Cognitive Hardiness in the New Zealand Military

Michael C. Carston, *New Zealand Army Psychology Service*

Dianne Gardner, *Massey University*

The current research investigated appraisal, coping, cognitive hardiness and work related stress in 439 military personnel. Associations were found between challenge appraisals, adaptive coping and positive psychological and physical outcomes. Associations were also found between threat appraisals, maladaptive coping and negative psychological and physical outcomes. Cognitive hardiness was not found to be associated with building adaptive coping strategies and did not mediate the positive pathway to stress. However, cognitive hardiness did mediate the negative pathway suggesting a potential protective element to this construct.

The motto used by the New Zealand Army Physical Training Corps is "*mens sana in corpore sano*" meaning "a sound mind in a sound body" and encompasses both physical and mental health. The present research explored stress, cognitive hardiness and coping within a military setting in order that insights into these issues can allow improvements in the programmes that contribute to maintaining a robust defence force. Military populations also provide a unique cross-section of society where valuable insights into occupational stress and resilience can be found.

Lazarus and Folkman (1984, p. 19) 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 well-being". The range of outcomes associated with or caused by stress is extensive. Consequences can include negative effects on general psychological health (Karademas & Kalantzi-Azizi, 2004), anger (Bongard & al Absi, 2005), psychological distress (Marchand, Demers, & Durand, 2005), burnout (Collins & Long, 2003), susceptibility to respiratory infections (Cohen, Tyrell, & Smith, 1993), heart disease (Rosengren et al., 2004) and cancer (Dettenborn et al., 2005). These affect the individual and may also impact directly or indirectly on organisational well-being (Jex & Crossley, 2005).

Cognitive hardiness

Reactions to stressful demands are influenced by situational and individual factors. Cognitive hardiness is a personality construct comprised of the characteristics of commitment, control, and challenge (Kobasa, 1979), often referred to as the 3Cs of hardiness (Maddi, 2002). People high in commitment are typically involved in their work, family and interests; people high in challenge tend to view life changes as opportunities to learn; and people high in control typically believe they have influence over events in life (Nowack, 1990). Together the components of hardiness combine to represent the day-to-day attitudes and beliefs that are held by an individual (Beasley, Thompson, & Davidson, 2003). There is increasing evidence that cognitive hardiness is a negative predictor of psychological distress and self-reported illness, and a positive predictor of well-being (Beasley et al., 2003; Kobasa, 1979; Kobasa, Maddi, & Kahn, 1982; Nowack, 1990). Hardiness has been related to higher levels of performance, cohesion and engagement in military personnel (Bartone, 2000; Bartone, Johensen, Eid, Brun, & Laberg, 2002; Britt, Alder, & Bartone, 2001) and athletes (Golby & Sheard, 2004).

The NZ Army prides itself on providing a challenging and stimulating environment for personnel. Army personnel also pride themselves on accepting both physical and mental challenges. The ethos and values of the NZ Army are: courage, commitment, comradeship and integrity (Chief of Army, 2006). These values have striking similarities with the three Cs of cognitive hardiness. Maddi (2002 p. 176) believes that "hardiness develops in people who are encouraged by those around them that they can turn adversity into opportunity and who observe themselves actually making this happen". It is likely that the NZ Army both attracts and develops cognitive hardiness in its personnel. It is important to identify characteristics that affect the positive and negative outcomes of stressors. This information can then be used not only to improve the psychological well-being of military personnel but also the general population.

Stressors, appraisal and coping

Stress is a complex multivariate

process that can have multiple outcomes (Hart & Cotton, 2002; Lazarus & Folkman, 1984). The transactional approach allows for a complex interplay between personal and environmental factors. Transactional models attempt to determine critical pathways in the stress process and to include intervening variables such as appraisal, coping and individual and environmental factors that impact on outcomes (Lazarus, 1990). Appraisal, the process whereby a person evaluates a situation and decides whether that situation will impact on their health or well-being, is a core concept in transactional models. Threat appraisals arise when a person perceives that their resources do not match the demands of a situation whereas challenge appraisals arise when a person perceives that a stressful situation has potential benefits for gain and their resources meet or exceed these demands. Threat appraisals have been linked to increased anxiety (Feldman, Cohen, Hamrick, & Lepore, 2004; Folkman & Lazarus, 1985; Skinner & Brewer, 2002), subjective stress (Anshel, 2001; Tomaka, Blascovich, Kibler, & Ernst, 1997), negative affect (Hasida, Dana, & Dorit, 2005), decreased performance on complex tasks (Drach-Zahavy & Erez, 2002) and job satisfaction (Cavanaugh, Boswell, Roehling, & Boudreau, 2000); while challenge appraisals have been positively associated with performance (Drach-Zahavy & Erez, 2002), positive affect (Hasida et al., 2005), expectations of coping and positive emotion (Skinner & Brewer, 2002, 2004). Hardy individuals should be more optimistic when appraising stress, whereas less hardy individuals tend to be more pessimistic and find change threatening (Ouellette-Kobasa, Maddi, Puccetti, & Zola, 1985). At present the link between hardiness and primary appraisal is more conceptual than empirical. The present research investigated this relationship further and proposed two hypotheses:

H1. Cognitive hardiness will be a) positively associated with challenge appraisal and b) negatively associated with threat appraisal.

Primary appraisal of threat and challenge are linked to secondary appraisal, or the evaluation, selection, and implementation of coping strategies. The terms "primary" and "secondary" appraisal do not imply that one process is more important than the other or that one necessarily precedes the other. Primary and secondary appraisal may occur simultaneously; however the terms are useful for dividing appraisal into its essential components (Lazarus & Folkman, 1984). Lazarus and Folkman (1984, p. 141) define coping as the "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person". Adaptive task-focused coping includes strategies such as planning and taking action, while less-adaptive strategies include avoiding problems and procrastinating (avoidance). Challenge appraisal has been found to be associated with task-focused coping while threat appraisal has been linked to increased use of avoidance (Carver & Scheier, 1994; Hasida et al., 2005). Another adaptive coping strategy is seeking social support which may work to facilitate task-focused coping and limit avoidance, and may be a facilitator of effective coping (Folkman & Lazarus, 1985).

Hardy individuals are more likely to use task-focused coping rather than avoidance (Kobasa, 1979; Kobasa, Maddi, & Kahn, 1982; Kobasa, Maddi, & Puccetti, 1982; Maddi & Hightower, 1999; Maddi, Khoshaba, & Pammenter, 1999; Ouellette-Kobasa et al., 1985; Soderstrom, Dolbier, Leiferman, & Steinhardt, 2000). This does not preclude the use of other coping strategies for example the seeking of social support (e.g. information or helpful guidance) (Maddi & Hightower, 1999). The military has a people-oriented culture with an emphasis on teamwork. At times military personnel spend long periods away from their friends and families and may also be exposed to particularly difficult working conditions. Social support plays an important role in military life and social support coping has been associated with psychological well-being in military personnel (Limbert, 2004). Less hardy individuals are not as likely to adopt task-focused or social support strategies when compared with hardy individuals and are more inclined toward avoidance because they are less committed, feel they are unable to control situations, and feel threatened as opposed to challenged when faced with difficult situations (Maddi, 1999; Maddi & Hightower, 1999; Soderstrom et al., 2000).

Outcomes

Positive affect (PA) is characterised by emotions associated with "energy, excitement and enthusiasm" while negative affect (NA) is characterised by emotions such as anger, disgust and depression (Watson et al., 1995). Despite the general acknowledgement that stress outcomes may be positive or negative, research has tended to concentrate on negative outcomes such as negative affect (Nelson & Simmons, 2003; Seligman & Csikszentmihalyi, 2000). Recently there has been a resurgence of interest in positive emotions as the positive psychology movement has argued for a shift away from the traditional stressor-strain approach (Folkman & Moskowitz, 2000a, 2004; Nelson & Simmons, 2003; Seligman & Csikszentmihalyi, 2000; Simmons & Nelson, 2001). Positive affect is associated with adaptive task-focused coping strategies, social support and challenge appraisals while NA is often associated with avoidance and threat appraisals (Folkman & Moskowitz, 2004; Hasida et al., 2005; Ntoumanis & Biddle, 1998). Although the mechanisms through which cognitive hardiness influence stress and wellbeing are not clear (Klag & Bradley, 2004; Soderstrom et al., 2000) a body of research suggests that hardy individuals are less likely to experience negative affect and more likely to experience positive affect (Beasley et al., 2003; Kobasa, 1979; Kobasa, Maddi, & Kahn, 1982; Nowack, 1990). It is therefore expected that:

H2: Positive affect will be positively associated with a) challenge appraisal; b) task-focused coping; c) social support and d) cognitive hardiness

H3: Negative affect will be positively associated with a) threat appraisal and b) avoidance.

H4: Negative affect will be negatively associated with cognitive hardiness

Research suggests that ongoing affective states can lead to long-term

individual (e.g. health) and organisational (e.g. intention to leave) outcomes (van Katwyk, Fox, Spector, & Kelloway, 2000). Of particular importance to organisations are rates of turnover, with organisations losing a significant investment in training and experience with each departure (Thoreson, Kaplan, Barsky, Warren, & de Chermont, 2003). Also important to organisational functioning is health-related absence. It is widely accepted that over time stress can lead to adverse health effects (Nelson & Simmons, 2003) but there is less research into the links between positive psychological states, cognitive hardiness and positive organisational outcomes (e.g intentions to stay, lowered heath-related absence). Positive affect may be an important antecedent of physical health and intentions to stay (Folkman & Moskowitz, 2000a, 2000b; Thoreson et al., 2003). Cognitive hardiness may also play an important role in this process with research finding hardiness to have a negative relationship with psychological distress and a positive relationship with well-being (Nowack, 1990). Bartone and colleagues studied military personnel in both peacekeeping and war and found evidence that hardiness was a significant protector against stress-related illness, particularly under high stress conditions. (Bartone, 2000; Bartone et al., 2002).

H5: Cognitive hardiness will be negatively related to a) health-related absence and b) intentions to leave.

There is evidence for a direct influence of cognitive hardiness on psychological and physical outcomes in military (Bartone, 2000) and other contexts (Beasley et al., 2003; Nowack, 1990). Although some literature suggests that cognitive hardiness mediates the relationship between stress and illness (Klag & Bradley, 2004), given the relatively short history of cognitive hardiness as a concept, its role as a mediator has not been investigated extensively. From the research reviewed earlier there are grounds for proposing that primary and secondary appraisals are associated as are secondary appraisals and affective outcomes. However there are also strong grounds for an association of cognitive hardiness with all of these variables (Beasley et al., 2003; Kobasa, 1979; Kobasa, Maddi, & Courington, 1981; Kobasa, Maddi, & Kahn, 1982; Kobasa, Maddi, & Puccetti, 1982; Maddi, 1999; Maddi & Hightower, 1999; Maddi, Kahn, & Maddi, 1998; Ouellette-Kobasa et al., 1985; Soderstrom et al., 2000). It is proposed that cognitive hardiness may act as a mediator between primary and secondary appraisals and between secondary appraisals and affect.

H6: Cognitive hardiness will mediate the relationship between a) challenge appraisals and task-focused coping and between b) challenge appraisals and social support.

H7: Cognitive hardiness will mediate the relationship between a) task-focused coping and positive affect and b) between social support and positive affect.

H8: Cognitive hardiness will mediate the relationship between threat appraisals and avoidance.

H9: Cognitive hardiness will mediate the relationship between avoidance and negative affect.

Method

A cross-sectional self-report survey was used to collect data. The questionnaire comprised six sections covering demands, primary and secondary appraisal, cognitive hardiness and outcomes (affect, intention to leave, and health). Before answering the questions on appraisal and coping, participants were asked to think about the most stressful situation that they had experienced at work or as a result of work in the last few weeks, briefly describe the situation, and then respond to the primary and secondary (coping) appraisal questions with that situation in mind.

Participants

The study was restricted to full time Regular Force personnel, the majority being located in military camps in Waiouru, Linton, Trentham, and Burnham. The rank groups of interest included Junior Non Commissioned Officers who will be referred to as junior soldiers (n = 174), Senior Non Commissioned Officers and Warrant Officers who will be referred to as senior soldiers (n = 108), Lieutenants and Captains who will be referred to as junior officers (n = 89), and those with

Table 1: Demographic information for the sample and for the NZ Army as a whole.

	Sample (%)	NZ Army (%)
Gender		
Male	353 (80.4%)	3791 (86.7%)
Female	77 (17.5%)	581 (13.3%)
Missing	9 (2.1%)	
Total	439 (100%)	4372 (100%)
Rank		
Junior soldiers	174 (39.6%)	1018 (41.8%)
Senior soldiers	108 (24.6%)	705 (28.9%)
Junior officers	89 (20.3%)	388 (15.9%)
Senior officers	59 (13.4%)	327 (13.4%)
Missing	9 (2.1%)	
Total	439 (100%)	2348 (100%)
Age		
Under 25 years	70 (15.9%)	1765 (40.4%)
25 - 34 years	202 (46%)	1421 (32.5%)
34 - 44 years	137 (31.2%)	956 (21.8%)
Over 45	21 (4.8%)	230 (5.3%)
Missing	9 (2.1%)	
Total	439 (100%)	4372 (100%)

rank of Major or above who will be referred to as senior officers (n = 59). These ranks were included to represent respondents with a range of seniority and experience in the organisation.

In total 439 questionnaires were returned from a total of 537 giving an overall response rate of 82%. Two hundred and seventy one participants were based at Linton Military Camp in Palmerston North, New Zealand. The remainder (n = 168) came from other military locations throughout New Zealand. Table 1 summarises the demographic information.

The sample did not differ significantly from the NZ Army as a whole in terms of gender ($\chi 2 = 0.79$, $df = 1$, $p > .05$) or rank ($\chi 2 = 0.92$, $df = 3$, $p > .05$) however the youngest age group was under-represented ($\chi 2 = 14.61$, $df = 3$, $p < .05$).

Measures

Primary Appraisal

The Cognitive Appraisal Scale (CAS) was used to measure threat and challenge appraisals (Skinner & Brewer, 2002). The measure consists of four threat appraisal items (α = .71; e.g. "I was thinking about the negative consequences of performing badly"), and four challenge appraisal items (α = .76; e.g. "I was looking forward to testing my knowledge, skills, and abilities"). Responses ranged from 1 (Not at all) to 5 (Very much). Scale scores were the means for each set of items.

Coping

The Brief COPE[1] (Carver, 1997; Carver, Scheier, & Weintraub, 1989) was used to measure coping. Principle Component Analysis with varimax rotation identified three factors accounting for 43.4% of the variance. The factors comprised task-focused coping (α = .75; e.g. 'I concentrated on doing something about it'), social support (α = .79; e.g. 'I got help and advice from other people') and avoidance (α =.73; e.g. 'I gave up trying to deal with it'). Responses ranged from 1 (Not at all) to 5 (Very much).

1. COPE is not an acronym but the name given to the scale derived by Carver, Scheier & Weintraub (1989) and revised by Carver (1997).

Positive and Negative Affect

The Job-Related Affective Well-Being Scale, JAWS (van Katwyk et al., 2000) measures 15 positive (e.g. "cheerful") and 15 negative emotions (e.g. "discouraged"). A five-point scale was used to assess how often participants had experienced each emotion. Responses ranged from 0 (Never) to 4 (Very often). Mean scores were calculated for each scale. Negative affect: α = .91; Positive affect: α = .94.

Health-related outcomes

Health-related outcomes were measured using a 10 item questionnaire (Lobb, McNeill, Bentley, Swann, & Muller, 2005) consisting of 5 questions asking how many days the participant had off work in the last twelve months due to common health problems (e.g. "In the last twelve months I have had __ days off because I had a cold/flu") and 5 questions asking how many days the person had experienced the common health problems without taking time off work (e.g. "in the last twelve months I have been sick but not taken time off work because of cold/flu __ times). The first five questions were added together to form a "Health-related absence" scale and the second block of five questions were added to form a "Times Sick" scale. These scales were highly skewed: 51% (209 out of 407 valid responses) had no health-related absence in the last 12 months (min = 0, max = 82), and 26.4% (97/367 valid responses) reported having had no times sick without days off (min = 0; max = 200). Nonparametric statistics were used for analysis of these variables.

Intention to Leave

Participants were asked how long they intended to remain in the organisation. Options ranged from 1 (leave "within six months") to 6 (leave "between 10-15 years"). Data were recoded so that higher scores reflected earlier intentions to leave.

Cognitive Hardiness

Cognitive hardiness was measured using Nowack's (1990), 30 item Cognitive Hardiness Scale (CHS). Responses ranged from 1 (Strongly agree) to 5 (Strongly disagree). Some items were reverse coded so that high scores indicated high hardiness. The 30 items were summed so that a mean cognitive hardiness score (ranging from 1-5) was calculated for each participant. A principal component analysis revealed a single factor solution. The reliability co-efficient for the present study was α = .75

Data Analysis

Data was entered into the Statistical Package for the Social Sciences (SPSS), version 15.0. The data was examined for violations of normality. The measures of health-related outcomes were skewed and treated as outlined above. Analysis of Variance (ANOVA) and chi-square were used to examine differences between groups. Principle Components Analyses with varimax rotation were carried out on the Cognitive Hardiness and coping measures as the factor structures of these variables is debated (Sinclair & Tetrick, 2000). All other questionnaire items came from scales with established factor structures. Baron & Kenny's (1986) guidelines were used to test mediation.

Procedure

Permission to conduct the study was granted from the Massey University Human Ethics Committee. Permission was also granted by the Army Chief of General Staff Human Resources in accordance with the regulations laid out in the Defence Force Order 21/2002 Authority to Conduct Personnel Research.

Results

Group differences

Because of the hierarchical structure of the military, different rank brackets vary in the amount of responsibility and control they have in their roles. Table 2 shows means of key study variables for each group.

Post-hoc tests (Dunnette's C, which does not assume equal variances) assessed where the differences lay. Junior soldiers used less task-focused coping and more avoidance, and showed less positive affect and more negative affect than other ranks.

Table 2: Differences between groups

	Junior NCO's	Senior NCO's	Junior Officers	Senior Officers	
Cognitive hardiness	3.19 (0.45)	2.91 (0.34)	2.98 (0.25)	3.08 (0.29)	F(3,385) = 13.33***
Threat	2.95 (0.98)	2.95 (1.02)	3.09 (0.95)	2.73 (0.90)	F(3,381) = 1.52
Challenge	3.17 (0.97)	2.97 (0.94)	3.07 (0.94)	2.95 (1.03)	F(3,381) = 1.12
Task-focused coping	3.53 (0.84)	3.92 (0.75)	3.85 (0.57)	4.07 (0.62)	F(3,379) = 10.05***
Social support	2.64 (0.93)	2.66 (1.01)	2.85 (0.81)	3.10 (0.84)	F(3,379) = 4.00**
Avoidance	1.82 (0.72)	1.56 (0.72)	1.55 (0.51)	1.53 (0.64)	F(3,383) = 5.16**
NA	2.78 (0.61)	2.49 (0.73)	2.37 (0.52)	2.28 (0.66)	F(3,418) = 13.81***
PA	2.91 (0.61)	3.18 (0.68)	3.12 (0.64)	3.25 (0.52)	F(3,416) = 6.11***
Intentions to leave	2.96 (1.56)	3.21 (1.24)	3.74 (1.43)	3.89 (1.24)	F(3,306) = 6.72***

** p<.01; ***p<.001

Correlations

Table 3 presents means, standard deviations, and correlation coefficients.

Challenge appraisal was positively correlated with task-focused coping, social support and positive affect, and negatively with avoidance and negative affect. Threat appraisal was related to avoidance, negative affect and times sick. With regard to coping, task-focused coping and social support were correlated with each other and with positive affect. Avoidance was positively associated with negative affect. Of the three forms of coping only avoidance was associated (negatively) with cognitive hardiness. Intention to leave and times sick were related to more avoidance and negative affect and to less positive affect.

Hypothesis 1 was supported as cognitive hardiness was positively related to challenge appraisal and negatively related to threat appraisal. Positive affect was positively related to challenge appraisal, task-focused coping, social support and cognitive hardiness, supporting all parts of Hypothesis 2. Hypotheses 3 and 4 were supported as negative affect was related positively to threat appraisal and avoidance, and negatively to cognitive hardiness.

Cognitive hardiness was unrelated to intentions to leave and to health-related absence so there was no support for Hypothesis 5. Cognitive hardiness was also unrelated to task-focused coping and social support. However, cognitive hardiness had a positive relationship with positive affect, and a negative relationship with avoidance, negative affect and times sick.

Mediation

Hypothesis 6, that cognitive hardiness would mediate the relationships between challenge appraisal and task-focused coping (6a) and between challenge appraisal and social support (6b) was not supported (Table 4).

Hypothesis 7 proposed that hardiness would mediate the relationships between task-focused coping and positive affect, and social support and positive affect. As neither form of coping was significantly associated with the mediator (see Table

Table 3: Means, Standard Deviations, and Correlations

		1	2	3	4	5	6	7	8	9	10	Mean (SD)
1	Challenge	-										3.07 (0.96)
2	Threat	.06	-									2.95 (0.97)
3	Task-Focused Coping	.23*	-.02	-								3.77 (0.76)
4	Social Support	.24**	.07	.40**	-							2.76 (0.92)
5	Avoidance	-.12*	.29**	-.21**	.09	-						1.66 (0.68)
6	Cognitive Hardiness	.19**	-.18**	.04	-.03	-.25**	-					3.05 (0.38)
7	Positive Affect	.30**	-.04	.25**	.21**	-.24**	.22**	-				3.06 (0.67)
8	Negative Affect	-.19**	.12**	-.28**	-.12*	.44**	-.31**	-.58**	-			2.55 (0.66)
9	Intention to leave	-.14	-.02	-.11	-.12	.12*	.07	-.36**	.36**	-		3.31 (1.46)
10	Health-related absence[2]	.04	.04	.02	.07	-.02	.05	-.01	-.011	.08	-	3.85 (3.85)
11	Times sick[2]	-.10	.18**	.01	.07	.20**	-.13*	-.15**	.20**	-.06	.27**	6.88 (14.65)

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

[2]Spearman's rank-order correlation coefficient. All others are Pearson's r.

Table 4: Cognitive Hardiness as a Mediator

Dependant variable	IV	B	SE B	*β*	Adjusted R^2	Sobel test
H6a						
1. Cognitive hardiness	Challenge	.07	.02	.19***	.03	.66 *ns*
2. Task-focused coping	Challenge	.18	.04	.23***	.05	
3. Task-focused coping	Challenge	.14	.04	.19**	.03	
	Cognitive hardiness	-.02	.11	-.01 *ns*		
H6b						
1. Cognitive hardiness	Challenge	.07	.02	.19***	.03	-.57 *ns*
2. Social Support	Challenge	.23	.05	.24***	.06	
3. Social Support	Challenge	.23	.05	.25***	.06	
	Cognitive hardiness	-.21	.13	-.09 *ns*		
H8						
1. Cognitive hardiness	Threat	-.07	.02	-.18**	.03	2.78**
2. Avoidance	Threat	.20	.03	.29***	.08	
3. Avoidance	Threat	.21	.04	.30***		
	Cognitive hardiness	-.35	.09	-.20***		
H9						
1. Cognitive hardiness	Avoidance	-.14	.03	-.25***	.06	3.97***
2. Negative Affect	Avoidance	.43	.05	.44***	.19	
3. Negative Affect	Avoidance	.39	.05	.40***	.24	
	Cognitive hardiness	-.37	.08	-.22***		

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

3) the first condition for mediation proposed by Baron and Kenny (1986) was not met. Further analysis of this hypothesis was not carried out.

Hypotheses 8 and 9 were supported (Table 4). Cognitive hardiness partially mediated the relationships between threat appraisals and avoidance and between avoidance and negative affect.

Discussion

Cognitive hardiness was considered to be an individual difference variable relevant to the military culture with potential widespread applicability in organisational psychology. Hardy individuals were more likely to appraise stressful situations as challenges rather than threats but, unexpectedly, cognitive hardiness was not associated with task-focused coping but was negatively associated with avoidance. Hardiness was positively associated with positive affect and negatively with negative affect. Previous studies have supported a direct or moderating role for cognitive hardiness in stress but few have investigated its role as a mediator. In the present study, relationships between threat appraisal and avoidance and between avoidance and negative affect were mediated by cognitive hardiness but cognitive hardiness was unrelated to processes linking demands to positive outcomes. The findings suggest that a lack of hardiness may be associated with increased vulnerability to work-related stress through its association with maladaptive threat appraisals and increased avoidance.

The findings support the notion that there are two pathways related to the appraisal of work-related demands. The negative pathway involves threat appraisals, maladaptive coping (avoidance), negative affect and negative outcomes. This pathway has traditionally been studied in the context of work-related stress and is well established. Although no causal attributions can be made with the cross-sectional design the findings converge with a solid body of evidence linking threat appraisal to avoidance and negative outcomes. The present findings also support the growing body of research showing that even stressful work-related situations can have positive outcomes through adaptive processes of challenge appraisal, task-focused coping and social support (Folkman & Lazarus, 1985; Hasida et al., 2005; Skinner & Brewer, 2002; Tomaka, Blascovich, Kelsey, & Leitten, 1993). These findings have important implications for employers. The presence of challenge in the workplace may be as important as the absence of threats in terms of workplace wellbeing. Demands can be motivating and inspiring and organisations need to encourage active engagement, not just "stress prevention", as well as providing employees with the skills to identify and negotiate stressful demands. This study helps complete the picture of work-related stress; it shows that stressors do not necessarily lead to strain.

The study sought to investigate outcomes relevant to both individual and organisational functioning. Threat appraisal, avoidance and both positive and negative affect were associated with times sick where no days were taken off work. Interestingly, cognitive hardiness, appraisal, coping and affect were unrelated to health-related absence. This may reflect an organisational

culture that tends toward getting on with work even when the going gets tough. Intention to leave was positively associated with negative affect and avoidance, and negatively associated with positive affect, supporting the notion that negative emotions prompt a desire to withdraw or escape from the situation causing distress while positive emotions can be associated with engagement rather than withdrawal (Pelled & Xin, 1999). Positive affect appears to be an important antecedent of engagement in work (Britt et al., 2001; Freeney & Tiernan, 2006; Saks, 2006). The findings suggest that increasing positive affect at work may be as important for retaining employees as reducing negative affect.

One limitation to the generalisability of the findings is that the study was conducted in a military setting. The military culture is well known for its direct and task-focused nature and for gaining satisfaction from identifying and successfully accomplishing tasks. The positive role of task-focused coping in this study is consistent with this culture and with other occupational cultures where problem-focused strategies are encouraged, but these findings may not generalise to situations where demands are not amenable to task-focused coping strategies. The study used a cross-sectional approach which may not have captured the complexity of coping. Coping is a process that unfolds over time. Cross-sectional self-report data risks omitting a great deal of this complexity as well as introducing other methodological problems such as recall bias and a possible confound between coping and outcomes (Lazarus, 1999; Lazarus, DeLongis, Folkman, & Gruen, 1985). The study design was chosen as a balance between pure theory-driven process research and practical conceptual applications. While cross-sectional data might not capture the intricacies of coping, the relatively large sample size and the theoretical basis for the research provides support for general adaptive patterns in coping.

Implications for Research

The mechanism by which cognitive hardiness influences the stress process is still unclear. The negative association of hardiness with threat appraisals and avoidance suggests that hardiness may mitigate the use of maladaptive strategies and serve as a protective mechanism. However, hardiness did not help build adaptive coping strategies, although it was associated with increased challenge appraisals and positive affect. Although hardiness is an appealing and exciting construct with a number of potential applications to organisations, the hardiness concept has a relatively short history and requires further attention. Some characteristics of hardiness such as questioning and encouraging change may not be welcomed in some organisational cultures (Maddi et al., 1999). Research needs to examine how organisations influence the stress process through their values and cultures.

Implications for Practice

Although transactional paradigms are appealing there has been debate as to how they should be applied to work settings, with some researchers suggesting that transactional methods of examining stress are too radical for traditional stress research (Dewe & Trenberth, 2004). Transactional models place emphasis on subjective interpretation of work-related demands and on the contextual and individual factors that affect appraisal. Organisations need interventions that can equip staff with the skills to identify stressors and select the appropriate coping strategies. Ironically context and meaning are important for this to occur and the question arises as to the extent to which organisations can manage the meaning that their employees place on work-related demands. This does not negate organisations' duty of care to manage work-related hazards, including stressors. Organisations need to realise that appraisal links the person with the environment and that stress is relational, but also that the matching of demands and resources can facilitate adaptive stress appraisals. Stress programmes need to shift away from identifying only those features of the workplace that lead to negative outcomes and to concentrate on identifying where there may be opportunities for challenges or positive outcomes. Policies that promote challenges, team work and individual well-being are likely to be associated with positive affective states which may be associated with a range of positive outcomes. Organisations can aim to build adaptive coping strategies and a team culture that thrives on challenges, as well as putting into place strategies that minimise exposure to potential workplace stressors. Organisations can influence how demands are perceived and interpreted through leadership (Bartone, 2003). This has particular application to a military setting where teamwork and cohesion are critical and where leaders are clearly identified and have high levels of control over policy, strategy and direction. A commander has potential to make a significant impression on their subordinates, peers and superiors. Bartone (2003) puts this down to a hardy commander's ability to reframe negative events and inspire people to seek meaning and enjoyment out of potential stressful events. Organisations can also look at the possibility of enhancing performance through hardiness focused training as well as managing the balance between demands and resources. There is growing evidence linking hardiness to active engagement in work and a sense of meaning that leads to increases in perceived benefits (Bartone et al., 2002; Britt et al., 2001; Freeney & Tiernan, 2006; Saks, 2006). Hardiness training has both individual and organisational benefits (Maddi et al., 1998). Employees who find meaning in their roles are likely to be actively involved in their work and also more productive.

References

Anshel, M. H. (2001). Qualitative validation of a model for coping with acute stress in sports. *Journal of Sport Behavior*, 24(3), 223-347.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychology research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.

Bartone, P. T. (2000). Hardiness as a resiliency factor for United States forces in the Gulf war. In J. Violanti, D. Paton & C. Dunning (Eds.), *Post-traumatic Stress Intervention: Challenges, Issues and Perspectives.* (pp. 115-133). Springfield, Ill.: C. C. Thomas.

Bartone, P. T. (2003). Hardiness as a resiliency resource under high stress conditions. In D. Paton, J. M. Violanti & L. M. Smith (Eds.), *Promoting capabilities to manage posttraumatic stress: Perspectives on*

resilience. (pp. 59-73). Illinois: Charles C Thomas.

Bartone, P. T., Johensen, B. H., Eid, J., Brun, W., & Laberg, J. C. (2002). Factors influencing small-unit cohesion in Norwegian navy officer cadets. *Military Psychology,* 14(1), 1-22.

Beasley, M., Thompson, T., & Davidson, J. (2003). Resilience in response to life stress: The effects of coping style and cognitive hardiness. *Personality and Individual Differences, 34*, 77-95.

Bongard, S., & al Absi, M. (2005). Domain-specific anger expression and blood pressure in an occupational setting. *Journal of Psychosomatic Research, 58*(43-49).

Britt, T. W., Alder, A. B., & Bartone, P. T. (2001). Deriving benefits from stressful events: The role of engagement in meaningful work and hardiness. *Journal of Occupational Health Psychology, 6*(1), 53-63.

Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. *International Journal of Behavioral Medicine, 4*(1), 92-100.

Carver, C. S., & Scheier, M. F. (1994). Situational coping and coping dispositions in a stressful transaction. *Journal of Personality and Social Psychology, 66*(1), 184-195.

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*(2), 267-283.

Cavanaugh, M. A., Boswell, W. R., Roehling, M. V., & Boudreau, J. W. (2000). An empirical examination of self-reported work stress among US managers. *Journal of Applied Psychology, 85*(1), 65-74.

Cohen, S., Tyrell, D. A. J., & Smith, A. P. (1993). Negative life events, perceived stress, negative affect, and susceptibility to the common cold. J*ournal of Personality and Social Psychology, 64*(1), 131-140.

Collins, S., & Long, A. (2003). Too tired to care? The psychological effects of working with trauma. *Journal of Psychiatric and Mental Health Nursing, 10*, 17-23.

Dettenborn, L., James, G. D., Berge-Landry, H. V., Valdimarsdottir, H. B., Montgomery, G. H., & Bovbjerg, D. H. (2005). Heightened cortisol responses to daily stress in working women at familial risk for breast cancer. *Biological Psychology, 69*(2), 167-179.

Dewe, P., & Trenberth, L. (2004). Work stress and coping: Drawing together research and practice. *British Journal of Guidance and Counselling, 32*(2), 143-156.

Drach-Zahavy, A., & Erez, M. (2002). Challenge versus threat effects on the goal-performance relationship. *Organizational Behavior and Human Decision Processes, 88*, 667-682.

Feldman, P. J., Cohen, S., Hamrick, N., & Lepore, S. J. (2004). Psychological stress, appraisal, emotion and cardiovascular response in a public speaking task. . *Psychology and Health, 19*(3), 353-368.

Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology, 48*(1), 150-170.

Folkman, S., & Moskowitz, J. T. (2000a). Positive affect and the other side of coping. *American Psychologist, 55*(6), 647-654.

Folkman, S., & Moskowitz, J. T. (2000b). Stress, positive emotion and coping. *Current Directions in Psychological Science, 9*(4), 115-118.

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

Freeney, Y., & Tiernan, J. (2006). Employee engagement: An overview of the literature on the proposed antithesis to burnout. *Irish Journal of Psychology, 27*(3-4), 130-141.

Golby, J., & Sheard, M. (2004). Mental toughness and hardiness at different levels of rugby league. *Personality and Individual Differences., 37*, 933-942.

Hart, P. M., & Cotton, P. (2002). Conventional wisdom is often misleading: Understanding the realities of police stress within an organizational health framework. In M. Dollard (Ed.), *Occupational Stress in the Service Professions* (pp. 2-43). Melbourne: Taylor and Francis.

Hasida, B.-Z., Dana, Y., & Dorit, O. (2005). Coping strategies and leadership in the adaptation to social change: The Israeli Kibbutz. . *Anxiety, Stress, and Coping3, 18(2)*, 87-103.

Jex, S., & Crossley, C. (2005). Organizational consequences. In J. Barling, K. Kelloway & M. Frone (Eds.), *Handbook of work stress* (pp. 575-599). Thousand Oaks: Sage.

Karademas, E. C., & Kalantzi-Azizi, A. (2004). The stress process, self-efficacy expectations, and psychological health. *Personality and Individual Differences, 37*(5), 1033-1043.

Klag, S., & Bradley, G. (2004). The role of hardiness in stress and illness: An exploration if the effect of negative affectivity and gender. *British Journal of Health Psychology, 9*, 137-161.

Kobasa, S. C. (1979). Stressful life events, personality, and health: An inquiry into hardiness. *Journal of Personality and Social Psychology, 37*(1), 1-11.

Kobasa, S. C., Maddi, S. R., & Courington, S. (1981). Personality and constitution as mediators in the stress-illness relationship. *Journal of Health and Social Behaviour, 22*(368-378).

Kobasa, S. C., Maddi, S. R., & Kahn, S. (1982). Hardiness and health: A prospective study. . *Journal of Personality and Social Psychology, 42*(1), 168-177.

Kobasa, S. C., Maddi, S. R., & Puccetti, M. C. (1982). Personality and exercise as buffers in the stress-illness relationship. *Journal of Behavioral Medicine, 5*(4), 391-404.

Lazarus, R. (1990). Theory-based stress measurement.. *Psychological Inquiry, 1*(1), 3-13.

Lazarus, R. (1999). *Stress and Emotion: A New Synthesis*. New York: Springer.

Lazarus, R., DeLongis, A., Folkman, S., & Gruen, R. (1985). Stress and adaptational outcomes: the problem of confounded measures. *American Psychologist, 40*, 770-779.

Lazarus, R., & Folkman, S. (1984). *Stress, Appraisal and Coping*. New York: Springer.

Limbert, C. (2004). Psychological well-being and job satisfaction amongst military personnel on unaccompanied tours: The impact of perceived social support and coping strategies. . *Military Psychology, 16*(1), 37-51.

Lobb, B., McNeill, R., Bentley, T., Swann, M., & Muller, R. (2005). *Measurement of occupational well-being in "blue collar" industries*. Paper presented at the Eighth Human Factors in Organisational Psychology Design Symposium., Hawaii.

Maddi, S. R. (1999). The personality construct of hardiness: I. Effects on experiencing, coping, and strain. *Consulting Psychology Journal: Practice and Research, 51*(2), 83-94.

Maddi, S. R. (2002). The story of hardiness: Twenty years of theorizing, research, and practice. *Consulting Psychology Journal: Practice and Research, 54*(3), 175-185.

Maddi, S. R., & Hightower, M. (1999). Hardiness and optimism as expressed in coping patterns. . *Consulting Psychology Journal: Practice and Research, 51*(2), 95-105.

Maddi, S. R., Kahn, S., & Maddi, K. L. (1998). The effectiveness of hardiness training. *Consulting Psychology Journal:*

Practice and Research, 50(2), 78-86.

Maddi, S. R., Khoshaba, D. M., & Pammenter, A. (1999). The hardy organization: Success by turning change to advantage. *Consulting Psychology Journal: Practice and Research, 51*(2), 117-124.

Marchand, A., Demers, A., & Durand, P. (2005). Does work really cause distress? The contribution of occupational structure and work organization to the experience of psychological distress. *Social Science and Medicine, 61*, 1-14.

Nelson, D. L., & Simmons, B. L. (2003). Health psychology and work stress: A more positive approach. In J. C. Quick & L. Tetrick (Eds.), *Handbook of Occupational Health Psychology* (pp. 97-117). Washington DC: APA.

Nowack, K. (1990). Initial development of an inventory to assess stress and health risk. *American Journal of Health Promotion, 4*, 173-180.

Ntoumanis, N., & Biddle, J. H. (1998). The relationship of coping and its perceived effectiveness to positive and negative affect in sport. *Personality and Individual Differences, 24*(6), 733-788.

Ouellette-Kobasa, S. C., Maddi, S. R., Puccetti, M. C., & Zola, M. A. (1985). Effectiveness of hardiness, exercise and social support as resources against illness. *Journal of Psychosomatic Research, 29*(5), 525-533.

Pelled, L. H., & Xin, K. R. (1999). Down and out: An investigation of the relationship between mood and employee withdrawal behavior. . *Journal of Management, 25*(6), 875-895.

Rosengren, A., Hawken, S., Ounpuu, S., Sliwa, K., Zubaid, M., & Almahmeed, W. A. (2004). Association of psychosocial risk factors with risk of acute myocardial infarction in 11119 cases and 13648 controls from 52 countries (the INTERHEART study): case-control study. *The Lancet, 364*, 953-962.

Saks, A. M. (2006). Antecedents and consequences of employee engagement. *Journal of Managerial Psychology, 21*(7), 600-619.

Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*(1), 51-82.

Simmons, B. L., & Nelson, D. L. (2001). Eustress at work: The relationship between hope and health in hospital nurses. *Health Care Management Review, 26*(4), 7-18.

Sinclair, R. R., & Tetrick, L. (2000). Implications of item wording for hardiness structure, relation with neuroticism, and stress buffering. *Journal of Research in Personality, 34*, 1-25.

Skinner, W., & Brewer, N. (2002). The dynamics of threat and challenge appraisals prior to stressful achievement events. *Journal of Personality and Social Psychology, 83*(3), 678-692.

Skinner, W., & Brewer, N. (2004). Adaptive approaches to competition: Challenge appraisals and positive emotion. *Journal of Sport and Exercise Psychology, 26*, 283-305.

Soderstrom, M., Dolbier, C., Leiferman, J., & Steinhardt, M. (2000). The relationship of hardiness, coping strategies, and perceived stress to symptoms of illness. *Journal of Behavioral Medicine, 23*(3), 311-328.

Thoreson, C. J., Kaplan, S. A., Barsky, A. P., Warren, C. R., & de Chermont, K. (2003). The affective underpinnings of job perceptions and attitudes: A meta-analytic review and integration. . *Psychological Bulletin*, 129(6), 914-945.

Tomaka, J., Blascovich, J., Kelsey, R. M., & Leitten, C. L. (1993). Subjective, physiological, and behavioral effects of threat and challenge appraisals. *Journal of Personality and Social Psychology, 65*(2), 248-260.

Tomaka, J., Blascovich, J., Kibler, J., & Ernst, J. M. (1997). Cognitive and physiological antecedents of threat and challenge appraisal. *Journal of Personality and Social Psychology, 73*(1), 1-21.

van Katwyk, P. T., Fox, S., Spector, P. E., & Kelloway, E. K. (2000). Using the Job-related Affective Wellbeing Scale (JAWS) to investigate affective responses to work stressors. *Journal of Occupational Health Psychology, 5*(2), 1-37.

Watson, D., Clark, L. A., Weber, K., Assenheimer, J. S., Strauss, M. E., & McCormick, R. A. (1995). Testing a tripartite model: I. Evaluating the convergent and discriminant validity of anxiety and depression symptom scales. J*ournal of Abnormal Psychology, 104*, 3-14.

Corresponding Author:

Dr Dianne Gardner,

School of Psychology,

Massey University,

Private Bag 102-904,

North Shore Mail Centre,

Email D.H. Gardner@massey.ac.nz