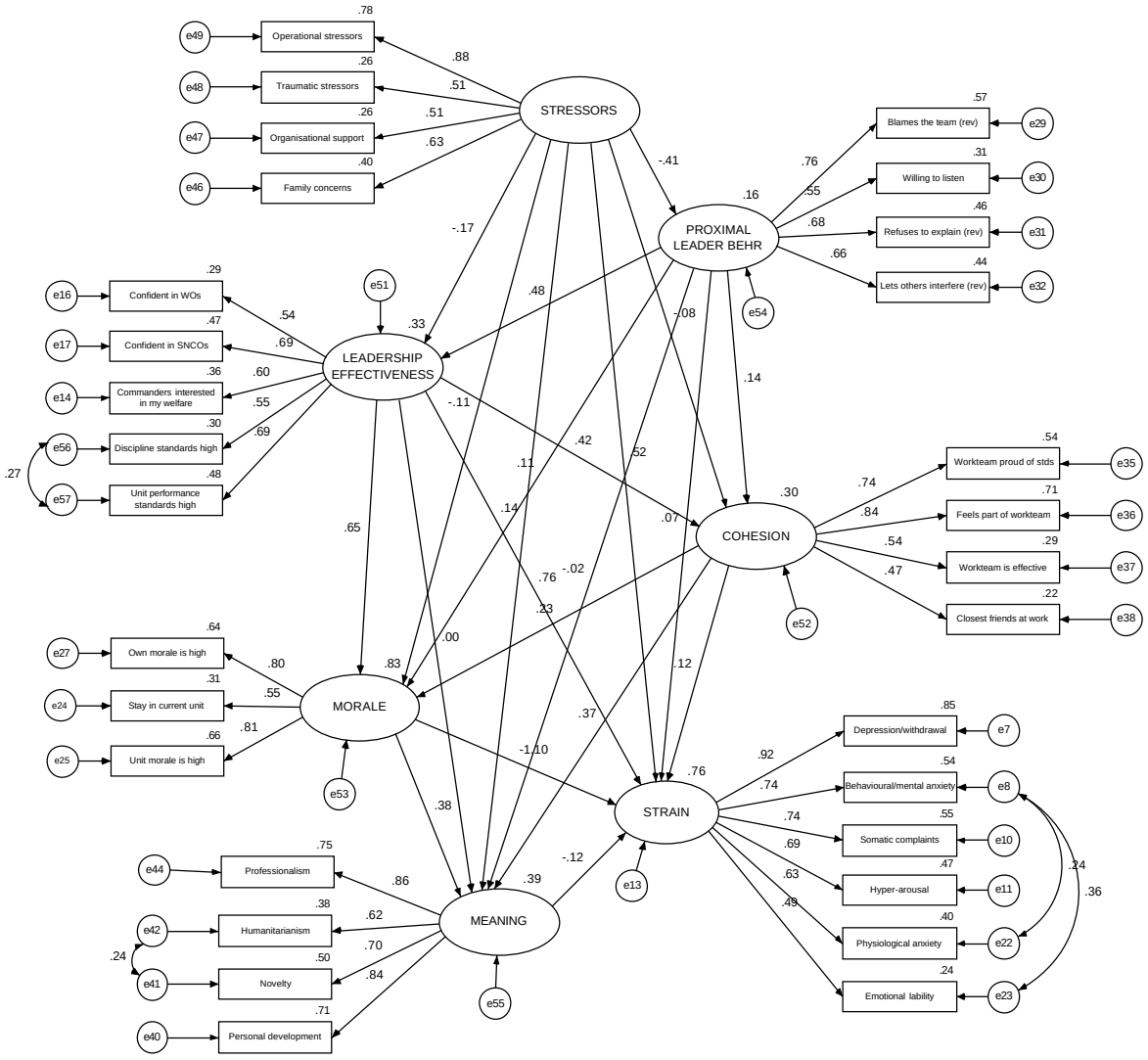


FIGURE AI1 Fitted latent structural model examining the mediating effects of the human factors of leadership, cohesion, sense of meaning, and morale between stressors and strain.
(Deployment Subsample 1, n = 223)

Appendix AJ

Hypothesised Structural Model Predicting Strain from Postdeployment Social Support

Hypothesised Structural Model Predicting Strain from Postdeployment Social Support

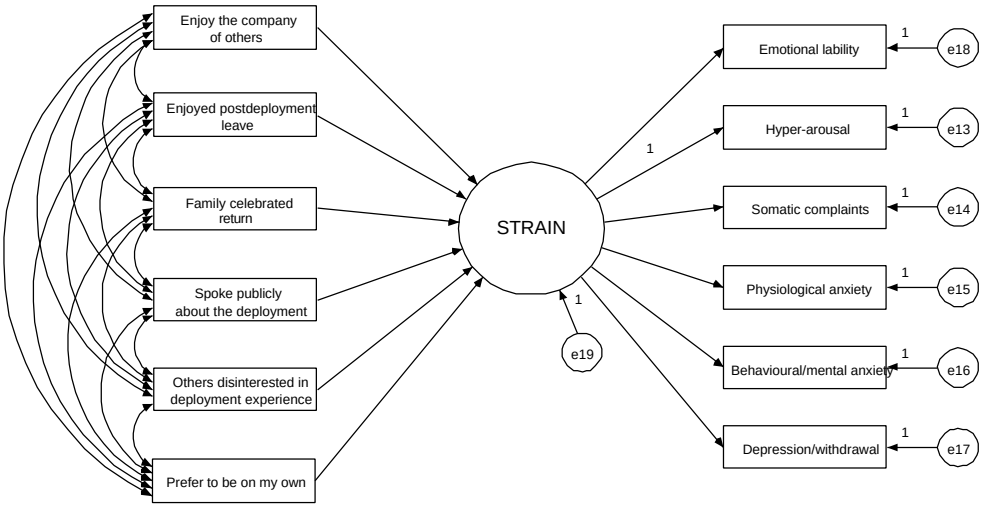


FIGURE AJ1 Hypothesised structural model predicting Strain from Postdeployment Social Support.

Appendix AK

Simplified Structural Model Examining the Influence of Social Support during Deployment and Homecoming Adjustment Factors on Postdeployment Strain

Simplified Structural Model Examining the Influence of Social Support during Deployment and Homecoming Adjustment Factors on Postdeployment Strain

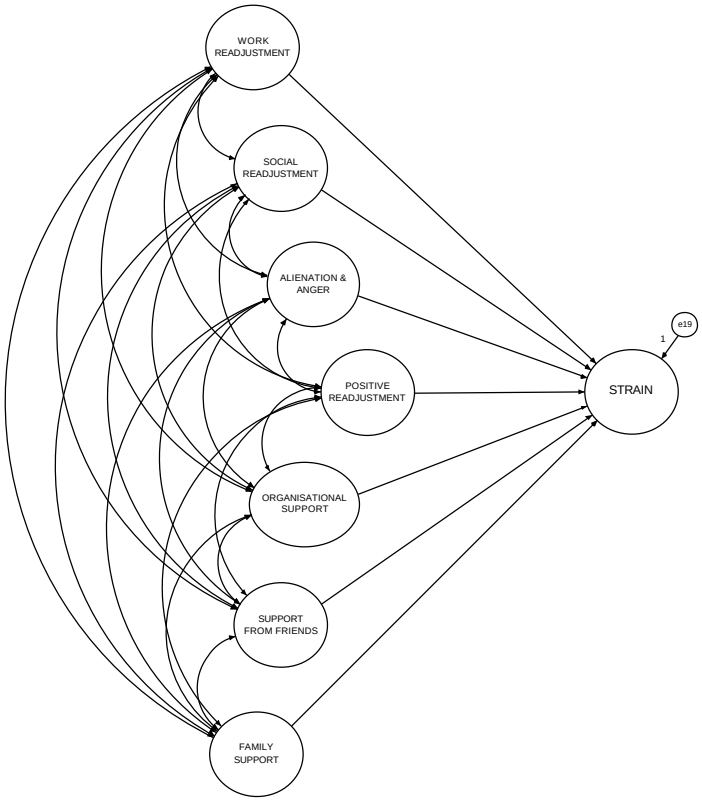


FIGURE AK1 Simplified structural model examining the influence of social support during deployment and homecoming adjustment factors on postdeployment strain (indicator variables not shown).

Appendix AL

Hypothesised Structural Model Predicting Postdeployment Strain
from three Traumatic Stress Variables

Hypothesised Structural Model Predicting Postdeployment Strain from three Traumatic Stress Variables

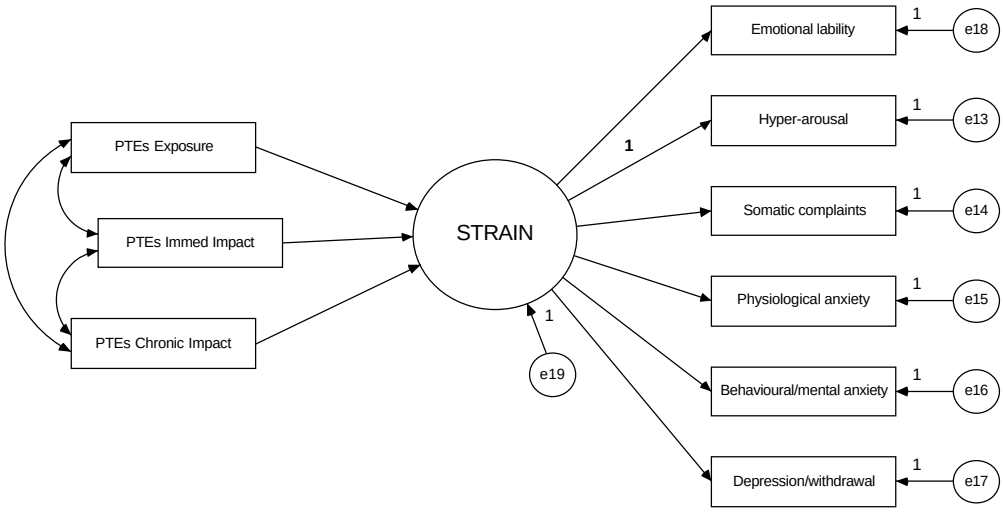


FIGURE AL1 Hypothesised structural model predicting postdeployment Strain from three traumatic stress variables.

Appendix AM

Hypothesised Structural Model Examining Potential Buffering Factors in the Stress-Strain Relationship During the Postdeployment Phase

Hypothesised Structural Model Examining Potential Buffering Factors (Postdeployment Social Support and Unit Climate Factors) on the Stress-Strain Relationship During the Postdeployment Phase

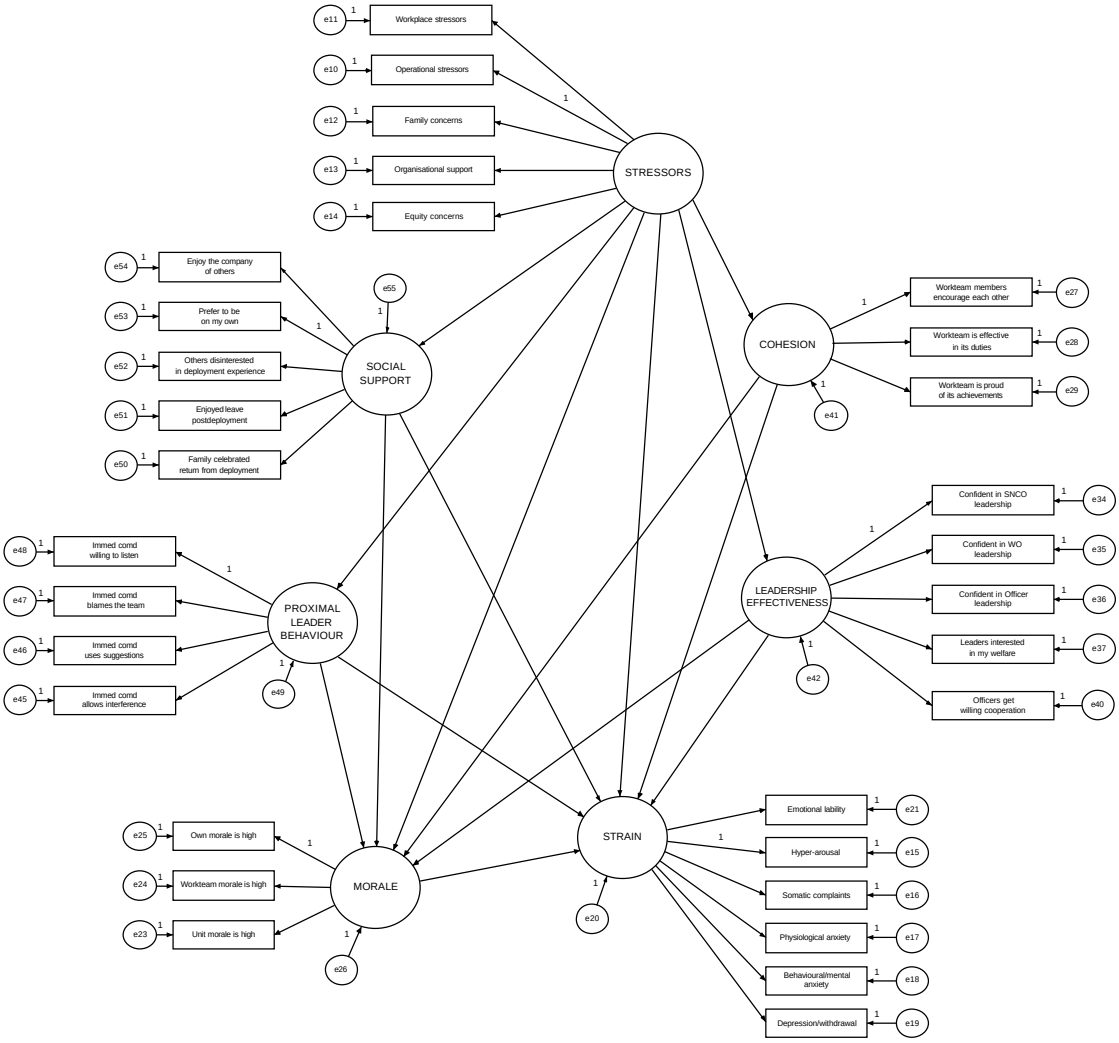


FIGURE AM1 Hypothesised structural model examining potential buffering factors (postdeployment social support and unit climate factors) on the stress-strain relationship during the postdeployment phase.

Appendix AN

Fitted Structural Model Examining Postdeployment Social Support and Unit Climate Factors as Potential Buffering Factors on the Stress-Strain Relationship during the Postdeployment Phase

Fitted Structural Model Examining Postdeployment Social Support and Unit Climate Factors as Potential Buffering Factors on the Stress-Strain Relationship during the Postdeployment Phase

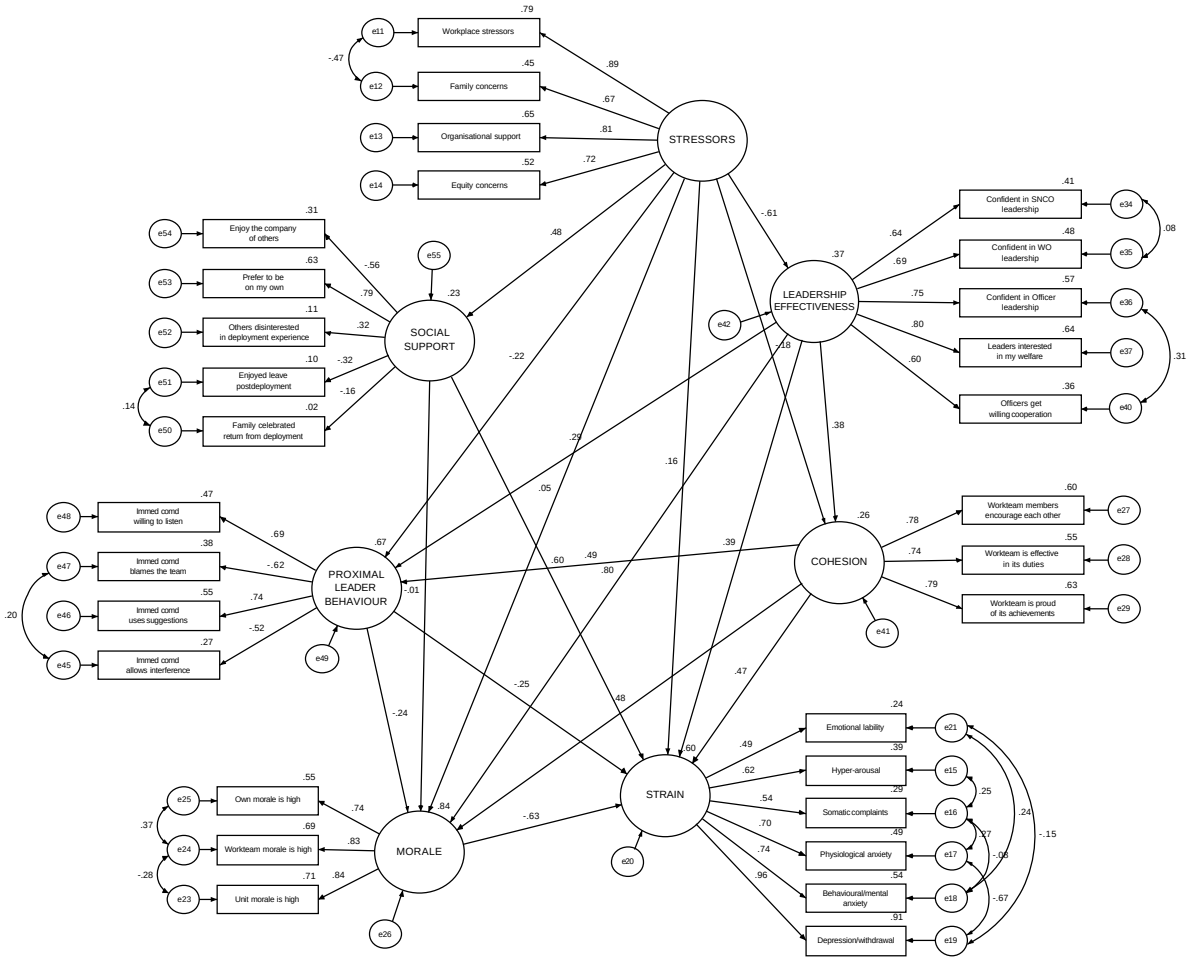


FIGURE AN1 Fitted structural model examining postdeployment social support and unit climate factors as potential buffering factors on the stress-strain relationship during the postdeployment phase (Sample 2).